

OUR BIG JOB AT PANAMA

Graphic Pictures of the Work Going on in the Culebra Cut.

(Special Correspondence of the Desert News by Frank G. Carpenter.)

In the Culebra Cut, Isthmus of Panama—I have come to Panama to tell you how Uncle Sam is digging his big ditch from ocean to ocean. I have traveled over the line of the canal from the Atlantic to the Pacific, have talked with the engineers of the various sections, and, in company with Chief Engineer Wallace and Governor Davis, have walked over the greater part of the Culebra cut.

I sit in the Culebra cut as I write, with thousands of men at work about me, with steam drills boring holes into the rocks for blasting and with the new steam shovels puffing away as they load the cars, each doing the work of hundreds of men.

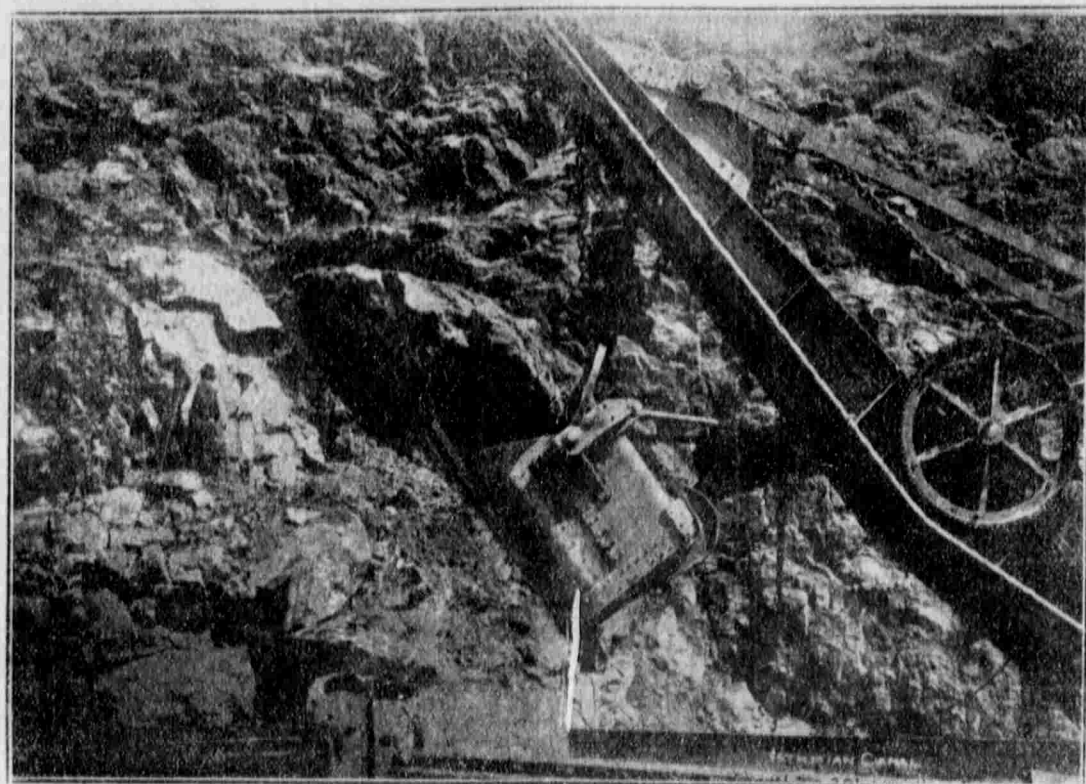
I am in the midst of the mountains. Rugged, rough and covered with a dense growth of vegetation, they rise above the great rocky gorge in which the excavation is now going on, with the water level in the bottom. Below me the water lies in the bottom of the cut, and looking up and down the line of the cut, and seeing the work of the French engineers. They labored 30 years and spent here and in Paris \$250,000,000 in gold; but they worked in the dark, and with only one-tenth of this excavation. The French were fine engineers on paper, but they never ascertained the cost estimates of men, machinery and materials which are absolutely essential to any rational deduction as to

UNCLE SAM'S BIG DITCH.

