

## TWO PICTURES.

An old farm-house with meadows wide,  
And sweet with clover on each side,  
A bright-eyed boy who looks from out  
The door with woodbine wreathed about  
And wishes, his one thought all day:  
"Oh! if I could but fly away  
From this dull spot the world to see,  
How happy, happy, happy,  
How happy I should be!"

Amid the city's constant din,  
A man who round the world has been,  
Who, 'mid the tumult and the throng,  
Is thinking, thinking all day long:  
"Oh! could I only tread once more  
The field-path to the farm house door,  
The old, green meadow could I see,  
How happy, happy, happy,  
How happy I should be!"

## GOLDEN GRAINS.

Thou must be true thyself  
If thou the truth would teach;  
Thy soul must overflow, if thou  
Another soul wouldst reach;  
It needs the overflowing heart  
To give the lips full speech.

Think truly, and thy thought  
Shall the world's fame read;  
Speak truly, and thy word  
Shall be a faithful seed:  
Live truly and thy life shall be  
A great and noble creed.

## THE IRRIGATION CONVENTION.

FROM the report of the proceedings of the Irrigation Convention, recently held at Denver City, published in the *Rocky Mountain News*, of Oct. 17, we extract the following address to the Convention, by A. M. Musser, Esq., the Utah delegate:

Mr. Chairman and Delegates of the Irrigation Convention:

It is well known, doubtless, to many of you that Utah—which territory I have the honor of representing at this important convention—was first occupied in the year 1847 by a handful of exiled "Mormons," under the immediate leadership of President Brigham Young. When those early settlers entered that territory—then belonging to Mexico—they were destitute of almost everything but faith and indomitable perseverance. They were ignorant as to the character of the soil; at sea as to climatic and other influences which they had to meet; entirely unused to the processes of irrigation; nevertheless they planted in faith, and in due course, under divine blessing, they harvested. Mr. James Bridger, of Fort Bridger memory, who was one of the oldest and most observing of mountaineers, offered the pioneers one thousand dollars for the first ripe ear of corn they might raise in Salt Lake valley. Such was his faith and encouragement to a band of earnest men in quest of some uncultivated spot on God's footstool, which they might occupy without fear of molestation. The magnitude of the undertaking in colonizing that then remote, isolated and unknown country, cannot easily be over-estimated. A year's supply of provisions and seeds, also implements of husbandry, were all freighted by ox and cow teams, a distance exceeding one thousand miles.

Utah now has a population closely approximating one hundred and fifty thousand souls. Possibly seven per cent. of this total are non-"Mormons." Quite ninety-five per cent. of the "Mormons" live in their own houses, and upon the fruits of their own industries. Aside from the numerous flourishing mining towns and camps built since the great trans-continental railroad made the mines available, one hundred and ninety odd prosperous cities and villages have been founded and built by the actual settlers.

Trenching thus much on your time, with indirect data, I will now give you some facts and figures bearing directly upon the system of Utah's irrigation and agricultural labors. Up to the year 1895 we constructed over two hundred and seventy-seven public canals and ditches for irrigating purposes. The aggregate length of these canals was ten hundred and forty-three and a half miles. These canals were built at an aggregate cost of \$1,766,939, which would amount to an average cost of \$1,865 per mile. The esti-

mated cost of canals that were in progress of completion at that time was \$877,730, which would make a grand aggregate cost of all canals built and reported to the Deseret Agricultural society amount to \$2,644,669.

The following statistics are for the year 1897 alone: 100,000 acres land irrigated; \$248,000 expended on canals and dams during the fiscal year ending October, 1897; 48,000 acres wheat raised, averaging 17 2-3 bushels to the acre, one-sixth of the crop destroyed by locusts; 6,300 acres barley raised, averaging 18 bushels, loss one-fourth; 1,900 acres oats raised, averaging 20 bushels, loss one-third; 7,900 acres corn raised, averaging 15 bushels, loss one-fourth; 1,800 acres sorghum raised, averaging 77 gallons, loss one-sixth; 6,300 acres potatoes raised, averaging 100 bushels, loss one-fourth; 380 acres carrots raised, averaging 250 bushels, loss one-sixth; 300 acres beets raised, averaging 280 bushels, loss one-eighth; 166 acres cotton, averaging 171 lbs; 30,000 acres meadow, averaging one three-fourth tons, loss one-eighth; 900 acres apples, from 100 to 500 bushels to an acre; 1,000 acres peaches, from 100 to 1,000 bushels to an acre; 75 acres grapes, from 350 to 3,300 bushels to an acre.

