CHAPTER IV

1890-1899

HISTORY OF DENVER WATER SYSTEM
# INDEX

**CHAPTER IV**  
1890-1899

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The closing years of the nineteenth century were extremely difficult ones for the water utilities serving the Denver area. Although the prosperous times of the late eighties continued on through the year 1892, the panic of 1893 brought on partly by the demonetization of silver, hit Colorado, the great silver producing state with an impact that had a lasting effect upon the economic, political and social structure of the city in common with that of the state and nation as a whole.

The great free silver issue during the early nineties brought about new political alignments in Colorado. It caused rifts in parties and made fusion of factions necessary for victory at the polls. It was responsible for the election of Davis H. Waite, a populist, as Governor, who took office in January 1893 when the price of silver was still on the decline and business was in a dangerous condition.

As spring advanced, business began to tighten, uneasiness became more apparent. The gold reserve in the United States Treasury sank to the danger point. President Cleveland fought frantically to maintain it at the accustomed figure of $100,000,000. Commercial houses began to fail, banks
contracted their loans and speculators dumped their holdings on the falling market. In May, there was a stampede for safety. In June the report that the mints of India had ceased the coinage of silver sent the price of that metal to new depths. In four days silver dropped from 83 cents an ounce to 62. This was a great blow to Colorado. The leading mine and smelter owners of the state announced that they must cease activity until a recovery in the silver price would permit profitable operations.

"The Populist Governor, honest, sincere and headstrong was thoroughly distrusted by many and was looked upon as radical and erratic. His political career was hectic, his difficulties legion. No sooner had the legislature adjourned (March 2) than he became embroiled in a conflict with the Fire and Police Board of Denver. Both sides resorted to armed enforcements, cannon were trained on the City Hall, and there was grave danger of a clash of rival forces. Federal troops from Fort Logan were brought upon the scene. Business men and the courts intervened and finally put an end to this "City Hall War" before actual bloodshed occurred."

"The panic broke in full fury in mid July 1893. People swarmed the streets. They stormed the banks amid scenes of wild disorder. In three days, ten banks closed in Denver alone, while throughout the state banks came down with a crash. Numbers of other business houses went to the wall. When the real estate bubble in Denver burst, building and loan associations went bankrupt. Men who were considered wealthy suddenly found themselves empty handed. The goods of the merchant and the manufacturer were in small demand. Economy was forced upon households that had almost forgotten its meaning."
"The closing of mines and the contraction of business resulted in the discharge of thousands of workers. When these began to drift into Denver, the army of unemployed and moneyless men caused serious public concern. Robberies and holdups were common; a brutal murder and a lynching in Denver gave rise to further apprehensions.

"The Panic of 1893 was general throughout the United States and the world.""

"With the panic, hard times, unemployment, strikes, dry farm disasters and defeat of free silver, the general outlook in the middle nineties was dark for Colorado. But there was one bright spot, the rise of the new mining camp of Cripple Creek, resulting from the discovery of gold there by William W. Womack in January 1891.

"During the late nineties there was a noticeable improvement in nearly all lines of endeavor. People, regaining confidence were launching new enterprises. Crops generally were bountiful. Prices improved. Fruit production on the Western Slope was assuming large proportions. As reservoirs were constructed to store water for irrigation purposes, more land was brought under cultivation. Introduction of the sugar beet crop, with the construction and putting into operation of the first sugar factory at Grand Junction in 1899, was but one of the significant factors in the general business revival of the time. Real estate in the cities and towns was recovering its lost value and business generally was showing signs of prosperity."

For more on this interesting decade in Colorado's history see Volume I, Chapter XXIV, "Colorado and its People" by Hafen, from which
much of the above has been taken.

It goes without saying, that this great upheaval in the economic, political and social life of the community had lasting effect upon the several water corporations operating in Denver at the time. This unsettled condition of affairs continued until the fall of 1894, when all of the various companies were consolidated into one under the name of the Denver Union Water Company. This company was incorporated on October 20, 1894, with David H. Moffat as its first president.

An account of the events leading up to this historic event follows in some detail, since the struggle for control of Denver's water system in the early nineties, laid the foundation for extended litigation between local and eastern capitalists, as well as between the corporations they represented and the City itself, that did not end until after the city purchased the privately owned water system some twenty four years later.

The granting of a twenty year franchise by the city to the Citizens Water Company, approved on November 22, 1889, put that newly organized local water corporation in direct competition with the Denver Water Company, which had served the city since the year 1872, and at this time was operating under a franchise not due to expire until May 9, 1891.

The best information available about the condition of affairs, as far as the community water supply was concerned in this competitive era comes from the daily press, even though the editors thereof took sides in the bitter struggle for supremacy then just begun.

For instance, the Republican of January 8, 1890 reported on the plans of the Citizens Company, as released to it by Mr. Richard Holmes, Manager
in part as follows:

"We have let the contract for a high service pipe line from the Canyon to the city. It calls for 19 miles of 30 inch pipe to be completed by May 1, 1890.

"We have sufficient water developed to supply that pipe line for service to 400,000 people.

"We have a reservoir site located between the foothills of the mountains near the mouth of the Platte Canyon, consisting of 640 acres of land, which includes a natural reservoir site of a capacity of 10 billion gallons." - 30,689 acre feet.

"We have secured the water rights from the Platte River and propose to fill the reservoir by extending a full pipe line from the forks of the Platte River in the canyon to the reservoir. This reservoir will hold about a two year supply for Denver, and will be filled from the surplus waters of the Platte during the winter, taking about 5 months to fill it.

"The water in the reservoir will stand from an elevation of about 500 feet above the head of our high service pipe line at the head of Platte Canyon, thus giving us an enormous head at all times to supply all parts of Denver and surroundings.

"The company proposes to have the water in the reservoir next fall so that by the spring of 1891 it will be ready for the city's supply and protection.

"In addition to the reservoir scheme, we propose to extend what we call a low service pipe line, beginning about 4 miles this side of the
canyon, entering the city on Broadway through a four foot pipe. This pipe line will be supplied from subterranean waters taken from the Platte just above Plum Creek.

"The laying of the mains throughout the city will be begun early in the spring and completed by the time we have water ready to bring to the city. The company engineers are preparing plans and specifications for piping the city on a scale sufficiently large to supply a population of 500,000 and this work will progress as rapidly as the others.

"We expect to have our high service pipe line ready to deliver water in the pipes by June 1, 1890. Of course, all the piping will not be completed by that date.

"On the line of our high service pipe line, near Sheridan Heights, a tunnel is being constructed 4 feet in diameter through the hill and is nearly half a mile long. About 1500 feet of the tunnel is already excavated, and about 300 feet of the remainder is already lined. The surveys and preliminary work necessary for construction of our system are nearly all completed, so that by opening of spring there will be no delay in construction."

When asked by a reporter if the Citizens Company would be able to supply the city with a sufficient quantity of water by the time the contract with the old company ran out, Mr. Holmes said: "Oh, yes. I believe the contract the city has with the old company expires in about 18 months. Long before that time we will have water in the pipes. We contemplate turning the water on about the first of June 1890.

"The extensive mains which we expect to lay throughout the city may
not be completed at that time, but before our contract with the city
commences, we will have the city properly laid with pipes and be able to
supply the city with water for all purposes for a population of 500,000 for
several years to come."

Additional publicity on the plans of the Citizens Company was
released to the Republican and published on January 11, 1890 at which time
it was stated that the directors had met the day before and decided to push
operations as fast as money and men could do it. It was reported that a
large force of men was engaged on the construction of a dam at the break
in the hog back which would form the front of the reservoir earlier mentioned
as having a capacity of 30,689 acre feet.

The Citizens Water Company plant as originally planned was that
developed by its Chief Engineer, Mr. C. P. Allen.

In April 1890, the Company retained Mr. J. D. Schuyler, Consulting
Engineer of Los Angeles, California to review the plans of Mr. Allen and
report thereon, which he did on April 25, 1890.

A copy of his report of that date is in department files with the
information quoted below copied from that source.

After stating that he had made a personal inspection of the proposed
field of operations, Mr. Schuyler said:

"The enterprise which you have undertaken is one of great magnitude
and importance. It has been gratifying to me to note the great breadth of
scope and comprehensive, far sighted liberality with which you are inclined
to approach the work before you.

"It is your aim to provide an ample water supply, not only for the
present population of the city, but to lay the foundation for a supply which shall be adequate for the wants of a city of 500,000 inhabitants, which your faith in the future of Denver leads you to believe it will attain within the next fifteen or twenty years. The marvelous growth of the past decade gives very good ground for unlimited faith in the future, and to build up a system of water works for the supply of such a city as Denver is to become, is certainly an achievement worthy of the expenditure of your best efforts, and justifying an outlay of large capital.

"The general plan of your works seems to me to have been admirably conceived. Starting with a supply of the purest mountain water, developed at comparatively small expense from a system of underground cribs in the gravel beds at the mouth of Platte Canyon and delivered into the city by gravity through an inexpensive wooden conduit, in quantity sufficient for the immediate present, while constructing your main works, you have projected a mammoth reservoir and conduit which shall impound and control all the surplus waters of the Platte, which is the only available stream of pure water within reach of the city that promises anything like an adequate supply.

"The quantity of water already developed in the cribs at the mouth of the canyon is about 4 million gallons daily, which is the measure of the flow at the present time.

"Cris are three feet square inside, and the total length of those already completed is about four thousand feet. They are connected and drained by 4,364 feet of twenty four inch wooden pipe, partially perforated which crosses under the river three times, below the last of the cribs, and
terminates in a masonry manhole, located on the right or east bank of the river, at an elevation of 291 feet above the level of low water in the Platte at Sixteenth Street or thirty three feet above the top of the new iron tank on the bank of Cherry Creek at Alameda Avenue."

(Note: An old map, DR 127-No. 39, water department vault, shows a 5-acre tract of land, owned by the Citizens Company, lying on the north side of East Alameda Avenue between South Williams and South Race Streets before vacation, upon which two 660,000 gallon iron tanks were later located. This is about the location of the present John Evans residence).

"From this manhole a 30-inch wooden pipe is being laid to the City crossing the River to the west side a few miles below its head, and following a very direct line to the city limits, which it enters on the Boulevard - Federal at Alameda Avenue. From this point, a twelve inch cast iron pipe is taken out due east along Alameda Avenue to the iron tank, while the main is continued north along the Boulevard with a cast iron pipe 30 inches in diameter to Ashland Avenue, where it turns west one and three fourths miles and terminates in two large distributing reservoirs which are to be constructed just across the County line in Jefferson County, at an elevation equal to that of the top of the iron tank.

"In addition to the cribs already finished two other lines are projected to run along the east side of the river with an aggregate length of 3,200 feet. When these are completed the supply developed should be considerably increased, and it seems to me not unreasonable to expect that you will be able to draw from seven to eight million gallons daily from this source. The
area of gravel beds thus partially drained by the cribs is about 60 acres. The capacity of the twenty-four inch pipe draining the cribs is a trifle less than five million gallons daily, hence it may be necessary to lay another line to the head of the thirty inch pipe when your consumption has exceeded this amount. Provision has been made, however, for drawing water directly from the river into the head of the thirty inch pipe at the lower manhole, and the additional supply to make up the 8,847,000 gallons, which is the capacity of the thirty inch pipe, may thus be diverted from the river.

"Of course, your right to make this direct diversion from the stream may be brought in question, at least in the irrigating season, but it is quite clear to my mind that the water drained out of the gravel beds is just as much at the expense of the flow of the stream as a direct diversion from the surface would be, although it is not so easily susceptible of proof. I think you must anticipate that this question will in time be brought up for judicial determination, in which event, although you could never be deprived of the water while devoting it to the superior use of supplying the city, you might be mulcted in damages. I believe that there are no Colorado decisions on this point thus far, although there are three California and two Nevada decisions, which hold that "Percolating water, or water passing through the soil in any manner other than in a well defined channel, cannot be distinguished from the estate itself, and the owner of the soil may use it as he may desire, free from any usufructuary rights of others." Possibly the Colorado Judges may decide the question differently. Under the circumstances, it would undoubtedly be better to refrain from a direct diversion
of the river in the irrigating season, and increase the capacity of the twenty four inch pipe by laying another when it may be necessary.

"The same measure of doubt as to the extent of legal interference with your operations to which you may be subjected, applies to the suggested plan of a low service supply to be developed by similar submerged galleries or cribs in the valley of the Platte at a lower elevation.

"While it is undoubtedly true that a very considerable supply may thus be developed at a reasonable cost, I can see several objections to the policy of immediately developing this source, in lieu of pushing to completion the great reservoir and the Platte Canyon pipe line feeder, to wit: the uncertainty of the supply obtainable; the insecurity of your rights to the water; the probable inferiority of the quality of the water itself as compared with the mountain water, or that obtained from the cribs at the mouth of the Platte Canyon; the reasonable assurance that the quantity thus obtained will not be adequate to the ultimate necessities; the inferior pressure with which it can be delivered to the city; the necessity it involves of a secondary system of distributing reservoirs, and a separation of the city into two districts of supply; and above all, the greater confidence which would be inspired in your ability to supply the future wants of the city by the immediate construction of a great reservoir and pipe line from the mountains, and the greater satisfaction you can give the public by furnishing pure, soft mountain water. The prestige which you would enjoy by the distinction of having constructed the highest dam in the world is also a factor not to be lost sight of."
After commenting further on the pressure advantages that would thus be obtained, Mr. Schuyler went on to discuss water requirements saying: "An allowance of one hundred gallons per capita per day for Denver would seem to be a sufficient supply". He then commented on the over appropriation of South Platte water, saying that the extent of the claims indicated that every drop of water of the river during the irrigating season - April 15th to November 1st, of each year, would be required to satisfy them. However, Mr. Schuyler remarked that during the other five and one half months of the year, when the water was not required for irrigation, the company would be at liberty to divert the whole stream without prejudice, except perchance to the rights already invested in the Denver Water Company's appropriation of the stream for water power purposes.

Mr. Schuyler frankly stated that he was unable to judge the effect, if any, prior rights might have on the company's appropriation in the Canyon, and said that he could see however that it would be open to attack in that direction.

After calculating in some detail what the supply and the demand for water during low river stages might be, Mr. Schuyler reached the conclusion that a reservoir with a capacity of 5 and 1/2 billion gallons would satisfy all requirements, although it would be desirable to be able to store at least 10 billion gallons to maintain a reserve supply.

After stating that in order to obtain 35 million gallons a day from the stream, which might be difficult, he suggested that the company might
enter into an arrangement with the city whereby the latter would
surrender its City Ditch appropriation of 85 cubic feet of water a second
to the company, in consideration for which the company would deliver
one half that amount for the irrigation at an altitude much higher than
that of the ditch itself. The result would be to give the company more
than 25 million gallons of water a day, which could be taken from the
cribs or through a second canyon pipe line as might be deemed advisable.

Such an exchange, if effected, would make the acquisition of
Marston Lake of great importance as it could be made to store the
compensation water due to the city.

Mr. Schuyler then went on to discuss design and construction
details of the proposed 240 foot high earth dam already mentioned, con­
cluding by saying:

"I should not advise the construction of any lesser dam than 240
feet, as the results would not justify the cost, nor would I advise the use
of the reservoir until the dam had reached its full ultimate height. It
will take two years of steady work to build the dam and by that time, you
may find you will need its fullest capacity."

The next important feature in the plans at the time was a conduit
leading from the forks of the river to the above reservoir.

In discussing it, Mr. Schuyler said: "It looks like a formidable
undertaking when one rides through the canyon and sees the ground over
which it must be carried, but like many other difficult jobs, when studied
in detail it has no impracticable features. A considerable amount of tunnelling
will be necessary, through spurs to save distance, and inside the face of


vertical cliffs to avoid suspending the pipe in dangerous places. The exact length of pipe needed is not definitely known, for the reason that numerous and desirable changes of the line have yet to be made. By the last line run it was about twelve miles to the forks with about one and a half miles further to go up each fork, but I judge that a considerable saving in distance may be made by the changes referred to, cutting out at least two miles in all leaving say thirteen miles including both branches at the head. I should advise the use of California red wood pipe for the whole of this line because of its superior durability and fitness to stand the high pressure which you will have at some of the dips across gulches. Sheet iron pipe is exceedingly difficult to handle in a place like that canyon, particularly pipe of such size. It is so easy to punch holes through it in handling over the rocks, and these will give endless trouble.

"The laying of sheet iron pipe is also difficult and expensive in such a place. Moreover, wooden pipe is cheaper and will certainly be more serviceable. Under high heads it is only necessary to band it proportional to the strain, and make it slightly thicker to withstand the tendency to ooze through the seams. The effect of pressure on the wood itself is rather to compress the fibres and render them more impervious, which is another reason for using redwood, because that wood is softer and more compressible than pipe. From the examination, I made of the line, I estimate the cost about as follows, allowing an average of $2.50 a foot for the 48-inch diameter size pipe:
5 miles at $23,000 a mile ........ $115,000.00
2 miles at $38,000 a mile ........ 76,000.00
4 miles at $18,000 a mile ........ 72,000.00
2 miles at $15,000 a mile ........ 30,000.00
$293,000.00

Total estimated cost of dam and conduit $733,000

The intake of water into the head of the pipe in the canyon can best
be arranged by a series of timber cribs in the bed of the stream similar
to those at the mouth of the canyon, by which means all silt, sand, leaves
and other impurities, as well as drift ice, may be excluded.

"From the end of the conduit at the reservoir, connections should be
made with the main pipe line already laid in order to be able to drawa
water from it without passing through the reservoir. Provision has been made
for this in the laying of the main conduit, which has been banded to stand
100 feet additional head from a point two and a half miles below its upper
end to the city. The connecting line will be about one and a half miles in
length. A pipe from the reservoir will also connect with the same line.

The elevation of the base of the dam is 254 feet above the top surface of
water in the Ashland Avenue Reservoirs and the spillway 477 feet above
the same point. Using 135 feet of this difference in level to give additional
head upon the main pipe there will be from 189 to 342 feet of spare head,
with an empty or full reservoir, which can be put to admirable service in
aerating the water. This may be done by letting it fall in cascades over a
rock channel, or it may be let fall from the top of a high stand pipe, or
forced up into the air through a nozzle and allowed to fall in a fine spray.
In this way the obnoxious effect of the growth of fresh water algae in the
reservoir may be entirely overcome and the organic matter in the water
so deep as there will be in this reservoir, but there is certain to be some, and you are exceedingly fortunate in having the means of so easily removing its unpleasant effect upon the water.

"The distributing reservoirs have been located upon the highest ground available for the purpose in the immediate neighborhood of the City. Those on the west end of Ashland Avenue consist of two basins, which are to be constructed side by side, the western basin to contain 15,900,000 gallons; the east basin to hold 14,300,000 gallons. They will each be twenty feet in depth and when full the water, surface will stand level with the top of the iron tank on Cherry Creek at Alameda Avenue. The excavation of these reservoirs will amount to about 150,000 cubic yards, and cost about $22,500.00. Lining with stone masonry one foot thick, coated with one inch of asphalt concrete will cost about thirty cents a square foot, and as their combined surface is 260,500 square feet, the total cost of lining will be about $78,150. Roofing, gate house, and gates will add, say $25,000 more to the cost of these two reservoirs, making a total of $125,650.00 or $4.15 per 1,000 gallons of storage capacity. The iron tank at Alameda Avenue has a capacity of 584,000 gallons and cost $10,000 or $17.12 per 1,000 gallons of capacity. The iron tanks are of course the most expensive form of storage, but in order to sustain the pressure in the southern portion of the city, they were the only resource.

"The pipe system through the city as laid out by your Chief Engineer seems to me a comprehensive and excellent one. I was struck
on looking over the plan with the fact that the general design was almost identical with those which I have heretofore planned for cities and towns in California, providing as it does for present needs and for almost indefinite extension of capacity in future, without removing any pipe previously laid. A circuit of large mains surrounds the central portion of the city and passes through it in opposite directions, giving abundant supply in response to every tap and call. The only criticism I can make of it is in the insertion of a piece of wooden pipe on the Boulevard between two sections of cast iron pipe.

"The Boulevard is likely to become a very busy street, and wooden pipe is not so desirable for tapping and maintenance in a crowded city as iron. I should advise a change to this extent that the wooden pipe be carried north from Alameda Avenue to Fifteenth Avenue-Colfax - on the Boulevard, where a thirty inch cross main is designed to tap it, and lay all the rest of the line to the Ashland Avenue reservoirs with iron pipe of suitable weight. The reason for this is that the carrying capacity of the wooden pipe is considerably greater than iron of the same diameter, and the full capacity of the main into the city should be extended to this point of junction in order to avail yourselves of all the water the wooden main will carry.

"I have been exceedingly interested in the investigation of your scheme, and can assure you that in my judgment it has no element of doubt beyond the possible complications arising from your rights to draw water from the Platte. As far as the engineering problems involved are
concerned, they are all simple and easily solved by those who understand them.

"The profits that may be derived from your work when completed, supplying water by gravity, without the cost of pumping to a city of this magnitude, will certainly be entirely satisfactory.

"From the conversations I have had with some of your directors, I understand that you would like some expression of my opinion as to the water supply available in Cherry Creek from the sub-flow of the stream. This is evidently a matter of no little interest to you, as the old company is apparently concentrating all their efforts for a supply in that direction.

"Their works are located just above the wagon bridge, some seven miles above the city, where they propose to sink a huge crib or caisson, across the channel to be 800 feet in length, 16 feet in width and to rest on bed rock 70 feet below the surface. They thus expect to intercept the subsurface flow and drain the entire valley above."

Mr. Schuyler then goes on to discuss the hydrology and possible yield from that valley concluding that, if it were possible to collect all of the subflow in a year like the past one, a yield of ten to twelve million gallons daily might be the result.

Granting that the past year had been an extremely dry one, he goes on to say that it seemed hardly possible in a channel like Cherry Creek to collect all the sub-flow in the sandy bed of the creek near Denver, or to even estimate the amount that would really be available. He stated further that it all was in the realm of speculation with one man's guess as good as
any other. After stating what he thought the old company's Engineer was basing his estimate of an unlimited water supply upon, he very frankly refused to hazard an opinion on the subject, ending with the statement: "I am inclined to think, however, that if Denver depended upon Cherry Creek alone, her future water supply would be somewhat precarious."

Here then, was the nucleus of an entirely new water system designed to serve the Denver area. Although modified in important construction details as the work of installation progressed, the basic concept of a full gravity supply of mountain water, free from all contamination, was never forgotten.

Within fifteen months from the date of organization, the Citizens Company under the determined leadership of Messrs. Moffat and Cheesman, had secured a large share of the water patronage of the people of Denver, fighting its way, inch by inch, through injunctions, harassments, personal encounters and a bitter rate war, that continued until April 6, 1894, when an armistice was signed which eventually resulted in a consolidation of the old and new companies and the organization of the Denver Union Water Company on October 20, 1894.

Returning to the early days of 1890 we find the following news item in the Republican of January 17th.

"It appears that instead of one gigantic water works system, Denver will have two of the largest in the west. The Republican is enabled this morning upon what it conceives to be a reliable authority, to state that the
old Denver Water Company has virtually fallen into new hands, and that arrangements are on the tapis and near perfection by which several hundred thousand dollars will be expended in enlarging the old plant and making it one of the largest and most complete in the west.

"From several members of the Board of Supervisors who returned yesterday from a visit to Omaha, the Republican is informed that the interest of the Archer estate in the stock of the Denver Water Company has been purchased by the American Water Company, represented by President Underwood who was recently engaged in completing a large plant in Omaha, and that work will shortly begin on the work of enlargements and extension in this city.

"It is also learned from a thoroughly reliable source that the new company has already let a contract for 15,000 tons of iron water pipes to be used in the extension of the reorganized plant of the city. It will be a formidable rival in every respect of the Citizens Water Company now engaged in putting in its plant, and Denver may at least expect competition in water rates such as few cities in the Union enjoy.

"The Archer estate held a controlling interest in the stock of the Denver Water Company, and this having been purchased by the American Company gives that gigantic corporation a strong hold in Denver which will make things hum. The Denver owners of the remainder of the stock in the Denver Water Company including Messrs. Sullivan, James, Mills, Kassler and others will retain their interests, and being citizens of Denver and interested in its welfare, will be apt to make it very interesting for all competitors."
"The American company which will succeed the Denver Company in the enlargement and operation of the works, is one of the strongest in the country. Its plant now nearing completion in Omaha is said by the members of the Board of Supervisors who inspected it this week, to be the finest in the west. The machinery used is of the most improved pattern, and the water is rendered clear and pure by a system of filtration through a series of basins, the design of which is the exclusive property of the American Company. The plans and specifications of the Denver plant are not quite ready for publication, but the Republican is assured they eclipse anything offered to the Queen City of the Plains in the problems of future water supply."---

With the announcement that eastern capital had obtained majority control of the Denver Water Company and that the company intended to enlarge and extend its water works plant and system regardless of the published plans of the Citizens Water Company to build a new and competing system for Denver, the battle between them for supremacy was joined.

Since it would be virtually impossible to record all of the many political, legal and economic measures taken during the year 1890 through 1894, by one company against the other, only the more important ones will be noted here. These will be grouped under general company headings for simplicity's sake rather than concurrently in time sequence, as would normally be the case.
On January 24, 1890, the Republican published an open letter addressed to the citizens of Denver by the Denver Water Company, dated January 23rd, in answer to one printed the day before, outlining further plans of the Citizens Company which read in part as follows:

"As it is known to all except the gullible that - the Citizens Company has neither money, land, water, franchise nor anything but plans, and that its plans have no other object in view other than to drive a bargain with the Denver Water Company, it might be passed without notice; but a pretended statement of facts might mislead some innocent people, and it is therefore deemed best to answer".

