

**THE CANADIAN PACIFIC RAILWAY COMPANY'S
IRRIGATION PROJECT.**

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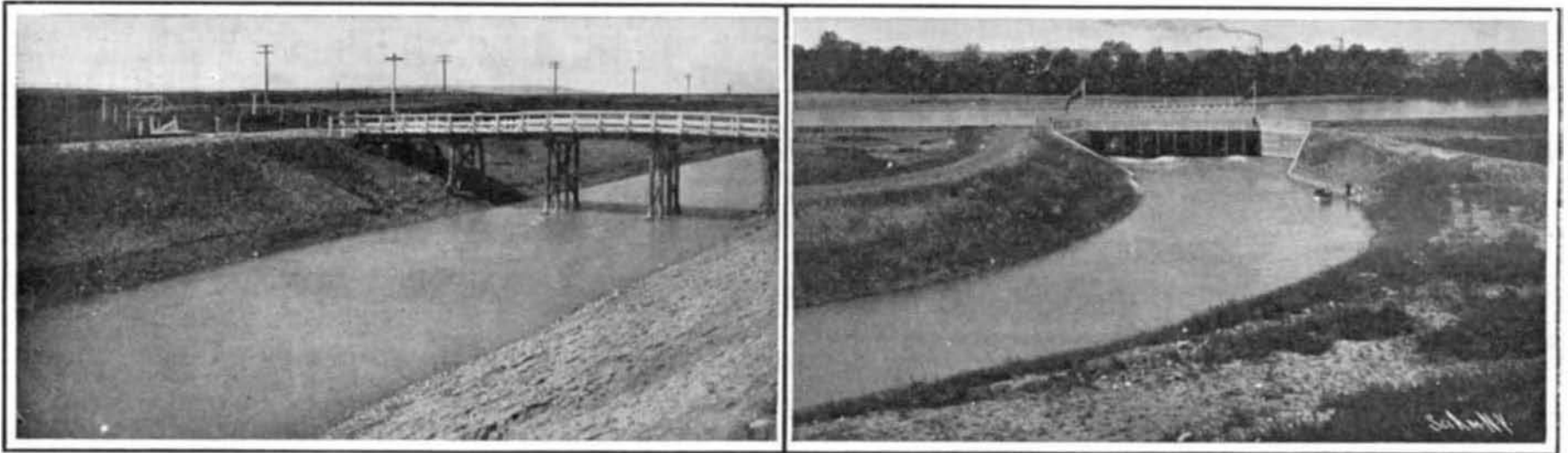
The Province of Alberta, which is seven hundred miles long and four hundred miles wide, is situated west of Saskatchewan, east of British Columbia, and north of Montana. The southern part of this great province is called Sunny Alberta, and the name is well earned. It is a land of mild winters and of perennial

able and non-irrigable areas in desirable proportions for grazing and crops, for ordinary and intensive farming.

In laying out this undertaking, the block has been subdivided into three main divisions of eastern, central, and western sections, containing about 1,000,000 acres each. The irrigation development is beginning with the western section.

The great plain comprising the block has a natural

sive undertaking. The engineering surveys have been rigidly scientific and exhaustively performed, the contours of the entire western section being located to 5-foot intervals. In the two remaining sections of over 2,000,000 acres it is intended to complete the topographical surveys to show contour elevations within the remarkably close scale of one foot, and in all the sections the maps issued show the exact acreage of irrigable land on each farm.



A Standard Highway Bridge.

Headgate of the Main Canal.

sunshine. The soft kiss of the Japan current and the warm breath of the Chinook winds are felt through its sheltered valleys and over its open plains, and horses and cattle range at will the winter through without being fed or sheltered.

The main water supply is the noble Bow River, which heads the Great Divide well up in the very heart of the Rockies, whose peaks are covered with perpetual snow; whose deep and rugged chasms are the glacier's home, and therefore the source of an inexhaustible water supply—the winter's store for summer's need. Unlike many other rivers, the banks of the Bow are not deep-cut below the plain, but are near the lands to be irrigated, and the supply at low water is more than double the demand.

In Canada all the rivers belong to the crown, and are under the immediate supervision of the government; they are measured and meted out by government officials, so that the water right is as good as the land title, and the stipulated supply is guaranteed with both.

The great tract to be irrigated by the Canadian Pacific Railway Company lies in southern Alberta between Calgary and Medicine Hat. It is one hundred and fifty miles in length and forty miles in width, lying between Red Deer River on the north and the Bow River on the south, and through its very center runs the iron way of the Transcontinental Railway.

This great irrigation block is the largest individual block on the continent, comprising over 3,000,000 of acres, and it presents the happy combination of irrig-

incline from west to east of some eleven hundred feet, and lends itself readily to the location of the great canals and secondary ditches. The main canal of the western section heads in the Bow River, about two miles east of Calgary, and is 17 miles in length; it is 60 feet in width on the bottom and 120 feet wide on the water line, and it carries 10 feet of water. It terminates in a natural reservoir 3 miles long, ½ mile wide and 40 feet deep. From this reservoir extend the secondary canals A, B, and C, which are 30 feet wide at the bottom and 60 feet at the water line, and these carry 8 feet of water, and their combined length is 150 miles. From these secondary canals the distributing ditches run over the plains, aggregating in the great western section alone a total length of some 800 miles, making a grand total for the western section of 967 miles of main water channels, exclusive of the farmer's laterals.

