

## **A Brief Review of the Cottonwood Water History and the Present Situation**

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*By Brigham Jarvis, Sr. written in August 1927 and revised in August 1928.*

The question of water supply for St. George has been one of great importance ever since the settlement of the country as the local springs were small, furnishing only one and one-half second feet of water of a very poor quality. This spring water was also found to be poisonous and dangerous, causing canker in people and being hard on plant life.

An effort was made by the city to get artesian water with the hope that more water of a better quality could be obtained. A well was drilled on the Public Square, to a depth of more than 200 feet by September 23, 1863, but to no avail.

Next, a charter right was secured on the Santa Clara stream, it being thought this could be utilized, and though surveys were made, a drought set in, the creek dried up and the Santa Clara people were obliged to haul water from St. George for their own use. This plan was therefore abandoned and no further efforts have ever been made to bring the Santa Clara water into St. George, although there continued to be much sickness at that time, many children dying, it was thought, as a result of the bad water.

In 1865, the question of our water supply was being discussed by George Albert Smith of the First Presidency of the Church, and in commenting on the sickness caused by the bad water he recommended the use of a goodly portion of fats with our foods to overcome the effects of the alkali in the water, and at the same time predicted that this city should yet have plenty of good water for culinary purposes.

Following the above prediction, considerable effort was made in trying to locate a route by which the Cottonwood stream could be brought into St. George. This water was then running down through Harrisburg Canyon into the Rio Virgin, and was being used by some of the early settlers in Cactus Flat and elsewhere along the stream. Among these users were the Leanys of Harrisburg, and "Mone" Alexander of Washington, who later sold to Richard Prince his interests near the head of the stream, after having used it for two years. Richard Prince held this for the succeeding seven years, during this time increasing the acreage up to about ten acres.

About this time Houston and West, then merchants of Silver Reef, being interested in the idea of building a city on Harrisburg Bench, offered Richard Prince \$1,500 for his interests in this stream, Prince being among others also connected with this movement. Some work was done, but owing to drought, there was a halt in their operations.

At this time, another project was under way by which in 1879 a survey was made with the purpose of bringing the Cottonwood stream into Spring Hollow by means of a canal and tunnel. This project would have required about three quarters of a mile of canal and approximately 2,000 feet of tunneling.

Some work was done in the fall of 1879, until snow set in and it was resumed the following February (1880) when the snow melted, but discontent arose over delayed supplies, as well as other matters on which all were not agreed, one particularly discouraging feature being the difficulties arising as a result of the red clay encountered at the head. As fast as a canal was finished and the water turned in, the clay soaked and softened, allowing the side hill to slide down, carrying with it brush and debris, and causing much trouble and dissatisfaction. The men finally discontinued work and returned home, and thus the idea prevailed that the project had been abandoned.

As a result of this idea, the other claimants on the stream, being unable to come to an agreement with those undertaking the project, decided to arbitrate the question and if possible

## **A Brief Review of the Cottonwood Water History and the Present Situation**

bring about a settlement. The arbitration date was set, the claimants agreeing to meet in St. George.

Meantime, a second survey was made by John MacFarlane under the direction of Erastus Snow. This line was surveyed below the upper site, and because of being run too low would require over a mile of tunneling, hence the apparent cost made this route prohibitive.

The above arbitration was called and Richard Prince, being dissatisfied with the way matters were progressing, left the meeting to return home, but was overtaken by Anthony. W. Ivins and the then Mayor Robert. C. Lund, who there negotiated a purchase of his rights, Prince explained that he had refused \$1,500 for his interests, but if, as they assured him the water was to be used in St. George, he was willing to relinquish his claims without further protest and would abandon his ranch. However, they insisted that he should have some recompense and asked him what the ranch had cost him. Learning that he had paid \$200. for his holdings they agreed to make this amount good to him, which was done. (See minutes at the Washington County Court House.)

