

which, with the exception of Kansas, irrigation projects had been initiated up to 1914. In fifteen of these States up to that time thirty separate projects had been constructed at a total cost of nearly £16,000,000. The building cost of irrigation-works for the 1,200,000 acres now under ditch has averaged about £10 per acre.

To understand the magnitude of these great reclamation projects it is necessary to consider the following work which has so far been carried out and completed in building these: 5,000,000-acre feet capacity of reservoirs; 9,000,000 cubic yards of material in dams; 2,000,000 cubic yards of cement masonry; 100,000,000 cubic yards of material excavated; 8,000 miles canals constructed; 22 miles tunnels; 82 miles dykes and embankments; 14 miles bridges; 22 miles culverts; 160 miles pipe-lines; 76 miles flumes; 51 miles railroad; 2,300 miles telephone-line; 360 miles electric transmission-line; 33,000 electric and steam horse-power developed; 400,000 barrels cement manufactured; 1,600,000 barrels cement used; 30,000 tons coal mined.

The Truckee-Carson Irrigation Project.—This project embraces a total area of about 206,000 acres of land in western Nevada. Of this area, over 50,000 acres are under irrigation, most of it lying near the Town of Fallon. About half of these irrigated lands are public lands under homestead entry, and the balance are in private ownership covered by water-rights more or less complete. Similar lands to those already occupied are available for purchase at prices averaging £1 10s. per acre.

The ruling size of farm is 80 acres, containing usually not less than 40 irrigable acres. It is possible for lands in private ownership to acquire water-rights up to 160 acres, but with further extensions of the project and improved methods of cultivation the tendency will be, it is said, toward the adoption of the 40-acre-farm unit, which is found to be ample when intensively cultivated for the support of a family.

The project is situated in latitude $39\frac{1}{2}^{\circ}$ N. The general elevation of these project lands is 4,000 ft. above sea-level. Temperature ranges from zero to 100° above zero. The annual precipitation or rainfall averages 4 in. Snow rarely falls, and usually does not remain more than a day or two. The air is extremely dry. It is said that humidity is seldom felt, and the climate generally is temperate and delightful. Owing to the altitude early and late frosts are to be expected, but these, as a rule, do not interfere with the great variety of crops usually grown. Wind and dust storms, however, are occasionally experienced. Although disagreeable, it is said that they are not usually destructive.

The water-supply is obtained from the Truckee and the Carson Rivers. These rivers, like all other streams flowing eastward from the Sierra Nevada Mountains, extend a comparatively short distance into the arid plains, where, under normal conditions, they are evaporated from the lakes or sinks which characterize this region. None of these intermountain streams have an outlet to the sea. The water-supply comes almost wholly from the accumulated snowfall on the high Sierras. This deep deposit of snow is rapidly melted during the spring and summer, and this produces the floods which it is the object of the Reclamation service to conserve and utilize.

The cost of building the irrigation system is now fixed at £12 per acre. The terms of payment cover a total period of twenty years for payment of the building-cost, with graduation of payments so as to favour the settler in the earlier years when he needs all his money for farm development.

The soil varies greatly. While sand, sandy loam, and volcanic ash predominate, clay and adobe soils also occur. Certain areas in every portion of the project may be found where the soil is covered with a crust or layer of alkali, and on some of these lands, where the alkali is not disturbed by irrigation, the deposits are said to be annually getting thicker.

The valley produces under irrigation every variety of crop grown in the North Temperate Zone. Lucerne, wheat, barley, and oats grow luxuriantly, and sugar-beets are a profitable crop. Potatoes, celery, asparagus, cantaloups (a variety of musk-melon of delicate flavour, greatly esteemed by Americans and extensively used) are shipped for special dining-car and hotel consumption. Onions and other vegetables are raised at a good profit. Lucerne is the great money crop of this region. It is sown any time after the 1st March until the end of August. April, May, and August are found to be the best months. The rate of seeding is from 12 lb. to 20 lb. per acre. It is generally broadcasted and harrowed in, but it is preferable to put it in with the grain-drill to a depth of $1\frac{1}{2}$ in. in sandy soils and in heavier land not so deep.

An up-to-date creamery costing £2,400, which is well established, is now taking the produce from 1,503 milk cows. The average price per pound paid for butter-fat in 1914 was 27.3 cents, or 1s. 2d. of our money.

A modern beet-sugar factory equipped for handling 500 tons of beet daily is situated in the Town of Fallon within the irrigation area.

Clearing and levelling the land: This irrigation project is situated in one of the driest regions in the United States. The native vegetation is extremely sparse, and is chiefly greasewood (*Sarcobatus*), rabbit-brush (*Chrysanthodendron*), and sage-brush (*Artemisia*). To prepare the desert soil for irrigation it is first necessary to clear the land of the brush that grows on practically all the soil suitable for crop-production. This can be done by grubbing, dragging a railroad-iron over it, or, where it is not too large, by disking with the common disk harrow. Some of the land on the project is naturally almost level, consequently the cost of getting it ready for crops is very low. Other areas are covered with small sandhills. The cost of clearing and levelling the land varies from £1 12s. to £20 per acre. Most of it can be cleared and levelled at a cost of £3 to £7 10s. per acre.

The object of my visit to this part was the Truckee-Carson Experiment Farm, which was established by the Bureau of Plant Industries of the Department of Agriculture, United States of America, in 1906.