Indeed, the work planned here is so vast that I can only describe it by simplifying the figures by homely comparisons. In the first place, let us take a bird's-eye view of the canal. It is to cross the isthmus through about the middle of the Panama republic, a country which is as long as from Washington City to Boston, via New York, and which ranges in width from 30 to 180 miles. The canal is to go through one of its narrowest parts, but it winds its way this way and that, and the distance from ocean to ocean will be about 45 miles, and with the dredging necessary at the entrances in the Atlantic and Pacific, just about 50 miles. Looking at the map the job seems a chore in comparison with the Suez canal, which is 100 miles long; with Kiel, which is 70 miles, or with the Grand canal of China, which runs north and south for more than 1,000 miles, crossing two mighty rivers, through a territory populated by millions.

This view of the canal changes when one stands on the ground. The job increases in size and a trip over the route shows even the amateur that it is the most stupendous engineering construction ever undertaken by man. At the two ends of the route the canal

What It Means—Two Big Ditches Around the World and a Tunnel Through the Center—A Wagon Train to the Moon and Back—The Question of Time—Eight and One-Half Years at Three Minutes to the Train Load—What Is Being Done at Panama—The Labor Question and the New Machinery—The Steam Shovels—An Army of 50,000 Man—Power in Steel and Steam.



THE NEW STEAM SHOVEL LIFTING A TEN TON ROCK IN CULEBRA CUT.

5,000 feet make a mile and dividing the 300,000,000 feet by that we have 60,000 miles as the length of our ditch. In other words, if the earth were solid the Culebra cut excavation which Uncle Sam has yet to make three feet deep, long enough to go two times around this 25,000-mile globe with 10,000 miles of ditch to spare. The left-over would equal a tunnel three feet square through the center of the earth and one-fourth the way back. A grizzly bear or a 300-pound hog could crawl through the gap.

Take another comparison. It is only 240,000 miles from the earth to the moon. That ditch, if the space between were solid ground, could be dug one-fourth of the way there with the same labor; and as the moon is only 2,400 miles around, such a ditch could grade that great body twenty-five times and leave plenty over for side tracks.

WHAT HANDLING THE DIRT MEANS.

But there is another big element in the Culebra problem which makes it enormously greater than the construction of a ditch of that kind. In our ditch the rock and earth could be thrown on the banks. Here it must not only be dug and blasted out, but it must be carried some distance. The distance of 10 or 12 miles away. A thousand elevators could not lift it over the hills on each side of the cut. It could not be stored on the slopes of the mountains. All the valleys about here could be filled up level with the dumping of a hundredth part of it. It must be carried on cars far off to other valleys or dumped into the Pacific ocean, which is about 12 miles away. The enormous amount of hauling. Indeed, this whole mass would have to be carried about 10 miles from where it now lies.

Let us take a homely glance at that item. A cubic yard is roughly estimated to weigh a ton. I am something of a farmer, and in the Virginia hills where I live a ton is a good load for two horses. Suppose this 100,000,000 cubic yards, each yard a ton, loaded on two-horse wagons and give each wagon and team a space 30 feet long on the roadway, making a chain of 100,000,000 wagons carrying this mass of earth. Let the chain start at Panama and move onward. Where would the first wagon be when the last wagon is loaded? It would be ten times as far away as the length of our big ditch. The train would have to be 600,000 miles long—long enough to reach to the moon and back again with enough left over to go almost five times around the world. The whole line of wagons would reach exactly 24 times around the globe.

THE QUESTION OF TIME.