After stating that the Citizens Company claim to control all the available water bearing land in the vicinity of Denver was manifestly absurd, and that its proposed reservoir system might be suitable for irrigation, but never for domestic water, the letter went on to say: "The secondary parties then disclosed their interest in certain lands and admit that their scheme is not to make money out of good water service, but to enhance the value of their Denver Real Estate by piping suburban districts.

"That was the policy of the Denver Water Company when the present management of the Citizens Company controlled it, to wit:

"To run the water company as a tender to their real estate speculation at the expense of the public service. The present management has no such ulterior object. It has labored strenuously since last spring, when it came into possession, to remedy the defects of the former management, and has succeeded in assuring to the city a first class service in all
respects."

"Whenever the Denver Water Company makes a move to improve the service, the Citizens Company runs its mains through the newspapers seeking to hinder and embarrass this great public improvement, and so to work a great injury to the city to promote this scheme admittedly for private gain in real estate speculation."

On this same date, it was announced in the press that the Denver Water Company was about to install two new pumps of 6 million gallons capacity a day each, at a cost of $65,000, and that when completed the company would have the finest pumping outfit west of the Missouri River.

The Board of Aldermen held a meeting on January 31, 1890 at which time the Denver Water Company submitted a proposed 20 year extension of its franchise for consideration. The letter accompanying the document in question recalled that the company had previously submitted an ordinance for a similar extension - on May 31, 1889 - but had later withdrawn it as the result of opposition inspired with a view to the promotion of a private speculation.

After stating that a contract had been entered into with the American Water Works Company to make substantial addition to its plant, various features of the proposed franchise extension were commented upon, which among other things, contained a stipulation that the rates to be charged consumers should not exceed the average rates charged by the municipally owned water plants of Chicago, Cincinnati and St. Louis.

This ordinance was submitted as Aldermanic Bill No. 44.
One week later, on February 6, 1890, the Board of Aldermen, by a two-thirds vote approved of the franchise as submitted, but only after an extended and heated session at which time the Citizens Water Company vigorously opposed its passage, but to no avail. It should be noted that the Denver Water Company was represented by its Attorney, Thomas M. Patterson, who was the architect of the franchise as passed. In the course of the debate between the Attorney's employed by both companies to argue their cases before the Aldermen, the Republican reported that "it was positively alleged, and not successfully controverted, that the Citizens Company had offered to take and the Denver Company had offered to pay $750,000, for the franchise recently granted to the Citizens Company. This of course, included the plant and property acquired by the new corporation since its organization. For some reason the negotiations fell through, and each company now declares that it has no desire to have further dealings with the other in the matter."

At this same meeting, it was reported that the Denver Water Company had formally protested to City Engineer McIntyre his action in granting permits to the Citizens Company to dig trenches and lay pipes inside the city. After consultation with the City Attorney, Mr. McIntyre issued the requested permits since he was advised that it was his duty to do so.

The Board of Supervisors met on February 10, 1890 and passed the 20 year renewal contract of the Denver Water Company over the vigorous protest of Supervisor Russell. In explaining his negative vote, Mr. Russell gave three reasons why he thought the franchise should not be granted. The first was that since the present contract did not expire until May 9, 1891,
the intervening time would be good for competition; second, he thought the city should hold in reserve its right to purchase the plant in 1891, and third, he did not care to take the risk of being in contempt of court, since there was an injunction enjoining the city from taking any action on a contract.

The injunction referred to being that of September 12, 1889 issued in connection with the City Council resolution, passed and later rescinded, in which that body waived its right to purchase the plant of the Denver Water Company as reported in the preceding chapter.

On February 12, a meeting was held by the Denver Chamber of Commerce at which time a lively discussion was had, resulting in a resolution being passed asking the Mayor to veto the bill providing for the Denver Water Company franchise renewal.

After considerable deliberation, Mayor Londoner, late in the afternoon of February 15, 1890, vetoed the measure as requested, giving his reasons therefor in much detail, closing his written communication to the city council with the following paragraph:

"In any event, and however impracticable you may deem the purchase in 1891, certainly the option should not be postponed to 1910, nor should it be waived at this time. You may hardly appreciate how unpleasant a duty it is to disapprove of any action you may take, but believing as I do, that it is a duty, and feeling that it is for the best interests of the large majority of the citizens, I am compelled to withhold my signature from the Bill."
The next obvious step to be taken by the Denver Water Company was to ask the District Court to grant a hearing on the injunction referred to above with the object of getting it dismissed or at least amended, so as to permit the franchise renewal to become effective, without a cloud of any kind upon it.

Although the injunction in question was against the city proper, Mr. Patterson, attorney for the Denver Water Company, undertook to handle the case for all the named defendants.

Action was started on February 25 when a request for an immediate hearing was presented to District Judge Allen by Mr. Patterson. The necessary answers were filed and the hearing begun on March 2, 1890. After an extended, and at times a very bitter court hearing in which Mr. Patterson leveled charges of conspiracy and bad faith against various officials of the Citizens Water Company, but never legally proven; this particular injunction proceeding was modified by Judge Rising on April 3, 1890.

In reporting upon it, the Republican the next day said: "Yesterday afternoon Judge Rising modified the injunction obtained by the Citizens Water Company restraining the City Council from acting upon the water question by resolution, and last evening, the Board of Aldermen met and passed the contract ordinance of the Denver Water Company over Mayor Londoner's veto by a vote of 6 to 2".

Some interesting facts of law were developed in this particular action, but in the final analysis it appears that had the City Council proceeded by ordinance instead of by resolution in dealing with the waiving of the option
to buy the plant of the Denver Water Company, the injunction would never have been issued in the first place.

Apparently, the Board of Supervisors took proper affirmative action at once, since publication of Ordinance No. 44 of 1890 was begun in April 11, with the Denver Water Company filing its official acceptance of the new contract on April 12, 1890, thus extending its franchise for a period of twenty years, commencing May 9, 1891. (See 1907 Edition Franchises and Special Privileges, granted by the City and County of Denver beginning on page 692, which includes Schedule A, water rates, as approved on April 10, 1890).

About this time litigation between the two water companies was going on in several places at once, with the Republican reporting on April 17, in a news item which said: "The suit of the Denver Water Company vs. the Citizens Water Company was continued before Judge Graham yesterday, resulting in an inglorious defeat of the plaintiff. This makes the fourth legal contest between the companies, three of which the Citizens Company has won. The fourth was a contempt case, which is only a partial defeat, since Judge Rising in his findings admonished the legal representatives of the new company - Citizens - that if the contract ordinance - Denver Water Company - was not legal there was another method for reaching it.

One of the more important of the numerous legal battles between the two water companies in this period, was the one referred to in a news item printed by the Republican on February 27, 1890. The article read in part as follows: "The war is on." The gun fired by the Citizens Water Company to demolish the contract which the city council intended to make
with the Denver Water Company has been answered by a whole broadside. 
The Denver Water Company has procured an injunction against the Citizens 
Water Company. The injunction was filed late yesterday afternoon by 
President Sullivan, and marks the commencement of hostilities that may 
be of long and bitter duration".---

After reciting the history of the water plant, the complaint stated 
that: "The principal consideration due to the plaintiff and its predecessor 
was the grant made to it in its franchise by the City of Denver of the sole 
and exclusive right to lay pipes for the distribution of water within the 
city limits of Denver for 17 years."---

Also, the Denver Water Company alleged in its complaint that the 
ordinance granting the right to the Citizens Water Company was not as 
provided for in the Charter and that by reason of that fact it was wholly 
inoperative and void. The complaint, a lengthy one, was brought about 
by the City Engineer refusing to issue a permit for the Denver Water 
Company to enter upon 16th Street at the same time the Citizens Water 
Company was installing its mains there.

After the usual hearings and procedures, District Judge Decker 
dissolved the injunction on April 11, 1890, ruling among other things as 
follows:

"Holding as I do, that the contract of May 9, 1874, fails to give 
the plaintiff company the exclusive right to lay water mains and pipes 
in the streets of the city, and that the ordinance under which the defendant 
company claims a right to lay its water mains and pipes in said streets
is also void, the question arises as to whether the temporary injunction should be made perpetual". --

"In my opinion, it is the duty of the city council to regulate the manner of laying pipes by these companies, so that the rights of each will be respected, and the rights of the public are not unnecessarily interfered with.

"The City Council having the power to grant to the defendant - Citizens Company - the right to lay its pipes in the streets of the city, and the plaintiff - Denver Company - under contract having already that right, each of them subject to such reasonable regulation that the city council may provide if one company shall illegally interfere with the other then upon proper application to the court it will be time enough to consider questions of that nature?"

"The judgment of the court will be that the injunction be dissolved and the complaint dismissed."

This decision against the Denver Water Company was appealed by it to the State Supreme Court on April 15, 1890, where, for undisclosed reasons, Docket No. 2840 lay dormant until the following entry was made in the State Supreme Court records of January 21, 1895;

"Now comes appellant - The Denver Water Company - by C. J. Hughes, Jr. Esquire, and on his motion it is ordered by the Court, that the order heretofor made for oral argument herein this day be vacated and the cause passed in accordance with the stipulation of the parties filed."
No copy of the stipulation seems to be available, hence it is assumed that since the two companies had been consolidated the previous October there was no point going further with this litigation.

The struggle for public support by means of the daily newspapers was continued by the Denver Water Company in a feature article printed in the Republican on March 23, 1890.

In this article it was stated that the American Water Company was proceeding to provide a supply of water which its President said would be ample for the needs of Denver when a population of 500,000 people had been attained. To do this, two million dollars was to be expended and added to the two million dollars already invested in plant.

500 men were at work in nine different gangs about the city and an immense underground reservoir with 50 million gallons daily supply was to be built at a location about six miles up Cherry Creek. This would give a gravity pressure of from 115 to 120 pounds to the inch within the city.

The pumping station at West Denver was being reconstructed with another pump of 6 million gallons capacity being added. Thirteen miles of wooden pipe in the city had been or would be replaced by iron pipe, and in addition, about 55 miles of new iron pipe was to be laid, a large portion of which would reach new sections with some replacing existing smaller pipe. Dead ends in the distribution system were to be eliminated, so that a constant flow through the entire system could be had. The large supply mains were being put in three semi-circles, one sweeping around the business section, a second taking Broadway and Tenth Avenue for its
greatest circumference and a third making a grand tour around by way of Alameda Avenue.

It was estimated that for the city extensions 16,000 tons of pipe would be required with the flow lines requiring from 12,000 to 14,000 tons more.

A 24-inch line was being laid leading from the West Denver pumping plant, under the railroad tracks eastward around Lincoln Park to Broadway. At South 8th Street it turned to 6th Avenue and thence on that street to Broadway.

The foundation for the new pump at West Denver was built on bed rock, and when this pump was installed the capacity at that location would be increased to 30 million gallons daily.

In the Platte River galleries, seven miles south of the city, a great enlargement was under way. One new gallery 600 feet in length had been cut and several others deepened and widened. At the original Cherry Creek supply point, 6 miles southeasterly, several galleries were being added from which a new main was to be laid. The second pump of 6 million gallons daily capacity was to be installed at the original 15th Street pumping plant.

The greatest work to be done was that in connection with the new plant on Cherry Creek. Captain Ruger, the Chief Engineer estimated that an additional supply of 35 to 50 million gallons daily would be developed here. Upon completion of the projects as contemplated, the company expected to have a supply of about 62 million gallons a day available at all times. The wooden pipes were being supplanted by iron because
they were a breeder of vegetable growth, according to the Captain.
He stated that in one section of wooden pipe taken up a nine foot tree
root had been found.

Again on May 30, 1890, the Republican published further details
on the new Cherry Creek development.

The diversion dam was to be a submerged one, designed to inter-
cept the subterranean flow of water under Cherry Creek. Its length
was to be 700 feet, its height from bed rock to the creek bed varied from
60 to 70 feet, which would allow the stream flow or freshets to pass over
its top without damming up the creek. The plan provided for a water
gallery 700 feet long, 70 feet deep and 16 feet wide from which the contents
would be pumped into a storage reservoir located west of Cherry Creek
on the Faber Ranch. Sec. 34, Twp 45, Rge 67 W - of about 50 million
gallons. This would give superior gravity pressure sufficient to reach
the highest building in Denver and cover the whole country east, west and
south of the city.

Construction work at the time was being done with a force of 50 men and
2 horse teams, to be increased within 60 days to 500 men.

The pumping station was to be 150 X 70 feet, with its foundation
resting in bed rock. The building itself, above the foundation was to be
of stone, housing 2 triple expansion pumps of 15 million gallons a day
capacity each.

A boarding house, 200 feet long, 2 stories high with a dining
room 100 feet by 30 feet had been completed and contracts had been let
for 3 brick dwelling houses and a brick storehouse, all to be permanent structures.

Two switches had been taken off of the Denver-Texas and Gulf Railroad at Oakdale, 10 miles from Denver.

The estimated cost at the time of all of these improvements was $500,000.

The American Water Works Company asked for proposals for the construction and erection of two triple expansion pumping engines for the Denver Water Company to be placed at its new pumping station at Sullivan, Colorado, early in 1890.

The proposal accepted was that of The Edward P. Allis Company of Milwaukee, Wisconsin. This proposal per Schedule "B", was dated May 20, 1890.

The cost erected on foundations built by the water company was $170,000 with the first engine to be ready for operation on April 1, 1891 and the second by October 1, 1891.

A copy of the specifications, providing that they operate against a head of 200 feet with the water ends to be set in a pit about seventy feet below the floor of the pumping station and the contract under which they were purchased is to be found in water department files, #250, Document No. 44.

These engines were guaranteed to each pump 15 million gallons of water a day at a piston speed not exceeding 160 feet a minute, with a guaranteed duty of 130 million foot pounds from each 100 pounds of coal.
consumed, based upon a boiler performance of the evaporation of
ten pounds of water per pound of coal consumed, with a steam pressure of
125 pounds a square inch.

A typical incident, illustrating the extremely personal feeling
that existed at this time between the two water companies and their
employees is that reported by the Republican in its issues of June 24th
and 25th, 1890.

In quoting Manager Holme of the Citizens Water Company, a
reporter wrote: "When the Denver Water Company learned of our purpose
to bring water from the mountains, they bought a half mile strip of land
this side of Platte Canyon, on what is known as Coleman's Ranch for the
purpose of shutting us out from the city, knowing that in order to get
our lines through we would require a right of way over this piece of
ground. The question was brought before the Jefferson County District
Court, and a strip 40 feet wide was condemned for the use of our Company.

On this order of the Court, we sent our Engineers and workmen to take
possession of the ground and proceed to work, but when our men arrived
they were confronted by a dozen armed men, headed by Bat Masterson,
employed by the Denver Water Company, and our men were ejected from
the premises. I am surprised at this action of the Denver Company in
this matter, for it is clearly an illegal proceeding, since the question
has been argued in court for a month or more and the case decided in our
favor. We had the authority under the Court to proceed with the work, and
we will now let the court enforce its own order. We have the pipe laid
up to that point and had the Denver Company not interferred, we would have had pure mountain water in Denver within the next 30 days.

"Mr. Dennis Sullivan, President of the Denver Water Company was called upon at the time by the same reporter but refused to talk.

On the following day, Mr. Holme was quoted as saying: "Our men began work on the premises this morning, but had worked for only a short time when a posse of armed men sent by the Denver Company appeared and ordered the men off. Our Chief Engineer read the order of the Court to them and exhibited a receipt for the deposit we made with the Court for the price of the land, but no attention was paid to either, so as we have the law on our side, our men withdrew without making resistance. They left the teams standing and the Denver Company's force unhitched them and lead them off.

"As soon as we heard of the matter, we made out an affidavit to the action of the Denver Company, which will be filed in the Court tomorrow and it will then rest with the Court to enforce its own decree. Sullivan, Patterson and McManus, as instigators of the trouble, together with the entire force of men employed to resist us, will in all probably, be ordered arrested for contempt of court."--

Mr. Dennis Sullivan again refused to be interviewed on the matter. On June 27, 1890, Judge Becker of the District Court, of Jefferson County had warrants issued and ordered the Sheriff of Arapahoe County to arrest Dennis Sullivan, Thomas Patterson and F. B. McManus. This order was carried out and these three, high Denver Water Company officials, appeared in Court at Golden on June 29, 1890. No record has been found of the
proceedings at that time, but events following prove that this attempt
by the Denver Water Company to stop the Citizens Water Company from
delivering mountain water to Denver was successful for a few days only.

On August 19, 1890, the Denver Water Company applied for and
obtained a temporary injunction in the District Court against the Citizens
Company from severing any Denver Company services until at least 24
hours notice to do so was given in writing.

In its petition, the Denver Company stated it had about 180 miles
of iron mains in the streets of Denver with close upon 10,000 service
connections to them. The petition also alleged that the Citizens Company
had taken forcible possession of the Streets of Denver in defiance of
city ordinances and had laid about 25 miles of pipe and was constantly en­
gaged in soliciting business and had succeeded in taking 170 customers
away from it.

Upon conclusion of the hearing held on this matter, District Judge
Allen, on September 9, denied the Citizens Company motion to dissolve
the temporary injunction related above, but amended it so as to compel
both companies to give 24 hours notice whenever the one intended to inter­
fere with the pipes of the other for the purpose of disconnecting services.

On October 24, the Denver Company appeared before Judge Allen
asking him to cause the Citizens Company to show why it should not be
held in contempt of Court, for violating the Court's order of September 9th,
citing among other instances the disconnection made without notice of the
service to the Arapahoe Building at 1852-1862 Blake Street.
A news item dated November 8 recited the great activity at Sullivan, a little town southeast of Denver, headquarters for the Denver Water Company's new engine and reservoir plants, stating that 20 houses had been built within the past 15 days and that the town had 2 hotels of 40 rooms each for the accommodation of water company construction crews.

This item was followed by one dated November 13, 1890, revealing the fact that Articles of Incorporation had been filed the day before, providing for the consolidation of the Denver Water Company, The Beaver Brook Water Company, and the Mountain Water Company under the name of The Denver City Water Works Company.

It should be remembered that the Denver Water Company had a wholly owned subsidiary, The Domestic Water Company, incorporated on March 24, 1886 for the purpose of constructing the original Cherry Creek galleries and the first Capitol Hill storage reservoir, which automatically became a component part of this newly organized company. The result therefore was to put but two privately owned water companies in the Denver field from this time on.

The Denver City Water Works Company was capitalized with 20,000 shares of stock, par value $100, or $2,000,000 of preferred stock and 50,000 shares of 7 percent cumulative common stock. Authorized bonds in addition totalled $7,000,000.

The directors of the new company were: W. P. Robinson, President, succeeding Dennis Sullivan, J. H. Pullen, Vice-President, M. A. Wheeler, Secretary, C. B. Rhodes, Treasurer, together with W. H. Hawes,
W. F. McCue, Jr., H. N. King, Phillip Feldhauser and J. C. Montgomery.

A progress report on the work being done at Sullivan was printed in the Republican for December 6, 1890 at which time President Sullivan said his forces were concentrated on the submerged dam being built at that point with a reservoir having a capacity of 43 million gallons and having been completed there.

The first hint to the public that all was not well financially with the Denver City Water Works Company, was contained in a news item printed by the Republican on December 10, 1890. At that time, it was reported that John Hipp, an attorney would cause a mechanic's lien to be served on the Denver City Water Works Company plant at Sullivan, on account of unpaid wages due workmen on a subcontract, the amount in question being $81. The lien was to be served on the entire Sullivan plant, with reports that other similar unpaid accounts existed but not there named.

A rumor was circulated among Denver business circles on December 12th, to the effect that the Denver City Water Works Company had sold its entire plant and franchise to the American Water Works Company which would absorb the former company and carry on its business thereafter.

It was noted by the Republican in its news item that the Denver Company a few days before had requested a contractor to cease work on the pipe lines then being installed with all gangs laid off and work practically stopped.

When contacted by reporters, officials of the Denver Company said they had no information on the rumored sale and refused to comment upon it.

Construction work on plant extensions and other facilities of the Denver Water Plant was resumed on March 2, 1891. President Underwood
saying that: The financial arrangements requisite had been fully made and that it was planned to spend upwards of one and a quarter million dollars during the spring and summer of that year. The reason for suspension of work in December 1890 being given as due to cold winter weather alone. Work was to be resumed at Sullivan and vigorously pushed to completion. Mr. Underwood was quoted as saying that: "The works there will make that point one of the show places of the suburbs of Denver and that at that point could be seen some of the finest, most substantial and ponderous water machinery in the world. The daily water supply there would be upwards of 100 million gallons, and would be taken without interference with the rights of other water users on Cherry Creek."

The effect of competition between the Denver and Citizens Water companies was brought out by an open letter written to the citizens of Denver by the Denver Company as early as April 24, 1891. In this letter it was stated: "We are creditably informed that certain persons are going to you and representing that by disconnecting from our mains and using some other source of supply, you will obtain a purer, better quality of water than you now receive. The assertion is false, and known to be such by those who make it.

"The water furnished through the mains of the Denver City Water works is of better quality than any furnished by any public supply in the city and particularly in reference to all those qualities which involve the health of those using it is very much superior. This can easily be demonstrated by a call at our office."
"This company is now giving about double the pressure throughout the city which was given by former management, and on April 30th, next, at midnight, the pressure will be further increased by about 35 pounds.

"Since the change in management of the Denver Water Company our endeavor has been to constantly increase both the efficiency and quality of the service, and by remaining connected to this company's mains, our patrons will be sure of adequate service and good quality for their money."

"To all patrons in the City of Denver paying for their licenses for the six months ending, November 1, 1891, on or before May 20th next, the following discounts will be made upon our rates - Schedule A in franchise - Irrigation 50%; other rates, 20%; which will make the cost of irrigation $5.00 per lot, and 20% reduction on all other rates.

"You may be solicited under the assurance of free water or some lower price, but no one gives something for nothing and we advise our patrons to not be mislead into making changes hastily which will involve you sooner or later in the expense of changing back to our mains at your own expense in order to obtain adequate service and water of the best quality".

This was followed by an advertisement dated April 26, 1891 which stated that "the water supply of the Denver City Water Works Company is taken entirely from horizontal wells and galleries in the gravel beds in the valleys of the Flatte and Cherry Creek, not a drop coming from any other source. The river may be as muddy as it possibly can be, but not water is taken therefrom under any circumstances. Analysis shows it the best and most healthful water in Denver."
In writing editorially on the competitive water situation on April 30, 1891, the Republican, among other things, said: "The competition caused by the struggle of the companies for patronage has already effected a large reduction in the cost of water service in the city, and to that extent it is a very good thing for consumers. It also doubles the supply of water available for all purposes."

Another editorial in the same paper appeared on May 1 in which it was noted:

"Within the past 36 hours, the Denver Water Company has been forcing the pressure in its mains in order to be ready to stand the test of 115 pounds to the square inch in the hydrant in front of the Union Depot, which is required by the new contract with the city, which goes into effect today. As a result, some of the mains have given way on the severe strain to which they were subjected and in two or three instances, private property has been somewhat damaged by flooding."

"As a matter of course, the maintenance of a pressure of 115 pounds at the level of the Union Depot and the corresponding pressure according to the elevation in all other parts of the city will insure better protection against fire. Heretofore the pressure in the mains has been so low that a line of hoses attached to a hydrant would not throw water above the second story in the business section of the city, but the pressure required by the new contract between the city and the Denver Water Co., if faithfully maintained, a line of hose attached to any hydrant below Broadway should throw a stream over the top of the highest building in the city without the intervention of a fire steamer."
Note: The hydrant pressure maintained by the Denver Water Department at the Union Depot in 1964 varied from 80 to 100 pounds per square inch. Of course, the fire department now had equipment to utilize the water available at that point to almost any amount and any desired pressure.

Publicity on pending changes in the management of the Denver City Water Works Company was admitted by Mr. Sullivan when questioned by a Republican reporter on May 8, 1891 at which time he said: "Nothing that I know of except there is a consolidation with The Denver City Water Works Company and a part of the American Water Works Company, which will be announced by the filing of Articles of Incorporation next week."--

In commenting on this development, the Republican said: "What the consolidation means is very likely the operation of the Denver plant and the Omaha Plant under one management, though no declaration has been made to that effect. It has been well established for many months that The American Water Works Company and the Denver Water Company are so intimately joined by virtue of combined interests that a consolidation under one name would naturally follow.

"Mr. Sullivan will be Vice President, it is understood, of the American Water Works Company."

A certified copy of the Articles of Incorporation, dated March 31, 1891, of the American Water Works Company, a New Jersey corporation, was filed with the Colorado Secretary of State at Denver on May 15, 1891.

The capital stock of the company, fully paid up, was given as 13 million dollars, with no additional bonds authorized on the Denver plant.
The officers of the new corporation were: W. A. Underwood, of New York, President; Dennis Sullivan of Denver, Vice-President; F. T. McManus of Denver, Secretary and Agent of the Company in Denver and Edward Ruger, Chief Engineer. It was stated at the time that the Denver works would continue under its own name.

Among the many disputes between the Denver and Citizens Water companies over service given to individual patrons, the one reported in the daily press on August 1, 1891 in connection with water service to the Denver and Rio Grande Railroad shops, seems worthy of notice at this time.

As reported in the Republican, the Denver Company secured a temporary injunction against the Citizens Company who desired to take possession of and use a six inch main to Burnham, the one through which the Railroad Company had been taking water from the Denver Company since the year 1883.

