

COST OF THE CANAL DOUBLED

Big Ditch, Half Done, to Entail
Total Expenditure of
\$375,201,000.

WAGES AND MATERIAL JUMP

Seven Craft in Dredge Fleet, 33,699
Men Employed — Isthmian
Commission Reports Rain
Retards Project.

(Continued From First Page.)

terially increased. Various changes have also been made in the adopted plan, increasing the quantity of work to be done. In addition, more detailed surveys and plans than were originally available have been made, and the work has progressed sufficiently to give reliable data relative to unit costs.

Figures Underestimated Work.

"Nearly 50 per cent more work is necessary to complete the canal than was contemplated by the original estimate and the unit prices, due to labor conditions, cost of materials, and gratuities given the employees, have been increased about 20 per cent. The estimate, as prepared, shows that the total cost of engineering and construction alone sums up to \$227,765,000, to which, if the purchase price and the estimated cost of sanitation and civil government be added, there results the sum of \$375,201,000 as the total cost of the canal."

It is somewhat difficult from the report to gain a comprehensive idea of the progress made on the canal during the past fiscal year. The work is divided into sections, and discussed item by item, there being no general description of the work as a whole. Something of interest, however, is found in reports on the Gatun locks and dam, the Culebra cut and the Atlantic and Pacific terminals. The report continues:

Lock Designs Complete.

During the past fiscal year the designs for the upper locks at Gatun and the locks at Pedro Miguel were finished. The locks at Pedro Miguel were finished. The locks at Gatun, separated by a wall 60 feet thick, are 110 feet in width, with 1000 feet usable length. The method of filling and emptying adopted is by longitudinal culverts in the side walls operated by sluice valves, from these culverts water passes through basins under the floors and perpendicular to the axis of the locks, from which openings upward admit water to or draw it from the lock chambers. The arrangement permits the passage of water from one lock to the other of any pair.

After study and investigation of various forms of gates, the double leaf, double chambered, straight, mitring gates were adopted as being the most economical in construction, operation and maintenance. In all plans for the canal it has been accepted as a fundamental feature of design that at each flight of locks there must always be two barriers separating the high level from the level next below. After careful study of the horizontal rolling gate as the barrier it was abandoned because of the great cost and weight, and another set of mitring gates was substituted with a chain barrier controlled by capstans in the wall. As over 95 per cent of the vessels of the world are less than 600 feet long, intermediate gates have been introduced as a feature of the finished design, dividing the locks into two parts suited to vessels of 350 and 350 feet in length respectively; these are also protected by a chain barrier.

Guide Piers.

Guide piers are to be constructed both up and down stream from the locks against which vessels will tie before entering the locks. Designs for electric towing machines are being prepared, which in all probability will be used for towing vessels into and controlling them across the narrow passage of the locks. In addition emergency dams are to be provided to cut off the flow in the event that a connection is made between the high level and the level below the flight.

Gatun Locks Under Way.

The work of excavating the locks was continued during the year by steam shovels throughout the roadway and the greater part of the lock chambers, and by one of the 20-inch suction dredges in the lower part of the lowest lock excavation. The work done in the dry amounted to 853,346 cubic yards, and that removed in the wet amounted to 479,929 cubic yards.

Gatun Dam Changed.

