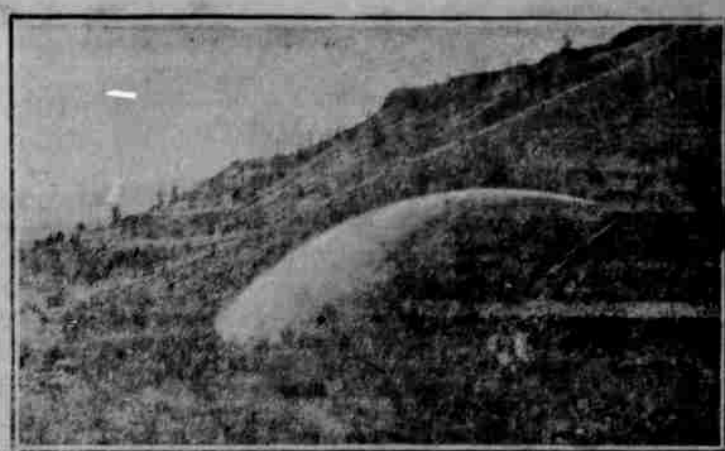




View of Reservoir, Looking East

The Ochoco Project IN TEXT AND PICTURE



View of Reservoir, Looking West

IMPORTANT PROJECT IS BEING RAPIDLY CAR- RIED FORWARD

TREMENDOUS STRIDES MADE

When Completed, There will be a
Body of Water of 54,000 Acre
Feet in Storage

Perhaps the most important step taken during the past year to insure the advancement of Prineville and safeguard it against a possible shortage of water for crops was when the District secured Twoby Brothers Company contracting firm for the building of the Ochoco Dam and Main Canal.

This dam will give the District a water storage of about 54,000 acre feet. That this is of the utmost importance to the growth and development of Prineville is recognized by all familiar with the city and its possibilities.

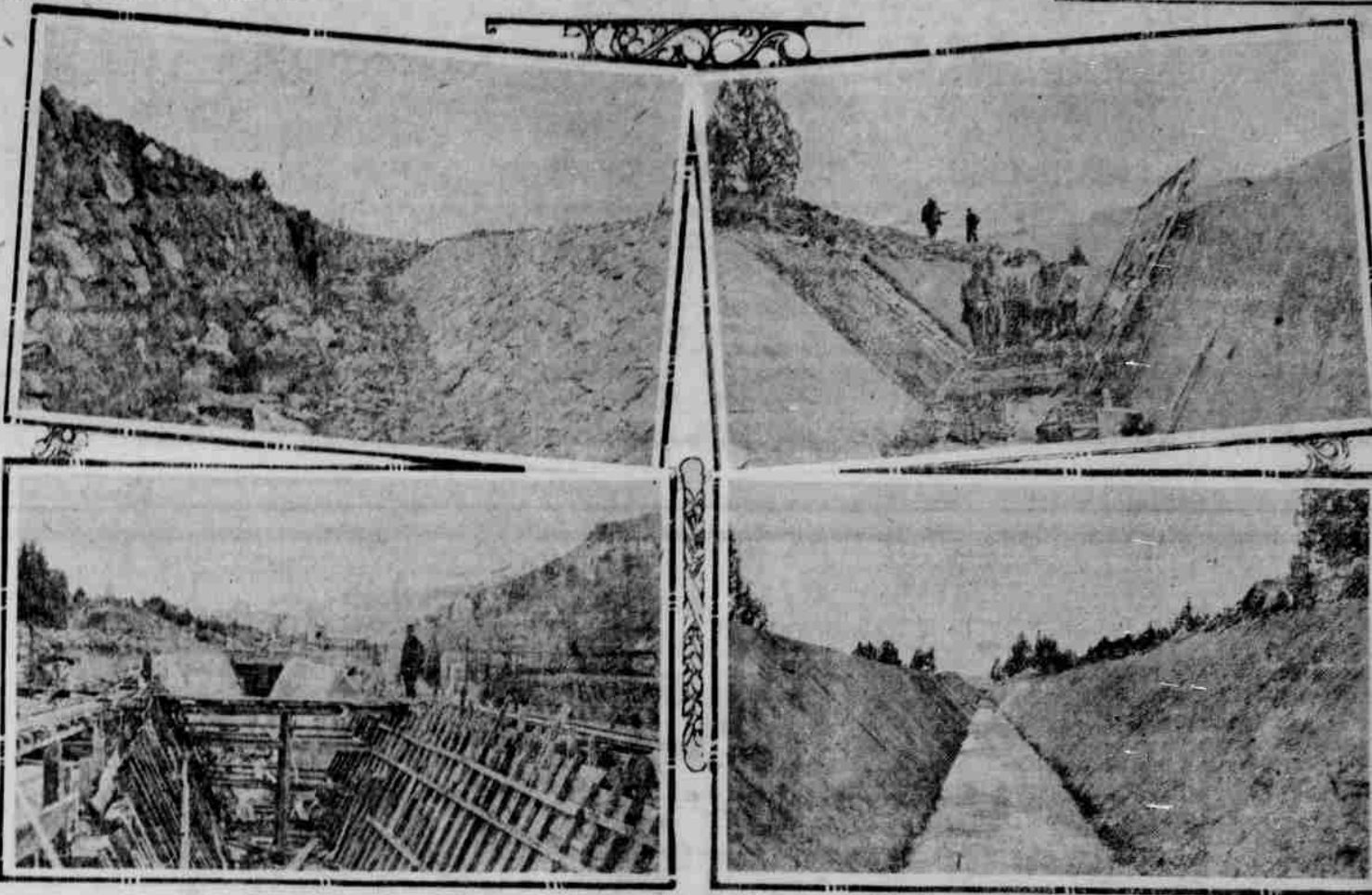
The new structure is being built by men skilled in the contracting and building business.