Following this, A. W. Ivins also obtained from Hyrum Leany his interests, he being the other one of the two largest owners. Mr. Leany, however, received no money settlement, surrendering his rights willingly and abandoning his holdings on Cactus Flat upon being told that the water was to be used in St. George, for culinary purposes. There were in addition, two other smaller claimants who surrendered their rights for the sum of \$40 each, according to the best memory of the writer and affirmed by others familiar with the case.

As a result of these acquired rights, under the direction of the City Council of St. George, a survey was made to divert the Cottonwood water from its regular channel with the idea of maintaining title. This survey extended from the Prince Ranch to the head of the Factory Wash, a distance of more than two miles, and was only intended to serve until such time as the people were able to locate some satisfactory route by which this stream could be conducted to St. George.

This canal was constructed at a cost of more than \$4,000, most of the money used being hired from Mrs. Alice Pendleton and George Woodward.

Before any of this expense had occurred further than the cost of the survey, a citizen (Brigham Jarvis), familiar with this part of the country condemned the proposed route on account of the gypsum formation through which it would pass, and offered to show the City Council a canal line by which the water could be delivered as desired. His information and offer were, however, rejected and the work on the canal was pushed forward. When the water was finally turned in, the absolute futility of the work done was manifest, the gypsum formation making it impossible to keep the stream in.

But though this condition existed, and the canal line was as much as 335 feet lacking in altitude, the next incoming council persisted in trying to maintain and extend the canal. In spite of the two men employed to patrol this canal, large breaks occurred, causing much additional expense, some of the breaks requiring some seventy odd dollars for repairs, only to wash out again. And thus the disaster continued.

Since the work on this route was begun during the incumbency of Mayor Robert. C. Lund, the writer (Brigham Jarvis) asked him for an expression as to why this persistent unnecessary expense on a useless route, and Mr. Lund reaffirmed the idea previously given out that the only purpose was to divert the water from its regular channel in order to maintain title.

The work on this project had been carried forward without the advice of President Erastus Snow, known as the Father of this Dixie Country, and upon whose counsel the people were wont

## A Brief Review of the Cottonwood Water History and the Present Situation

to rely, but he was at this time out of the country and therefore not available. At an earlier date the writer (Brigham Jarvis) had discussed the route he had defined with President Erastus Snow and both had foreseen that unless some immediate action were taken, title to the water would have to be secured by purchase, as finally proved to be the case.

In 1896, a final effort was made by the aforementioned citizen (Brigham Jarvis), who asked that a town meeting be called where the question as to formations that will hold water be discussed. This meeting was called by Francis. I. Daggett?, who was then Mayor, (probably Edward M. Brown in 1896) and at the session the citizen reported a feasible route which would bring the water through granite, sandstone and basalt formations most of the way. His report received favor, whereupon, it was moved and carried that this citizen be made a member of the City Council and be placed in charge of the proposed project, and a committee of five citizens was appointed to accompany the incoming council in looking over the proposed route.

During this inspection trip an incident occurred which provided occasion for the naming of Snow Hollow. E. B. Snow, Sr., (now deceased) then a member of the St. George Stake Presidency, did not leave with the main party but followed them later in the day. While trying to locate the others, darkness came on, finding himself in a high-walled box canyon with no apparent exit except by retracing his course. He therefore dismounted and sat alone in the canyon all night, holding his horse by the reins. Knowing he was to join them later, and fearing, as night came on, that he had lost his way, the others tried to find him. Although they could hear him "halloing", and he could hear their voices, their voices reverberated from the walls of the box canyon and left him unable to determine what direction to take. When he ceased calling, it was decided he had returned home, and the search that night was discontinued. But, he joined them the next morning, having found his way out of the canyon after daybreak, and was quite ready for the hearty camp breakfast, which all enjoyed. Because of his name and the experience of the previous night, it was decided to call this echoing canyon, "Snow Hollow", and an almost snow-white ledge in the canyon adding purposeful effect to the name.

The program of inspection was continued, the entire party being greatly delighted with their findings, and on their recommendations the launching of the project was authorized and work was commenced immediately. In order to provide sure title, and to quiet title to all possible claims, the Superintendent of Canal Construction made filings to cover the eight second feet of water and transferred the same to the City of St. George for bare cost of filings.