The railroad company had concluded that the reduced prices and superior water of the Citizens Company suited them better than the water of the Denver company and had entered into an agreement to make the change. Upon notification by the Citizens Company to the Denver Company of its intention to take possession of the Burnham main and thereafter take over the water service, the Denver company stationed a guard at the valve through which the main was served and succeeded in protecting its position until the morning of July 31, when it secured its temporary injunction. The Denver Company claimed that the six inch main in question was its property and that it would be taken up, rather than let the Citizens Company use it.
On the other hand, the railroad company thought that the main belonged to it and it therefore devolved upon the court to determine the facts at the time the motion to make the injunction came up. In an interview with a Republican reporter, the Attorney for the Denver Company, a Mr. Hartzell, declared that the Denver Company would fight the Citizens Company even to the extent of losing money on its property. He said that the American Water Works Company, a gigantic corporation with 17 million dollars capital which owned the Denver plant was making so much money out of their possessions in other cities that it was not necessary for the Denver plant to pay expenses.

However, the Republican on August 3rd discussed the recent resignation of President Underwood, quoting Mr. Sullivan as saying that he thought that resignation resulted from Mr. Underwood having amassed enough money to satisfy his wants.

There were rumors current of serious disagreements having arisen between the officers and stockholders of the company that forced the resignation although most people placed little credence in them.

As a result of the hearing held upon the temporary injunction issued against the Citizens Company on July 31, that injunction was
dissolved on August 21, 1891 by stipulation, since it was proved to the court that the 6-inch service main in dispute was in fact owned by the railroad company. In this case, the Denver Company was forced to surrender unconditionally relinquishing all claims for damages.

When the Citizens Company attempted to transfer the service connection from the Denver system to its own line, a small sized riot broke out between employees of the two companies. Superintendent D. C. Thomas of the Denver Company appeared upon the scene, South 5th Street and West 12th Avenue at 10:30 A. M. August 24 with a gang of 15 men and one Molly McGuire, a woman, and attempted to stop the work being done by the Citizens Company forces by flooding their trench. The row that ensued, in which pick handles and other clubs were freely used, resulted in 17 men with Molly being arrested for disturbance, released on bond and later tried in police court.
Recourse to the public press was once again taken by the Denver Company in an all out attempt to stop the transfer of water services from its mains to those of its young competitor. A notice to water consumers printed in the Republican of September 15, 1891 read in part as follows:

"Between now and November 1st next, you will be visited by the agents and solicitors of the Citizens Water Company. They will personally and by advertisements in the papers, make all sorts of representations about their water and the prices for the same, to induce you to connect with their mains. They will endeavor to make you believe that their company alone is supplied with pure, soft mountain water and that they have the only available and adequate supply and that their prices are much lower than ours. On neither of these points are they truthful or correct. That their water is from the mountains originally is true enough, as is necessarily all of the water supplied from the mains in the city of Denver. That it is pure and soft is not correct, because they secure it from open irrigating ditches without filtering or cleansing process of any kind, and conducted to the city through a leaky wooden pipe of one inch common pine boards, in which a growth of vegetable and fungus matter takes place and soon decays; therefore their water cannot be pure and healthful. On the other hand, every drop of our water, all of which comes from Cherry Creek and the Platte river, is perfectly filtered and free from surface contamination, and is taken from tunnels and galleries 15 to 30 feet below the surface of the ground, out of the sand and gravel beds of these two sources. We request (and this
will be as much to your advantage as ours) that you do not accede to their solicitations and misrepresentations of the opposition company. To those who are now using water from the Citizens Company mains, and are dissatisfied with it, we will connect you back to our mains free and give you pure wholesome water making no charge for same from now until November 1, next. In the matter of prices, we need only say we have been selling water as cheaply as anyone, and we will continue to do so."

The water company war broke out again on October 28, when employees of the Citizens Company undertook to transfer the service serving a property at 19th and Pearl streets from the main of the Denver company to that of its own. Superintendents Thomas of the Denver Company and Holmes of the Citizens Company were taken to police headquarters and their forces except two men on each side, left as sentinels, dispersed by the police.

At police headquarters, Alderman McGilvray, a staunch supporter of the Denver Company attempted to interfere without success and was induced to retire. After full explanations were given by both superintendents, they were released with further work on this particular job suspended for the time being.

One of the many important legal steps against the American Water Works Company, was that taken on November 12, 1891 when David H. Moffat and George W. Clayton applied to the District Court of Arapahoe County for the appointment of a Receiver, charging that the company was insolvent.

These two men were trustees for the owners of $150,000 in 8% bonds issued by the Domestic Water Company which matured on October 1, 1891 and upon which default had occurred both as to principal and accrued interest.
It will be remembered that the Domestic Water Company was a wholly owned subsidiary of the Denver Water Company created in 1886 for the purpose of developing the original Cherry Creek galleries, the conduit connecting them to Capitol Hill reservoir No. 1 and allied gravity improvements in that general area of the city.

The comments by the Republican made in connection with this action in parts were: "The law suits and fights for rights-of-way in public streets waged by the two competing companies have been sensational reports for some time. One of their most notable conflicts has been for the right to supply the Town of Highlands with water. The Denver Water Company, because the improvements proposed by the old trustees were not made, had failed to supply that town with the water it demanded and the Citizens Company has claimed the right to step in and supply the deficiency. The suit over this controversy is now pending".

"There are those who will regard the present action as but another phase of the many legal complications that have marked the intercourse between the two water companies, but there is nothing in this as Messr's. Moffat and Clayton are simply acting as individuals."--

"As Mr. Moffat and Mr. Clayton, according to allegations, own most of the bonds in question, they stand in a position to an extent of being trustees of their own interest."

Whether these two gentlemen active in the management of the competing Citizens Water Company had motives in addition to the one given above, was a subject of much discussion at the time.
Further financial troubles of the Denver Company were publicized on December 22nd when an attachment was issued on the property of the American Water Works Company in Denver for a $10,000 claim by the Chattanooga Pipe Company. The dishonored paper was issued by Venner and Company, the water company's eastern agent, which had failed before the note became due. In the complaint it was also stated that some $150,000 worth of company bonds had defaulted on interest due. $6,000 of which amount originating with loans to the Domestic Water Company which had a priority status.

The attachment was lifted one day later upon payment of the $10,000 claim. Actually, Deputy Sheriff Hunt was in possession of the company's main office at 1709 Glenarm Street for a few hours only.

Dissension between the Eastern and Western interests composing the American Water Works Company, was noted in the Republican of December 28 at which time, Dennis Sullivan, Vice-President of the company in Denver, was quoted as saying he knew nothing of a temporary injunction secured in New York restraining him and two other company representatives from interfering with the financial affairs of the company. When asked as to whether or not he was engaged in a great "freeze out" game, Mr. Sullivan replied that he had nothing further to say.

Whatever the conflicts in interest between the warring factions of the American Water Works Company might have been, the fact remains that the litigation started in November and December of 1891 remained at issue for a number of years thereafter, with far reaching effects upon the future fortunes of the Denver water system.
In its New Year's edition of 1892, the Republican said: "The American Water Works Company owns and operates the Denver Water Company, Denver; the Beaver Brook Water Company, Highlands; the American Water Works Company, Omaha, Nebraska; the Mountain Water Company, Barnum, and supplies the Towns of Montclair, Elyria and Harmon. Dennis Sullivan was President and D. G. Thomas was Superintendent. The company had about 300 miles of water mains, having laid some 100 miles last year - 1891. It has about 1,565 fire hydrants now in the city. The water is gathered in underground galleries, conducted to a reservoir in West Denver and pumped into the city. This plant has two six million Gaskill Compound Pumping Engines; four-gear pumps, operated by water power with a capacity of 10 million gallons a day, making a total of 22 million gallons daily. In addition to this supply, they are constructing a still greater plant. It is located on Cherry Creek about ten miles south of the city, and consists of a submerged dam 700 feet long and 70 feet deep, from which they expect to secure 50 million gallons each 24 hours, which will be pumped into a reservoir now completed at an elevation sufficiently high so that the water will flow by gravitation to all parts of the city and surrounding parts of the country, including Highlands and Cottage Hill.

"The engines are of the Ellis Triple Expansion type, similar to those now in operation in the City of Chicago.

"During the past year they have made some 3,500 new connections giving the company as of this date, including Highlands, about 15,000 connections.

The article above quoted failed to mention that the company also had a supply of water obtained from galleries built in 1886-87 located lower down
on Cherry Creek. The original yield here was about 9 million gallons a day which rapidly diminished to only 2 million gallons a day after the first year of service.

The internal friction that had been building up for some time between factions within the management of the American Water Works Company came to a head in Omaha on January 12, 1892 on which date the eastern group brought suit against the western one, naming Dennis Sullivan and a number of his associates in Denver for having combined to aid Mr. Underwood in getting control of the revenues of the Denver Company; that they were illegally paying salaries to Mr. Sullivan and Mr. McManus and refusing to forward the balance of the revenue to the company's office and were instituting attachment suits to embarrass the company and cause a default in paying the interest on the company's debts.

A temporary injunction enjoining the defendants from interfering with the affairs of the company except when authorized by the proper Board of Directors was granted as requested.

On the following day, January 13, 1892, The Denver City Water Works Company and The Denver Water Company, through Mr. Dennis Sullivan and his group applied to the United States Court in Omaha for the appointment of a receiver.

The Court thereupon issued an order calling upon The American Water Works Company to appear in Court on January 26th to show cause why a receiver should not be appointed.

In the petition for a receiver, collusion and dishonesty was charged
against some of the officers of the American Water Works Company, with
the Court being asked to take charge of the property and order it sold for the
benefit of its stockholders.

The Denver Times in its issue of February 3, 1892 reported that
Dennis Sullivan had been appointed receiver by District Judge Allen for the
Denver portion of the American Water Works Company on February 2nd
under a $400,000 bond, and that two suits for an accounting had been begun
against the company.

Carlos S. Greeley of St. Louis was the plaintiff in the one, and
James V. Dexter, Charles D. McPhee and Catherine Archer being the
plaintiffs in the other. These were in addition to the one earlier brought
against the company by Messrs. Moffat and Clayton.

The appointment of Dennis Sullivan as Receiver for The American
Water Works Company, immediately brought an end to all construction
activities of the company. The most important project at the time being
the work then under way on Cherry Creek, near Sullivan.

The following partial comments made by the Republican on the
situation in its issue of February 3, 1892 are quoted here as being timely.

"The American Water Works Company of Denver is a commercial
evolution. The seed for the gigantic corporation was sown years ago, when
Colonel Archer, deceased husband of one of the present plaintiffs established
in this city a water plant designed to quench the thirst of 25,000 people."--

"He put in the plant, but Denver grew so rapidly that it had to be
increased frequently to supply the demand. It was hard for the old plant
to keep pace with the city's growth.

"As supply always responds to extraordinary demand, rival companies sprung up in the course of years, under many and various titles, designed to divide the patronage of the city.

"But Colonel Archer and his successors were not friendly to that idea, and in order to preserve the monopoly over the city's water supply, bought out successively each company so incorporated.

"These companies seldom had much money, they possessed valuable franchises and issued bonds to a large amount to cover the expense of establishing and maintaining the plant.

"When the original company bought out a rival, it of course, had to take debts and all. Usually new bonds were issued by the absorbing corporation, to replace the old ones.

"The bonds were secured by trustees. Thus the transformation proceeded, rival after rival being vanquished by alliance, until unpaid bonds and mortgages served to oppress the surviving corporation. As old issues of bonds became due, new issues were authorized to tide over embarrassments, until now, the complaint alleges the total indebtedness of the American Water Works Company, centering about the Denver plant, aggregates $3,600,000."---

"There are now, it is said, a trust deed on bonds of the Denver Water Company for $2,500,000 due, which should have been paid as well as bonds for a large sum - $150,000 - issued by the Domestic Water Co. also past due. There was a trust deed given to the Farmers Loan and Trust Company of New York in consideration of a loan for $2,000,000; and
one to the Central Trust Company of that city for $1,280,000.

"Both of these are overdue but the trust companies cannot foreclose for three months. They consented to the appointment of a Receiver on the application of the Denver capitalists.

"Mrs. Archer came to her property in the alleged insolvent company through successorship to her husband. She owns 144 Domestic Water Company bonds and 122 Denver City Water Company bonds, that she says are past due.

"The American Water Works Company is the last of the successors to the long list of corporations that have been organized to supply Denver with water. When it shouldered the Denver corporation, it issued $7,000,000 worth of bonds.

"It purchased the Beaver Brook Water Company and the Highlands plant.

"When this large issue was announced a great many conservative business men of Denver caught their breath. It is averred that the monopoly will probably expire before it succeeds in catching its breath."

The internecine strife between the two principle factions within The American Water Works Company continued with Mr. Venner starting a suit on February 9, 1892 against Dennis Sullivan, alleging that the so-called Denver Vice-President had never been a legal officer of the company and was therefore not entitled to a salary as such and was without authority to control company funds. The action was started to recover $67,290 of alleged misappropriation of company funds by Mr. Sullivan. In an interview with a Republican reporter on the evening of February 9th, Mr. Venner
outlined his position at great length. Upon being questioned about the financial condition of the company he claimed that the whole proceeding in connection with the appointment of a Receiver was a part of a scheme to wreck the company, saying that it did not have a dollar outstanding which was liable to bring a foreclosure.

This action upon the part of Mr. Venner was promptly countered by Mr. Sullivan, the Republican of February 11, stating that a suit would be commenced at once in the United States District Court by Dennis Sullivan, as Receiver for the company calling C. H. Venner to account for $205,000 in bonds of the Denver Water Company he is alleged to have confiscated or sold for his own benefit.

In commenting on this fast moving financial drama, the Republican said: "The charges in this case, will be, it is understood, both grave and vigorous." --

From suits already filed, it appears that the company has had a most singular way of transacting business, it is a strange thing to find that all of the officials of the company have not from the beginning been fully posted as to the inter working of things." --

"Mr. Venner says Mr. Sullivan has appropriated $67,000 to his own use and Mr. Sullivan says Mr. Venner is a liar. Mr. Sullivan says that $205,000, a portion of a bond issue totaling $584,000 put on the market by the Denver Water Company, went into the hands of Mr. Venner and has never been seen since."
"The money, of which Mr. Sullivan is accused of misappropriating, was according to him, used for construction purposes by the Denver City Water Works Company.

"It is known that a city election was pending at about the time most of this money was spent. This may be an accidental coincidence, however."

The next legal move was for Mr. Venner to ask District Judge Allen to remove the American Water Works Company case to the United States District Court. This request was granted by Judge Allen on February 12, who said: "I think the proper place for this action is in the United States Court, since it is a suit between litigants residing in separate States."--

At this time the papers in the Sullivan suit against Mr. Venner had not yet been filed with the Court.

The Central Trust Company filed its complaint on March 25, 1892, against the Denver City Water Works Company, alleging that on November 1, 1891, there was due to it $1,128,000 as principal with interest of about $11,500, that was unpaid and therefore sought to foreclose the mortgage held by it.

A good explanation of the water rate situation as it existed in the summer of 1892 was given by the Republican on August 20, at which time it said:

"Within the past few days the American Water Works Company has been quietly notifying its customers to pay their water rent for the term of six months which will end November 1, on a basis of 25 percent of the old rates."
"This is a surprise. The American Water Works Company was supposed to be in the fight to stay. Its patrons have been going along the theory that the water of that company would be as cheap for as long a time as that of the Citizens Water Company.

"When the announcement was made last May by the Citizens Company that to end the rate war then in progress, water would be furnished absolutely free for a period of six months, one of the officers of the American Company said, whatever cut they make, we'll meet them. If it comes to free water, we can afford it as well as they.

"That was about May 1 and since that time the Citizens Company has been giving free water."

"Hence, the surprise occasioned by the action taken by the American Company in the last few days, but the sudden change of heart may be easily accounted for when the legal complications of the company are considered. The question has been raised as to the probable right of Receiver Sullivan to allow any reduction in the regular rates and the representatives of eastern bond holders are inquiring into this subject of possible disappearing revenue.

"The importunities and queries of the bond holders has no doubt caused the sudden desire on the part of Mr. Sullivan and his officers to retrench themselves. Should the Court chance to decide that the Receiver had no right to allow a cut, the latter would discover himself in an unhappy position. So it is better to have 25 percent than nothing at all."

A search of the court records at the time August 20, 1892 failed to show that an order hearing on the rate question had ever been made.

It was reported on April 26, 1893 that the rate war was still on.
and according to Mr. Holme of the Citizens Company, it would continue until the American Water Works Company changed hands.

The trial date for the suit of the Farmers Loan and Trust Company against the Denver Water Company for foreclosure of the mortgage of the former upon the plant and property of the water company to secure bonds in the amount of $2,500,000 was set by District Judge Allen on May 12th, for May 29th, with the suit of Greeley vs. The Domestic Water Company involving the same property being consolidated at this time with that of the Trust Company.

The trial was held, arguments made and briefs filed with Judge Allen handing down his decision on July 8, 1893.

At that time, the Judge found in favor of the Farmers Loan and Trust Company, deciding that it had a prior lien on all of the property of the Denver City Water Company by virtue of its mortgage as against the claim of the Central Trust Company and all creditors except those who hold certificates of indebtedness issued by Dennis Sullivan, the Receiver.

The court ordered that all the property known as the Denver City Water Company, including all its franchises and plant; the Beaver Brook and Mountain Water Companies and other property in and about Denver, be sold to satisfy the lien of the Farmers Loan and Trust Company.

The sale was to be made by a Commissioner or by the Receiver as counsel for the parties through proper.

Judge Allen signed the decree in this case on July 20, 1893, with Dennis Sullivan, Receiver, being appointed as the Commissioner to conduct the sale to be held in 60 days after being duly advertised.
The Judge allowed an appeal to the Supreme Court by the Central Trust Company, subject to an appeal bond of $1,000,000 to be filed within sixty days.

The Denver Republican, in reporting on a meeting of the Board of Supervisors held on August 10, 1893, said, - "The resolution adopted by the Aldermen, providing for a committee to consider the advisability and practicability of purchasing the plant of the American Water Works Company was rejected by the Board with only two of the five members being in favor of it.

The subject of a possible purchase of the two water companies was again brought up for discussion at a meeting of the Board of Aldermen held on August 17, 1893.

A resolution was introduced by Alderman Curran providing for the appointment of a committee to inquire into the feasibility of the city purchasing the plant of the American Works Company, a suggested amendment was submitted by Alderman Phillips to the effect that the resolution stated that the city would not interfere in the contest between the two water companies, but that if it purchased one, it purchase both was debated and defeated by a vote of 8 to 2. Thereupon the original resolution was adopted by the same vote.

The matter was again brought up by Alderman Curran at the meeting held by the Board of Aldermen on August 31, 1893. He again introduced a resolution providing for the appointment of a special committee.
to inquire into the feasibility of the city purchasing the American Water Works plant. The first resolution was defeated by the Supervisors, the second was still in its hands. Mr. Currigan said for some reason, he was not to say what, the Supervisors refused to take any action. His resolution was passed by a vote of 8 to 4. City Engineer Hunter took part in the discussion saying that the city would have to own its water plant sooner or later and that he was heartily in favor of the resolution. It is to be noted that the panic of 1893 was in full force and that a real financial emergency was facing the city at this time.

A legal notice concerning the sale of the Denver Water Company as ordered by Judge Allen was published in the Republican on September 23, 1893, setting the date of sale at noon on the 24th day of October 1893.

However, this sale date was later postponed until April 21, 1894.

The Highlands water case won in the District Court by the Denver City Water Works Company was reversed by the Supreme Court on December 4, 1893. This was a case connected with the franchise granted by that town to the Beaver Brook Company on January 13, 1888 and ratified by the voters of Highlands on April 3, 1888.

An interesting side light on one of the small water supply promotions made in connection with real estate developments in southeast Denver was noted in the December 30, 1893 issue of the Republican in which it was stated that Judge Allen had signed an order permitting Dennis Sullivan, Receiver to cancel an indebtedness of $516 due from Milo A. Smith to the
Water Company, upon the latter's transferring to the Receiver all the property of the Eastern Capitol Hill Water Plant for which $15,000 had already been paid.

The Eastern Capitol Hill subdivision was 80 acres in extent. It was bounded by East Bayaud and East Alameda Avenues, South Holly street and South Monaco Parkway. Water was originally provided by pumping from two artesian wells located on the property. The first of these wells was one drilled in 1888 for Charles Wilson, part owner, with a water tower 36 feet in height and 10 feet in diameter erected on a high knoll producing a static head of 96 feet.

The more ambitious project for this same area was that promoted by Milo A. Smith and John Miller early in 1889, who obtained a franchise from the County Commissioners to construct and maintain a battery operated electric tram system north to connect with the cable system on East Colfax Avenue. The Smith well was 715 feet deep. The steam pump connected to it had a capacity of more than 47,000 gallons in 10 hours. The stand pipe was 30 feet in diameter and 75 feet high, having a capacity of 176,256 gallons of water. The distribution system consisted of a 6-inch main north to Colfax Avenue and one east on Sumner Street - East 2nd Ave - with 4-inch laterals on intermediate streets. Mr. Charles P. Allen, Chief Engineer of the Denver Water Company was consulting engineer for the water portion of the project. The high point in this subdivision was very close to its southwest corner.

That the American Water Works Company expected to continue in business, even though it had been ordered sold, is shown by a news item
on February 1, 1894 in which it was reported that Judge Allen had authorized Dennis Sullivan, Receiver, to prepare and sign an acceptance of a contract to supply the town of South Denver with water for ten years from March 1, 1894 in accordance with an ordinance passed on January 29 by the South Denver Town Board.

The quality of water furnished by the American Water Works Company to the people of Denver was again questioned in the spring of 1894. The result was an investigation ordered by the Board of Supervisors on March 17 of that year. The principal complaint being that the company was taking water at night from the Platte River at Alameda Avenue, at a point where it was charged with the sewage and chemicals from the paper mills and the settlements surrounding them.

An official examination of the city's water supply was made by the water committee from both branches of the council accompanied by Health Commissioner Lemen beginning on March 21, 1894. In an interview with a Republican reporter, Dr. Lemen said that the examination would be a complete one with all sources of supply being investigated.

He further stated that analyses of water taken from both the American and Citizens mains within a week showed them to be entirely satisfactory to his department. He further stated that there was a good deal of bunkum in the talk about impure water since there was not then or had there been lately anything wrong with the supply from either of the local companies. No record had been found of the results, if any, of the above city council examination.

At the request of two bodies of mortgage equity holders of the
American Water Company, District Judge Allen issued an order on March 29, 1894 modifying the previous decree of sale made on behalf of the Central Trust Company of New York. Frank B. Arbuckle, Receiver of the Beaver Brook Water Company having petitioned that in the event of a sale of the American Water Works Company, his company should be included therewith. He also asked to be discharged as Receiver, turning the Beaver Brook property under his control over to Dennis Sullivan so that a joint sale could be made.

The Arbuckle request was granted by Judge Allen on April 3, 1894. He was ordered to deliver all of the property to Dennis Sullivan and to present his own accounts to the Court.

The news that an armistice had been signed on April 6, 1894 ending the rate war between the American and the Citizens Companies was announced in the Republican on April 7, and again on April 8, 1894. In summing up the situation leading to this action, which, later on in the year, resulted in a formal consolidation of the two companies, the Republican said in part:

"The American Water Works Company and the Citizens Water Company have consolidated."

"The preliminary contract was signed on Friday, April 6th - It put an end probably forever to the freeze out process which had been going on for years between the two companies."

"For the past two years the Citizens Water Company has been furnishing its consumers with free water. This was not done out of philanthropy, but to bring its rival to terms."

"The American Company had to follow suit in furnishing free water."
This took place after the rates had been cut to less than one half. Of late this company's most-constant source of revenue has been from the City of Denver, which has been paying about $60,000 a year for its hydrant supply. After the company had gone into the hands of a Receiver, a rate of 25 per cent of the regular charges was imposed on the consumers in order to pay the running expenses; but this did not effect its purpose. Receiver's certificates had to be issued to keep the company going and it is said that something like $200,000 in amount of these have been floated."

"For the past five years the water fight has been a potent influence in local politics. It has been the most apparent factor at every city election."

"From the political point of view the American Water Works Company has been the most successful, but it bankrupted or helped to bankrupt the company."

"The last city election returned a majority of Aldermen in favor of the American Company, which precluded any attempt to pass the measures so much desired. The deadlock which occurred at the City Hall when the present council entered office and which has continued more or less up to the present time, to the demoralization of public business, was caused mainly, if not wholly, by the conflicting interests of the two companies. The election of a Democratic president by a Republican Board of Aldermen was due to the water fight."

"One or two Republican Aldermen maintained that they were defeated at the city election by Republicans who wanted Democratic Alderman favorable to the American Company. Large sums of money have been spent in corrupting
a city government, only too willing to be corrupted.

After a long contest in the courts between its stockholders and the company, the American Company was placed in the hands of a Receiver, Dennis Sullivan, its president being appointed to that office. The cut in rates forced by the Citizens Company and other circumstances, prevented the payment of interest and last July the District Court ordered the sale of the property.

"At one time it was proposed to purchase the plant for the city to prevent a monopoly by the consolidation of the two companies. This fell through, however, and since then the stockholders and debtors have been dependent upon the Citizens Company."

"Richard Holme, Manager of the Citizens Company, was not advised of the terms of the agreement. He believed, however, that the Citizens Company would have the controlling management after the consolidation. He said the Citizens plant was the better of the two, and that the company was in much the better condition from a financial point of view."