As a general thing we have found that the air currents passing through the canons are a great protection to most kinds of fruits and other tender vegetation raised at the mouths of canons by dissipating the early and late frosts.

Meeting many of the leading men of the territory at our late semi-annual conference, I obtained some canal data, of which the new beginners in the art of irrigation may take advantage. These gentlemen gave me the length, width of bottom, depth of water, fall of water per mile, number of acres, and the kind of soils watered, of twenty-five of their main canals located in different parts of the territory; 165 miles is the aggregate length of the twenty-five canals; 6 3-5 miles is the mean length of each canal; 150 feet aggregate width of bottom; 6 1/2 feet mean width of bottom; 388 inches aggregate depth of water; 15 1/2 inches mean depth of water; 585 1/2 feet aggregate fall to the mile; 23 1/2 feet mean fall to the mile; 40,750 aggregate number of acres watered; 1,638 mean number of acres watered. Thus we see that a canal 6 3-5 miles long, 6 1/2 feet wide at bottom, with 15 1/2 inches depth of water and with a fall of 23 1/2 feet to the mile, will carry water sufficient to successfully irrigate—taking one season with another—1,638 acres of cereals, vegetables, fruits and meadow. The character of the soils thus watered is: 7,200 acres of black loam; 8,800 acres sandy loam; 8,250 acres loam and gravel; 3,500 acres loam and clay; 1,206 acres loam and alkali; 5,000 acres clay and gravel; 3,500 acres clay and plaster paris; 2,500 acres of iron, alkali and sand; 1,000 acres sand, alkali and volcanic.

Our reclaimed alkali lands, of which we have many thousand acres, are among our richest, strongest and consequently most remunerative soils. The process of reclamation is simply leaching the land by successive elaborate irrigation and by repeated plowing, thus exposing it to the direct influence of segregating agencies which carry off the volatile and objectionable ingredients.

The foregoing statistics are confined solely to Utah. They do not include great tracts of land cultivated by our people in Idaho, Nevada and Arizona, nor do they embody the thousands of acres of cereal, vegetable, fruit, and grape producing lands which now need no artificial irrigation. When Salt Lake City was first founded the water capacity for irrigating purposes did not exceed 800 or 900 acres. Now between 4,000 and 5,000 acres are successfully irrigated. At first the land was arid and thirsty. Subsequent irrigation saturated and settled the soil and thus slaked much of its early thirst. The increased rainfall—no doubt superinduced by occupation and cultivation—and the numerous fruit and shade trees—like so many mulching agencies neutralizing the drying effects of the sun's rays and prevailing winds—have very largely contributed to cool and moisten the soil and to lessen the necessity of frequent and elaborate watering. Notwithstanding the process of irrigation is attended with much labor and expense, yet the people of Utah find it a great convenience to be enabled to put the water on

the land when the crops are actually needing it, and a great fertilizer, as it is the means of covering the soil with rich vegetable matter from the mountains. After successive years of watering the upper or bench lands, we discovered that the lower lands, including much arable, and about all the grass lands, received all the water they needed through the permeating "waste" waters alone.

We have but very few troubles over the many intimate interests in water and water ditches. The county courts as a general thing regulate and control the waters in the main canals, (some of which they construct and keep in repair), by the appointment of head water-masters, whose duty it is to see that the water is equally distributed in the lateral ditches, which are generally built, kept in repair and managed by the people, who appoint sub-water-masters for the season. When difficulties do arise between watering interests they are universally settled, like all our troubles, by referring them to disinterested peers who labor, without partiality for both parties and without pecuniary cost to either.

On account of the heavy grades of our canyons (from fifty feet to five hundred feet to the mile), each successive year we are forced to spend thousands of dollars repairing dams and canals. They are very often carried away in the midst of the irrigating seasons by what are termed cloud-bursts or waterspouts. We have sustained untold loss in canals, dams and reservoirs from these and kindred causes.