About this time a change in the Stake Presidency brought Edward H. Snow into office and from the first he manifested keen interest in the project. Knowing that 800 feet of tunneling through the south wall of Snow Hollow would replace the one and one-half miles of canal, and that 1,300 feet of pipe-line across another canyon at Tunnel Ridge, would have another three-quarter mile of canal, besides preventing the washing of accumulations of decayed vegetable matter and other debris, and that the fifty feet of extra fall provided would supply the necessary head pressure for the pipe-line, the Superintendent explained these items to President Edward H. Snow, and on request the President accompanied him on a trip to go over the situation. Although the tunneling and pipeline were not planned for, the Superintendent felt the facts merited consideration before the project was carried beyond this point, the tunnel site at Snow Hollow being approximately two hundred rods from the head of the canal.

President Snow, however, expressed regret that the funds necessary could not be obtained by the city at that time, since the annual revenue did not exceed \$1,500.00. The canal project was therefore continued and in due course of time the much needed supply of water was delivered into the City of St. George. Much joy was expressed when this splendid stream was seen

## A Brief Review of the Cottonwood Water History and the Present Situation

plunging down over the red hill at the foot of the Sugar Loaf, and a general city celebration marked the occasion.

As soon as the water reached the city, President Snow began urging the cultivation of vacant lots, and has never ceased to advise and encourage every movement looking to the building up and developing of the resources of this country.

This canal was completed by 1898, having been accomplished at a cost of approximately \$8,924.59 with an actual cash outlay of \$823.05, which amount was appropriated by the city to purchase supplies for such contractors as were unable to finance their own outfits, and this cash outlay was fully recovered by water script or credit as the city's portion of title. Practically all of the construction work down to the Divide at the head of Washington Hollow was done by contract job, the contractors receiving water credit in recognition of their rights as per their agreement with the city to become pro rata stockholders according to the credits set opposite their names in the Superintendent's report and copy of agreement attached hereto. From the Divide on down the work in the main was done by day's labor, including the laterals necessary to connect with the city ditches.

Soon after the water was brought into the city, Jean F. Webb, representing the Utah and Eastern Copper Company, then operating a smelter at the head of Diagonal street, presented his company's offer to pipe the Cottonwood water from its source in return for the privilege of using the stream in connection with the West Spring, which they were then using, to increase the power for their smelter. This would have delivered the water to the city in its pure state, however, Mr. Webb's proposition was rejected.

During the time of construction of the canal, what was thought to be a splendid site for a storage reservoir was investigated, but was condemned on account of its formation, the ground proving to be unfit for the purpose desired since it contained fissures, seams, cinder beds and sink holes, some of which would take the entire stream for weeks without any apparent tendency to fill up. It was not at this time generally known that the stream would serve eventually for culinary purposes only, and was not so much adapted for irrigation, as the water flow lowered perceptibly during the late fall, was frozen up at the head during the winter, etc., the highest flow coming in the late spring from April to June. Therefore, the idea of reservoiring would be rather a disappointment than an advantage, and was abandoned by the council then serving.

A later council revived the idea and prepared plans and estimates for the proposed reservoir.

The first cause of dissatisfaction occurred after the Cottonwood stream reached the town, when the city council began to make distribution of the water. According to the contract, the city was only entitled to water credit sufficient to cover the cash outlay made during the canal construction of \$823.05 plus the amounts paid out to the original water users for their interests as heretofore explained, and plus the \$73.05 for powder, fuse and supplies delivered and distributed on the work. But the city assumed the right to take credit to cover the cost of the former abandoned canal, in spite of the fact that this canal was not, nor ever could have been used in connection with the route completed.

The contractors therefore felt that the city had in this way broken faith with them in that they were failing to live up to that part of the contract and agreement which provided for the pro rata division of the water. (See contract—not reproduced in this compilation). This the contractors considered was in direct violation of what they maintained was a legal and binding agreement, and they felt that their contract prices might as well have been cut in two.

