

A conduit of this capacity is ample for every requirement Salt Lake City will develop, and in reducing the dimensions the cost per mile can be reduced to \$20,856.

At the Sugar House Ward the end of the new canal is twenty-three feet above the head of the old one, which between this point and the city is little more than level and calls for special attention.

One remedy for the evil here existing would be to secure a new right of way and distribute uniformly over the whole distance the drop of twenty-three feet, which is now concentrated at one point. This would involve a gradient of seven feet per mile and require a masonry conduit of curtailed dimensions, which could be built for \$18,744 per mile, not including the cost of new right of way.

Another would be to lay a wooden pipe from the end of the new canal to the city.

One four feet in diameter, similar to that now in use in Denver, will cost about \$2.75 per linear foot, and will discharge 29,264,784 gallons per twenty-four hours, under the head here attainable; but wood is objectionable in requiring renewal about every ten years. The most economic means is that which costs least in the long run.

A masonry conduit of twelve-foot bottom width, above suggested, can be built right in the present canal with a created grade of one foot per mile, at a cost of \$20,756 per mile, or a total of \$70,910, then as finances permit other necessary improvements might be made in conformity.

From an inspection of its condition while running the levels through the canal between Sugar House Ward and its head, we were led to suggest to the council a thorough cleaning out of accumulated deposits, much of which has been carried in by lateral drainage.

This plan was approved, and the work is now progressing under the charge of the city watermaster; as at the time of construction no provision was made to carry the lateral drainage over instead of into the canal, this provision must be made now. Also the Cottonwood bottoms and other loose gravelly sections must be given special and proficient attention or the supply of the canal will still remain deficient.

While we decidedly favor repairing with the masonry conduit wherever repairs are necessary, we will suggest that if the cost of such substantial repairs is considered too great to be at the present entailed, the great seepage occurring at these latter places can be considerably reduced by removing a section of the porous material and substituting one of a more retentive nature.

Between Sugar House ward and the head of the canal the repairs necessary to meet the requirements of a few coming years will consist of cleaning out, substituting material and protecting against lateral drainage, and will cost about \$1,000 per mile, or \$24,000 for the entire distance.

The exigencies of the past season led to our suggesting the importance of some provision for drawing water from Utah Lake at a lower level

than has heretofore been possible, on account of the elevation of the East Jordan and the Utah and Salt Lake canals. These take their water from the river at an elevation fifty feet higher than does the city canal. By enlarging their dimensions the grade can be reduced at their heads, so as to admit of drawing from the river two or three feet lower and at the same time retain their discharging capacity. We are informed by Mr. J. L. Rawlins that the East Jordan canal company are now contemplating such an alteration in their canal, which will require the Utah and Salt Lake Canal Company to make a similar move. If this is done the resulting benefits will be almost incalculable; for the river bed has been lowered at points above the old dam, and when the new inlet now being dug is completed, an additional two feet of water can be drawn from the lake, which has an area of 127 square miles. The water extending over this area, two feet in depth, amounts to 7,081,113,600 cubic feet, which could be drawn off as needed, and is sufficient to irrigate 53,500 acres of land from May 1 to September 31, figuring from our basis of one cubic foot to the 100 acres. It thus remains only a question of storing the available waters in Utah Lake to insure a permanent and abundant supply of irrigating water for our city. This will be done by completing the dam now in course of construction at the old Indian ford in the Jordan narrows.

Notwithstanding the above recommendation, we do not advocate a low level for Utah Lake. On the contrary, we most decidedly favor increasing its depth to the greatest practicable extent. Further, had the delegation sent by the City Council to confer with the canal company been a majority, the new dam would have been constructed at the inlet to the Jordan; but the canal company preferred to have it where the man employed at the other dam can also give it attention. The expense of cutting the inlet, dredging the river bed and constructing the dam will be about eight thousand dollars, which is to be born equally by the city and the four canal companies.

In conclusion, upon the canal mainly depends the solution of our water problem. Put into the condition suggested, it is capable of bringing ninety millions of gallons daily for use in the city and exchange elsewhere, there is little doubt that from 40 to 50 per cent of the Cottonwood stream may be obtained when once the canal's efficiency is established; at present this is out of the question, at least such is our judgment from the many conversations had with parties owning in the Cottonwood water. All of which is respectfully submitted.

J. FEWSON SMITH,
W. E. JACOBS.

SALT LAKE CITY, Jan. 12, 1890.

Statement of disbursements of water commission as shown by accompanying vouchers:

ARTESIAN WELLS.

For machinery, tools and well material..... \$3,687.93

For men's wages..... 699.25
For R. R. freight..... 537.18
For moving machinery and drayage..... 161.05
For coal..... 106.75
For repairs and purchase additional tools..... 221.44

\$5,413.6

DRIVE WELLS.

For men's wages, tools and use machinery..... \$6,526.50
For material for wells.... 1,254.49

\$7,780.99

SUNDAY EXPENSES

For surveys.....\$ 66.00
For team hire..... 25.00
For stationery..... 9.50
For telegrams..... 4.15
For incidentals..... 41.45
For exchange in payment foreign bills..... .75
For salary paid Commissioner Jacobs..... 300.00

\$446.85

\$13,641.44

For amount still due F. E. Roche for March..... 1,000.00

INVENTORY OF MATERIAL ON HAND.

1 drilling machine and tools..... \$ 2,000.00
818 8-inch wrought iron pipe..... 1,245.10
340 9-inch sheet iron pipe..... 323.00

\$3,568.10

Outlay exclusive of material on hand..... \$10,073.34

The report was received and filed. The financial part was detached and referred to the committee on finance.

The expense bill of C. H. Wilcken, watermaster, was referred to the committee on irrigation.

The report of expenditure by Jesse W. Fox, Jr., on the Jordan canal of \$39,170.36, was referred to the committee on canal.

The report of the watermaster of expenditures on Salt Lake and Jordan canal, for the three quarters ending Dec. 31, 1889, was referred to the committee on canal.

The report of the chief of fire department for the quarter ending Dec. 31, 1889, was referred to the committee on fire department.

The report of the superintendent of water works for the quarter ending December 31, 1889, was referred to the committee on water works.

The report of the city marshal for the quarter ending December 31, 1889, was referred to the committee on police.

The report of the city attorney for the quarter ending December 31, 1889, was received and filed.

The city attorney reported a resolution to grant a franchise to the Salt Lake Rapid Transit company. Ordered printed.

The report of the city auditor for the quarter ending December 31, 1889, was referred to the committee on finance.

Recorder Wells asked for an appropriation of \$800 for clerk hire for the eight months ending February 15 next. Allowed.

The petition of Robert Anderson, asking for a title to a lot in the Lindsey entry, was referred to the city attorney.

A communication from the Salt Lake City Railway Company, asking for the right of way to the present Rio Grand Western depot, was referred to the committee on streets to be considered in connection with the franchise question.

Mr. Young wanted the order of business suspended and the charges against the mayor investigated.

The committee on claims recommended that B. Y. Hampton be al-