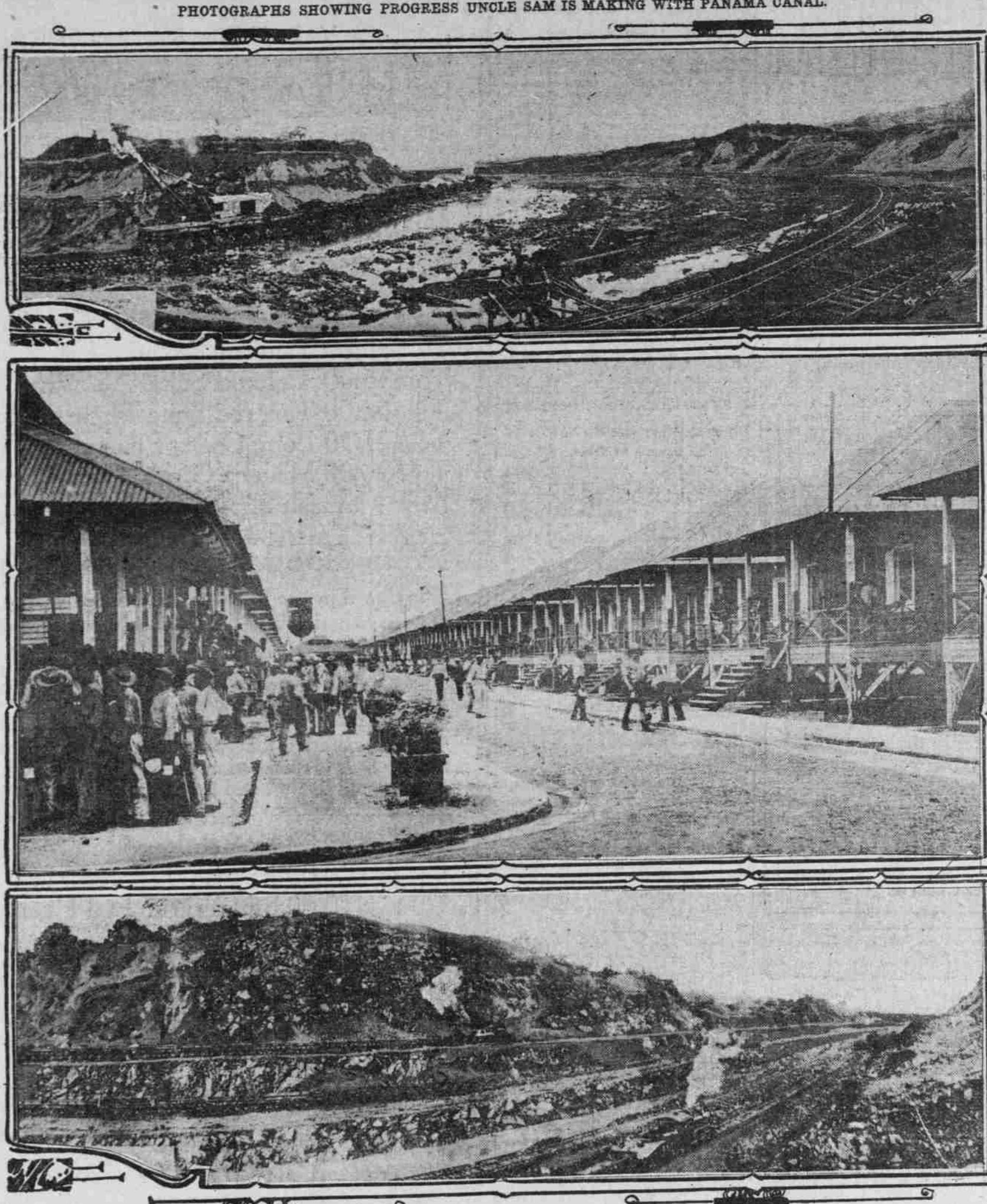
The cross-section of the dam as originally proposed was changed by making the slopes flatter, modifying in part the position of the dam, and by the construction of two rock piles across the river at the foot of the dam. The work was continued until it reached an approximate elevation of 55, reaching the Chagres River and the French Canal. Before the north pile was started a suction dredge removed deposits that had accumulated in the channel over the 1200-foot length, and also over the same distance in the French Canal. When this was done the north rock pile was started across the channel, and the water areas thus inclosed were pumped out, about 100,000 cubic yards of material being removed up to sea level permitting the accomplishment of this.