## **A Brief Review of the Cottonwood Water History and the Present Situation**

In order to allow the credit assumed by the city it would have made necessary a division of the shares originally agreed upon, which was unfair to the contractors, and to this they were directly opposed since they also realized that they must yield their entire interests whenever the growth of the city demanded the use of the entire water supply for culinary purposes. They were, however, willing to submit to any advisable or necessary tax for the improvement and maintenance of the project during the time that these shares were in their possession.

The city had been unable to finance the project on account of the heavy obligations they were still under as a result of borrowing money for the project that had been abandoned, and the amount needed was beyond the city's bonding privileges at that time. This responsibility was therefore assumed by the contractors after having obtained advice from Judge Thurman of Provo, then recognized as the best advisor in the state. A copy of the contract was sent for his consideration and opinion, which he expressed freely to the effect that since the city was unable to finance the project, should the citizens be willing to assume the obligations there would be no objection to the proposed pro rata division of the stock as per the agreement. But in spite of the complete report of the Superintendent, showing the credit due the different citizens, and in direct disregard to the advice of Judge Thurman as to the legality of the matter, a resolution was drawn up, proposed, and carried, authorizing the city to assume the water credit being then protested by the original, or contract stockholders.

A motion then followed proposing that inasmuch as the city had assumed the right to said credits, the water covered by the same be distributed equally throughout the city for regular use, a tax of fifty cents per share to be added for its use, this added tax to take care of the city's portion of the expense of upkeep and assist in paying off the obligations they were carrying. This motion was carried and served in a measure to appease the contractors, who realized that in this way the water would be assured for culinary purposes for the city for some time to come, which was in effect the purpose of the motion, and whatever surplus there might be would continue to serve for use on the lots.

On account of the expense incurred in constructing the lower abandoned project, the city was still deeply in debt, and the contractors knew that as property owners they had been and would continue to be taxed to meet the payments on the George Woodward and Mrs. Alice Pendleton notes, of which only part had thus far been paid.

So long as the city distributed this water equally to each lot the probability of litigation seemed less apparent, but when this water was withdrawn and rented to others, a new situation arose. Sufficient water was retained by the city for culinary purposes, which was right, but although the remainder was rented to land holders in the valley, the citizens continued to be and still are taxed the extra fifty cents per lot without the use of the water, and those to whom the water was rented are also taxed, making this in effect double tax on the same shares.

There seemed to be a lack of revenue to meet the city's requirements, hence the original shares of water held by the stockholders were cut in two. This was termed a doubling of the shares, but since all shares continue to be assessed the same as original shares, it was in reality creating a second double tax. This action was not warranted by law for no company or corporation has any legal right, after acknowledging a stockholder, to change the established time schedule of an individual's water right without his knowledge and the voted consent of the stockholders. (See Kinney on Irrigation.)

The attention of the citizens was next called by the city to the construction of the proposed storage reservoir. Judge Thurman was again consulted and advised as to what the city proposed to do. The Judge gave an opinion against any such action. His advice, however, was

## A Brief Review of the Cottonwood Water History and the Present Situation

ignored, and as has since been stated by one individual when asked as to why, that "had the Judge's opinion not been ignored, the reservoir would never have been built."

The stockholders knew that the reservoir plan had been condemned, but labored under a variation of ideas, the one most definite being that of overcoming the former objection by increasing the shares of stock, and from the sale of this proposed new stock to finance the construction of the reservoir, instead of assessing the original shares as the stockholders anticipated would be done for any and all improvements that might be made.

The vote of consent at the meeting where the reservoir project was presented, was a mass citizen vote rather than a majority vote of the recognized stockholders, and was the result of the desire on the part of the citizens to obtain water for irrigation purposes, rather than to obstruct the interests of the original stockholders, but few, if any, were clear as to the actual facts in the case.

On April 9, 1912, following the above mentioned mass meeting, D. R. Forsha, then city recorder, issued according to instruction, a notice substantially as follows:

The subscription list is now open at my office to all those wishing to take stock in the Cottonwood Reservoir, according to the following rules and regulations:

Provided that five per cent of all subscriptions shall be paid down on the date subscribed.