In reporting upon this truce between the two companies, the Times in its issue of April 9, 1894 said: "A dispatch from New York confirms the news, first published in the Times of the amalgamation of the two companies but none of the interested bondholders would make public the details.

Messrs. Moffat and Cheesman of the Citizens Company, said it was purely a private affair, and as all interested parties - except the public - were satisfied with the terms of the agreement, it was not necessary to divulge them."
Eleven years later in 1905, J. Warner Mills, a prominent member of the Denver Bar and an active worker for municipal ownership of the water system, wrote an article, under the heading "The Denver Union Water Company" in which he said in part:

"On the 6th day of April 1894, a written agreement was executed between Daniel E. Heald and others representing the reorganization committees, and David H. Moffat and Walter S. Cheesman, representing the Citizens Water Company, by which the program at the foreclosure sale was specifically mapped out, and the corporate handling of the whole water works system of Denver was provided for. Here is the scheme:

"The Heald party, or its representatives, were to bid the property in at the sale for the amount of the mortgages, court and receivership costs. A new corporation was to be organized under the laws of Colorado, to be called the Union Water Company, but by supplemental agreement on October 8, 1894, this name was changed to the Denver Union Water Company.

"It was to have 9 Directors, four from the Heald party and five from the Citizens group. All property of both parties was to be conveyed to it. Its capital was to be $7,500,000 divided into 75,000 shares at $100 each. It was apportioned as follows:

"To the Heald party, embracing the Sullivan Underwood and Archer interests, $1,000,000 in common and $1,250,000 in preferred stock. To the Citizens Water Company people, $4,000,000 in common and $1,250,000 in preferred stock. It was also provided in this agreement that 8,000 bonds of $1,000 each should be issued by the Denver Union Water Company and
disposed of as follows: To the Heald group, 4,500 at $1,000 each or $4,500,000, and to the Citizens group 2,500 at $1,000 each or $2,500,000 with 1,000 bonds of $1,000 each retained for use in future operations.

"The Venner interests received nothing and the New Jersey Company was wrecked.

The ninth paragraph of this April agreement expressly provided that each party would cause the water rates in Denver to be increased for the year beginning with May 1, 1894, to the rates prevailing and charged by the Denver Water Company in the year 1890, with such exceptions as might be agreed upon by Mr. Heald and Mr. Cheesman, and such rates should be maintained until the new company should come into possession."

In this article, Mr. Mills goes on to say that "the form of conducting a sale under the Title of Commissioner - strange to Colorado law - the receiver was allowed $16,000 for this service alone. He also listed a number of other items paid to Mr. Sullivan, totalling more than 1/3 of a million dollars for the people to pay was thus absorbed in fees by Mr. Sullivan's extra-ordinary receivership - most of which, it appeared, stuck to his own fingers."

After further remarks, Mr. Mills states, "enough is now rehearsed of these flashy magnates of finance to show that in the history of the Denver Water Plant there have been frauds and crimes and over-reaching, that, if done by poor men or tramps with a peck of pickles or an ordinary hen-roost, would have led to stripes and bars, but being done by "respectables" with a public utility running into millions, the perpetuators are enthroned in wealth and power, and the servicable attorney is made Lieutenant Governor of Porto Rico."

66.
"Without paying, a cent of cash, and by putting the financial obligations of the "transaction" wholly upon the shoulders of the people, our free water givers are now in sole possession of the entire plant of the city and their triumph and revenge is sweeping and complete."

(See Arena, Volume 34, June to December 1905, under the general title "The economic struggle in Colorado", Norlin's Library, University of Colorado at Boulder).

The Republican, in its issue of April 10, 1894, commented at length on this latest water development saying:

"The consolidation of the two water companies is not looked on with favor by the politicians at City Hall. While the fight lasted between the corporations there was always the chance for pickings. Between them the companies paid more for political services than all the other powers combined. The water pool will put a stop to the bribery that became so open at times, that it fell at the very nose of the grand jury on more than one occasion."

On the day before the public sale was to take place, Wayne MacVeagh, a stockholder in the old Denver company and at the time United States Minister to Italy, applied to the District Court for an injunction to prevent the sale set for April 21, alleging that the proposed consolidation and the named defendants had conspired and confederated among themselves to defraud him as the owner of 570 shares of stock in the Denver Water Company. However, the sale was held as advertised and a formal agreement made, with the bondholders becoming the purchaser of the American Water Works Company for the sum of $1,010,000. Attorney W. A. Underwood was the representative for the consolidated committee of the Central Trust Company and the Farmer's Loan and Trust Company in this matter.
Although Mr. C. H. Venner did not attempt to meddle with the sale in any way, he did read a legal notice to the effect that he had appealed his intervention proceedings to the United State's Supreme Court, thereby publicly notifying all possible purchasers of his intention to carry on his fight to the last ditch. He also read a notice that he was about to foreclose on the Mountain Water Company on a claim for $40,000 which he held against it. It was understood at the time that he was responsible for the MacVeagh suit as well, also designed to stop the proposed consolidation, if it could possibly be done.

A short news item in the Republican of April 24, 1894 stated that Judge Allen had confirmed the sale of the American Water Company's plant in Denver for $1,010,000.

Less than a week after the above confirmation had been given to the sale, Receiver Sullivan appeared before Judge Allen - April 27th, informing him that the circumstances which made it advisable to reduce the rates more than a year before no longer existed and that it was now possible for the company to obtain better prices for its water. He thereupon submitted a new schedule of rates to be charged and asked for permission to put into effect on May 1, 1894, which was approved by the Judge without further ado.

This new schedule of rates was a composite one prepared by the Citizens Water Company based on Schedule A contained in the 1890 franchise of the Denver Water Company and that used by the Citizens Water Co. before the rate war began. The Republican also said on April 27, 1894 that - "The rates
which now will be charged for water will be the same as those enforced before the water war and allowed by the franchises of the old companies except in cases where reductions are made. As now arranged, they will give the bond holders a fair interest on the money invested and nothing more."

In this same news item, the statement was made that the new organization would operate under the American Company franchise, granted to its predecessor company, the Denver Water Company in 1890, and called attention to the provision in that franchise which provided that after five years from the date of its approval, April 11, 1890, the city council could require the company to fix rates for private consumers equivalent to the average rates prevailing in the cities of Chicago, St. Louis and Cincinnati for the same purposes.

The decision to operate under the 1890 franchise of the old company was a necessary one, since section 3 of the Citizens Water Company franchise approved on November 22, 1889 expressly provided for a forfeiture of that franchise if the Citizens Company sold its plant or consolidated with or pooled rates with any other water company furnishing water in Denver.

Within a month, the long and bitter controversy between the water company and the city council over fire hydrants, their location and number was revived by the manager of the Water company who stated that the contract it had with the city for additional hydrants would be insisted upon, claiming that the reason it had not been carried forward before was that the company did not have the money to do so.

The annual report of the American Water Works Company for the year ending December 31, 1893 was filed with the Secretary of State on
June 14, 1894. The amount of existing debt against the company in Colorado being given as $4,428,207.83.

By the first of June, the Platte River, as well as most other streams in the State, was at flood stage, which almost immediately brought complaints from Denver citizens on the muddy, contaminated and animal life content of the water being furnished them by the newly consolidated water concern.

The excuse given for an admittedly bad condition of affairs was that, under flood conditions with the American plant under water, the Citizens Company was overloaded and did not have filter capacity to meet the extraordinary demand then placed upon it, but that the necessary additions were under way and would be in service shortly.

A significant event took place on July 3, 1894 when Attorney's representing the South Platte Canal and Reservoir Company or more properly the Citizens Water Company appeared before the Board of County Commissioners at Golden, asking for approval of company plans to construct a huge dam across the South Platte River at a point about 20 miles upstream from Platte Canyon. The dam was to be 473 feet long and 211 feet high.

The last chapter in Denver's five year water war ended on October 18, 1894, when the Articles of Incorporation for the Denver Union Water Company were filed with the Secretary of State.

Note: The date of incorporation of the Denver Union Water Company is given in the diagram on Page 3 of the Metcalf and Anderson Inventory of 1913, as October 20, 1894.
This company was capitalized at $7,500,000, consisting of 25,000 shares in preferred stock and 50,000 shares of common stock having a par value of $100 a share. $8,000,000 in bonds was also authorized.

The newly organized company combined the properties of the Denver portion of the American Water Works Company, the Denver City Water Works Company, the Denver Water Company, the Denver City Irrigation and Water Company, the Beaver Brook Water Company, The Domestic Water Company and the Mountain Water Company, these being all of the offshoots of The Denver City Water Company, founded by James Archer and incorporated by him on November 30, 1870; with The Citizens Water Company and its subsidiary, the South Platte Canal and Reservoir Company.

The first officers and Directors were: W. S. Cheesman, President, Thomas S. Hayden, Vice President; David H. Moffat, Treasurer; Secretary, Walter Miller; G. W. Clayton, Moses Hallett, D. A. Heald, George Cortell, Theodore C. Woodbury all of the Citizens Water Company, with James P. Grant a principal owner of the American Water Works Company branch, being the sole representatives of the American Company in the directorate of the consolidated company.

Richard Holme was chosen Manager and Charles P. Allen, Chief Engineer, both having held similar positions with the Citizens Company.

The closing legal act in the consolidation of the water companies of Denver occurred on November 2, 1894 when The Continental Trust Company
of New York filed with the County Recorder a Mortgage for $8,000,000 against the property of the Denver Union Water Company.

The consolidation, from an operating point of view, took much longer to become a reality. This was brought out later in November when the Mayor transmitted to the city council an explanation from Manager Holme in response to severe criticism of the company by the Insurance Exchange with respect to poor pressure for fire department uses.

Mr. Holme told the Mayor, "that while the American and Citizens Water Companies were consolidated several months ago they did not get possession of the plant of the American Water Company until about November 1st, therefore they had not yet had time to physically connect the two systems which would be necessary before they could give the pressure required in the City contract. Mr. Holme further said that the work was under way and asked the City's indulgence for at least one month more to complete the job."

At a meeting of the Board of Aldermen held on December 17, 1894, Mr. Martin D. Currigan, Alderman from the Fourth Ward, introduced a resolution instructing the Mayor to call upon officials of the Denver Union Water Company and demand that water rates be reduced by one half. The discussion that ensued was a heated one, with the result that the people outside the railing hissed the council when, by a vote of 7 to 6, the resolution was referred to the committee on water.

This committee reported favorably on the resolution at the next meeting, held on December 20, 1894. A motion was then passed to the
effect that Alderman Currigan accompany the Mayor when he called upon President Cheesman to find out what the company intended to do on the rate question. Note: As will be seen later, this was the beginning of a fight for lower water rates that did not end until the question raised had gone up to the United States Supreme Court with the water company emerging as the victor in that piece of litigation.

Before outlining the construction and other activities of the Citizens Water Company prior to its consolidation with the various other water companies of Denver, it seems desirable to retrace our steps and pick up some of the activities of the sundry subsidiary concerns, private and public, that played a minor, but significant role, in the overall water picture.

The Beaver Brook Water Company

This company was absorbed by The Denver City Water Works Company on February 3, 1891 with the permission of the city of Highlands subject, among other things, to the proviso that the Denver Company maintain an office in Highlands for the convenience of its citizens. At this time, Dennis Sullivan was the Vice-President of the Beaver Brook Company with Frank P. Arbuckle its Secretary.

Frank F. Arbuckle was appointed Receiver of the Company by Judge Allen on January 12, 1893 in order to bring it under the deed of trust which covered the Denver City Water Company of which Dennis Sullivan was Receiver, and the American Water Works Company of which one E. H. Rust was Receiver. Since the Beaver Brook Company had been under Mr. Arbuckle's...
management after it was acquired by the Denver Water Company in 1891, this was the logical thing to do under the circumstances.

Later, on June 6, 1896, the city of Highlands passed an ordinance authorizing the Denver Union Water Company to remove the Highlands office to its central office in Denver.

After its reorganization in 1889, the company quietly proceeded to enlarge its system. A news item dated March 8, 1890 stated that the West Colfax Improvement Association had awarded it a contract to run an 8-inch main on West Colfax Avenue from Federal Boulevard to a point a mile west of the Jefferson County Line, total length two miles, ending at Wadsworth Boulevard.

The legal and other difficulties in which this company became involved with the Citizens Water Company and others during the early years of this decade will be discussed later under another heading.

The Mountain Water Company

A news item in the Engineering News for March 1, 1890 stated that:
"The Mountain Water Company has received its works from the contractor, F. P. Arbuckle of Denver, a satisfactory test having been made. It was also stated as earlier noted, that the company had filed a certificate to the effect that its capital stock of $100,000 had been fully paid up.

The incorporators were Frank P. Arbuckle and A. W. Witaker. It was the plan at the time to lay a considerable amount of 6 or 8 inch pipe in West Colfax.
Two weeks later on March 15, the Engineering News printed a news item saying: "The West Colfax Improvement Association has contracted with the Mountain Water Company to lay one and one half miles of 8-inch pipe, and lay 6-inch cast iron mains on West Colfax Avenue from Federal Boulevard, westward one and one half miles to the county line between Jefferson and Arapahoe counties and set a hydrant every quarter mile and one at the county line.

"The contract provides that these improvements shall be made and water furnished for a term of five years for $7,800." The Engineer was F. P. Arbuckle of Denver.

Note: This work, no doubt, was the same work referred to above under the Beaver Brook Water Company heading, the two companies being very closely associated at the time.

Again, on April 5, 1890, the Engineering News, noted that the County Commissioners of Jefferson County had granted a franchise to the company to lay pipes in several streets west of Federal Boulevard and south of the Golden road.

The Mountain Water Company, the Beaver Brook Water Company and the Denver Water Company were the constituent companies forming the Denver City Water Works Company, incorporated on November 12, 1890. As earlier noted, the Domestic Water Company, incorporated in 1886, was a wholly owned subsidiary of the Denver Water Company and it was therefore a silent partner in this latest corporation move.
The South Denver Water Works

This municipally owned suburban water system, was, as noted by the "South Denver Eye", on January 1, 1890, when completed in November 1889, as fine a system of water works as there was west of the Missouri River considering its size. At that time the water supply came from horizontal wells sunk in the gravel beds along the Platte River above Petersburg. The pumping capacity was said to be 2 million gallons a day.

The Town Board passed and approved, on March 11, 1890, Ordinance No. 51 granting to the Citizens Company the right to lay and maintain for a period of twenty years, a water main not exceeding four feet in diameter, inside measurement, in and along Broadway from the south to the north boundaries of the Town.

This ordinance was granted with the express understanding that the Citizens company would furnish water for all purposes to the Town of South Denver, and to its inhabitants upon the demand by the Board of Trustees, at lowest prices and terms that it, the company, furnished water for or to its consumers and patrons.

At the regular municipal election held on April 8, 1891, a bond issue of $100,000 for water plant extensions was approved.

On that same date, the Citizens Water Company presented an

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agreement to the Town Board to provide the town with water, asking that the water works belonging to the town be turned over to it for use in the process. (Copy not available).

The water bonds authorized at the election of April 8 were eventually sold to E. H. Rollins and Company of Denver, according to the Times of May 23, 1891. Early in June, a contract for laying about 20 miles of water mains in South Denver was awarded by the Trustees to Rhodes Brothers of Denver for a total of $59,124.

Actually, the Citizens Water Company did supply water to South Denver for a short time that summer since the Times in its issue of June 17, 1891 said: "The peculiar facts of this peculiar case came to be that the representatives of the Citizens Water Company and Mayor Vaughn entered into an implied agreement. Mr. Vaughn thinks the agreement was that the company was to furnish water for not more than $8,000 a year. The company did not recall that amount as the one having been agreed to. When the Town Board decided that the company could not furnish sufficient water, it was ordered cut off. Thereupon the Citizens Company presented a bill for the three months water had been furnished, at the rate of $12,000 a year. The Town Board cut the bill down to the $8,000 and there the matter stood."

A water shortage in South Denver the next summer brought many citizen complaints about the manner in which the public system was operated as indicated in a news item published in the Republican.
on August 27, 1892. The article read:

"Notwithstanding the resolution passed at the last meeting, of the Town Board, the citizens of South Denver continue to complain of the water service. The town is divided into two water districts for specified hours for using water. The resolution however, provided for one exception, that is, it did not apply to greenhouses. This was one cause of complaint; one citizen asking why should our lawns and gardens suffer from the want of water and the greenhouses, which are protected from the sun, given all the water they want? The water plant of South Denver is owned by the town and it is further alleged that the trustees have taken it upon themselves to authorize a connection of the South Denver water pipes with the mains of the Citizens Water Company that are supplying water to other parties outside of Denver." (No doubt this was done under the terms of Ordinance No. 51 of 1890.)

The second water ordinance passed and approved by the South Denver Board of Trustees for the Citizens Water Company was dated November 7, 1892. This Ordinance, No. 116, gave the company the right to lay and maintain for a period of twenty years, a water main, not exceeding four feet in diameter on University Ave. from the south to the north town limits.
Like the one passed in 1890, it provided that: The Citizens Water Company, its successors and assigns, should furnish and supply water to the town of South Denver at any time upon demand, after the completion of its water mains from Platte Canyon to Denver at a price and rate for water not to exceed five and one-half cents per thousand gallons, the quantity to be determined by meter measurements.

That the South Denver water plant and system was again in trouble was indicated by the Republican on May 1, 1893 when it noted: "A large amount of money must be spent or else the water plant must be sold. This was the conclusion arrived at after a visit to the plant by Town officials had been made the day before.

The repairs necessary are the replacing of the old 12 inch pipe by one of 18 inches, the construction of a new filter and the enlarging and repairing of the reservoir. The most imperative item was that of a new charcoal filter having a capacity of 1 million gallons a day which it was estimated would cost about $4,500. At the time it was thought best not to consider the existing method of filtering through gravel.

Apparently, the situation about this time in South Denver was such that both the American and the Citizens Companies thought the time was ripe to get control of its plant, if possible. This fact was brought out in a news item published by the Republican on June 18, 1893, in which it was stated that both companies had submitted bids for the property which, while not yet made public, were understood to not exceed the cost of the plant with interest to date. No record has been found of the disposition made of these bids by the Town Board, but it is known that water from the Citizens Company was turned
into the South Denver mains on June 24, 1893. A short time thereafter on
July 2nd, it was reported that the trustees thinking they could supply
water from their own pumping plant for three cents a thousand gallons,
refused to entertain a one year contract with the Citizens Company at the
ordinance rate of five and one half cents a thousand gallons.

The possibility that the people of the Town of South Denver might be
interested in annexing to Denver at a coming election was reported as having
been discussed at a meeting of the Board of Trustees held on January 16, 1894.

The date for a vote on the annexation question was later set for Tuesday
January 30, 1894. In reporting on the general public interest taken in the
matter, the Republican on January 25 said: "The outlook is that South Denver
will be annexed and it is hoped that good water may be secured to the suburbs
before Denver can forestall any such acquisition. The contract by which the
Citizens Water Company is to furnish a supply at five and one half cents a
thousand gallons for ten years was considered at the last Board meeting and
referred to the Town Attorney. There will be considerable opposition to the
granting of the franchise and defeat is not improbable."

At a Board meeting held on January 29, a contract with the Citizens
Company was seriously discussed after the old question of selling the Town
plant had been resurrected. The rates set in the proposed contract were
$5.00 a year for irrigating a 25 foot lot, $30.00 a year for Fire Hydrants
and 80 percent of the existing rates for domestic purposes. Although not
definitely offered, it was stated that these terms would be acceptable to the
Citizens company, and, if so, the contract was to be entered into at once."

However, at this same meeting, held the evening before the election on the question of annexing to Denver was to take place, Ordinance No. 133 was passed and approved by the Trustees, which granted and leased to The American Water Works Company for a period of ten years, the full and complete possession, use and control of the water plant then owned by the Town of South Denver, including real estate owned and used for the location construction, maintenance or operation of the water supply system of the town: In consideration thereof, the American company agreed to furnish the town all the water it might need, either for municipal or domestic purposes, at an agreed price not to exceed 5 cents a thousand gallons so furnished.

(See 1907 edition. Franchises and Special Privileges granted by the city of Denver, page 627.)

This is the contract already noted as having been approved by Judge Allen on January 31, 1894.

On January 31, 1894 the Republican announced that South Denver had voted in favor of annexation to Denver. The vote being, 288 for and 100 against.

Although the County Court order dissolving the Town of South Denver was not filed with the City Clerk of Denver, until February 9, 1894, the Charter of the City and County of Denver as revised up to January 1, 1927 gives the date of annexation as February 7, 1894.

On the date of annexation to Denver the assessed valuation of property for tax purposes of the Town of South Denver was $4,157,160 with a tax levy of 14 mills on that valuation having been set for the year 1894.
At this time it was reported that South Denver had a bonded debt of $263,000 against its water system together with $70,000 issued for general improvements, town hall and street grading. All of these bonds became obligations of the City of Denver after the annexation took place.

Opposition to the American Water Works Company contract of January 29, 1894 was first noted in the newspapers of February 4, 1894 at which time the Town Attorney, Mr. D. C. Weber was quoted as saying that the ordinance authorizing it was illegal and unconstitutional. He further stated that it had been passed without his knowledge or consent, at a time when he and two Trustees were absent, and after another ordinance, in favor of the Citizens Water Company had passed twice, which assured the community and its inhabitants a supply of pure water from a source other than the contaminated one owned by the Town and which would be used by the American Company under this arrangement.

On February 20, 1894, District Judge Allen granted a temporary injunction at the request of Willis Day, restraining the American Water Works Company, through its Receiver, Dennis Sullivan, from taking possession of the South Denver Water plant.

The petition for the writ set forth that the Town Trustees had no authority to enter into a ten year contract and also had no right to turn over the property of the Town of South Denver to a private corporation. Two days later, Town Trustee Miller was quoted as saying that the water works lease would not stand, claiming that the very idea of South Denver turning its plant over to the City of Denver and asking that it pay $260,000 for it, and
immediately taking it away, was too cold blooded a procedure for any
man to consider.

Notwithstanding the fact that District Judge Allen had enjoined
any one from taking possession of the South Denver water plant in the
then pending suit to break the contract with the American Water Works
Company of January 29, 1894, the Denver Board of Public Works appoint-
ed a caretaker on February 23, 1894 to protect the machinery there from
freezing and other possible damage.

With the scene of municipal operations shifted by annexation from
South Denver to Denver proper and the ending of the water war between
the American and Citizens Companies by agreement on April 6th, the
water problems of South Denver consumers became largely those of poor
pressure and indifferent water quality that became intensified as the
summer season advanced, with both companies as well as Denver being
subjected to criticism on this score.

After the usual political maneuvering between factions in the Denver
City Council, that lasted for some months, Alderman Phillip introduced
a bill on November 20th, which provided for the leasing of the South Denver
water plant to the Denver Union Water Company, successor to the American
and Citizens Companies, which after the customary procedure, was passed
by both branches of the City Council and approved by Mayor VanHorne on
December 15, 1894.
During the time the Phillips Ordinance was being considered by City officials, the people of South Denver objected strenuously to it.

They were at the time, getting their water at much lower rates than the rest of the city and naturally, did not want to pay the higher Denver rates the Ordinance allowed.

It was brought out in the public discussions of the matter that in 1893, before South Denver was annexed to Denver, its water plant did not pay its way, only $8,317 having been collected in that year for water, building and plumbing permits, dog taxes and miscellaneous items, leaving a deficit of about $7,300 after water bond interest had been paid which necessarily must be paid from general tax funds.

The Ordinance authorizing the Contract was No. 54 of 1894. A copy of it is to be found beginning at Page 671 in the 1907 Book of Franchises and Privileges granted by the City and County of Denver.
Portions of the above ordinance are quoted here for the purpose of clarifying, to some extent, a situation that, due to incomplete records, would otherwise be somewhat confusing.

Section 1. - "Whereas, The City of Denver is now the owner of water pipes, mains, hydrants and pumping machinery situate in and belonging to the town of South Denver at the time of annexation of said town to the City of Denver; and Whereas, On account of the insufficiency and impurity of said town's supply of water the said town had for some time previous to its annexation to the City of Denver purchased all of its water supply from The Citizens Water Company, and the said city of Denver has continued such purchase up to the present time; and Whereas, The Denver Union Water Company, a corporation organized under the laws of the State of Colorado, is the successor of the said, The Citizens Water Company, and the owner of its plant and source of water supply; and Whereas, The City of Denver is now operating said water system at a loss, and it is therefore deemed for the best interests of the City of Denver that the pipes, mains, hydrants and pumping machinery of said water system be leased to the said, The Denver Union Water Company, to be operated and maintained by said company, with the right of said company to collect water rents;

Now, therefore, the City of Denver hereby leases and demises unto the said The Denver Union Water Company all of the pipes, mains, hydrants, and pumping machinery formerly belonging to the town of South Denver for and until the tenth day of April, A. D. 1910, but expressly excluding from this lease any and all real estate, ditches and water rights formerly belonging
to said water system; and the said The Denver Union Water Company in consideration of the leasing of said pipes, mains, hydrants and pumping machinery by the said City of Denver to the said The Denver Union Water Company, doth covenant and agree with the said City of Denver to pay to the said city of Denver as rent for the said pipes, mains, hydrants and pumping machinery, per annum the sum of six percent, upon the appraised value thereof."

The ordinance provided for the appraisement by a group of 5 persons, with the amount fixed by a majority to be conclusive.