When the water level in the French Canal had been reduced to -10, on November 20, the memorable slip of a portion of the south toe occurred at the intersection of the rock pile and the east bank of the French Canal. The top of the pile was nearly at its proper elevation. The depression in the crest was about 20 feet, the length of the slip being about 200 feet. The slip moved northward about 10 feet; the track on the south side, however, at about the same elevation was not disturbed. The slip was of no more significance than those which had occurred on the railroad embankment in the vicinity of Gatun. However, it caused a feeling of uneasiness concerning the safety of the project, and the President of the United States, the Hon. W. H. Taft, then the President-elect, to the isthmus with the following engineers to examine into and report upon the situation: Frederic P. Stearns, Arthur P. Davis, Henry A. Allen, James D. Schuyler, William Randolph, John R. Freeman and Allen Hazen. To them was submitted a plan for a dam with uniform slopes to the top, which was placed at US place level. They reported to the President on the Gatun situation as follows:

"We are satisfied from the records of the experiments that have been made and from our own personal examination of the material, that there will be no danger of any objectionable seepage through the material under the base of the dam; nor are they so soft as to be liable to be pushed aside by the weight of the proposed dam so as to cause dangerous settlement. "We are also satisfied that the materials available and which it is proposed to use are suitable and can be readily placed to form a tight, secure and permanent dam. "The type of dam now under construction is one which meets with our unanimous approval."

The dam as proposed is more than a third of a mile in horizontal thickness at its base, including the rock-fill portions. The design upon which the work is now being prosecuted abundantly fulfills the required degree of stability, and goes far beyond the limits of what would be regarded as sufficient and safe in any less important structure.

As a matter of convenience and economy during construction, materials have been piled up on slopes much steeper than those contemplated in the finished work. Generally the materials so placed have remained in position; but in some cases slips have occurred. The occurrence of these slips is of no serious consequence, either in the practical execution of the work or in the



TWO VIEWS INDICATING PROGRESS OF WORK ON GREAT DITCH AND ONE SHOWING LABORERS' QUARTERS.

ultimate stability of the structures. We can readily understand how incorrect deductions may have been drawn from the fact that the work is now being done in the dry, and that the character of the materials, and the angle of dip of the proposed structures in their final form.

Atlantic Terminals Active.

The dredging fleet, consisting of one sea-going suction dredge, two 5-yard dipper dredges and three French ladder dredges, worked on the section between Gatun and Pedro Miguel, removing from deep water in the Caribbean, removing from the channel a total of 6,039,934 cubic yards, of which 47,000 cubic yards were rock. At the close of the year nearly 41 feet at mean tide) were completed.

The work of construction of the central division embraces all the excavation between the Gatun Dam and Pedro Miguel. The Culebra section of the division measures 18,442 feet, the resulting divide measures 2700 feet along the cut, involving an area of about 27 acres. The total amount already excavated for the year 670,017 cubic yards, and it is estimated that 700,000 cubic yards of material are still in motion, all of which will be removed as it reaches the edge of the cut.

In addition to the Culebra slide the next largest is at the village of New Culebra. It is estimated that 125,000 cubic yards are in motion and will have to be removed. Slides have also developed at old Culebra; on the east bank of the canal opposite White House Yard, and at Paraiso, together with three or four smaller ones resulting from the widening of the canal. During the year 884,538 cubic yards were removed from all the slides, and it is estimated that 1,000,000 cubic yards are still in motion.

Slides Are Troublesome.

The slides continue to be a source of annoyance. The Cucaracha slide has extended northward until it joins one just south of the hill. The resulting slide measures 2700 feet along the cut, involving an area of about 27 acres. The total amount already excavated for the year 670,017 cubic yards, and it is estimated that 700,000 cubic yards of material are still in motion, all of which will be removed as it reaches the edge of the cut.

