

## IRRIGATION IN UTAH.

In the June number of the Historical and Political Studies of the John Hopkins University, there appears a contribution by Mr. Charles Hillman Brough, of Ogden, Utah, entitled "Irrigation in Utah." This description of Utah's wonderful industrial system last year won for Mr. Brough the Fellowship in Political economy in the John Hopkins University, carrying with it a prize of \$500. The study is based on Church records and manuscripts supplied by the Church historian, and letters received from representative irrigators in all parts of the State and the arid region, and required two years of careful research in its preparation. It is written in a fluent style and in convenient book form, has already attracted a great deal of attention throughout the east, not only as portraying the possibilities of irrigation, but also the advantages of co-operation, which was the primal principle of Mormon colonization.

Several chapters are devoted to a description of the co-operative system, through which the Pioneers were enabled to construct the necessary irrigation works without expending any money, contracting any debts or floating any bonds. The distinguishing features of this system, as stated by the author, were:

1. Associated labor in the construction of canals and irrigation works, enabling the laborer to become his own employer.

2. A small farm unit devoted to diversified protection and intensive culture.

3. The privity of rights system, under which water was distributed among the irrigators in the order of settlement.

4. Water right appurtenant to the land so as to prevent speculation in either land or water.

It is shown in the monograph how this principle of co-operative organization carved out of the necessities of Pioneer life and first applied in the irrigation of farms, has since been extended throughout the entire economic structure of Utah. Mercantile enterprises, of which Zion's Co-operative Mercantile Institution is a type, and banking and insurance institutions are organized on the principle with the result that consumers are protected against the extortionate profits of middlemen, and at the same time producers are insured a fair remuneration for their labor. Since its commencement in 1869, the annual sales of the Z. C. M. I. have averaged \$3,000,000, and the average of cash dividends paid to stockholders has been 9-13 per cent per annum, aggregating in July, 1897, \$2,163,000, besides stock dividends to the amount of \$415,000. One thousand dollars' worth of stock invested in the Z. C. M. I. in March, 1869, was worth \$2,014.30 in July, 1897.

The author is warm in his praise of irrigation socialism, as typified by the co-operative system, but thinks it would be impossible to apply it to the reclamation of large areas of land, because of the waste of seepage involved in a multiplicity of small canals and ditches.

In an interesting chapter on "Capitalistic Irrigation," Mr. Brough traces the natural evolution of irrigation in Utah from a small stream that a single farmer or group of farmers could divert and use, to the larger creek calling for the combined effort of the community and finally to the larger undertaking by which thousands of acres are reclaimed under a single system of works.

He points out the invaluable aid capital has rendered in constructing storage reservoirs, introducing better agricultural appliances and securing an economical utilization of the water sup-

ply. He makes a suggestive comparison of the co-operative and capitalistic systems and thinks the people of Utah need to have no fear of exorbitant water rentals being charged by bona fide irrigation companies, of which the Pioneer Electric Power company, the Bear River Irrigation company, the Mt. Nebo Beet-Sugar and Land Co., and the Lake Bonneville Water and Power Co. are types. The large irrigation plants already in operation, as well as those in process of construction, are described in detail, and a particularly valuable supplement to the chapter is found in the appendix, giving the names, dates of incorporation, capital stock invested, par value of shares and places of business of all incorporated irrigation companies of each county in the state. This list is official, having been compiled from the records of each county by the county clerks.

The development of agriculture and horticulture in Utah through irrigation, the average yield of the staple crops, the expenses and revenues of irrigated farms, the difference between irrigated and "dry farm" yields is indicated in convenient form in tables, which have been compiled from the government and other official records. One of the most striking of these tables is one comparing the average yields of the staple crops in the United States at large with the average irrigated and "dry farm" yields of the same crops in Utah.