It also provided that new construction necessary to be made would only be done after approval by the city engineer. Upon termination of the lease, this new construction work was to be likewise appraised for possible purchase by the City of Denver, with provision made for the purchase of the city's portion of the leased property by the company in case the city desired to sell at that time.

Rates to be the same in South Denver as those charged in other parts of Denver, with service conditions to apply equally and made a part of the general franchise proposed to be granted in said territory.

Section 8 of the ordinance read: "This ordinance shall become a binding contract between the City of Denver and The Denver Union Water Company, its successors and assigns, when accepted by the Denver Union Water Company, within thirty days after the final passage hereof, with a release to the City of Denver of all liability which might arise by reason of not carrying out Ordinance No. 133 of the Town of South Denver, passed and approved January 29th, 1894. All ordinances conflicting with this ordinance
are hereby repealed. Approved December 15, 1894."

The property appraisal provided for in the above ordinance was completed and sent to the Mayor and officers of The Denver Union Water Company on April 8, 1895.

The appraisers, C. P. Allen and Thomas D. Robinson representing the Denver Union Water Company, J. B. Hunter and E. P. Martin, representing the City with F. J. White the fifth man picked by the other four, found that the property they were asked to evaluate had a total value of $142,209.32 which included a sum of $5,331.44 representing pipe, fittings and valves attached to the South Denver system but laid by private citizens.

The report pointed out that the matter of placing a value upon real estate, water and ditch rights, ditches, buildings, wells and cribs, commissions and interest upon bonds, and various other items of expense which originally entered into the aggregate cost of the water plant to the Town of South Denver did not appear in the amount given, since the appraisers had not been asked to report on those items. (See page 675, 1907 Book of "Franchises and Special Privileges", also Report of Public Utilities Commission, page 45, for the year 1910, in which it is stated that the valuation of $142,209.32 was the figure used to compute a semi-annual interest charge of $4,266.28 as provided for in Ordinance No. 54 of 1894.)

"It became a matter of critical interest, as time passed and financial data came to light, that the net result of this entire operation was to give The Denver Union Water Company a very profitable return on water sold in South Denver"
with the taxpayers of Denver picking up the tab for an annual deficit of nearly $7,100, which sum represented the difference between bond interest charges of $15,600 and a rental of $8,533 received under the terms of the Ordinance. As far as known, the offsetting credit resulting from the increase in Denver's assessed valuation of over 4 million dollars by reason of this annexation was never publicly discussed.

The Citizens Water Company

No time was lost in getting construction work under way after this new company entered the field.

Within fifteen months from the date of its incorporation, March 1889, it had completed a 30 inch gravity pipe line from Platte Canyon to the city, 20-1/4 miles long; had laid some seventy miles of mains in the city and secured a large part of the patronage. To do this, it had to fight its way inch by inch through injunctions, harassments and personal encounters, whose history would fill volumes.

The Republican in its issue of September 15, 1890, in commenting on the plans of the company, and the progress made up to that time said:

"The Citizens Water Company of Denver is constructing in the Platte Canyon one of the most magnificent water systems in the world."

"Wheatland, 17 miles southwest of Denver, is the scene of action. A great natural double basin in the hog back of the mountains is to be converted into twin reservoirs, with a combined capacity of 9 billion, 5 hundred million gallons. (30,945 Acre Feet)."
"Two colossal dams are to be erected. One dam will be 275 feet in height and will cover an area of 18 acres at the base and weigh 3 million tons, the other will be like it. The two reservoirs will cover an area of 480 acres." (Note: These proposed reservoirs were located about 2 miles north and 2 miles west of the present Martin Company plant. Construction work was begun in 1890, but abandoned before completion in favor of Marston and Cheesman Lakes.) Continuing, the Republican went on to say --"At present the Citizens Water Company supplies the city by means of the South Denver or Petersburgh Pumping works. But the Platte Canyon - Conduit No. 1 - will be completed sometime during the coming week, when water will be turned into the city at the rate of 4 to 6 million gallons a day, and the Petersburgh works will be disconnected."

(The following description of Conduit No 1 has been condensed from an illustrated paper read by Consulting Engineer, J. D. Schuyler on September 20, 1893. See Volume 31, Transactions of The American Society of Civil Engineers, for further engineering and construction details.)

The water for a preliminary supply was obtained from beds of gravel, saturated with water, located on lands purchased by the company near the point of exit of the South Platte river from the canyon of that name. Beginning at a point on the west side of the river in the NW 1/4 of Section 34, Twp. 6 South, Range 69 W, at an elevation sufficient to admit of the free flow of water therefrom to the highest points within the city limits, trenches were dug on light grades following down the general course of the river valley with several lateral branches.
In these trenches were constructed rectangular wooden cribs or galleries, 30 inches square, formed of 2"x4" rough lumber on the sides with 1/4" spaces between them, the tops solidly planked over and the trenches refilled. The total length of main trunk cribs was 3,584 feet, with 328 feet of laterals. Their depth below surface was 14 to 22 feet, and their total cost, including 5 masonry manholes with valves was $47,807.90, an average of $6.89 per foot. The total excavation required was 45,212 cubic yards. The result of this work was a measured flow of 3,260,000 gallons of pure, clean water, which remained constant for many months until the galleries were flooded to increase their yield up to the capacity of the pipe, 8,400,000 gallons daily; gaugings at the different manholes indicated that the yield of the cribs at 22 feet depth was nearly three times that at 13 feet. Four large ponds were formed over the galleries, and water turned into them from the river. They covered about twenty acres and were cleaned out twice a year, the deposited silt being scraped out and the surface of the gravel loosened by plowing. From them the water percolated freely to the drainage galleries, where it emerged perfectly filtered and clarified. These ponds later became parts of the Kassler filter beds.

From the cribs to the Ashland Avenue distributing reservoirs, located some four miles west of the center of the city, a 30 inch conduit was constructed, the total length of which was 107,012 feet - 20.26 miles. Of this distance, the greater portion, 87,580 feet, or 16.4 miles, was made of wooden stave pipe. Cast iron pipe was required to be used for a
distance of 17,144 feet, passing through the streets of the municipality of Highlands.

"A tunnel on the line, 2,288 feet in length, 36 inches in diameter, lined with concrete, completed the entire length.

"The wooden pipe was banded to withstand a maximum pressure due to 185 feet of static head below the hydraulic grade, which extreme occurred near its junction with the iron pipe.

"At the crossing of the valley of Bear Creek, it lay 150 feet below the grade line for more than 1,000 feet, and at numerous points, it withstood from 50 to 100 feet head of pressure. The total number of bands used was 271,900, which, divided by the length, gave an average spacing of 3.86 inches, which was sufficient for an average head of 70 feet throughout. This, however, was much more than was required for the grade line from the original source of supply, the extra banding having been added with a view of increased pressure to be given to the line by a proposed branch line from a large reservoir that was to be constructed at a high level near the head of the pipe. (This, the "Strong" reservoir was never completed).

The cost of this 16.4 miles of wood pipe was very moderate, consisting of $105,698.83 for material, $13,866.03 for contract labor on erection, and $41,823.94 for trenching and backfilling, a total of $161,388.80 or $1.86 + a foot complete in place.

"Trenching and backfilling was rendered unusually expensive by several miles of cutting from 10 to 30 feet deep, and one river crossing where the channel was turned and the pipe laid several feet below the bed of the stream.
"The general course of the conduit was north, and for the greater portion of its length, it was on the west side of the Platte River.

"Although the actual terminus of this conduit was at the Ashland reservoirs, connection was made with the city distribution system at various points from two to five miles above the reservoirs. Being thus freely attached to the city mains, with open connection with the reservoirs, only the surplus over and above the consumption at any time passed into the reservoirs, which occurred chiefly at night. Whenever consumption temporarily exceeded the volume of normal flow in the conduit, the deficit was drawn from the reservoirs, and thus for the lower two miles or more the water flowed alternately in and out of the reservoirs through the conduit."

The capacity of the conduit to the reservoirs with city connections closed was 8,400,000 gallons daily, at the maximum, or 6,300,000 gallons with reservoirs at full stage.

"The wood pipe, having a smooth interior which became smoother with use, had a decidedly greater carrying capacity than cast iron pipe of equal diameter, the difference amounting to about 16 percent."

The Republican carried a detailed account of the original construction work carried out by the Citizens Company, in its issue of March 16, 1890 saying in part:

"The special feature in this water works system is that the water is brought from the source of supply to the point of consumption by gravity alone, and all the expense of pumping is thereby dispensed with."
'Near the city the company has purchased three sites for distributing reservoirs. One at the intersection of Alameda Avenue and High Street, just north of Broadway Heights, where steel tanks are now being erected and will be completed inside of 30 days; a second near Sheridan Heights, north of St. Mary's Academy on the Boulevard - Federal - where a reservoir will be constructed which can be increased to a capacity of 25 million gallons, (there is no record of this reservoir having been built,), and a third near Cottage Hill, Block 22 north of Lakeside in North Denver.

'Old maps and records show that two iron tanks were erected in 1890 on the top of an embankment twenty feet high on the north side of east Alameda Avenue about 800 feet west of South University Boulevard, with their tops level with the high water line in the Ashland Avenue Reservoir. These tanks had a combined capacity of 1,320,000 gallons and were originally fed by a 12-inch pipe line laid along Alameda Avenue from a connection with Conduit No. 1 at the intersection of that Avenue and the Boulevard. After the completion of Conduit No. 2 in 1893, they were connected to that source of supply also.

Mr. Schuyler later said: "They served a useful purpose as equalizers to maintain supply and pressure to that part of the city and to relieve the main pipe of Conduit No. 2.

The Cottage Hill Reservoir, a 50'x50' iron tank was erected by contract on foundations installed by the company with completion in 1895 at a cost of $13,665.18. Its capacity was stated to be 823,631 gallons, although the sizes given in the specifications would limit the capacity to 734,350 gallons. See decree entered by the District
Court of Douglas County, Judge Arthur Conforth, on June 16, 1930, for 12.38 cubic feet of water per second of time as of October 1, 1889 covering transfer of water originally diverted at head of Conduit No. 1 to Intake of Conduit No. 8.

This decree specifically prohibits duplicate diversions of water at the same time by means of the original galleries, and Conduit No. 8 and orders records to be kept as in the case of diversions by means of the High Line Canal. (12.38 second feet is equivalent to 4 million gallons of water a day from both sources).

Construction of the Ashland Avenue distributing reservoirs was begun in December 1890, with completion without covers in 1891.

A December 1890 newspaper description of them follows:

"The two mammoth storage reservoirs of the Citizens Water Company situated at the west end of Ashland Avenue are being constructed with marvelous rapidity. One of the principal objects of the company, that is, the storage of a large supply of pure water during the winter for distribution next summer, would be lost if these reservoirs were not complete. So the haste is to complete them before cold weather necessitates closing down work.

"Engineer Allen has a force of 300 men and 200 teams that work night and day to accomplish the purpose. The Citizens Company owns ten acres of ground just over in Jefferson County, on which the twin tanks are being built.

"They are being constructed of dirt embankments, to be covered with layers of stone and asphalt. The depth of each is 29 feet, and on the
dividing embankment is a circular tank encased in stone, which contains valves to regulate the inflow and outflow of water."

"The reservoirs cover 7 acres of ground and will require 145,000 cubic yards of embankment before completion. This great task was undertaken but two weeks ago, and in less than four weeks from time of beginning, Engineer Allen proposes to have the entire dirt work completed. Later on the pipe line will be laid from the Platte Canyon, in a line as the crow flies to the Ashland Avenue storage tanks.

"The water will have an outlet through a 42 inch pipe down Ashland Avenue to Highlands, and thence via 16th Street to the City of Denver. The new reservoirs are 200 feet above the city base at Union Depot. The expense of constructing them will be $135,000, the embankment alone costing $50,000.

On June 1, 1890, charges were made that the reservoirs were unsafe. After a Republican reporter had been taken to inspect them by Chief Engineer Allen he wrote: "To all appearances the reservoir is in a safe and perfect condition. There is no visible evidence that any water has crept through the walls and everything is perfectly dry, save where the water has been let out through the proper outlet.

"The reservoir is sunk 12 feet on solid rock, and when the maximum amount of water is in the reservoir its level will be only two feet above the rock at the lowest point!

"In constructing the walls, Engineer Allen explained that the earth was laid on in layers and pressed down with a 12-Ton Roller. Over this,
as well as the bare rock, an average thickness of 1-1/2 inches of asphalt has been placed. No concrete has been used in the construction of the reservoir. On the west side wall the coating of asphalt is parted and slid down for two feet, forming loose folds. This was caused, Mr. Allen claimed, by the looseness of the underlying dirt and is a very insignificant damage.

"It was for the purpose of repairing this crack in the asphalt lining that the water was let out of the reservoir. Workmen are busily employed in finishing the reservoir and covering it with a shelter of boards. Mr. Allen insists that the reservoir is perfectly safe, and its general appearance under careful examination enforces his statement."

It will be remembered that, in the preceding chapter, the need for covering a reservoir of this type was discussed in connection with Capitol Hill Reservoir No. 1, with quotation from Engineering News of September 28, 1888 written on the subject of vegetable growth in reservoirs.

Again, in the issue of February 25, 1897, Engineering News, in writing about the water supply of Denver said:

"The two high service distributing reservoirs - Ashland - were formerly open and great trouble was experienced from the algae growths, as the water is known as "white water" (practically colorless) through which the sunlight easily penetrates, and the algae grow rapidly from the bottom, sometimes 6 inches in a day. When things got very bad the water would be drawn off, and men with forks would pile the stuff up into heaps
like haycocks and then load it upon wagons, from 90 to 100 hay wagon loads being sometimes taken out. When the Engineer first proposed to cover the reservoirs, there was not much faith in the plan, but eventually he was allowed to cover a part of one reservoir. The algae growths then stopped as though cut off at the line of the covering and the result was so convincing that Mr. Allen was then allowed to cover both reservoirs entirely. The covering is of planks and joists carried by vertical posts, and there is now no trouble from the algae!.

The original type of wooden roof used here was periodically renewed at considerable expense, until finally in 1964 the west basin was covered with a concrete slab, 321 feet wide and 422 feet long at a cost of approximately $350,000.

In the Metcalf and Anderson inventory of 1913, the area of the water surface in these basins, when full, was given as 6.13 acres. The capacity was stated to be 39 million gallons, extreme depth 25 feet and elevation at operating level, 246.3 feet above city datum.

Within a year after completion of the first conduit - 1891 - it became evident that another of still greater capacity was immediately required to supply the growing demand for "mountain" water.

On February 16, 1892, Mr. Schuyler submitted a lengthy report to the Directors of the Citizens Water Company on the various proposals that had been advanced for augmenting its supply, recommending the immediate construction of a new conduit from the mouth of Platte Canyon to the Archer ranch, the erection thereof of a filtering plant with a capacity of
12 million gallons daily and the completion of the east side pipe line via Littleton, suggesting that the line be of 34 inch diameter, since it would have a substantially greater carrying capacity at a small increase in cost over a 30-inch line.

This report was followed on February 27, 1892 by another one dealing with mountain reservoirs and water storage.

Since this later report sheds considerable light on the background for subsequent decisions on basic company policy, portions of it are here reproduced.

Mr. Schuyler began as follows: "The desireability and necessity of providing for the storage of pure mountain water in large quantities sufficient not only for the immediate present supply of the city, but for all future time to come, has always been the basis and ground work upon which the operations of this company have been conducted, upon which their plans have been laid, and their hopes of success have been founded. You have all recognized this feature of the scheme and accepted it as a foregone conclusion.

"Pressing necessity compelled you to deviate from the general plan to secure an immediate supply, pending the construction of the storage work, by, first, developing what could be gathered from the gravel beds at the mouth of Platte Canyon, and second, by the purchase of irrigation water rights in the river.

"While I have never questioned the entire feasibility of constructing the Strong's reservoir earth dams and conducting water into them by the
canyon aqueduct from the forks of the river, the large expense involved, the length of time required to construct the dams during which the capital invested would be idle, the uneasiness felt by the public living in the path of overflow of dams of such unprecedented height, and the difficulty in inspiring absolute confidence in the security of structures of the enormous dimensions of these dams in the minds of investors, have always impressed me with the desirability of seeking other sites in the mountains where the same quantity of water might be stored with dams of lesser height and less cost.

"I have frequently talked with Mr. Allen on this subject and have written him concerning it at various times, urging him to make a thorough examination in the mountains for such sites.

"Since my last visit, a number of desirable locations and projects have been presented, all of which I have carefully examined, involving a long and arduous trip through the mountains.

"Some of these are so obviously superior to the proposed foot hill reservoir not only in the matter of cost and security, but in the volume of water that may be stored, that in my judgment, an entire change in your plans is advisable. So great a saving in cost can thereby be effected as to make it a subject of congratulations that circumstances compelled a suspension of work on the foot hill reservoir last year, and lessen the regret that may be felt over the expenditure already incurred."

After discussing the Lost Canyon, Tarryall and Antero sites, as well as sites on Elk and Deer Creeks, with preliminary estimates of
cost, he narrowed his choice down to the Lost Canyon and Tarryall sites.

He then discussed the estimates of cost that had been made on the final location of the Canyon conduit which would feed the Strong Reservoir and came up with a new plan, saying: When its purchase - Marston Lake - was originally considered, about the time of my first visit to you, the price at which it was held was a bar to its acquisition. I understand that it can now be bought at a reasonable figure and although it is not immediately needed as a part of the system, it may become a most desirable feature of the works later on.

"A grade line conduit to reach the lake, Marston, from the river would head about a mile above the head of the High Line Canal, and follow nearly parallel to and a little above the Little Granger Ditch. This aqueduct, which would be the next in sequence after the construction of the pipe line - Conduit No 2 - recommended in my report of the 16th inst. may not be required for many years to come."

"Were it not for the length of time required to complete this conduit, from its head as far as the Rebecca Archer ranch, and the fact that it would cost very much more for that distance than the new Platte Canyon Ditch, recommended in my report of the 16th inst. and that this difference in cost would be idle capital until a third pipe or aqueduct were built to Marston Lake and the city, this line of conduit could be very well substituted for the new Platte Canyon ditch line."

"There will be a tunnel of about 500 feet to build near the High Line Canal, and a flume over the river.

"There is this to be said in favor of its construction: that it would be the highest canal on the river, above the ever hungry maw of the High Line
Canal and it would thus be certain to get the water belonging to it without fear or interference. The highest divertor of the stream certainly has a positive advantage."

On February 22, 1893, Messrs' Allen and Schuyler reported to the President and Directors of the Mountain Water Works Construction Company in part as follows:

"It is about a year since we submitted to you our plans and recommendations for the construction of a second conduit from Platte Canyon to Denver, to carry an additional water supply of 16 million gallons daily to the city. This conduit is now rapidly nearing completion, and by April 1st, we hope to have water flowing through it from the Canyon as well as from Marston Lake."

"The pipe laying, at the present rate of progress, will be practically completed by the end of the coming week as far as Alameda Avenue, and the entire line finished to Eighth Avenue in about two weeks thereafter, or about March 20th, as the materials are now nearly all on the ground, or en route.

"The main line from Platte Canyon is just twenty-one miles long from our tunnel near the head of the High Line Canal to 8th Avenue and York Streets, or 19-3/4 miles to the city limits at Alameda Avenue. The first 3-1/2 miles from the tunnel to the filter plant at the Rebecca Archer Ranch is 30 inches in diameter, laid on a heavier hydraulic grade than the remainder of the line, so that its capacity is somewhat greater than the larger main below, the excess in capacity being sufficient to furnish
all the wash water needed for washing out the filters without interfering with the full supply of the main.

The remainder of the conduit is 34 inches inside diameter, (or as actually laid, about 34-1/2 inches), excepting about three miles of cement pipe and cement lined tunnels which is 38 inches in diameter and 2,000 feet of 44 inch pipe from the junction with the Marston Lake main to Wynetka, where connection is made with the first 30 inch conduit. (Conduit 1.)

"The cement pipe is distributed along in ten different sections of various lengths, from 300 to 3,600 feet, wherever the pipe lies on the hydraulic grade and is consequently free from pressure. The total length of cement pipe is a little less than three miles.

"Since the line was originally planned, a number of changes in the design have been adopted, which are highly advantageous in every respect."

"As it was reported, upon in February of last year - 1892 - it was intended to start as a reconstruction of the Platte Canyon Ditch, which was to head at the old dam near the railroad station, and be located on higher ground than the present ditch and be lined and covered. In lieu of this, a 30-inch pipe has been substituted and extended some 2,000 feet further up the stream to the tunnel which is now under construction. This tunnel forms a part of the large 50 inch conduit which you have in contemplation as a feeder of the Marston Lake Reservoir, which conduit is now the sole reliance for carrying out the appropriation of the winter waters of the Platte, originally filed upon at the Forks, some ten miles higher up. In order to make a partial..."
use of the appropriation for the 34-inch conduit - No. 2 - we have con-
templated the construction of the headworks, and that portion of the
larger conduit above the tunnel in advance of the construction of the
remainder of the large conduit.

"The line has been definitely located on this upper division, the
distance from the tunnel to the diverting dam being 4800 feet. The
estimated cost is $21,350.

"A temporary arrangement has been made with Mr. Gilmore,
Manager of the High Line Canal, by which we expect to take our supply
through their tunnel until the upper portion of our work is completed.
(Limited to an estimated 12 million gallons daily.)

"Connection will be made at the High Line waste gates, by means
of a short flume with sand gates and regulators, with the South Platte
spanned by means of two 13 inch wooden pipes built in the form of an arch,
discharging into the 30-inch main on the opposite side of the river leading
to the Willard Filter Plant. This span is 104 feet in length, with one end
24.5 feet higher than the other."

In describing this rather unique bit of construction, Mr. Schuyler
afterwards said: These pipes are spread about twelve feet apart at the ends
and are brought together at the center for a distance of 20 feet where they
are tied together with iron bands. This construction, which was made as
a cheap and temporary crossing is novel but is staunch and effective and
illustrates what may be done with wood pipe.

"The arch was built on light falsework and was finished in less
than a week from the time the materials were assembled.
"When the falsework was removed and the pipes were filled with water the maximum deflection was but 7/8 of an inch with 8 men standing on it.

"A somewhat similar arch occurs at another point on the line, where the 34 inch line crosses a canal and is unsupported for about 60 feet."

For further data on this and other construction details used in building Conduit No. 2 see Mr. Schuyler's paper in Volume 31 of The Transactions of the American Society of Civil Engineers, already mentioned.

Conduits No. 1 and No. 2 crossed at Wynetka, where a two way connection permitted water from each of the mains to be turned into the other, with Venturi tubes installed below the cross for easy volume measurement of water flows.

In commenting on the advantages to be obtained by the construction of Conduit No. 2, Mr. Schuyler said on February 16, 1892 - "The location of this pipe line crossing to the east side of the Platte at Littleton and terminating at the Alameda Avenue tank, meets with my hearty approval. Its advantages are manifold. It brings the towns of Littleton, Petersburg and South Denver directly under your system without additional expense, and it throws a large supply into the city on the opposite side from where you now enter it with the present main - Conduit No. 1. Should you ever get control of the other company's works, it would couple with their system very advantageously, as their largest mains are apparently laid with a view of getting their chief supply from the direction of Cherry Creek."

"We have not pushed the work above the tunnel, in the hope that as this arrangement with the High Line people would probably be of no
inconvenience to them, for the reason that we only use their tunnel and practically take their waste water, it might be unobjectionable to them to continue it through the present season, thus saving the expenditure of $21,000 for some months at least. (This sum was omitted from the estimate of money required to complete the conduit and the work above the tunnel postponed until 1897 as will be seen later.)

"The contract for the tunnel was let and work begun January 6, 1893, the price being $6.75 a foot. The Contractors have worked diligently since, and now have about 220 feet of the 540 feet finished. The rock is exceedingly hard, and it was evident about the 10th instant that the contractors had taken the work at too low a figure, and in order to keep them at work it was necessary to help them out a little further. This was done by agreeing to furnish them their powder in addition to the contract price, which amounts to $1.00 a foot. Even with this assistance, they will make very poor wages. It was expected that the tunnel would be finished about May 1, 1893."

After reciting the progress that had been made on the Filter Plants, Marston Lake improvements and the Harriman Ditch flume, the report went on to say:

"The work in hand is so nearly finished as to enable us to approximate quite closely the probable expenditure needed to fully complete it. Mr. Holme has prepared a statement of this estimate and the expenditures to date."

See decree entered in Douglas County District Court on June 16, 1930 for 25.33 cubic feet of water a second as of September 1, 1892 covering transfer of water diverted from the head of Conduit No. 2 about 600 feet upstream to the head of Conduit No. 8. (8,251,000 gallons).
Willard Filters

The first mechanical filter plant installed on the Denver water system was the one built in connection with Conduit No. 2, located about 3-1/2 miles below the north end of Tunnel No. 1.

It immediately became known as the "Willard" filters and had an original estimated daily capacity of 5 million gallons.

Mr. Schuyler described this initial plant as follows:

"When the plan for the second conduit was adopted and the mechanical filtration of its water supply was decided upon as a resultant necessity for at least a portion of the year an investigation of the cost of mechanical filters on the market led to a research for some cheaper way of accomplishing the same results on a large scale. The plans finally adopted, which are the invention of Mr. C. P. Allen, Chief Engineer of the company, bid fair to be not only thoroughly successful but in many respects an improvement upon the well known types of filters in use, particularly in the matter of rewashing and cleansing the filtering material; while the cost of the plant per unit of capacity is but one-fifth to one-fourth the cost of efficient filters on the market."

