

that there were ample opportunities in Box Elder County for making reservoirs and increasing the water supply, and mentioned in particular the efforts of the people of West Portage, who had expended considerable labor and means in constructing a reservoir but who lacked the means to finish it.

#### SENATOR STEWART

remarked that he had passed through Box Elder County twenty-five years ago when the population was meagre and the cultivated land quite limited, and that he was both pleased and surprised at the evidences of thrift and prosperity and increased population which he noticed on recently riding through that county on his way to this city, and still more so on learning now of how the streams had been developed and the possibilities for making a living there had been increased by the peaceable and united efforts of the early inhabitants.

Samples of wheat, rye, barley, oats, pears, peaches, plums, grapes, etc., grown in Box Elder County, were then shown and admired.

#### GOVERNOR THOMAS

then took the stand and stated that with a view of assisting the committee in their investigation of the subject of irrigation he had solicited written reports from all of the twenty-four counties of the Territory and procured maps from twenty-one of them, and hoped yet to obtain maps from the remaining three. He explained, lest the committee might be misled by what had been said about county courts exercising jurisdiction in the matter of dividing the streams, that such a custom no longer prevailed.

He then called attention to and read selections from the following written report prepared by Prof. Marcus E. Jones for the use of the committee in connection with the county maps:

#### Report on Irrigation and Water Supply in Utah Territory, 1889.

Hon. Arthur L. Thomas, Governor:

Dear Sir—The annual rainfall of this Territory will not exceed eight inches per annum, and were it not for the lofty mountains storing up the water in snow, the Territory could not be inhabited. Therefore the settlements are to be found along the streams which are fed by the snow, and they are located chiefly at the bases of the mountains, though running out into the valleys as far as there is water.

The Wasatch, rising over a mile above the valleys run, from north to south through the Territory a little west of the middle, till they reach Iron County, where they turn to the southwest and fade away in Nevada. Their average height will not fall far below 10,000 feet above the sea. Nearly east of Salt Lake City the Uintahs, still loftier than the Wasatch, about on them and run eastward till they pass out of the Territory. These are so close to the northern edge of Utah that we get little benefit from them, while to the south of them is an Indian reservation. Nearly due east of Utah Lake and about 40 miles from the Wasatch, the coal range

starts from the Uintahs and runs southward parallel with the Wasatch for 160 miles, when it joins them at Panguitch Lake. These three ranges form the watershed of Utah, the coal range and the Uintahs forming the rim of the Great Basin, while the Wasatch perform a similar part below Panguitch. The Wasatch and Uintahs are narrow, lofty and rugged, while the coal range is younger, lower and broad. The coal and Wasatch inclose between them some of the most fertile valleys of Utah. The Wasatch reach their culmination near Salt Lake City, and, aided by Great Salt Lake, give the greatest water supply in the Territory. The streams from this source irrigate the bulk of the cultivated area of Utah.

For ease in comprehension Utah may best be divided into three divisions: The moist counties, whose rainfall exceeds 12 inches per annum; the dry counties, with a rainfall of 6 to 12 inches; and the hot counties, with a slight rainfall and great heat.

The moist counties are Cache, Box Elder, Rich, Morgan, Weber, Davis, Summit, Salt Lake, Utah, Wasatch, Uintah, Sanpete, Sevier and parts of Emery, Garfield, Piute and San Juan.

The dry counties are Tooele, Juab, Millard, Beaver, Iron and parts of others.

The hot counties are Washington, Kane and parts of San Juan, Piute and Garfield.

#### MOIST COUNTIES.

Cache County is situated in the middle of the northern end of the Territory, at an elevation of 4533 to 5000 feet above the sea. All the arable land is in Cache Valley, which lies between two ranges of mountains, the Wasatch forming the eastern boundary. The water supply is 420.13 cubic feet per second, and comes from eight streams and rivers. The whole supply will be in use next year. The area of the county is 633,600 acres, of which 43,154 acres were cultivated this year; 1710 acres were dry farmed, and 14,385 acres of crops were lost by lack of water. There are 40 canals reported, aggregating 110.5 miles. The irrigating season is 122 days long, and land is irrigated 35 hours per year. The duty of water is less than a cubic foot per second to 100 acres. The average depth of snow in the mountains is 3 feet. The committee report water storage as the only means of increasing the cultivated area, since there are more than 420.13 cubic feet per second running to waste for 243 days, enough to irrigate from 50,000 to 75,000 acres.

Many good reservoir sites are mentioned, but details are not given.

It is probable that artesian wells can be obtained in some parts of this valley.

#### BOX ELDER COUNTY.

This lies in the northwest corner of the Territory. The eastern part is very fertile and well supplied with water, but the western and greater part belongs to the dry counties. The area is 2,767,360

acres, of which 53,280 acres are cultivated, and of these latter 19,190 acres are cultivated but not irrigated. The elevation of the fertile parts is 4215 to 5000 feet above the sea. There are 12 canals reported; length 76 miles. A branch of the great Bear River canal is to irrigate a large area in this county. Large quantities of fruit are raised here, and still greater amounts of small grain and hay. The extensive valley of the Bear has been for half a century the recruiting place for overland travelers by team. Artesian wells are very numerous and add greatly to the productive area. Water storage is the main question here. Five reservoir sites are reported in detail and several others in general. Bear Lake is the natural reservoir for this and Cache County and will store all the water that will ever flow into it.

#### RICH COUNTY.

This lies at an elevation of 6000 to 7000 feet above the sea, in the north-east corner of the Territory, at the eastern base of the mountains. It is high and cold, raising only small grain, hay, etc. It lies all in one valley; is watered chiefly by the Bear River and some streams that flow into the lake. The land takes little water to mature crops, and much produce is raised without irrigation. The soil is sandy. The area of the county is 497,280 acres. There is no report from this county.

#### WEBER COUNTY.

This lies south of Cache, extending from Great Salt Lake through the Wasatch to the headwaters of Ogden River. The best portion lies in Salt Lake Valley, at an elevation of 4315 feet, while Ogden Valley, lying along that river, lies east of the Wasatch and is more elevated. The water supply of this county comes from 17 streams and rivers, flowing 323.66 cubic feet per second. There are 117,600 acres under cultivation, of which 29,400 acres are fully irrigated, while the rest is partially irrigated or dry farmed. The soil is sandy, with clay close to the lake. Five thousand one hundred and seventy-two acres are irrigated from artesian wells. The duty of water is one cubic foot per second for 80 acres, or thereabouts. There are 25 canals, length not given. The irrigating season is 122 to 152 days long. This county is one of the most productive we have, raising all kinds of fruit and produce that is raised in Great Britain. The only solution of the water question is storage. There are over 323.66 cubic feet per second going to waste for 213 days, enough to irrigate 30,000 to 40,000 acres. One reservoir site is reported, of small dimensions, while others are reported from Huntsville and Wheeler's Creek, and there are numerous sites at the head of the Weber.

#### DAVIS COUNTY.

This county lies wholly west of the Wasatch and between them and the lake, being south of Weber and north of Salt Lake Counties. There is very little waste land in this smallest county in the Territory, whose arable land lies wholly in