Owing to the constantly increasing demand for arable lands we are now forced to construct many larger and longer canals than those heretofore built, to lead the plus waters of the large streams over the lands now arid. For this purpose the waters of Bear, Cub, Smith's Fork, Ogden, Weber, Jordan, Provo, Sevier and Rio Virgen rivers are soon to be diverted and utilized. It is intended to make one or more of these canals navigable.

Temple block, Salt Lake City, has an altitude of 4,300 feet above sea level. Our lowest settlement—St. George—has an elevation of 2,700 feet, while our highest town does not exceed 7,000 feet. Most of the settlements are under 5,000 feet above the level of the sea. The mean temperature of Salt Lake City for a number of past years was—spring, 51°; summer, 75°; winter, 32°; for the year, 53°. The mean rainfall for the same period has been about 22 inches.

As a general thing wheat and other cereals are watered from two to four times the season, while the gardens and orchards on the bench or uplands—which are generally gravelly, sandy and light—require it once a week during the season. The curling of the leaves is always a sure sign that water is needed. By subsoil plowing and thorough stirring, the corn, even after the blades curl, will straighten out, and the necessity of immediate watering is thereby superseded.

Our experience is that by irrigating fruit and other trees quite late in the fall they will stand the winter better.

In times of scarcity of water and when crops are in great want of it, the work of irrigating with us is carried on day and night and even Sundays.

Our waters never run to waste so long as there is arable land below for them to spread over. The altitude of this beautiful city is one mile above sea level. I see that your peach and apple trees are looking healthy and vigorous. This great altitude need not discourage you about putting out fruit trees, as we are raising fruit successfully above this height. Our trees, however, receive the protection of towering surrounding mountains, and as I have remarked, the dissipating effects of the Canyon winds. If you should not succeed in wintering all your trees for the first two or three years, I would respectfully suggest that you keep trying, just as we had to do in the commencement of nearly all our settlements. When a Pennsylvanian moves into a new country his first work is to build a barn to protect his horses and products; the first work the "Mormon" does under similar conditions is to plant out fruit trees. In Utah it takes ten years to grow a ten year old tree, while with means a magnificent house can be built in a few months.

I thank you for your attention.

## Some Interesting Data Concerning Utah, by Bishop Musser.

DENVER, Oct. 17, 1878.

Editor News:—As a kind of supplement to what I yesterday submitted to the irrigation convention, I beg to hand you a few further statistics on Utah, which, I trust, will pay for perusal by those interested in such matters. Utah is pushing forward her railroads and telegraph lines north, south, east and west of Salt Lake City. The Utah Northern will soon be completed from Ogden to Franklin, making a distance—with the extension to Corinne, now several months finished—of about ninety miles. The Wasatch and Jordan Valley road is finished from Sandy station, on the Utah Southern, a distance of nine miles, and within about six miles of the rich mines of Little Cottonwood canyon. The Bingham road will soon be completed to Bingham city, from Sandy station, distant eighteen miles. The American Fork Canyon road has eighteen miles of completed track. The Salt Lake, Sevier Valley and Pioche Road company, has fifteen or twenty miles graded, and has on hand the ties, iron and rolling stock to complete the distance graded. The Echo and Coalville road, nine miles in length, has been running over a year. The above are all narrow gauge (three feet) roads, and we find them A 1 in every respect. The Utah Central, connecting Ogden and Salt Lake City, is thirty-seven miles long, and, like the Utah Southern, which will soon be finished to Provo, some forty-seven miles south of Salt Lake City, is the same gauge as the Union Pacific road. It is designed to push this road southward as fast as possible.

The Deseret Telegraph Company's lines connect all the principal cities, towns and camps of Utah, and penetrate south-eastern Nevada, and northern Arizona and southern Idaho.

There are seven woolen and one woolen and cotton factories, doing a successful business in Utah. One of the seven has 2,500 spindles, and has been built and machinery set going at a cost approximating \$300,000. This one, and two others, are built and run on the co-operative principle. Every person who so desired took stock in them. Our grist and saw mills number in the neighborhood of two hundred.

The business of the Z. C. M. I. Co-operative store, of Salt Lake City, last year amounted to about five millions of dollars. It is now paying \$25,000 per month for freights. Co-operative enterprises are eminently successful. The "Co-op" stores equalize the prices and never permit "runs" or "corners" or speculations in prices on any article they have on hand, no matter how scarce the article may be or how great the demand for it.