In most other irrigation projects on this continent the general plan has been to carry water in a secondary canal or ditch to a point near a considerable area to be irrigated, and then leave the farmers to combine in digging and maintaining ditches, at their own expense, to deliver the water to their several farms; but this company is making the signal departure of carrying the water direct to each individual farm, leaving nothing for the farmer to do but to open up the small furrow laterals on his own lands.

The construction of the canal in the western section with its hundreds of miles of secondary canals and distributing ditches has been a large and expen-

sive undertaking. The total excavation in the main canal of the western section was approximately 2,500,000 cubic yards; secondary canals A, B, and C about 5,000,000 cubic yards, and in the distributing ditches 750,000 cubic yards, making a grand total excavation for the western section of 8,250,000 cubic yards. At one point it was necessary to cut away the top of a jutting cliff 1,000 feet long, 180 feet wide and 100 feet deep.

Steam shovels and small construction locomotives were used in excavating the large canals and ditches, and in carrying out the earth, and, wherever possible, elevating graders were used, employing steam and horse power. In the construction of the greatest care and skill have been shown. The porous surface soil has been stripped off and the harder clay and excavated soils have been used for filling in depressions and building the banks. In building the banks the soil was put on in layers, wetted down, and then packed by rollers to make them strong and water-tight, so there is little danger of breakage or loss from seepage. The soil through which the canals are dug is very hard and clayey, so there is little seepage or erosion.

The intake receives the water, as has been stated, from the Bow River some two miles below Calgary, and when the water was first let on, although only two of the twenty headgates were open, that is, only one-tenth part of its possible flow, yet in the very short space of forty-six hours the water had reached the extreme end of the main canal, a distance of seventeen miles, and the difference of level at the intake and the



A Huge Cut on the Main Canal.

end of the canal was only one inch. This was a remarkable showing, and speaks well for the engineering skill displayed in locating and constructing the canal.

A large amount of heavy timber has been used in the construction. At the great intake just below Calgary, for the protection of the headgates, a double

that the water is being supplied to the farmer in this great scheme at 50 cents per acre per annum, the duty being 1 cubic foot per second, flowing continuously, for 150 acres, and in selling irrigable land an allowance of 10 per cent of the area is made for the space to be occupied by farm buildings, etc. Demonstration farms have been opened in the western section, and next year

The abundant water supply, the easy slope of the land, the rich and level country through which the great canal runs, with all the possibilities of the most diversified farming, the happy combination of grazing and irrigable lands in the same quarter section, the absolute security of the water right from the crown, and the supply of water needed during the irrigation



Team Excavations on the Main Canal.



Along the Main Canal.

row of heavy piling has been driven along the river's front for several hundred yards. Farther down the main canal a large spillway has been introduced by means of which, in case of needed repair, or for any other cause, the water can be entirely drained off into the Bow River.

At several points on the main and secondary canals the slope of country necessitated the construction of falls or "drops" which carry the water safely to the levels below, without erosion of sides or bed.

will show the wonderful possibilities of the irrigation of land under this canal in southern Alberta.

In comparison with other irrigation undertakings the project of the Canadian Pacific Company is the largest on this continent and ranks with the great irrigation schemes of the world. I have ridden on donkeys or walked on foot over the rich irrigation strip of old Egypt, but Egypt, from Cairo to the First Cataract of the majestic Nile, is small compared with the great domain contained in this irrigation block.

season guaranteed by the Dominion government—all these conditions promise a bright future for irrigation in southern Alberta.

It is filling up rapidly with farmers from the Western and Central States. Ninety-five per cent of the present settlers in this part of the province are Americans. This great irrigation block has room for half a million people and a capacity to feed two millions. The Canadian Pacific Railway has intrusted the development and completion of this great project to

Mr. J. S. Dennis, a well-known civil engineer of the Dominion, now assistant to the second vice-president of the road, and his skill and indomitable determination have had much to do with its present realization and its great future possibilities.

A steel-making company in Indiana has given the largest single order for gas engines ever placed by one company. It is for eight gas engines of 3,000 horse-power each, capable of delivering 30,000 cubic feet of free air per minute to the furnaces which produce the blast-furnace gas, which, in its turn, is also used to operate the engines.



A Steam Excavator at Work.

If the same proportion of mileage and excavation obtains in extending the irrigation system through the central and eastern sections of the block, this scheme will ultimately embrace a total of 2,900 miles of canal, and the excavation of the enormous mass of 24,750,000 cubic yards of material.

The Bow River has an abundant natural storage, not only in the deep snows and mighty glaciers of the Rockies, but also in the many mountain lakes which pour their overflow into the river. Devil's Lake alone is 12 miles long, ½ mile wide, and 40 feet deep, and its great basin is available for storage. In addition there are many other places where the storage of enormous bodies of water can be effected, but the river has in itself a capacity of 6,000 cubic feet per second during the irrigation season.

It may be of special interest to note



Headgate and Piles for Protecting the Banks of the River.

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