The filters consisted of a series of wooden tanks, twelve feet in diameter, fourteen feet high ranged in rows on either side of the main supply pipe. These tanks had a false floor of wood, one foot above the bottom, supported and firmly attached to the bottom by cast iron posts, one foot apart, with bolts running through both floor and bottom. In the false floor strainers of finely perforated brass plate were placed in holes bored through the floor, six inches apart, there being 500 strainers, two inches in diameter.
in each tank. Each tank above the floor was divided into four compartments by wooden partitions reaching to within four feet of the top. Clean quartz sand to the depth of three feet was placed in each of these compartments.

This was dried, screened and crushed, with only that portion passing a No. 20 screen, but retained on a No. 30 screen being used. The particles were therefore between 1-400th and 1-900th of an inch in diameter.

Each compartment was provided with a valve for washing out the sedimentary deposit of filtration, this valve being placed about 18 inches above the top of the sand. A valve in the main conduit, when closed, forced the water to rise into a flume passing the whole length of the plant at the level of the top of the tanks. Outlets with regulating valves connected the flume with each of the compartments of each tank. The filtration was downward, the clear water being collected between the floors of the tanks, whence it was conducted again to the Conduit - No. 2 - below the main shut-off valve and allowed to flow to the city. Washing was accomplished by a reversal of the flow with either filtered or unfiltered water used in the process. The compartments were washed one at a time, until all had been cleaned. The capacity of each tank was about 500 thousand gallons a day, with a velocity of about five inches a minute through the sand. This was greater than existing practice through open pond filter beds, but with the aid of a coagulant to ensare and precipitate the particles of sediment, and by frequent washing, the operation seemed to be satisfactory.

In order to further clarify the river water, it was planned to build a settling flume at the upper end of Tunnel No. 1 to precipitate all sediment that would not be transported with a velocity of about 0.2 feet per second,
thereby increasing the duty of this plant.

At the main outlet to Marston Lake Reservoir, a similar filter plant was erected in 1893 consisting of a battery of ten tanks. The water of the lake being comparatively free from sediment, required but little effort or expense to render it clear, pure and sparkling.

The history of early water purification in Denver was well presented by an article in Engineering News, dated February 1, 1894 from which the following has been taken.

The article covered a period of twenty years and said that Denver had used nearly all the types of filtration which had, up to that time, been tried in the United States.

"Large infiltration wells were first used - 15th Street Pumping Plant then a filter crib in a reservoir through which the water passed horizontally - Lake Archer. This was followed by infiltration galleries - Mississippi Street and Cherry Creek - and finally by gravity mechanical filters. Some of the changes were made because of contamination to the supply and others were caused by the necessity of securing additional water. The large well and the filter cribs were abandoned many years ago. The infiltration galleries are still in use and the mechanical filters were put in use less than a year ago."

In commenting on the mechanical filters, the article stated: "One of the new filtration plants - Willard - is located about 4-1/4 miles below the head of the supply conduit - No. 2 - and about 3 miles below the arched pipe bridge over the Platte River"
"The other plant is at Marston Lake, a 5 billion gallon storage reservoir some two miles west of the bypass connection - Wynetka - shown in the issue of August 31, 1893.

"The Lake plant has not been in constant use as yet, owing to the fact that since its completion the lake has been but little drawn upon. Next spring the company proposes to build additional filters, making the total capacity of the new plants, 25 million gallons a day.

"Each plant consists of ten tanks with a daily capacity of 500,000 gallons each, arranged on both sides of a supply flume and a clear water conduit."

"The company's construction account shows the cost of the filter plant as $2,500 per 1 million gallons of capacity, including the foundations."

Marston Lake

It was publicly announced on October 12, 1892 that the Citizens Company had purchased about 320 acres of land on which the Lake was located, and that it would be enlarged at once and become a unit of the Platte Canyon System then under construction.

This decision meant that a material change in earlier plans had been decided upon.

In reporting his views on the situation, Mr. Schuyler, Consulting Engineer, said on August 22, 1892:

"I regard the Marston Lake scheme with much more favor than ever before, probably because I have gathered more data regarding it, and have studied it more thoroughly in all its bearings. I look upon it as a substitute
in all practical ways for the huge and more expensive Strong's Reservoir."

"Looking at this project in all its bearings, it seems to me to be the simplest and least expensive of the various plans yet proposed for increasing our water supply to the full capacity of the needs of the city for some years to come, and I heartily recommend it. As I have said before, it does not entirely relieve us of the necessity of storing water in the mountains, but it does so far relieve us that the Lost Canyon Reservoir would probably suffice for all our future needs."

As will be seen later, the proposed Lost Canyon Reservoir, located on Goose Creek about 6 miles above its junction with the South Platte was abandoned soon thereafter for the Lake Cheesman site.

Abandonment of the Strong Reservoir project, necessarily carried with it the abandonment also of the proposed 14 mile, 42-inch diameter pipe line to feed it with its Intake located on the North Fork of the South Platte River, estimated to cost about $360,000.

Since the original purchase did not provide sufficient lands to carry out the plans for enlargement and coordination with the balance of its plant, it became necessary for the company to immediately begin negotiations for the acquisition of about 400 acres more of the ranch property adjoining the Lake.

Unfortunately a feeling of antagonism against the company grew up during the course of these negotiations which ended in condemnation proceedings being started in the District Court at Golden on November 29, 1892.

After depositing $27,300 with the Court, an order for possession was issued to the company on December 1, 1892.
Fences were torn down and construction work started only to be stopped by one of the property owners, Mr. J. H. Bowes, who, after having the order read to him on December 2nd, by Chief Engineer Allen, still refused to comply with it. Thereupon Mr. Allen, put a hand on a fence post, gave it a pull and was immediately struck down from behind, by Mr. Bowles, who fractured his skull with a loaded whip handle.

For several days Mr. Allen's life hung in the balance but he eventually recovered.

Mr. Bowles was fined $5.00 on December 3rd by a Justice of the Peace in Littleton for assault, which he paid.

In due time, Mr. Allen filed suit against Mr. Bowles, claiming $50,000 damages for the assault. After three days of trial, the case was settled out of court on April 25, 1893. In reporting on it, the Republican the next day said: "The sudden termination would indicate that Bowles had become alarmed at the verdict that would probably be rendered against him and arranged for a compromise." The terms upon which the settlement was made were not reported at the time.

On December 23rd 1892, it was reported that all of the condemnation suits, except two, had been settled and that these would be disposed of shortly. At this time, work on the project was stated to be going ahead with little delay.

On February 23, 1893, Mr. Allen and Mr. Schuyler made a joint progress report to the President and Directors of the Mountain Water Works Construction Company, referring to this project in part as follows: "The preparation of Marston Lake for its conversion into a reservoir has been
carried out in a very substantial manner; the outlet tunnels, shafts, gates, 
gate chambers, etc. having been completed and lined about January 1, 1893. 
Since that time a small stream of water has been flowing into the Lake, 
although we had no means of conveying more than 2 to 3 million gallons 
daily until the completion of the flume from Harriman's ditch."

The main outlet to the reservoir was at the southeast corner of 
the Lake and consisted of a tunnel 1600 feet long, driven to tap the Lake 
at its lowest bottom. It was 38 inches in diameter and was lined with 
concrete. From this tunnel a 44 inch wood pipe line, 8900 feet in length 
built early in 1893, connected the Lake outlet with Conduits No. 1 and 2. 
As already mentioned the cross connection at Wynetka made it possible 
to route water from one conduit to another, with water from Marston also 
being made available to either one as required.

The flume which will convey the waters of Harriman's ditch to the 
lake, is so nearly completed that next Saturday, February 25th, has been 
set as the day for turning in the water."

"The entire construction of the past year - 1892 - bids fair to realize 
in every way our expectations. We shall have an abundance of water from 
the river, and a surplus of fully 2 billion gallons stored up in the Lake - 
Marston - available for draft at any time.

"To enable us to furnish the entire city supply we shall only require 
additional filters and the construction of another pipe line from the north 
outlet of Marston Lake to the Ashland Avenue reservoirs."

In his paper of September 20, 1893, Mr. Schuyler described the
Marston Lake Reservoir at some length, stating among other things, that
the basin, without artificial embankments had a capacity of 2.272 billion
gallons, covering 383.5 acres, and that by the erection of dikes across
two low gaps in the surrounding rim, its capacity could be increased to
over 5.6 billion gallons, the limit fixed as being then desirable."

"The water shed of Marston Lake is not over three square miles
in area, and has no means of being filled except by the construction of
feeders to it. To supply the reservoir, a conduit of 60 million gallons
daily capacity is projected to be built from the Platte River.

"Pending the completion of this conduit, a temporary arrangement
for filling the lake has been effected for the use of a large canal leading
from the Canyon of Bear Creek, an important tributary of the Platte. A
flume one and one-third miles in length, with a capacity of eighty cubic
feet a second has been built from the canal to the lake."

The Schuyler paper of September 1893 summed up the situation from
the Citizens Water Company point of view at the end of 1893, ending with the
following general observations:

"The waters of the Platte are so entirely appropriated for irrigation
during seven months of the year that in order to maintain a constant supply
flowing into Marston Lake, a mountain reservoir on the headwaters of the
stream has been determined upon as a necessary part of the water works,
to store the surplus flood water of early summer and the unused flow in the
winter. A number of sites of large capacity are available, and active work
upon a masonry dam of generous proportions will be one of the next items
of construction to be undertaken."
When completed, as it has been outlined in these pages, the system will be one of the most perfect in the United States, for amplitude of supply for a much larger population than the city now has and for purity, clearness and general excellence of quality. The two conduits already built have a combined capacity of 24 million gallons daily from the river, or 30 million gallons if part of the supply be drawn from the higher level of Marston Lake Reservoir, while the extension of the third conduit from Marston Lake to the Ashland Reservoirs will have a capacity of 30 million gallons daily. As the latter is but nine miles long and can be built in a few months whenever needed, it is evident that no danger of water famine need ever threaten the city after the main feeder to the lake is completed. (Conduit No. 7 built in 1911.)

The present consumption of water in Denver is enormous, reaching fully 200 gallons daily per capita in the summer and fall months. This is doubtless due to the reckless waste stimulated by "free water", which the exigencies of sharp competition between the two companies have enabled the citizens to enjoy for eighteen months.

The normal consumption under ordinary prudential use, even in a climate as arid as that of Colorado, will probably not exceed 125 gallons per capita.

The present population of Denver is about 150,000 and the summer consumption is estimated at 30 million gallons a day. Even if this rate be continued and increased, the works of the Citizens Water Company, completed and under construction, will amply provide for the needs of the growing city. The entire plant, when completed to the extent now contemplated,
will represent an outlay of about 3 million dollars. The company has no indebtedness, no interest charges to meet and small operating expenses. Its rival has an outstanding debt of $4,200,000 and is in the hands of a receiver. Under these conditions, the consolidation of the two companies may be shortly anticipated and the novelty of "free water with a chromo" brought to an end."

In order to carry out the 1893 recommendations of its Consulting Engineer, Mr. J. D. Schuyler and its Chief Engineer, Mr. C. P. Allen, with respect to the necessity of providing a mountain storage reservoir, it was necessary to widen the scope of the Citizens Water Company's field of operations beyond that originally contemplated.

Consequently an auxiliary corporation, The South Platte Canal and Reservoir Company was organized and filed its Articles of Incorporation with the Secretary of State on January 13, 1894. The capital stock was set at $500,000 with D. H. Moffat, W. S. Cheesman, Thomas S. Hayden, Charles T. Allen and Richard Holme, named therein as the incorporators.

The objects of the company were to furnish water in Douglas, Jefferson, Arapahoe, and Weld Counties for irrigation, domestic, sanitary, fire, mining and manufacturing purposes.

Specifically, it was organized to build the Cheesman dam, Platte Canyon Reservoir, Platte Canyon Filter plant, and other works at Platte Canyon. Its property was leased by the Denver Union Water Company after the consolidation and included in the valuation placed upon that company by the Board of Appraisers.
With negotiations for consolidation actively under way, construction work on the two Denver water systems was held to a minimum during the year 1894. Nevertheless, this situation did not prevent the finalizing of plans for integration, nor the making of extensive plans for system expansion after the consolidation had been effected in November of that year.

The Denver Union Water Company

At the time this company was organized, there were five separate and distinct sources, exclusive of suburban wells, from which water was obtained, for municipal use.

The underflow of the Platte River was taken from galleries located at Mississippi Street and at South Platte station near Kassler, and Cherry Creek was tapped near Sullivan in a like manner.

Water was also diverted from the Platte River through the temporary use of the High-Line Canal at the north end of Tunnel No. 1, and from Bear Creek at a point located below Morrison, via the Harriman Ditch and flume into Marston Lake.

The water from these several sources was conveyed to the city by four wood stave conduits, two - 30 inches in diameter; one - 34 inches, and one - 48 inches, with Marston Lake water delivered by a 44" conduit to one 30 inch and one 34 inch conduit at Wynetka, ten miles above the city where by-passes, suitably valved, permitted water from three of these five sources to be transferred from one conduit to another in case of necessity.
Conduit No. 1, a 30 inch pipe line began at the Kassler underground galleries and ended at the covered Ashland Avenue Reservoirs. These reservoirs had a capacity of 39 million gallons and were located at West 29th Avenue and Fenton Streets.

Conduit No. 2, a 34 inch pipe line started at the temporary point of diversion on the High Line Canal and terminated at East Alameda Avenue and South High Streets in two iron tanks having a capacity of 1,500,000 gallons. The top elevation of these tanks was the same as the high water level at the Ashland Avenue Reservoirs.

Conduit No. 4, a 48 inch pipe line, conveyed water from the Mississippi Street galleries to the West Side covered distribution reservoir. The capacity of this facility was 12 million gallons. It was located at West 12th Avenue and Shoshone Street.

Conduit No. 5, a 30 inch pipe line, had its origin in the Cherry Creek galleries near Sullivan and delivered water to Capitol Hill basin Number One, the capacity of which was 7 million gallons, exclusive of the attached stand pipe. This covered basin was located north of East 9th Avenue at Elizabeth Street.

Two mechanical filter plants each of 5 million gallons daily capacity were in operation at this time, one was located on Conduit No. 2 about 3 1/2 miles north of Platte Canon Station and the other on the 44 inch conduit below the outlet of Marston Lake. The clear water from this second plant was returned to the 44 inch conduit, after which it was delivered to Conduits No. 1 and No. 2 at Wynotta.

Two pumping plants were in service on January 1, 1895, one located
at the foot of 15th Street and one at the West side works. Both of these stations were served with water taken from the Mississippi Street galleries and delivered by Conduit No. 4 to the West Side distribution reservoir.

The pumps at the west side had a rated capacity of 22 million gallons daily. The 15th Street plant was fed from the west side distribution reservoir through a 22 inch wood stave pipe, 1.69 miles in length connected to a tank at 14th And Delgany Streets. This station had a rated capacity of 6 million gallons daily, and was used to keep the downtown pressure at a satisfactory level during periods of peak demand. It was not entirely dismantled until about the first of April 1898.

In February 1895 it was reported that the combined mileage of conduits and mains was 247 equivalent to 330 miles of 8 inch main serving 19,591 taps.

Chief Engineer Allen, in his 1895 annual report, dated January 7, 1896 listed the total number of hydrants set and in operation at the end of the year as 2570, 1920 of which were located in Denver, Harman and South Denver. 646 more were in 60 suburban communities with 4 private ones at the Union Station and at the Stockyards.

Water delivered into the city of Denver by the company during the calendar year 1897 as reported by the Chief Engineer totalled 9.94 billion gallons - 30524 acre feet - divided by source of supply as follows:

Mississippi Street galleries, 20.2 percent; Cherry Creek galleries 17.2 percent; Platte Canon galleries, 27.5 percent; South Platte River diversion 28.5 percent; and Bear Creek diversion via the Harriman Ditch, and Marston Lake, 6.8 percent. The maximum daily demand of 41.2 million
gallons occurred on September 4th,

Much of the activity connected with plant improvement during the years 1895 to 1899 inclusive, in addition to the completion of projects started by the Citizens Company before consolidation together with new ones started during this period had to do with adjustments in the distribution system for the purpose of eliminating about 50 miles of duplicate pipe, improving pressure conditions throughout the city and in general, consolidating two independently constructed water systems into one of better over-all effectiveness.

It seems proper to note here that work on the uncompleted project of the American Water Works Company designed to obtain a large supply of water from Cherry Creek, upstream from the original galleries in that stream, was not resumed after the consolidation. Likewise, work on the uncompleted "Strong" or "Hog Back" reservoir and the South Platte River Canal which was intended to supply it with water from the Two Forks area on the South Platte River started by the Citizens Water Company, was suspended by the new management. Both of these projects were, according to newspaper releases in 1899, being held in reserve for future consideration.

Projects started by the Citizens Company, temporarily suspended during consolidation negotiations together with new ones started after January 1, 1895 included: (a) Construction of the first unit of a pumping plant at Capitol Hill reservoir, Basin No. 1 and the installation there of two Holly pumps and one boiler transferred from the Petersburg Plant in 1895, and put in operation early in 1896. The capacity of these pumps at the time was given as 7 million gallons a day.
This project followed the extension of Conduit No. 2 north on York Street from East 8th Avenue to the Capitol Hill Reservoir, which thereafter was fed from the Platte River as well as from Cherry Creek. (b) Completion in 1895 of the Highlands Tank located on Block 22, Cottage Hill addition at a cost of $13,665.18. (c) Construction of a temporary high service station located on leased land at West 29th Avenue and Sheridan Boulevard. This plant equipped with 2 Deane horizontal Duplex Compound pumping engines built in 1889, of 1 million gallons daily capacity each, was put in service in April 1896, the total pumpage for that month being 18,185,000 gallons. It fed water into the Cottage Hill Tank which, in turn, supplied water under pressure to high points in the Highlands area. It was dismantled after the first installation of the present plant, located at the southwest corner of the West 29th Avenue and Sheridan Boulevard intersection, was built in 1907. In his report dated November 1, 1898, City Engineer Hunter listed this plant as having a total value of $5,000. (d) Enlargement of the filters at Platte Canyon and at Marston at regular intervals, so that by the end of the year 1899, the daily capacities were 13 and 12 million gallons respectively, or a total of 25 million gallons which, with the cribs at Platte Canyon located at the head of Conduit No. 1, gave a capacity of filtered water from the South Platte River and Bear Creek of 33 million gallons a day.

The total volume of water delivered to the system from these three sources, for the year November 1, 1898 to October 31, 1899 was: from Platte Canyon Cribs, 2,768,212,670 gals; from Platte Canyon Filters, 3,347,813,448 gals; and from the Marston Lake Filters, 1,346,763,386 gals, a total of 7,462,789,504 gals, representing an average daily volume of 20.73 million gallons. In addition, water taken
from the Mississippi Street and Cherry Creek galleries averaged about 10 million gallons a day. (e) In order to avoid taking contaminated Bear Creek water into Marston Lake from the first point of diversion located below Morrison, a 34 inch wood stave pipe line 2578 feet long salvaged from abandoned lines in the city, was built in the winter of 1897-1898 for the purpose of by-passing that community.

This pipe line extended upstream from a point on the Harriman Ditch just below the original Head Gate, to a new point of diversion on Bear Creek situated well above the town.

Water was turned into the line on Sunday, January 23, 1898 with all work completed by March of that year. From this time on Bear Creek water traveled about eight miles by pipe line, ditch and flume before reaching Marston Lake. The carrying capacity of this facility was estimated at 160 cubic feet of water a second with control of the Harriman Ditch then resting in the Denver Union Water Company. (f) Enlargement of Marston Lake as a part of the Platte Canyon project of the Citizens Water Company, with the necessary inlet and outlets facilities providing for future pipe line connections to the South Platte river and the Ashland Avenue reservoirs was carried forward from the time of its purchase in 1892 to the end of this period, December 1899, with its capacity being increased from 6975 acre feet when purchased to 17,307 acre feet as the recommended ultimate volume desired. (Note: The maximum capacity of Marston Lake was later limited by the State Engineer to 16,640 acre feet).

(g) In December 1897 the long delayed extension of Conduit No. 2, upstream from the High Line Canal through Tunnel No. 1, a distance of
6,200 feet to a permanent point of diversion from the South Platte river was completed. The original pipe arch bridge over the river was replaced as a part of this project by an iron structure on masonry piers. It was reported on May 17, 1897 that the head gates, bridge piers, 30 inch pipe across bridge and connection with tunnel No. 1 had been completed.

Although the entire project was not completed to the satisfaction of the Chief Engineer until late in the year, water was turned into Conduit No. 2 from this new river intake on June 27, 1897. This intake served as the principal point of diversion from the South Platte River until 1912 when it was replaced by one built about 1828 feet upstream in connection with the construction during that year of Conduit No. 8.

True to the long standing conviction of Mr. Cheesman and his associates, that mountain storage capacity in substantial amounts was a necessary adjunct to the Denver Water system more than two years of preliminary negotiations and investigations ended on January 22, 1899 when it was announced that work had been started on a dam located just below the junction of Goose Creek and the South Platte River, about 15 miles south of Buffalo Park.

The site selected by Chief Engineer Allen after much study was considered to be suitable for a rock fill type of dam having a height of 210 feet above low water stage elevation zero or 225 feet above the low point in the solid granite foundation. The width of the canon at elevation 15 feet was 30 feet at elevation +30 about 40 feet, at elevation 90 about 130 feet, gradually lengthening to about 710 feet at elevation 217.
The top of the dam was straight in plan, with the steel plate upstream face in one plane on a 1/4 to 1 slope. This plate was to be anchored into a 12 inch slab of concrete laid against a heavy masonry wall built of hand selected stone supported by a footing of Portland Cement masonry. Behind this the rock fill was to be placed with a downstream slope of 1-1/4 to 1.

It was proposed to draw the water from the reservoir through three tunnels driven through the left abutment at elevations +10, +60 and +110.

The lowest tunnel was driven and a 42-inch twin valve to regulate the outflow and a guard balance valve at the entrance of the tunnel were placed in position. The flow of the river was then diverted through the tunnel by building a temporary dam across the river just above the site of the proposed permanent dam.

Work on the rock fill dam was then commenced, with a bridge being built across the canyon at elevation 100 for use in dumping loose rock into the dam.

Work was prosecuted until May 1900 at which time the masonry and steel facing were at elevation 28 and the rock fill behind it at elevation 54.

In the latter part of April, rain added to the melting snow caused a flood in the river of greater volume than the discharge capacity of the tunnel at elevation +10. The reservoir was filled rapidly and on May 3, 1900, the flood overtopped the rock fill and washed it away completely, leaving only the masonry and steel facing. As will be seen later, this event
caused the original design to be changed from a rock fill to the solid masonry type, becoming the Cheesman dam of today.

Going back to December 1894, it will be remembered that the President of the Board of Aldermen, Martin D. Currigan, succeeded in getting that branch of the city government to pass a resolution calling upon President Cheesman of the water company to outline his position with respect to the rate question, which, according to the 1890 franchise, would soon be up for review.

As a result of the directive that followed, Mayor VanHorn and Alderman Currigan called upon Mr. Cheesman on January 5, 1895. In the hour long discussion that followed, mostly between Mr. Currigan and Mr. Cheesman, it developed that nothing short of a 50 percent cut in all water rates would satisfy Mr. Currigan, which Mr. Cheesman refused to consider, saying, the stockholders of the company had not received a cent in dividends since the company had been formed. He stated further that the two old companies had lost $1,500,000 during the time they were trying to freeze each other out. The conference ended in a hostile atmosphere, with Mr. Cheesman asking Mr. Currigan who he was working for, the interests of the city, or as rumored, for a syndicate antagonistic to the water company.

Two days later, President Cheesman sent a letter to the Mayor and Alderman Currigan in which the situation from the point of view of the company was set forth in considerable detail.

After calling attention to the fact the company on May 1, 1894, had voluntarily reduced rates to the extent that the company revenue was fully...
20 percent below what it was authorized to receive under Schedule "A" of the 1890 franchise, he proceeded to point out the difficulty of making a fair comparison of rates in Denver with those of comparable cities located in more humid portions of the country.

With a municipal election coming up in April, the divergent attitudes of the factions within the City administration at this time relative to the water and other problems were obviously influenced by political rather than by business considerations.

During the campaign preceding this election, Alderman Currigan presented a plan for the construction of a municipal water plant, and introduced an ordinance for the issuance of $2,750,000 in bonds to finance it. However, he did not have the necessary support within the city council and the scheme was killed at a meeting of the Board of Aldermen held on February 21. This was a hot meeting with the lie being passed freely over accusations made by Mr. Currigan that certain Aldermen had approached President Cheesman for money to secure their votes on the South Denver lease arrangement. However, proof of such charges was not to be had, and the matter was eventually dropped.

Since the five year term on the rates provided for in the 1890 franchise would expire on April 10, 1895, the leading question of the city election that was held on April 2, 1895 was whether reliance should be placed in the company to live up to the rate section of its franchise, or whether a municipal water system should be built by the city.
According to "King", page 203, "The Water Company, through the regular Republican party machinery, nominated its ticket; those that preferred municipal ownership or any other solution, other than a supine reliance upon the company nominated theirs."

The candidates on the company’s ticket signed a written pledge that they would see that the provisions of the rate section in the franchise were carried out. In reporting the results of the election, the Republican on April 3, 1895 said: "Every Ward gave a Republican majority sufficient to elect the whole Board of Aldermen. The next administration will be Republican throughout."