Salt Lake City has some five miles of street railroads, fine gas works, and is now introducing water through cisterns and iron pipes from City Creek.

Utah is importing much fine stock from eastern marts. We have in the Territory, now, some 250,000 head of sheep. A good deal of attention has been paid to sericulture, while apiculture has become one of our chief studies. Many bees have been destroyed by the disease known as "foul brood."

The shipment of ores, bullion, lead, silver and gold bars and dust, for the year 1872, amounted to three millions. There are in the territory over a score of smelters, aggregating a reducing capacity of over seven hundred tons per day; also two steam batteries and four stamp mills, with a capacity of one hundred tons per day. The splendid separating and refining works of the Germania Company, located near Salt Lake City, are highly successful.

The following is a list of most of the mineral products of our territory: Gold, silver, iron, copper, cinnabar, sulphur, alum, borax, nitrate of potash, carbonate of soda, gypsum, salt, coal, marble, fire, potter's and brick clay, chalk, limestone, plaster paris, etc., etc.

We have in the Territory some four hundred primary and intermediate schools, and about the same number of Sabbath schools. But few of these are "free," yet no child in Utah need go without an education, as ample provision is always made to educate the children of the poor. The policy has been to furnish remunerative employment to parents, so that they can, with comparative

ease, not only feed and clothe, but also school their children. We have now about 30,000 children between the ages of four and sixteen attending the different schools.

In no one direction have the citizens of Utah been more successful than in the natural and sorely neglected science of stirpiculture. I am proud to state that our estimated product for the year 1872 was ten thousand souls.

The most of this day I have devoted to looking over your nice, clean, well-built city, and in visiting its water and gas works—its parks, race tracks, fine buildings, stores, etc. The site and soil of the city could not well be bettered. Your streets will never need paving; nature has furnished a magnificent pavement, which needs only to be kept moist to silence the dust. Adieu.

Respectfully yours,  
A. M. MUSSER.  
—Rocky Mountain News, Oct. 18.

## THE IRRIGATION CONVENTION.

On the afternoon of the first day's session of the Irrigation Convention recently held at Denver, the following

## MEMORIAL TO CONGRESS.

was reported by the Committee on Memorial, and unanimously adopted by the Convention:

To the Honorable the Senate and House of Representatives of the Congress of the United States of America:—Your memorialists, citizens of the States and Territories west of the Missouri river, would most respectfully represent:

That the portion of the public domain lying between the ninety-ninth meridian of longitude west from Greenwich, and the Pacific ocean, is arid and generally incapable of cultivation, except by means of irrigation.

That this arid region embraces more than one-third of the geographical area of the United States, or over one million square miles, and comprises the Territories of New Mexico, Arizona, Colorado, Wyoming, Utah, Idaho and Montana, and the State of Nevada and large portions of the States of Oregon, California, Nebraska, Kansas and Texas, and the Territories of Washington and Dakota.

That the soils of this vast region are remarkable for their productiveness, when subjected to irrigable agriculture.

That the water supply of its rivers and smaller streams is abundant to reclaim millions of acres that now lie waste and unproductive.

That a system of irrigation that will meet the wants of the country will be too extensive and costly for either individuals, private corporations, territorial or state governments to successfully construct.

That the present agriculture of this region is confined to the immediate valleys of the water courses where irrigating canals are of easy construction and comparatively inexpensive, and it will remain so confined to these narrow limits unless some extensive system of irrigation can be established.

That for these reasons vast areas of land will remain unsold by the government for years to come, or perhaps forever, unless they can be made available to the agriculturist by irrigation.

That the public domain outside of this region, subject to the homestead and pre-emption laws, is comparatively exhausted, and the tides of immigration westward annually increasing in volume, are unable to make available, under these beneficent laws, the millions of acres of rich lands embraced in this region, by reason of the aridity of the climate, and their financial inability to construct extensive irrigating canals.

That no interest is more important to the nation than the development of its mineral resources. Thousands of gold and silver mines are now unworked for lack of water to drive machinery to crush the ore. This can be secured only by governmental aid. Reservoirs constructed near the sources of mountain streams will furnish the necessary supply, and the water, after driving the stamp mills at the mines, will flow onward to enrich and fertilize the arid plains we are now seeking to reclaim for cultivation.

That the general government has established ample and numerous