The work of the Pacific Division consists of the construction of the locks and dam at Pedro Miguel, the establishment and operation of the Ancon quarry. The work done results in the completion of the canal, and the excavation for the Miraflores lock site was continued by steam shovels in the upper locks, and by a suction dredge which had cut its way through to the lower locks. The total amount removed was 1,147,327 cubic yards, and about half the total estimated quantity. Of this amount, 307,000 cubic yards were placed in the toes of the dam, and 200,000 cubic yards were used in making fills necessary for construction purposes.

To secure the necessary width and depth of channel between Pedro Miguel and Miraflores, 1,270,000 cubic yards of material, for which 65,000 cubic yards are of rock, must be excavated. The material still to be removed amounts to 13,900,000 cubic yards of loam, and 1,725,000 cubic yards of rock. Because of the tidal oscillations and the difficulties that always arise in removing rock under water, it has been decided to remove the rock between the locks, and for about two miles below Miraflores locks, in the dry. To accomplish this, it is proposed

to place a temporary dam about two miles below Miraflores locks to remove the overlying soil by an outfit of sluicing and dredging pumps, and to excavate the rock below by steam shovels in the dry. This will leave below the temporary dam about 3,600,000 cubic yards of loam, and 123,000 cubic yards of rock, which will be removed by dredging and by subaqueous blasting and rock breaking.

The dredging fleet during the year consisted of one sea-going suction dredge, one 20-inch suction dredge and four French ladder dredges, one of the latter being in commission only since May 10. During the year 8,478,031 cubic yards of material were removed from the channel proper, which is computed for about five miles from deep water in the Pacific.

A steady increase of the unskilled labor force continued until it reached its maximum on April 28, when the reports show a total of 33,699 men actually working for the commission and the Panama Railroad. The number of Europeans and West Indians brought to the Isthmus during the year shows a decrease over the preceding year; they numbered 741 Europeans and 1802 West Indians. The European laborers, however, assumed some bearing on the Bellingham-Finchot controversy, destined to be aired in Congress at the pending session. His constituents are awaiting with interest the methods he will pursue in striking at the Forest Service and also the attitude that Senator W. B. Heyburn, who recently returned from a trip abroad, will take.

The total value of material received during the year amounted to \$9,696,000, and stocks on hand June 30 totaled \$3,000,000.

GUESTS RAIDED IN BEDS

PENDELTON'S MORAL CRUSADE TO BRING DAMAGE SUIT.

Midnight Demand for Marriage Certificates Stirrs Married Folk in Pendleton Hotel.

PENDELTON, Or., Nov. 21.—(Special.)—Mayor Murphy's moral crusade was inaugurated shortly after 2 o'clock this morning, when seven rooming-houses and one of the leading hotels of the city were raided. All guests were roused from their slumbers and, where rooms were occupied jointly by men and women not known to the officers, the occupants were compelled to produce marriage certificates. Few arrests were made, but a veritable host of warrants were issued. It is declared that damage suits will be instituted tomorrow against the officers and the Mayor.

The raid was made at the instance of Mayor Murphy, and, according to Chief of Police Gurdane, every place visited was in accordance with instructions from Murphy. When called upon today, however, by the manager of the hotel and some of the enraged guests, he denied that any complaints had ever been made concerning the hotel visited. He had nothing on which to base suspicion against the place.

Chief of Police Gurdane and Night Officer Kearney were accompanied on the raid by Councilmen A. L. Knight, William McCormack and V. Strobbe, who had been named by the Mayor as a special committee for this purpose. The raid is supposed to be the result of a demand on the part of many citizens to have the city freed of undesirable, but innocent guests who were pulled from their beds at unseemly hours declared the move is a political one, the city election being only three weeks away.

BORAH SEES PERIL

Forestry Officials' Course Tends to Bureaucracy.

FARMERS ARE DRIVEN OUT

Settlers Entitled to More Consideration—Incident of Sheepman Fined Without Trial Told as Illustration.