Immediately after the new council had been organized, Mayor McMurray on April 11, sent a message to the Board of Supervisors transmitting rate information that had been collected by the previous administration, reminding the members thereof that each had agreed as a candidate for office that if elected he would faithfully enforce the provisions of the water franchise with respect to rate revisions, and called upon them individually to give the matter their immediate attention.

In due time water committees were appointed by both bodies of the city council who, after much discussion but without technical advice, were unable to come up with definite recommendations on the subject, even though the time for collecting water rates on May 1st had been passed.

Consequently, on May 13, 1895, President Cheesman wrote a long letter to the joint committee on the matter herequoted in part as follows:
"From the fact that it is necessary for the Denver Union Water Company to collect its water rates on or about the first days of May and November of each year, and that we have deferred making any attempt to collect them on the first day of May of this year, at the request of your committee, so that the rates might first be adjusted, and that so far as we know, no definite results have been reached, we deemed it desirable to place before you certain facts and to a certain degree, at least define our position with reference to this matter with the intent that you may have these facts before you in your deliberations and with the hope that they may assist you in arriving at a speedy conclusion of your labors."

After stating that the company up to that time had ignored the many false and misleading statements published about it, Mr. Cheesman said he felt the time had come to bring out the facts. Thereupon he presented a statement of revenues and expenses for the year ending April 30, 1895, which showed that revenue collected from customers, exclusive of lawn irrigation, amounted to $433,852.64; from lawn irrigation $91,705.05 and from Hydrant rentals, $83,705, making a total of $609,262.69 in gross revenue for the year; expenses were: Operation and Maintenance, including taxes, $180,188.26; Interest at 5% on 7 million dollars of outstanding bonds, $350,000; Miscellaneous, $456.11 and $107,130.76 expended for additions and betterments to plant. The total expense of $637,775.13 was therefore $28,512.44 in excess of gross revenues.

After reminding the committee of the difficulties encountered in obtaining a supply of mountain water for Denver and the plans of the company for the future, as well as mentioning many other related matters,
Mr. Cheesman concluded his letter by saying: "After carefully considering this matter, we think your committee will agree with us that a general reduction of 10% upon every item in our schedule, except irrigation and meter rates would fairly represent the average rate prevailing in the cities of Chicago, Cincinnati and St. Louis for the same service and we suggest this is a correct solution of the problem. This proposal for a 10 percent reduction, taken in connection with the voluntary reduction already made on irrigation and other items is equivalent to a total reduction of 20 percent from the Schedule Rates as provided by Ordinance No. 44 in the Series of 1890."

"Up to this time we have submitted to criticism that was unjust, unfair and untruthful without reply, feeling that when the proper time had arrived to consider these matters we would meet with a fair and candid hearing by the people most concerned. If such fair treatment is accorded us, we can make no complaint, but we must maintain that the integrity of the contract with the city is essential to our own ability to carry out that contract."

With a taxpayers committee insisting that nothing less than a 30 percent reduction in rates would be acceptable, the joint water committee in a majority report to the Mayor and members of City Council dated May 31, 1895, after reviewing its efforts said: "We are, therefore, compelled to say to your Honorable Body that we have simply been unable to estimate these several items - in the rate structure - correctly, and for that reason, we do not feel justified in submitting the schedules herewith. The introduction of the meter system has been suggested as a
solution of the matter. We have looked into this question as carefully as possible and are of the opinion that the adoption of the meter system at this time would not be desirable or advantageous to the water consumers of the city."

Thus the whole question went back to the City Council unsolved, where it seemed to properly belong.

With much loose discussion, pro and con about rates, both publicly and privately engaged in without tangible results, a notice was issued by the Denver Union Water Company on June 1, 1895, stating that pending the adjustment between the city council and the water company, it was compelled to proceed with the collection of water rates as usual, with the promise that any legal reduction made in the existing rates would be promptly recognized.

During the next few months, the rate question remained prominently before the people and the city council with several efforts being made to pass a rate schedule that all of the contending factions could accept, without success.

Eventually, the matter was brought before District Judge Johnson, by a group of interested citizens, who, after the usual hearings, on September 28, ordered that a writ of mandamus should be issued to compel the City Council to require the Denver Union Water Company to make a new schedule of water rates for private consumers in Denver equivalent to the average rates charged for like service in the cities of Chicago, St. Louis and Cincinnati.

The City Council promptly proceeded to pass an ordinance by
concurrent resolution on October 2, 1895, requiring the Water Company to fix a schedule of rates in accordance with franchise provisions, as ordered to do so by Judge Johnson.

Within a few days, a resolution was introduced in the Board of Supervisors asking the City Attorney to report on the steps necessary to take toward the alternate purchase of the water system by the City.

The annual meeting of the Denver Union Water Company was held on November 12, 1895, at which time Mr. Cheesman was re-elected President and the rate question discussed at some length at that and subsequent meetings by its Board of Directors.

As a result of these company deliberations, the water company put a new schedule of rates into effect on November 1, 1895 which was commented on editorially by the Republican on November 25th of that year, in part as follows: "After an unnecessary and unwise delay of seven months, the Denver Union Water Company has made a reduction of 20 percent in its rates for all house service of every kind, and 15 percent in its rate for lawn service".

"The reduction will lessen the annual receipts of the Company from private consumers by about $100,000 which certainly is a substantial saving to the people and probably is as heavy a cut as the Company can stand at this time without risk of insolvency. One of the conditions demanded by the company in all previous negotiations on this subject was the enactment of a revision by Ordinance to make the new schedule, whatever it might be, binding on the water consumers of Denver for 15 years to come. This the "Republican" resisted with all its might and the company has felt compelled to abandon it."
"The community and the company should treat each other fairly, and we are sure that if the company had made the reduction six months ago, which it now concedes, the water question would be a half forgotten memory now and a great deal of bitter feelings would have been averted."

The concessions made by the company in its new rate schedule did not satisfy either the Mayor or the public, and before the year closed, a "Water Users Protection Association", was formed, filing its Articles of Incorporation on November 30, 1895. The stated purpose was to enforce the terms of the franchise with respect to rates as well as to encourage the purchase of the water plant or to construct a new one.

Attempts by the water company to collect for water furnished by it under this new schedule of rates, with the threat of having it shut off if prompt payment was not forthcoming, soon brought the courts into the water controversy.

The first action was one started by a Doctor Freyermuth and some other water consumers in which District Judge Butler was asked to issue a blanket injunction preventing the water company from turning off the water from all premises in order to enforce the payment of rates, which it was claimed were not according to the terms of the contract between the City and the Company.

The Judge refused to grant an injunction to more than the parties to the suit itself. Later, District Judge LeFevre when asked to interfere in the matter, declined to act contrary to the decision of his fellow Justice. The case was finally heard by District Judge Johnson on its merits. On
May 11, 1896 he ruled in favor of the water company.

In reporting this decision, the Republican said in part: "The
decision is important, as it would compel each and every water consumer
to sue for himself if Dr. Freyermuth wins."

Political and other differences with regard to practically every
issue that came before the City Council during the year 1896 prevented
most worth while projects of a municipal nature from becoming realities,
with mayor McMurray and 2 Supervisors together with 5 and sometimes 6
Aldermen, out of 14 lined up in opposition to 3 Supervisors and 8 Aldermen
comprising what the Republican called the combine and claimed by it, to be
dominated by three distinct utility interests; the lighting, the water-tramway
and the telephone corporation.

In commenting on this unfortunate situation, the Times on January
5, 1897 said: "Supervisor Scobey has stood in the way of more desirable
legislation during the past two years than any other member of the city
government. He has in his possession over three hundred bills, reso lutions
and other proposed measures which were referred to him as Chairman of
different committees. All of these he has failed to report back and they
remain pigeon holed, some dating back to early in 1895."

According to "King", the three interests named were correlated with
the larger industrial corporations and problems of the state, with the
tramway concerned with inter-urban and railroad development, the state's
fuel supply through the mammoth coal beds of Routt County tapped by the
Moffat Road, and with the water power in the State through the Tramway
Power Company. "The water company was concerned with irrigation, with
water rights and the statutes pertaining thereto. The Lighting Company was also interested in the water power and electrical development throughout the State and the Telephone Company in telephone service everywhere. The States every leading industrial interest, was therefore closely linked with Denver's Public Utilities. Control of both lay through control of party machinery. The industrial interests that wanted their will expressed through the Denver Government had equal reasons for using for their ends the State Government and the State Party. In these facts lie the explanation and essence of actual government in Denver."

The possibility that the City might condemn, acquire by purchase or construct a duplicate water plant of its own was raised from time to time during this rate controversy. With the City Attorney having ruled that the city did not have the power of condemnation in this instance, the Board of Public works on December 23, 1896 adopted a resolution instructing its engineer to procure as soon as possible full information as to the approximate amount of money required to secure by purchase or otherwise a water plant suitable to provide the city with water, concluding data on operating and maintenance costs.

On February 18, 1897, the Board of Supervisors passed a resolution referring to its resolution of March 12, 1896, in which it was recommended to the City Council that an election be called for the purpose of authorizing a bond issue in the amount of 5 million dollars at 4 percent interest for the purpose of acquiring a complete system of water works for the city and upon which no action had as yet been taken by the Board of Aldermen, requesting
that the water committee of that body report without further delay, so that a vote could be taken at the municipal election of April 1897.

Although such a bond issue was not voted upon at that time, the water question was the sole issue of the campaign with Mayor McMurray and all of his ticket being re-elected on April 6, 1897 with the help of the Civic Federation and the vote of the women.

As a direct result of this widespread support, the City Council, on April 29, 1897, passed an ordinance in which it was declared that the rates charged by The Denver Union Water Company to private consumers were not, and had not, been since October 2, 1895, equivalent to the average rates prevailing in the cities of Chicago, St. Louis and Cincinnati to private consumers of water for the same service, and required the company, on or before 10 days after the date of the passage of the ordinance and the service of a copy thereof upon the company to comply with the terms of the resolution of the city council passed October 2, 1895.

The water company made no pretense to comply with this demand and therefore, on May 21, 1897, a suit was brought, at the instigation of Mayor McMurray, in the District Court of Arapahoe County to compel the company to comply with its contract.

The complaint in this suit was based on three items, (a) that the company had failed and refused to comply with the requirements of section 5 of its franchise regarding rates; (b) that the company had violated section 6, in that the water which it had furnished was impure and unwholesome for domestic uses, and (c) that there had been a failure of the company to comply with the provisions of section 8 regarding pressure.
The complaint was amended by the city on June 19 and again, as a result of a court order, on October 15, 1897, so that as the trial finally proceeded it was upon the three causes of action above stated namely, price, purity and pressure.

During this same period of time, the City Council passed and the Mayor approved on July 28, 1897, an ordinance specifying heavy fines for each and every time the company collected on the existing rate schedule; a heavy fine for each day that the company failed to supply water "of as pure and wholesome a quality as that shown by the analysis of Professor Joseph A Sewall", and a heavy fine for each day the company failed to get its pressure up to the required standard.

Here the matter rested while both sides waited for the outcome of the District Court suit started on May 21, 1897.

After four months of hard work, Judge LeFevre, on February 9th, 1898 decided on the rate portion of that case by handing down a schedule of minimum and maximum rates, as fixed by him for private consumers of water in the city of Denver, to become effective on May 1, 1898. The schedule was stated by the Judge to be equivalent to the average minimum rates then prevailing in the cities of Chicago, St. Louis and Cincinnati for the same service. He further found that the rules of the company were not harsh, oppressive nor unreasonable as charged by the city.

At this time he set February 17th as the date upon which he would take up the trial of the case so far as purity and pressure were concerned. The trial proceeded as planned with respect to these items, ending on July 8, 1898 with a decision by the Judge in which he found for the company on every
point raised by the city.

An appeal was subsequently taken to the State Supreme Court with that body dismissing it on September 18, 1899 for lack of jurisdiction and other reasons as stated in Colorado Reports, Volume 26, page 413.

Retracing our steps somewhat, it is to be noted that the water company was engaged during those early years of its existence in other litigation in the Federal Courts as a result of the "Venner" and allied suits over the sale of the American Water Works Company property which preceded the consolidation of that Company with the Citizens Water Company.

Without detailing all of the moves made in the State and Federal Courts along those lines, suffice it to say, that on October 28, 1897, at the request of the water company, Judge Thayer of the United States Circuit Court at St. Louis granted a temporary injunction against the City officials of Denver restraining them from interfering with the collection of water revenues until November 6, 1897. This injunction against the city restrained it from taking any steps or action whatsoever, whether by suit or by arrest to enforce the provisions of the ordinance passed by the City Council and approved by the Mayor on July 28, 1897 as noted above.

This injunction was continued in effect by an opinion rendered on November 15, 1897 by Judge Thayer.

In that opinion, Judge Thayer in part said: "The bill filed in the case complained principally of the provisions of the various ordinances passed by the Denver City Council and the object of the motion was to obtain an order staying enforcement during the pendency of the suit. It alleged in substance that there was in existence a conspiracy among the officers..."
and citizens of Denver to harass and oppress the Water Company to
prevent it from collecting water rates from the city and private customers
for the purpose of depreciating the value of the company's property destroying
its credit and ultimately enable the Municipality to acquire the plant for much
less than its actual value.

The history of the pending rate case was referred to by Judge Thayer,
who then proceeded to say: "After a careful perusal of the affidavit the court
concludes that the complaint made by the city of the lack of pressure at the
Union Depot hydrants is not well founded and not made in good faith."

"On the whole and for reasons intimated, the court has concluded that
enough doubt has been excited relative to the validity of the ordinance in
question - dated July 28, 1897 - to warrant the court in enjoining the en­
forcement of its provisions pending the trial of this case until its final
determination."

On November 16, 1897, the Times, a local newspaper friendly to the water
company, commented editorially on the general water problem at considerable
length with the quotations that follow taken therefrom.

"The leaders in this warfare have from the beginning been Thomas
M. Patterson, Corporation lawyer and personal organ, Editor, The News,
assisted by Thomas M. McMurray, Mayor and gubernatorial aspirant. These
two political demagogues have lost no opportunity of misleading, deceiving,
and falsely inciting the people upon the water rate question and incidentally
of manipulating the unwarranted public sentiment thus created to their own
personal profit. Beaten upon every legitimate proposition in connection
with the controversy they have resorted to every unscrupulous and illegitimate
device which a cunning brain is capable of, regardless of right or justice
or expense to the people."

"They have attacked public enterprises, villified private character
and pillaged the people, only to increase the burdens of those whom they
were hypocritically pretending to be friends."

"These public highwaymen have about run their gamut and the people
of Denver are to be congratulated that the end is near."

Again, a few days later, on November 20th, the Times gleefully
reported that Judge LeFevre had issued an order against delinquent water
consumers requiring them to pay up or be in contempt of court.

The long awaited report on the feasibility of the erection of a competing
city water plant by City Engineer John B. Hunter was submitted to the Board
of Aldermen by Mayor McMurray on November 16, 1898.

Mr. Hunter then recommended the construction of a water plant by the
city at an estimated cost of $5,700,000. He placed the value of the plant
of the Denver Union Water Company, for which the company was asking 9
million dollars, at $3,763,617, which did not include the franchise value,
the assessed valuation of which was one million dollars.

The report was transmitted to the Board of Public Works and referred
for study to its engineer, Mr. H. C. Lowrie.

The municipal election campaign of 1899 was centered about the
water question and the bid of Mayor T. S. McMurray for a third term.
There were seven candidates for Mayor at that time, all running with partisan support of one kind or another.

The official tabulation of votes after the election of April 4, 1899 gave Henry V. Johnson, the democratic candidate, 9,696; Thomas S. McMurray, good government candidate, 8,287; Willard L. Ames, Teller silver republican candidate, 7,885; and Russell Gates, regular republican candidate, 7,451.

An editorial in the Republican of April 5, 1899 stated that the News and Post supported Mayor McMurray, the Times, Mr. Gates and the Republican, Mr. Ames.

The successful candidate, H. V. Johnson, was elected, in the opinion of the Republican, by a policy of intimidation and coercion resorted to by the democratic manager, backed by a splendid party organization supplied with abundant money, with the Sheriff's office and the Fire and Police Forces tipping the scale in his favor.

Again quoting from King, page 205, "The corporations all contributed bountifully toward the defeat of Mayor McMurray."

After an absence of four years, Martin D. Currigan was returned as Alderman from the 4th Ward at this time and soon resumed his efforts to solve the water problem with plans of his own.

At the time Mayor Johnson assumed office he said that his administration was pledged to the idea of municipal ownership of all utilities, but that the desired results to that end would not be attained over night or even after a period of two years. However, he did hope to eventually secure lower rates for all services, without carrying a knife up his sleeve or by making and
waging relentless warfare on fellow citizens in the utility business who, had rights that had to be respected and could not be confiscated. He further explained that he intended to deal fairly at all times, and expected in return the same kind of treatment, all for the benefit of the people of the city.

Some idea of the policy the water company intended to pursue with the new municipal administration was obtained at a meeting held between representatives of the city and the corporation on April 19, 1899.

When asked if the company had any propositions to make, Mr. Cheesman said he had none, other than the one submitted to the Board of Public Works in the summer of 1898 offering to sell the water plant to the city for 9 million dollars. In the course of the discussion that followed, President Cheesman stated that, in his opinion, the construction of a new water plant by the city, to compete with the existing one would be a menace to the best interests of the community and lead to the bankruptcy of one or the other.

Mr. Hughes, counsel for the water company, briefly presented a resume of the litigation over water rates and said that it might be a long time before the Supreme Court took action on the case then before it.

Mr. Cheesman intimated that the water company was strongly fortified by its 1890 contract, drawn by Thomas M. Patterson and that it knew its legal rights and was not at all disturbed by the existing clamor against it.

The new Board of Aldermen opened up its program on May 4, 1899 at which time, among other anti-utility actions, Alderman Kelly introduced
a resolution demanding that the Board of Public Works devise plans by which the city could get a water plant of its own for three and one-half million dollars. This proposal adopted by the Aldermen did not meet with the approval of City Engineer Hunter, who insisted that about 5 million, 5 hundred thousand dollars was the sum needed.

After mulling the matter over, the joint water committee of the City Council sent a communication on June 26, 1899 to the Board of Public Works requesting that it ask the water company to again put a price on its plant, with a view to selling to the City. This request was forwarded at once to Mr. Cheesman who, because of absence from the city, did not reply until August 11th, when the entire matter was again discussed in a joint conference with city officials without tangible results.

In the interim, a full page illustrated article on the Goose Creek dam then under construction was published in the Republican on July 2, 1899.

This was written by a special correspondent of the New York Herald and contained information of much value pertaining to the project, which as has already been noted, was later changed from a rock-fill to a solid masonry type of dam.

During this interval various proposals for bond issues to build a city owned system were also studied by the City Attorney, so that all known legal obstacles could be successfully avoided when the time came to take action.

The Republican announced on August 16, 1899 that the first active steps would be taken on that day by City officials to secure a publically owned water system, unless the water company fixed a reasonable price below the 9 million dollars then asked for it.
The Currigan plant bobbed up in an editorial, which appeared in the Republican of August 20 in which it was said, that the Aldermen's plan gave evidence of unreliability and want of coherency, particularly since Mr. Currigan limited the price to be paid for the existing water company plant to 2 million dollars. His estimated cost of $3,875,000 for an independent plant competent to meet the needs of the city was then stated to be ridiculous in the face of City Engineer Hunter's estimates.

An answer to the city's request for a list of its holdings was furnished by the Water Company on August 31, 1899. This list was a comprehensive one and gave much valuable information on the physical features of the plant, the water rights owned and the real estate holdings, as well as miscellaneous personal property.

On September 8th, the Board of Public Works rejected the water company proposal to sell for 9 million dollars and proceeded to further examine the report submitted earlier by City Engineer Hunter.

This action was followed by the Board of Public Works recommending on September 18th to the Mayor and City Council that a bond issue of $4,700,000 be asked for to build a city plant. When asked why the figure was one million dollars below Mr. Hunter's total, President Shackelford of the Board of Public Works said: "Our basis for this figure was the city engineer's report giving an estimate of $5,700,000 that included a reservoir to cost one million dollars, but which will not be necessary for several years. We believe the sum we have recommended to be ample, even a little more than enough to accomplish the purpose of the resolution."
On this same day, September 18, 1899, the Supreme Court threw the water rate case out of court as earlier noted, thus giving another court victory to the water company.

After much sparring over the terms of the proposed ordinance creating a municipal water system, largely due to the tactics employed by Alderman Currigan, a bill was finally passed and signed by the Mayor on October 13, 1899.

One week earlier on October 5, the City succeeded in getting the rate case earlier dismissed by the Supreme Court for lack of jurisdiction transferred on a writ of error to the State Court of Appeals. The abstract filed with the court at the time consisted of six bound copies each containing 1,047 pages with illustrations. There were also 18 bound volumes of testimony, making it the most voluminous one filed up to that time in either the Court of Appeals or the Supreme Court.

The proposed water bond issue of $4,700,000 was voted upon and passed by nearly a 2 to 1 majority at the election held on November 7, 1899. It is to be noted that while the News and the Post supported it, the Republican, for various reasons, took an opposite stand.

An interesting side light on this situation was commented on by the Republican in its November 22nd issue when the Board of Public Works sent Alderman Currigan a letter asking him to give them any definite information he might have on the proposed water plant. It then developed that the Alderman had held an option on the Mullen Ditch for some six months, contrary to charter limitations, which called for a $100,000 purchase price for a ditch said to be worth only $40,000.
Needless to say, Alderman Currigan's failure to consult his colleagues on the council before taking the Mullen ditch option, did not tend to gain further support for his program from them.

More conferences held with Water Company officials over an acceptable purchase price for the existing plant were of no avail, with the City Attorney again ruling that the right of condemnation possessed by the city was confined to water and ditch rights and not to the plant as a whole.

After a number of minor delays, the Bill for a $4,700,000 water bond ordinance was introduced at a meeting of the Board of Aldermen on December 28, 1899 and referred to the committee on water without debate.

The Platte Water Company

City Ditch

Although the 1889 Supreme Court decision in the Platte Water Company vs. Northern Colorado Irrigation Company case, reported in Volume XII Colorado Reports, page 525 heretofore mentioned, did definitely limit diversion of South Platte water into the city ditch to the irrigation decrees earlier established by the District Court of Douglas County, it failed to resolve other very important questions that had been raised as will be seen in the concluding paragraphs of the decision, quoted below:

"This case is a special statutory proceeding for a particular purpose. Appellant (a private corporation), and not the city of Denver, is the party to the record. Appellant has never exercised the exclusive right to the use of the waters of the South Platte River, nor has such right ever in any manner
been recognized by Appellee, or by any party having authority in the
premises.

"It will be observed that we indicate no opinion either as to the
right of appellant as an appropriator of water for purposes other than
irrigation, nor as to the rights of the city of Denver as a consumer of water
for any purpose. We are of opinion that the district court of Douglas County
did not err in the matters complained of by appellant, and its decision in
that behalf is accordingly affirmed."

Since the State Constitution gave water for domestic use the top
priority, Denver insisted that its uses through the city ditch were for that
purpose, and that consequently its priorities took precedence over all other
uses at times when there was not enough water in the river to satisfy all
demands.

This Denver theory was vigorously opposed by other South Platte
water appropriators with the result that, in order to clarify this and other
disputed points connected with water use arising out of vague and seemingly
contradictory court decisions, the Legislature on April 1, 1889 authorized
the Governor to appoint a Water Commission consisting of three men to
"enter upon the work of drafting, framing, digesting and codifying a complete
system of law in accordance with the provisions of the Constitution, and
subject to rights vested thereunder, embracing the whole subject of the
waters of the State."

This report was ordered to be complete on or before the first Monday
in December 1890, so that the Eighth General Assembly could act upon any
recommendations for further legislation that might be deemed best under the circumstances.

The report was made and submitted to the Secretary of State on December 1, 1890. It was in much detail with particular stress laid upon the use of ditch water for domestic purposes and the need for a better definition of what that use was intended to be.

Consequently, an Act was passed and approved on April 1, 1891 as an emergency measure which defined domestic water use as follows:

"Water claimed and appropriated for domestic purposes shall not be employed or used for irrigation or for application to land or plants in any manner to any extent whatever; Provided, that the provisions of this section shall not prohibit any citizen or town or corporation organized solely for the purpose of supplying water to the inhabitants of such city or town from supplying water thereto for sprinkling streets and extinguishing fires or for household purposes. Section 2 of the act provided penalties for using water decreed for domestic purposes for other purposes, and Section 3 provided that "In consequence of the near approach of the irrigation season and to avoid litigation, it is deemed that an emergency exists; and therefore, this act shall take effect from and after the time of its approval."

During the 1890 irrigating season, city officials continued to regard all water diverted by the Platte Water Company into the city ditch as having a prior right on all other users, up to 85.9 cubic feet of water a second, for any use it cared to make of it.

In pursuance of this policy, Mayor Londoner approved a set of rules on May 1, 1890 which had been drawn up to govern the activities and duties of the 33 waterpolice detailed to supervise the distribution of ditch water within
the city. For the first time they were given full police authority, seemingly
needed for protection against the indignities heaped upon them in previous
years by certain property owners.

The sixth annual inspection of the ditch which had been thoroughly
repaired and reconditioned for a carrying capacity of 87 cubic feet a second
under the terms of the Eaker-Williams contract of March 2, 1888, was made
by city officials on May 6th. After that inspection general satisfaction was
expressed over the condition of the ditch and the prospects of an abundant
water supply for the year.