Provided that the original stockholders shall have a preference right to take up to 90% of their holdings.

It is further provided that any person who is a property holder in the city may take stock, but in no case shall anyone be permitted to take the amount of \$500.00 or less than one-fourth of a share.

That the city may put in some amount later. (Amount not stated.)

It is plain to be seen that the phases of this notice are conflicting, since those who held seven shares or more of the original stock could not take the allowed 90% without exceeding the \$500.00 limit, original shares being valued at \$125.00. Nor were such stipulations lived up to, for later on new purchasers secured as many as twenty shares of this Reservoir stock. Neither did the above notice make any provision for the equalizing of the original and reservoir shares.

At first there was talk of allowing original stockholders two shares of Reservoir stock for each \$100.00 worth of credit they obtained. Later it was decided to charge \$125.00 for each and every share both of the original and the reservoir stock.

The work of constructing the Reservoir was finally begun and a trench was made in which to lay up the face wall of the Reservoir dam. In this trench, cinder beds were opened up which fairly drank in the water and could not be dammed off, notwithstanding a force of men and teams were used. The water was then turned off above, the trench filled up with earth hauled into it and another wall was constructed some twenty feet east of the first one, but on the same black lava ledge. During the process of construction, several test pits were made which revealed the fissured condition. These cinder beds and sink holes were cleaned out to various depths and filled with earth in the hope of making them retain water.

As the work progressed, several of the subscribers became convinced that the reservoir was more or less of a speculation and some of them transferred, sold, or otherwise disposed of what credit they had accumulated, and had it not been for the promise that the reservoir stock would be made of equal value with the canal stock, it is certain that many who continued to work out their subscriptions, would also have taken the same course. As it was, the city was obliged to appropriate several thousand dollars to complete the reservoir. Never since the canal was completed and the water turned in, has the average annual flow been sufficient to justify the

## **A Brief Review of the Cottonwood Water History and the Present Situation**

expense of this reservoir. Nor would this expense be justifiable if the water supply were sufficient, since the reservoir will not retain the water, as experience has proved.

The present water master's statement is to the effect that during the past three years there has never been sufficient flow of water to justify wasting it in the reservoir, especially during the years just past (1926). From observations he has concluded that the greater pressure of water occasions greater proportionate loss through the porous seams of the rock bed of the reservoir. This fact has been noted by him and by others more deeply interested, there being a rise in the water for a few days followed by a perceptible lowering without any decrease of the inflow, or increase in the outflow. A repetition of these variations has been observed by the water master, the present Mayor and the writer (Brigham Jarvis).

This condition was particularly noticeable last year, for although we experienced the most open winter known in the history of the country, and the inflow was more regular than ever before—there having been an interruption due to freezing of three days only—it required only one week to draw out the entire accumulation from the reservoir. On June 1, 1926, the stream was measured, showing a flow of nine (9) second feet at the head of the canal. At this time of the year the stream is usually at its highest flow.

On account of the open winter more call was made for water for gardening, as a result of which more than the regular amount used for culinary purposes was turned through the culinary pipe for irrigating, the stream being too small to divide for both purposes. There was also a very small amount drawn from the reservoir to meet the demands of a few lots in the East District.

During the winter of 1924, conditions were different. The weather was decidedly colder and more difficulties were experienced with ice flow along the Gulch. Also, due to the extreme cold, less water was required for winter gardening, and though the flow at the head was somewhat larger, the reservoir accumulations were drawn off in four days. When measured in May, 1925, there were less than four second feet of water at the head. This amount showed no appreciable increase at any time after this measurement, but continued to decrease throughout the season.

It has been noticed also that during storm periods, when the water was muddy, the waste in the main canal from the head down, was proportionately less than when the water was clear and less in volume. For this reason the need of improving the canal from the head down to the reservoir by cementing, piping, etc., is very apparent, as in hot weather and low stages there is a loss of nearly 50% of the water, due to soakage and evaporation, between the headwater and St. George, a distance of sixteen miles.