Twoby Brothers Co. has completed the main canal, which means the closing down of three of their camps; but one big camp remains at the dam. As an indication of the thorough and efficient manner in which the Twoby Brothers Company are handling the project by keeping men in close contact with the work, superintendents' cottages, roomy bunk houses and other structures for the accommodation of the employees have been built at the dam site. A sewer system, water system, hot and cold dressing rooms, big store, office and warehouse combined, mess hall to dormitory—the best possible accommodations for all who are furnishing their brains and muscles in hearty cooperation with the company.

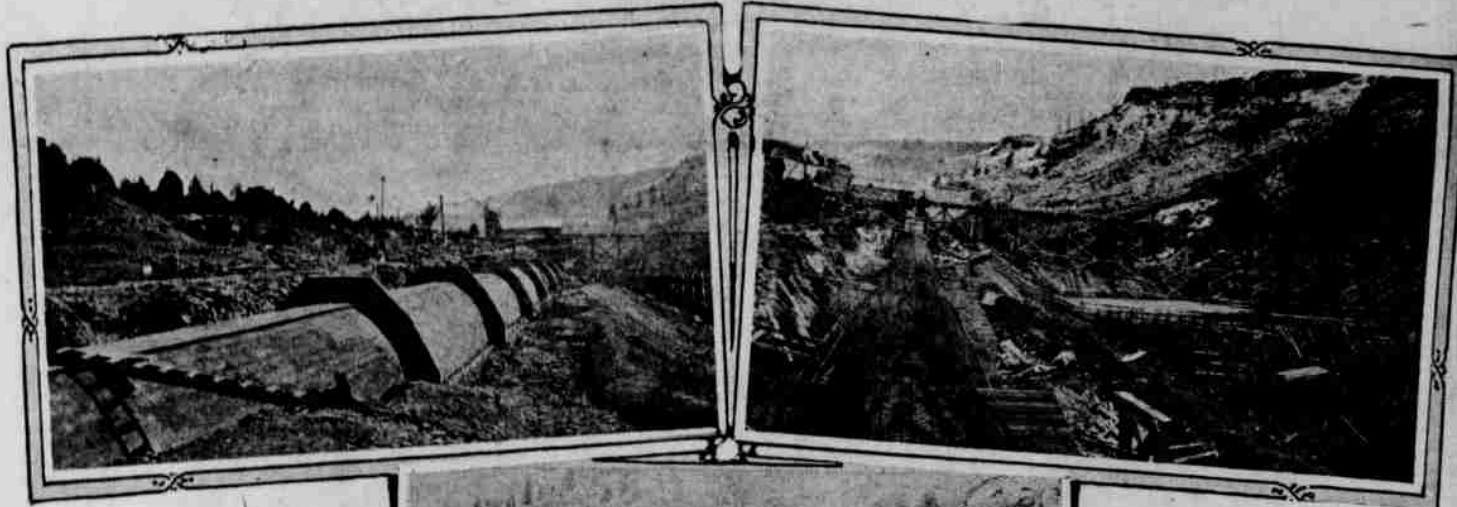
The land owners of the Ochoco Irrigation District are to be congratulated for having selected a board of directors who were so far sighted to award the contract for the construction of the main canal and the large dam to Twoby Brothers Company. This firm of contractors is one of the strongest on the Pacific Coast and they have within the year past completed a large aviation field for the government and have under way at the present time millions of dollars worth of war contracts.