Several chapters are devoted to tracing the history of irrigation legislation in Utah, particular stress being given the Utah District Law, passed January 20th, 1865, under which over 7,000 acres have been reclaimed, and the irrigation legislation enacted by the last legislature. The connection between irrigation and other factors of Utah's industrial system, the influence which irrigation has had in working out Utah's present material prosperity and the debt which the arid region as a whole owes to the Pioneers of 1847, is graphically yet truthfully shown. Mr. Brough's researches have led him to assert that the Mormons were the first Anglo-Saxon irrigators in the New World, for while he finds earlier traces of irrigation in the gardens of the mission fathers of southern California, in the canals of the Aborigines of Arizona, and in the utilization of the water of creeks by various Indian tribes, these are evidences of Latin rather than Anglo-Saxon civilization. The Mormons, he claims, were the pioneers in the art of irrigation in the sense in which the term is used today, viz: (1). The power of applying water in exactly the right quantity. (2) The power of applying water exactly when needed. (3) The power of giving water to some crops and withholding it from others.

As the first part of the monograph is historical, the second is constructive, dealing with the problems confronting Utah's irrigators. These problems he finds to be: (1) The reclamation of the whole body of irrigable land in the State. (2) The formulation of system by which the lands already ceded may be administered. (3) The correction of abuses arising from prior rights in water. (3) A remedy for the evils of the commission system in marketing irrigation produce.

At the present time there are about 2,518,000 acres of irrigable land in the State not under ditch—37 per cent of this is in the Uintah and Uncompahgre reservations, and practically all of it is held in fee by the United States government. Three plans for the reclamation of this land are proposed, viz: (1) Reclamation under the present land laws, the homestead and desert. (2) Reclamation by the general government through appropriations and surveys. (3) Cession of the lands to the State in trust.

Reclamation under the present land laws is rejected, (a) because these laws

commit the land to unrestricted private enterprises under conditions which mean the virtual confiscation of the canals built to reclaim them; b) because these lands encourage the wasteful use of water by failure to place restriction on the construction of canals and ditches, and also by failure to provide for the utilization of natural drainage by the construction of storage reservoirs.

Although reclamation by the general government is desirable and has proven historically a success in Egypt and India where the experiment has been tried, it is deemed impracticable.

(a) Because it savors of paternalism, and would be resisted by the farmers of the east, south and middle west who could never be convinced that it was right to put money in the federal treasury to create farms in the West, and thus bestow expenditures upon men who would become their competitors in the agricultural market of the world.

(b) Because conditions vary so much, in different parts of the arid region that water-laws applicable to one state would be ill suited to another, and hence, any attempt to secure unity of management and enforce a uniform system of laws would work a great hardship on present irrigation interests.

The plan that is recommended by Mr. Brough is the cession of all irrigable lands in Utah to the State upon condition of their reclamation and delivery to actual settlers. To this end he proposes the opening of the Uintah reservation to public settlement and the immediate transfer of all lands now held in fee by the government to the State. His reasons for this recommendation are:

(a) Irrigation, in its final analysis, is distinctly a local problem and the people in the arid states are more likely to be thorough students of its possibilities than government officials 3,000 miles away.

(b) The possession of all the irrigable land in the State would enable the State to exercise a systematic supervision over the water supply it controls.

(c) State cession would vest the control of the land and water in the same authority and thus prevent the speculation incident upon divided ownership. At present, according to the common law, the State is the owner of all unappropriated waters, and the government is the owner of all unappropriated land.

(d) Historical precedents exist for the policy of State cession, the most notable one being the disposition of over 400,000 acres of swamp lands.

A problem more urgent of solution than state cession, because the advisability and success of a policy of state cession really depends on its correct solution in the formulation of a system according to which the lands should be administered in the event they were ceded to the state. Three plans are discussed, viz:

1. Administration of the state itself.  
2. Administration by public corporations with water districts organized under the laws of the state.  
3. Reclamation by private enterprise, operating under grants from the state with proper restrictions imposed upon the grants.

The plan of reclamation and administration by the state is rejected because of the necessity which it would incur of increased taxation by the state for the construction of the requisite irrigation work, because of the sacrifice of the revenues now accruing from the ownership of private property, because of the introduction of complexity in administration, and, finally, because of a disposition on the part of taxpayers to demand lower prices for the products of state industry.

Reclamation under the district sys-