Since neither the reservoir accumulations nor the actual stream volume could supply sufficient water for the shares of Reservoir stock that had been sold to original stockholders and new purchasers, the only possible recourse would have been a division of the original stock. It is plainly neither right nor just for any company or corporation to diminish the volume of water by attempting any division whatsoever of the original stock, nor by putting the same into any reservoir that fails to retain the water supply. Nor is it just or reasonable that the original stockholders be asked to accept Reservoir stock as of equal value with their original shares. But, should it be determined to make this division, why should not the distribution of water be made direct from the canal instead of attempting to turn it into the reservoir where its value will be so diminished and wasted.

One item worth considering at this point is the fact that up to the present time the city has never presumed to assess the so-called new shares of stock, commonly known as Reservoir

## **A Brief Review of the Cottonwood Water History and the Present Situation**

stock. This is no doubt because of the continued dissatisfaction and the apparent uncertainty of their being legally recognized.

Some people were unwilling to purchase this Reservoir stock and others were unable to do so. Such individuals have been termed unwilling to support the city in its projects, yet willing to share in whatever advantages and benefits came therefrom. However, the fact remains that those who bought Reservoir stock were merely cutting their own original shares in two and paying for the privilege of so doing, a fact overlooked by those who agreed to the proposition and purchased Reservoir stock.

Some claim that the work on the reservoir protected the city's rights to the water, especially in the winter time. This, however, is not correct, for while the reservoir was being constructed, the canal was permitted to fill up with gravel and debris from a dislodged portion of a ledge having fallen into the canal at the head, as a result of which an overflow occurred whereby five of the original thirteen second feet of water were lost, filings on this having been made and allowed. It is claimed that the city regained five second feet at least by a later filing. It is not possible that this could be other than secondary water right as long as the filing made and allowed earlier is not allowed to lapse, as there is not available the eighteen second feet of water which this would otherwise necessitate.

Now, had the money put into the reservoir construction been spent at the head of the canal in tunneling, cementing and improving, thus shortening the course, it is not difficult to determine what results could have been obtained in retaining and controlling the water supply during the entire year. During the winter months the flow becomes so reduced that the canal, being frozen at the head, serves as a sort of natural pipe-line and no overflow results. Now had the debris and gravel been kept cleaned out at the head, the spring season overflow which was lost by filing would never have occurred. If cemented at the head where needed, the water would be delivered safely throughout all seasons of the year and under all conditions.

It would seem, therefore, that the only just and sane solution would be for the city to take over the stock in its entirety, renting back to the stockholders whatever surplus is available over and above that needed for culinary purposes. By so doing the stream would be established primarily for culinary purposes and the dangers of litigation would be eliminated. In this way the water would be made to serve the dual purpose of city and stockholder until such time as the entire supply is needed for culinary purposes. But so long as the present unsatisfactory conditions maintain, a litigation is at any time possible, probable.

For the current year the matter has been tabled and no immediate action will be taken, the water master having been ordered to make distribution according to the former schedule. Since it is now a matter of general knowledge that this stream should and will be depended on for culinary purposes only, we should do everything possible to insure the safe delivery of the entire volume in its pure state. Already \$10,500 has been spent on the city water system and an additional \$35,000 on the culinary pipeline from the city to the reservoir. Of this last bond issue voted there is still a few thousand available. Let us hope that as soon as consistent this will be used to improve the canal from the head down, to avoid the waste which now occurs.

And because this stream must eventually be used entirely for culinary supply, we should look to supplying the valley with irrigating streams from the Virgin river. A feasible plan for thus utilizing the waters of the Rio Virgin is now outlined and could be put into service. Also, a reservoiring of the local irrigating supply should receive consideration, so as to avoid the necessity of nighttime and Sunday irrigating, and affording a possibility of making this a real city of roses as it should become. The prediction concerning the supply of culinary water has been

## **A Brief Review of the Cottonwood Water History and the Present Situation**

fulfilled. Shall we not then fulfill the other prediction made that "this city shall be built from ridge to ridge with the Temple standing in the center thereof." Brigham Jarvis