Any contractor not supported by the strong financial resources of the Twoby Company would have been obliged long ago to abandon the work on account of the enormous increases in the cost of labor and construction materials occasioned by the war. The price of labor at the present time is 35 per cent. higher than at the time the contract was awarded. Steel cable, which is very difficult to get now, costs 100 per cent. more than previously. Blasting powder has risen 40 per cent., and cement 20 per cent. Feed, oats, and hay now cost 100 per cent. more than they formerly did, and freight rates have increased 25 per cent. All of these items are used almost daily in large quantities on this construction work.

Although the concrete work is now only about one-half completed, 4,000 barrels of cement have already been used. 50,000 pounds of black powder and 60,000 pounds of dynamite have been used to break up the rock at the dam and along the canal; and to explode this powder required 30,000 blasting caps and 50,000 feet of fuse.



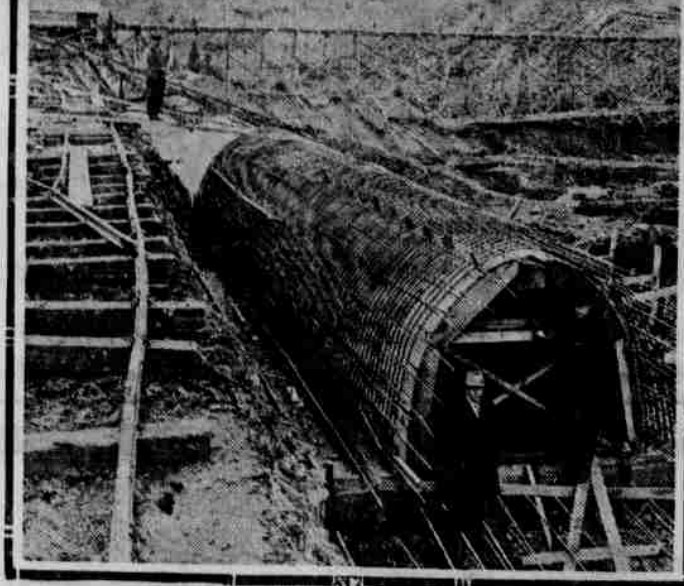
Various stages of construction of Cement Lined Main Canal Below Reservoir



Completed section

The work of excavating the main canal has been completed for some time and the large steam shovel, the heaviest piece of machinery ever used near Prineville, has been moved to the dam. Considerable of the main canal excavating has been through solid rock cuts and several long stretches of flume aggregating about 4,000 feet in length have been replaced by the large earth and rock canal, thereby making a more permanent job.

The large reinforced concrete conduit, which will carry 1,000 cubic feet of water per second through the dam is already completed, and water has been flowing through it for several months. After leaving the conduit the water flows through a concrete lined canal built on the steep rock hillside for about one and one-half miles. This canal has a rock wall on one side and has a three inch concrete lining throughout the whole mile and a half. Although there was more than five times the quantity of this rock wall than estimated, the contractors would have completed the canal and lined it with concrete within ten days of the contract time, if it had not been



Views of Conduit showing Reinforcements of Steel Used in Its Construction

necessary for the directors to have this work temporarily discontinued, in order to irrigate some of the land. It was necessary to build almost half a mile of road to get sand and gravel for the concrete up to the canal.

The big dam, which is 125 feet high and over 1,000 feet long, is the largest and most important part of the project. To build it will require over half a million yards of earth and rock and nearly 6,000 yards of concrete. To stop the water from flowing under the dam, it was intended to excavate through the gravel in the foundation into the solid clay bed underlying the dam site, and to fill this trench with clay. It was, however, decided to build the dam in two individual sections, the first to raise the water about forty feet and the second section to raise the water the full height. It was therefore necessary for the contractor to excavate two puddle trenches instead of one, and the dam now has this additional factor of safety.

The main part of the dam is being built of earth and rock sluiced down

from the mountain sides. Two large pumps driven by a 400 horse power electric motor pump 6,000,000 gallons of water a day under a great pressure loosens the material which is then carried into the dam through flumes and pipe lines. This pumping unit which consists of one 400 horse power electric motor which revolves 690 revolutions per minute and is directly connected to twin five stage pumps weighing 40 tons each and mounted on a concrete foundation of equal weight.