Unfortunately, this state of affairs did not last long since, due to
low spring run-off, the State Engineer, acting upon legal advice, found it
necessary to limit, beginning with June 5, city ditch diversions to 30 cubic
feet a second, which volume was later reported by him as being the average
amount diverted by the city ditch for the 1890 season of 212 days.

Even in the face of these adverse circumstances, the city extended
its city irrigation lateral system by 30 miles during this year.

It is of interest to note that the Republican in its issue of July 18, 1890
printed a long article on the history of tree planting in Denver, which started
with the completion of the city ditch in 1867, and which 23 years later had
transformed the city from a desert of sage, sand and cactus to one of
beautiful lawns and perfectly shaded streets admired by resident and visitor
alike.

Without down grading in the least, the benefits conferred upon the
appearance of Denver by the Platte Water Company canal during the first
23 years of its operation, it must be said that even before 1890, its
disadvantages from a public health point of view brought insistent demands from many sources for the complete abandonment of all side laterals and the piping of the main ditch throughout its entire course within the city.

However, with the public interest being placed, only too often, secondary to the interests of the party in power with considerable job patronage at stake; the process of removing this menace to health from the streets of the city was a long drawn out and tedious one.

The objections to proceeding with the work ranged from doubts of legality, through lack of finances for capital improvements on down to the belief that by maintaining the status quo, city officials would have a powerful club to hold over the water company in the fight that was being carried on at the time.

The attitude of the medical profession was illustrated by the following news item published in the Republican for Saturday, April 29, 1893:

"It is nearly six years since the agitation against the city ditch was started by Doctor Lemen, the present Health Commissioner. He showed then as he has done repeatedly since that it is a burden of disease and a danger to the community. Before he argued in behalf of closing the ditch he made inquiries and found that the pretense of the water saving shade trees was so much nonsense. The trees on the vacant lots all withered and died because there was no one to attend to and water them. Any person can easily see that the ditch does not irrigate or nourish a tree or shrub along its course in the city limits by watching the trees that are not attended to and watered from hydrants. There is no excuse in this world for allowing the water to stagnate and pollute half the city.

"There is no reason in the world why the taxpayers should have to pay
20 or 30 thousand dollars a year to perpetuate the unsanitary conditions that exist. The St. Joseph Hospital staff, which is composed of the best physicians in the city, discussed the city ditch purely on sanitary grounds on Thursday night, and the unanimous opinion was that the ditch under its present condition was a nuisance to health and ought to be condemned as a sanitary precaution. The majority of those practicing medicine know what the evil effects have been."

President William N. Byers of the Chamber of Commerce, took the opposite view in the matter when on May 3, 1893 he was quoted as saying: "The abandonment of the ditch would, in his opinion, cause the death of one-third of one-half of the trees set out along the street lines below the ditch. While admitting the ditch was in an unsanitary condition, he said this could be remedied at no great cost by proper care.

In September 1893, Joseph Williams presented a proposal to the Board of Supervisors in which he offered to overhaul and keep the city ditch in repair through the irrigating season of 1898 for $28,300. The proposal was referred to the water committee with the next action taken being to instruct City Hunter to survey and examine the city ditch from its head gate to the City and report thereon. This was done and a report submitted on November 23, 1893. In that report, Mr. Hunter stated that there were 9,250 feet of ditch in the streets and alleys between Cherry Creek and Colorado Boulevard not piped, with the estimated cost to do so set at $32,000. An additional amount of 5,000 was estimated as being needed to fence the ditch south of the city limits and 1,000 to make a proper right-of-way survey.

The survey was ordered and the work completed in December 1893, thus giving the city a permanent record of the ditch alignment for the first
time in its history.

At a meeting held by the Board of Aldermen on December 18, 1893, two resolutions were offered in connection with city ditch affairs. One by Alderman Currigan directing the City Treasurer to call for bids to reconstruct, repair and strengthen flumes and in general to clean out the ditch in accordance with plans on file with the City Engineer. This resolution was referred to the water committee. The second resolution was offered by Alderman Deverand calling for bids to supply the city with water for five years and to keep the ditch clean. After much discussion and several amendments and counter amendments, the original resolution was passed by a vote of 7 to 5.

The appropriation ordinance for 1894 approved in March of that year carried the following items with respect to water:

Salary of Water Commissioner, $2,500; 20 water police at not to exceed $60.00 a month for 5 months, $6,000; cleaning and repairs of City Ditch and levels, including labor and materials, $5,000; provided however that the work of cleaning the city ditch inside the city limits was not to be commenced until the written order of the Mayor to the Water Commissioner had been filed with the City Auditor.

To the City Ditch Department, the appropriation for repairing and placing the ditch in proper condition, including repairs to Cherry Creek and other flumes, measuring boxes, sand gate and thorough cleaning from headgate to the Town of Harmon, including superintendence and care, $5,000.

The water contract department appropriation for water rentals and hydrants totalled $60,000.
After a hearing by the County Commissioners ending on March 13, 1894, the rate charged by the Platte Water Company for water furnished irrigators outside the city was reduced from $2.50 to $1.25 an inch.

A sign of the times with respect to the wheeling and dealing by city officials in city ditch affairs came to light on May 19 and May 20, 1894 when it became known that a group of Aldermen had tried, unsuccessfully to get the contractor on the city ditch, after the repairs had been completed and the job accepted, to assign his operating contract to them for $1,000.

After reporting the offer to some of the Supervisors, Mr. Jackson the Contractor refused to go along with the "so called" combine offer. In commenting on the budding scandal, the Republican said: "In former years the scandals generally arose regarding the sale of water to those along the line of the ditch.

"The city received but a small proportion of the returns, and some of those who have been investigating the matter of the $1,000 premium are inclined to think that the "combine" which was going to buy out Mr. Jackson intended to recoup the amount with interest by the sale of water on its own account. Others again are inclined to believe it was the intention to have the water police, employed by the city, to watch the ditch inside the city limits, and allow the stool pigeon of the Aldermen to take the money due the city and "divey" up what could be obtained by allowing outside water boxes to run as long as required."

Another tangle in this department came up at this time. It appears that Water Commissioner Davidson was allowed to name only one man on the water police force. He protested by discharging the whole body and shut
off the ditch water. The trouble was finally settled by the Mayor and a few aldermen who compromised by promising the Water Commissioner five appointments of his own selection.

Trouble again broke out on June 9, when a group of citizens living east of Broadway and South of Cherry Creek complained that the Water Commission had wholly neglected their neighborhood and as a consequence many trees were dying for lack of water. A dispute between the street sprinkling and the ditch departments likewise developed and was not settled until the general subject of patronage had been acted upon by the City Fathers.

The appropriation ordinance for the year 1895 carried $2,500 for the Water Commission, $8,643.75 for salaries and labor on ditch operations with $63,000 allotted to the contract department for hydrants, etc.

During the summer of 1894 the City Board of Health ordered the Park Commissioner to cut off the supply of water in the City Ditch north of City Park, which action brought protests in the spring of 1895 from residents in the area affected. In fact, the Chamber of Commerce was brought into the dispute, the committee to whom the matter was referred eventually deciding that it was not in its power to act. The reason given for the Board of Health order was that, as a result of street grading, ditch water was allowed to seep into the brickyards where it became stagnant and was proved to be the source of much illness in the district concerned.

In April the contract for operating the City Ditch was awarded to J. A. Jackson for $1,700 and in May, it developed that the expenditures were running in excess of the appropriation, so that if the job was to be done,
a new appropriation would be required. However, water was turned into the city laterals on May 10, 1895 after repairs had been completed on the flume across Cherry Creek. This permitted the City Park lake to be filled also, which up to that time had been an unsightly, disease breeding expanse of mud.

The long delayed program for piping the City Ditch within the city limits finally got under way on June 20th after the City Council had appropriated $2,000 for that purpose. The plan then adopted was for the City to pay the entire cost only where located in streets, alleys and street crossings. At other locations, the city agreed to lay the pipe free of charge when purchased by interested property owners.

By this time and for months thereafter, the rate controversy with the Denver Union Water Company was the main subject of concern by City officials with ditch problems temporarily set aside as being of secondary importance to the public welfare.

Owing to basic differences of opinion between Mayor McMurray and the "combine", in the two Boards comprising the City Council, the appropriation ordinance for 1896 was not approved until June 5, at which time a six months deadlock was broken and appropriations of $3,000 for the City Ditch, $5,656 for the Water Department and $67,000 for water contract obligations were made available for the purposes indicated.

The annual cleaning of the City Ditch between Yale Avenue and City Park was carried out under the direction of the City Highway Commissioner in 1898 with 8 extra men employed out of 80 applicants of all classes, ages and nationalities.
City Engineer Hunter announced on April 15, 1898 that repairs had been completed on the ditch for 17 miles from the headgate toward the city and water turned into the reservoirs at City Park. The Highway Commission had charge of operations, using 6 water policemen and an Inspector with the expense charged to the appropriation of the Board of Public Works. By July 2nd, water for the ditch was in short supply owing to the light spring runoff with prorating considered likely among the farmers dependent upon it for their livelihood.

In July of that year the Times published a detailed report of city expenditures for the year 1894 through 1897, listing those for the City Ditch as $4,946.98 in 1894, followed by $4,492, $2,914.25 and ending with $3,331.36 for the year 1897.

The City Engineer, in his annual report for the year 1898 had the following to say about the City Ditch:

"The supervision, care, maintenance and operation, including the delivery of water to purchasers outside the city limits, has been under this department for the seasons of 1897 and 1898, with the lowest appropriations ever made for the purpose. It has, I believe, been satisfactorily managed.

"A new dam across the Platte River near the headgate of this ditch was constructed a year ago under supervision of this office at a total cost to the city of $761.78. The structure is permanent and substantial and will, I believe, serve the purpose it was built for without further cost to the city for a number of years to come.
"For the purpose of changing the location and construction of that portion of the ditch crossing Cherry Creek near Harmon, and at the request of the Commissioner of Public Highways, this office prepared the plans and specifications which were used in the construction of a new crossing in the county road about one quarter of a mile west of the old line and extending from the westerly side of the Creek to and across Third Avenue in the Capitol Annex Addition. This change in location and the construction of a new flume and pipeline forever abolished what has proven an expensive public nuisance and the care, repairs and annual reconstruction of portions of an old submerged flume which was completely rotted out at the time."

Water was turned into the City Ditch in May 1, 1899, with supervision under the City Highway Commissioner. The water police force was composed of 11 men and 1 Superintendent.

Because of lack of funds, all of the water policemen and the Water Commissioner were laid off on August 1st or two and one half months before the usual time of closing down the ditch.

It is of interest to note that among the various schemes advanced in connection with the construction of a municipal water plant at this time, City Engineer Hunter, was quoted on December 2, 1899 as saying that the city had enough water in the City and Petersburg ditches to supply more than 300,000 persons or double the amount supplied by the Denver Union Water Company at the moment.

In his semi-annual report dated January 16, 1893, the City Auditor listed the book value of the Platte Water Company, including stock, franchise and right-of-way at $500,000.
The Northern Colorado Irrigation Company

High Line Canal

Although the early corporation records of this privately owned irrigation company, which did not contract to sell its stock to the Public Utilities Commission of Denver until 1915, are not available, sufficient information is to be found in the newspapers of the period to show that the farmers, dependent upon it for their water supply were not at all satisfied from 1889 on with its management, its charges for water, and most of all, with the inadequate and intermittent supply of water available to them at times of very moderate stream flow.

The basic trouble seems to have been caused by the fact that the State Engineer did not really begin to enforce the law with respect to priority of appropriation until about the year 1889 by which time the January 18, 1879 decree in the amount of 1,184 cubic feet of water a second of time owned by this company was found to be junior to a number of other ditches with headgates located both above and below its point of diversion on the South Platte River.

The operating and other problems pertaining to this Canal in 1890 were discussed at some length in two letters written to the Editor of the Republican published in July of that year. The first of these, dated July 1, was by Judge Amos Steck, a prominent pioneer, who considered himself a victim of misrepresentation upon the part of the promoters of the project and did not hesitate to severely criticize both the past and present management of the company.
Among other things, he strongly intimated that the company knew before the canal was completed that its priority was of little value, with the volume of water in the South Platte generally not sufficient to meet the needs of more than one half of the ditches having priorities senior to it.

The following quotation taken from this letter of Judge Steck's seems to sum up his thinking in the matter.

"If the company knew they had not the water to carry and took royalty and annual money from the poor victims who had faith in its officers, no punishment is too great to mete out to its managers. How many hundred of thousands of dollars they have wickedly taken from their victims during the seven years of its life, nobody but the company knows. Every dollar it got was obtained upon false pretenses. It has no water to carry, it never had any, and it is not entitled to have. It built no reservoirs against the day of drought, the collection of royalty is gone forever. Its collection is a State Prison offense. (Session Laws of 1887, page 309)"

The letter printed in reply to the above, signed by S. J. Gilmore, President, Northern Colorado Irrigation Company was published on July 11, 1890.

After some general observations on the vague and abusive portions of the Steck letter, Mr. Gilmore said the complaint seemed to resolve itself into two arguments, first, that the company insisted on a royalty or bonus, knowing that all the water in the river had been appropriated by other ditches before January 1879 and second, that every year since the construction of the canal, the farmers had paid for water which was never carried by the
company, and the company had not paid any part of the money back.

In answer to the first allegation, Mr. Gilmore proceeded to point out that, according to Court Records, there were 161 ditches constructed on the Platte River and its tributaries, exclusive of those on tributaries below Denver, with aggregate claims of 4,578 cubic feet of water a second. Every foot of which was junior in law to the priority held by the High Line Canal. From this fact he concluded that if there was not water for the High Line, why were those ditches built with no other source of supply than the South Platte, knowing all the time that their rights were inferior to the High Line Canal?

He then proceeded to show that the promoters of the canal in the first place were some of the most prominent men in Denver, whose good standing in the community had never before been questioned.

Mr. Gilmore admitted that, while there never may not have been enough water to irrigate 50,000 acres of land there was a vast difference between that figure and the 31,000 acres of land for which the High Line Company had sold water rights. This wide margin of safety had been established in 1886 when the company refused to sell more than about one half of the water it expected to receive under its priority. It was further stated, that no person in purchasing a High Line water right had asked the company to warrant a supply of water, since the company had specifically exempted itself from the effects of drought and other causes beyond its control.

Mr. Gilmore insisted that the company had always acted in good
faith, and that it had every reason to believe that there would be an ample supply to irrigate all the lands for which water rights had been purchased, if all priorities on the stream were strictly observed.

In replying to the second charge, Mr. Gilmore stated, that the money paid every year by the farmers (for water) or for carrying water, which since the construction of the canal had been necessary, and was used to maintain the canal in good order, and to operate and manage the business had not equalled the necessary and unavoidable annual expense.

Mr. Gilmore was also quoted as saying: "If the priority to water which was secured by the construction of the canal, and which was good at the date of such construction and at the dates when the water rights were sold, has since become impaired, either by drought or by a lack of strict and prompt enforcement of the law by State officials appointed for that special purpose, it was the duty of the land owners to secure themselves against these contingencies, whether temporary or otherwise, by constructing reservoirs or other means."

"Reservoirs would supplement the volume of water secured by the canal priority and assist the land owners by tiding them over the difficulties that then existed."

A letter written by the State Engineer to Mr. Gilmore on July 8, 1890, was attached to the above correspondence, in which the State Engineer admitted that, due to personnel problems, the Superintendent, in ordering the High Line Gates closed on May 20, 1890, did so in error since he had not ordered gates closed in the South Park area on any ditches with post-dated
priorities there. However, the State Engineer, while recognizing the serious condition of the farmers along the High Line Canal, stated he was constrained to sustain the action of the Superintendent of Irrigation in closing the High Line headgates in view of existing conditions.

Forced to recognize the fact that storage reservoirs were a necessity if crops were to be protected in times of short supply or drought, a group of farmers owning lands under the High Line Canal, decided that a reservoir site on state owned land near Buffalo Creek in Park County should be immediately developed for the protection of their irrigating interests.

Application was made to the State Land Board on June 30, 1891 for the necessary land and in due time 2,836 acres were purchased for the sum of $5,570 with $1,700 additional being expended on account of improvements thereon.

The High Line Reservoir Company was incorporated on January 28, 1891 with a capital stock of $150,000. One share, valued at $10.00 was issued for each acre of land which had a water contract with the Northern Colorado Irrigation Company.

Construction work was started on the South Platte Reservoir in the Antero basin on November 15, 1892, although public announcement of that fact was not made by President Cyrus G. Richardson until December 20, 1892, who said that "the fact had been kept in the dark by the company for business reasons."

Indecisive company 13

159.
In discussing company plans with a Republican Reporter, Mr. Richardson said that the proposed dam would be 4,000 feet long, 40 feet high and would cost in the neighborhood of $140,000. The average depth of water in the reservoir when full was to be 15 feet and it would have a surface area of 4,000 acres.

The dam foundation was on a ledge of conglomerated rock with the dam itself composed of puddled clay of selected and tested quality. Water from this reservoir when completed was to be carried by the South Platte River a distance of about 90 miles to the High Line Canal headgate, without the necessity of building ditches or other facilities for that purpose.

In May 1891, a resolution was passed by the Board of Aldermen, authorizing the purchase of 40 million gallons of water at $15.00 a million gallons from the High Line Canal to be delivered at the headgate of the Fairmont lateral and used to irrigate portions of Capitol Hill lying above the City Ditch. This purchase was made under the terms of the 10 year contract, dated June 12, 1884 between the City and the Irrigation Company. The water seems to have been supplied early in the year when not wanted but was paid for nevertheless.

At a hearing held by the Arapahoe County Commissioners in April 1898, the charge for water to farmers along the High Line Canal was ordered reduced from $1.75 to $1.50 an inch even though the farmers thought $1.00 an inch was all they should be required to pay.

The Farmers and Gardeners Ditch

This ditch was adjudicated for irrigation on April 28, 1883. The general findings of the referee were as follows: The water was diverted from the South Platte River for irrigation purposes, with original construction
begun on March 15, 1863.

The original ditch was 2.5 miles in length, 6 feet wide on the bottom with a depth of 1 foot. The slope of the banks was 1 to 1 grade, 5 feet to the mile, giving a velocity of 1.96 feet a second, with an estimated carrying capacity of 823 cubic feet a minute - 13.72 cubic feet a second.

It was enlarged and extended for an additional 2.5 miles with work begun on April 1, 1874.

The decrees authorized by District Judge Elliot on April 28, 1883 were: Priority No. 3 for 823 cubic feet a minute as of March 15, 1863, and Priority No. 34 for 617 cubic feet a minute - 10.28 cubic feet a second, as of April 1, 1874. (Total of the two decrees, 24 second feet.)

The headgate was located on the left bank of the South Platte River in Section 28, Twp 3 South, Range 68 West between 18th and 19th Streets, a short distance south of Platte Street.

Articles of Incorporation of The Farmers and Gardener's Ditch were filed with the Secretary of State on January 28, 1873. The trustees to serve for the first year were James A. Shreve, Henry Graff and John B. Hindry. The stock of the company was divided into 50 shares at $100.00 each.

On February 1, 1894, about one year after the original 20 year Charter had expired, the Trustees and Directors conveyed by warranty deed, all right, title and interest to water and rights-of-way of every description to Arapahoe County, Colorado.

In reporting this item of news, the Republican on March 18, 1894 said: "The title to the Farmers and Gardeners ditch now vests in the county
which has bought up all the stock. The Charter has expired, and a deed was secured from the last Board of Directors. The ditch runs through the land at the county farms."

A memorandum regarding this ditch by Mr. George M. Bull, together with much miscellaneous data from the Manager of Improvements and Parks prepared soon after the Board of Water Commissioners was organized, is filed under Number 290, Document 27, with other records, in the vault of the Board Secretary.

This ditch was purchased by the Arapahoe County Commissioners for use in connection with the now abandoned Arapahoe County Poor Farm Number 1, comprising 240 acres located in Section 11, Township 3 S, Range 68 West, in Adams County. Its operation and maintenance was transferred from the Department of Improvements and Parks to the Board of Water Commissioners in the fall of 1918.

Water Purification

In 1872, when a public water supply was first made available to the citizens of Denver, the standards of water quality were few with freedom from mud, objectionable taste and odor being the prime requisites. Little or no attention was given at the time to the fact that a clear, sparkling supply could, and often did, contain disease organisms dangerous to those who might use it for domestic purposes.

"To be sure, chemical tests were made from time to time to determine the general character of the water and to indicate whether or not
the supply had been exposed to pollution of public health significance by the character and concentration of organizes matter and deleterious soluble salts of various kinds.

However, it was not until the year 1885 that the role of bacteriology in the field of water sanitation was definitely established by a demonstration of the removal of bacteria from water passing through the London slow sand filters.

"The incidence of typhoid fever constitutes probably the most significant and ultimately accurate measure of the sanitary quality of a community water supply, even though the disease may, of course, also be contracted by the consumption of infectious milk, shell fish and other foods."


Statistical information on the incidence of typhoid fever prior to the year 1880 is fragmentary for the country as a whole, with such data not being available for Denver prior to the year 1887.

During the decade 1880-1889, the typhoid fever death rate per 100,000 population for 47 large American cities, varied from 26 to 114, the average being 58.

During the last three years of this period, the corresponding rate for Denver averaged 158, or 2.7 times that of the 47 cities mentioned above.

In the following decade, the typhoid death rate per 100,000 population in 66 cities of the United States varied from 13 to 147, averaging 47.
Denver had its highest typhoid death rate of 268 in 1890. This was followed by 9 years of a greatly improved condition, with a variation of from 88 in 1891 to 33 in 1898, the average being reduced to 59 or only 1.26 times that of the 66 other United States cities cited.

It seems fair to assume from these data, that, the bringing of "pure mountain" water to Denver by the Citizens Water Company beginning in 1891 was largely responsible for this remarkable reduction, which steadily improved from that time on, in the incidence of typhoid fever and allied water borne diseases.

City Government

As legislation upon what Denver as a municipality could do and how she could govern herself, depended upon the State legislature during this period in her history, it seems desirable to here note the significant actions taken by that body in the 1890-1899 decade, which had a bearing, more or less important, upon the general water situation of the time.

Session Laws of 1891

An Act was approved on March 4, 1891 establishing a fire and police board of three members to be appointed by the Governor, with the advice and consent of the Senate to hold office for two years beginning March 10, 1891 and every two years thereafter.

Among other duties and responsibilities, this board was given "full power and authority to select sites for fire hydrants, alarm boxes and so forth and to change the location thereof from time to time, as to them shall deem proper".

164° 56' 8"
Another Act, approved on April 11, 1891, enlarged the scope of the work of the Board of Public Works created by the 1889 legislature by giving it full power to govern, manage and direct all the parks, boulevards and pleasure ways within the city and directing the City Council to levy annually the sum of one-half mill and set the money collected thereby apart in a fund for the improvement and beautifying the grounds known as the public parks of the city, to be expended under the direction of the Board of Public Works.

Session Laws of 1893

In 1892 the Chamber of Commerce appointed a committee to draft a new up-to-date charter for the city - a charter that should tend to secure efficiency in city government.

As a result of this action, a new charter was introduced into the legislature, but it was there amended to the point that only the slightest traces of its good provisions remained before being passed and approved on April 3, 1893: The civil service feature was cut out, save regulations as to the issuance of public franchises were dropped, the state boards were continued, officers and salaries multiplied, the Mayor was made a figure-head, the government was de-centralized, responsibility diffused. In short, a politicians government was adopted. For more on the details of this Charter, which became the basic law of the city until the adoption of the home rule Charter in 1904, see King on "The History of the Government of Denver with special reference to its relationship with public service corporations 1911."
There were three provisions in the 1893 Charter that deserve mention at this time; one, The Parks were taken away from the Board of Public Works and placed under a three man park board; two, an annexation procedure was established with another act providing for the annexation of contiguous towns and cities approved April 11, 1893 which was later declared valid by the Supreme Court, and three; the powers of the Board of Public Works were widely extended, even though it was relieved of control over the public parks. In fact, it was granted virtually full control over all the public works and streets of the city, free from any necessity of securing the approval of municipal officers.

Towns annexed to Denver in this period were: South Denver on February 7, 1894; Hardon on February 18, 1895; Highlands on August 25, 1896; Barnum on September 1, 1896 and Colfax on July 7, 1897.

In commenting on the 1893 Charter, "King" said: "The governmental plan provided for in 1893, despite some improvements, was as thoroughly inefficient as any scheme that could have been devised. Its great weakness was its utter want of unity. Six large administrative departments were provided for. Two of these departments were headed by elective officials, two by officials appointed by the Mayor and two by boards appointed by the Governor."--The one unifying force, without which the plan would have broken down long before it did, was the persistent demand for economy. This necessitated some unity of purpose among departments otherwise discordantly independent."
An Act was approved on March 28, 1895 amending the annexation
Act of April 11, 1893, mentioned above, for clarification purposes. The
charter was amended by an Act approved February 18, 1897 concerning
taxation on annexed territory; and again in 1899 by an Act approved
March 23rd, authorizing Denver to contract an indebtedness through the
issuance of general obligation bonds at not to exceed an interest rate of
5 percent for various city purposes, including the construction of
reservoirs within or without the city limits, for the storage of water to be
used in irrigating the trees of the city and for sanitary and domestic purposes,
including the acquisition of land for such reservoirs.

During the session of the "Fusion" Legislature of 1899, there was
much talk, both in the Legislature and out of it, about home rule for Denver,
but the session closed without action.

Messrs. John A. Rush and J. Warner Mills, were especially active
in their efforts to secure favorable action in this regard, but, according to
King, party politics and the influence of the public utility corporations proved
to be too strong a barrier.