BOISE, Idaho, Nov. 20.—Taking a defiant attitude in opposition to the bureaucracy which he asserts this country is rapidly going into, following the theories assumed by the Forest Service, and pledging himself to use his influence in support of a measure that will regulate that bureau so that there will be less so-called conservation of the forests and more real benefit to the settler, United States Senator William E. Borah is now en route to Washington to prepare for the coming session of Congress.

This determined stand of Idaho's junior Senator to force the Forestry Department to more beneficial regulation may have some bearing on the Bellingham-Finchot controversy, destined to be aired in Congress at the pending session. His constituents are awaiting with interest the methods he will pursue in striking at the Forest Service and also the attitude that Senator W. B. Heyburn, who recently returned from a trip abroad, will take.

Bureaucracy Is Threatened.

"This country is going into a condition of bureaucracy faster than many persons think," declared Senator Borah before leaving for Washington. "I do not believe that any bureau has the right to make law or that any person shall have his liberty or property confiscated without due process of law. Forest reserve laws should be duly enacted by Congress, that the settler may know his rights under the law. There is a golden mean between those who uphold the bureau in its every action and those who can see no good in the policy, and I hope to see that middle ground struck."

Senator Borah made the following pledges: That he will make a determined stand against the present forest bureau policy with reference to lawmaking and conservation detrimental to the settler. That he will endeavor to have a policy adopted by which every acre of ground within the domain of this country can be developed and thus prevent the migration of Americans into Canada.

That he will support a river and harbor bill for the development of the Northwest.

No Trial Precedes Fine.

Senator Borah retold an incident which came under his observation in Southern Idaho, where a man had been fined by

the forest bureau because his sheep had strayed on the forest reserve. This man was fined without a trial, without ability to get into a court, on the ipse dixit of a bureau official.

"I do not believe in that form of government," said Borah, "which takes from the man the right to trial or which takes from him his liberty or his property without the due process of law." Senator Borah maintained that Congress should enact the rules for the government of reserves.

"The Nation has the appalling situation before it," said the Senator, "of seeing 60,000 farmers crossing the boundaries to secure farm lands in the Canadian Northwest, while upon the other side of our country there are being congested into our cities more than an equal number of undesirable foreigners. The Government should do everything in its power to develop every acre of ground within its own domain."

"I was told recently by a man who knows that the richest undeveloped country in the world is in Northern Idaho and parts of Oregon. "I look for a river and harbor appropriation bill and I know that the West will secure some advantages under it or it will be a long time in passing."

OLD STAH IS STILL SPRY

Indian, Aged 90, Testifies in Land Suit at Goldendale.

LYLE, Wash., Nov. 21.—(Special.)—Old Skookum, the so-called apple king of the Klickitat River country, has an uncle, Old Stah, 90 years old, who in spite of his furrowed face and toothless old age, is as erect and agile as any of the young bucks. Old Stah has recently appeared as a witness before the Land Commissioner, Nathan L. Ward, at Goldendale, in the case in which the Government is trying to nullify the patent held by Mrs. Lyle.

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Virginia Bratton-Morgan to land at the mouth of the Little Klickitat River, where Old Stah and his tribe once held their teepees.

This land was taken from the Indians by the Government and turned into school land and immediately leased. Mrs. Bratton-Morgan filed on a section and there is much interest as to whether she will be allowed to keep the land.

Railway Builds Into Tillamook.

TILLAMOOK, Or., Nov. 21.—The City Council has granted a franchise to the Pacific Railway & Navigation Company to lay a track along Front street. The railway company will run a spur from the depot along the waterfront of this city.

Churches Unite for Thanksgiving.

ALBANY, Or., Nov. 21.—(Special.)—All of the churches of Albany will unite in Thanksgiving services next Sunday morning in the United Presbyterian Church. Rev. J. C. Elliott, pastor of the Grace Presbyterian Church, will preach the Thanksgiving sermon.

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