It was contemplated to get all the half million yards of material for the big dam from the south side of the valley. The material there, however, has proved a great disappointment to everybody connected with the project. It proved to have so much rock and so little earth, that the powerful giants were unable to loosen it. The contractor, at great expense, moved his giants and pipe lines to five different pits, but each place that he tried turned out to be a disappointment. By resorting to a great deal of expensive blast-

ing and other unusual work, enough material was secured to build the first section of the dam, which contains about 50,000 cubic yards of materials. Another body of material has been located on the opposite side of the valley and all the giants, pipe lines, etc., have been moved over to this pit. The large pumps and motor have been moved so that the work of tearing loose the material and placing it in the dam will go on uninterruptedly. Mr. W. M. Grier is in charge of the work for Twoby Brothers Company and although the materials encountered in the construction have been very discouraging, and he has had many serious and difficult construction problems to solve, he has untiringly prosecuted the work and brought it to its present stage.

Although the dam is not completed to the stage that it was anticipated to be at this time, no expense has been spared and everything has been done to expedite the work. The lack of suitable material could not be foreseen by the contractor or anyone else and if good material had been available the dam would now be over half completed.

There is no question about the material being available, however, and the contractors assure the directors that the entire project will be completed by March 1, 1919.

MARCH AVIATION FIELD

Government Record Broken By Erection of Military Camp in 60 Days

Saved Uncle Sam \$250,000.00

Commenting on the recent achievement of Twoby Brothers Company, whereby the March Aviation Field was erected inside contract time and at a saving to the Government of \$250,000.00, the Riverside, California, Enterprise, in its issue of May 31, 1918, has to say the following:

"About midway between Riverside and Perris, on the broad plains of Alessandro, one will see a small new city standing out prominently against the mountainous background.

"If the traveler is a stranger, he will be told with pride by any he should chance to question that this peaceful-looking city with its magnificent new white buildings and splendid roadways is none other than the recently completed March Aviation Field, named in honor of the brave and daring young aviator, Peyton C. March, Jr., who lost his life in practice flight on the plains of Texas. Here will be found accommodations for the training of 2,000 red blooded Americans, who will give battle to the Huns.

"This wonderful city was erected in 60 days, thereby breaking previous government construction records, as it is reported to be the only military camp completed within contract time. This remarkable record was accomplished by Twoby Brothers Company, with headquarters in Seattle, Washington; Portland, Oregon; San Francisco, and San Diego, California.

"The personnel of the firm consists of Judge John Twoby, president; John D. and Robert Twoby, vice-presidents; and James F. Twoby, secretary and treasurer. Judge Twoby has spent considerable time in the east of late on important matters relating to the organization.

"Before Uncle Sam threw his hat into the European war ring, this company was actively engaged in the development of the Pacific coast and the west, numbering among their larger and more important achievements the construction of the San Diego and Arizona railroad, Spaulding Lake dam for the Pacific Gas and Electric Co., one of the largest concrete dams in the west; Canadian Northern Railroad, a connecting link between the east and the west. They are also engaged in railroad car building in their own plant and have recently embarked in steel ship construction, having a \$17,000,000 contract with the Government for the rapid construction of steel ships.

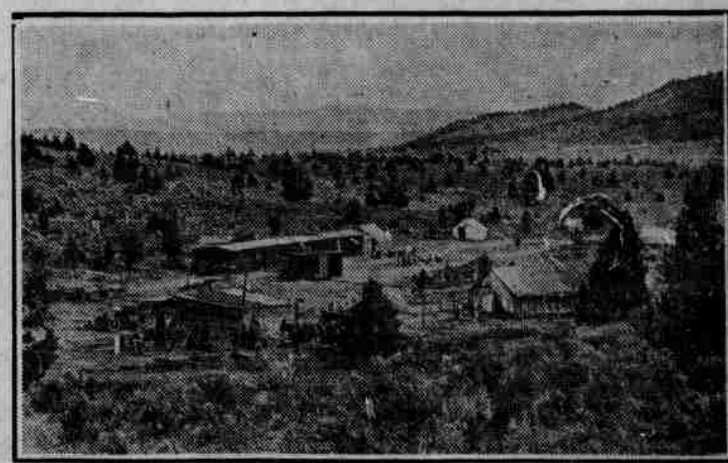
"When the government call for assistance came, we find that this powerful organization threw its entire strength and support to the cause. Laying aside practically all of its private interests, it entered wholeheartedly into the gigantic task of winning the war.

"A few of the details of the remarkable record made in the construction of the field will give one a comprehensive idea of the magnitude of the undertaking, among them being the grading and rolling

Continued on page 7



One of the pits on South Side of River



General View of Camp No. 4