All this excavation work at Culebra has to go on in the short space of eight miles. This limits the number of men and machines which can be employed at one time and it forms a big element in estimating the length of the job. Figured out by the former commission, it would require 20 years to complete it; but with the best of modern machinery and American business methods two or three shifts a day will be had and by means of electricity the work will go on night and day all the year through. At this early period the chief engineer does not pretend to give an opinion as to the cost of the canal nor as to the time it will take to finish it. He does not say and has not said whether he thought a lock canal would be preferable to a sea-level canal. He only says that he is here as the servant of the canal commission, of the president and the American people, ready to do to the best of his ability what they shall decide they want done. He is now gathering the information by practical work which will enable him to figure out what each kind of canal will cost and how long it will take to build it.

To show you how such things are calculated let me give you an estimate of the handling of this 100,000,000 cubic

HOW DRUNKENNESS CAN BE CURED.

If you are a slave to drink, what would you give to overcome the habit? What would you give to have a clear brain, strong nerves and perfect manhood? What would you give to save the money that you squander over the bar? The "Temple Appeal," the official organ of the temple trustees of the W. C. T. U., tells how this terrible habit, or disease, as it truly is, can be cured at little cost and with no publicity or loss of time. In a recent issue it says: "Orin is a new cure for drunkenness. A Washington chemist is the discoverer. Remarkable changes have been wrought for suffering drinking men by its use." Orin No. 1 can be given secretly, without the patient's knowledge. No. 2 is in pill form, for voluntary treatment. Conquer the drink habit by this simple and scientific remedy, price \$1 per box. It is absolutely harmless. Orin is sold and recommended in this city by Smith's Drug Store, Salt Lake City, Utah.

at work actually excavating enormous amounts of material. The product, however, is nothing, in comparison with the value of the knowledge gained for estimating the work of the future. Nothing of this kind was ever done by the French.

THE STEAM SHOVEL.

Just now the advance guard of the great army of American machinery is at work in the cut. I wish I could show you these big steam shovels which are working away under my eye. The word shovel gives no idea of them. Each is a gigantic machine worked by a steam engine with a steel dipper as big around as a hoghead and great steel teeth at its end half as long as your arm. This dipper is raised and lowered by the touch of a button. It grinds its way into the rock and gouges out five two-horse wagon loads of stuff at a bite and lifts it up and drops it down on the car. Two bites are a load for a car and, indeed, sometimes one bite means almost that much. I saw one shovel pick up a rock weighing 10 tons and lift it to the car trucks as though it were feathers.

Each of these shovels working steadily at 10 hours a day can handle 25,000 cubic yards in a month, which, taking our ditch illustration, means an excavation three feet wide, three feet deep and 15 miles long. If it works day and night it can gouge out a ditch 30 miles long in one month. This means that one shovel working night and day will do more than a mile of ditch in that time. In a year it would make a ditch

from Washington city to Albany. Something less than a score of these machines have been ordered, and four are already at work. It is the intention of the chief engineer, when the excavation is in full blast, to have 100 such shovels plugging away and thousands of cars keeping them busy day in and night out.

As to the question of labor, the French at one time had several thousand men at work, but they never had a force equal to these machines. Each shovel can do the work of 500 men, and when we have 100 of them stationed here we shall have 50,000 human beings in steel, men who will not get yellow fever, and who will not lay off for malaria, who will never grow tired and never strike. We may have trouble with the 10,000 or 15,000 human beings who will be hewers of wood and drawers of water, but this great machine force of 50,000 men is what under good business direction will give Uncle Sam his canal at a lower cost and in a shorter time than the ordinary mind can conceive.

FRANK G. CARPENTER.

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A FAMOUS FUGITIVE.



JOHN F. GAYNOR.

Probably no fugitive from the United States has had more written about him or been more in the public eye than J. F. Gaynor, the man wanted with his partner, Greene, in connection with the Savannah river frauds. At last they have been practically defeated in their fight against extradition. At the hearing of their case on March 14 it is probable they will be turned over to the United States.

GOVERNOR DAVIS AND CHIEF ENGINEER WALLACE.
(Photo Made for the Desert News by Frank G. Carpenter.)

the time it will take to build the canal or the money needed for the purpose.

WHAT IS BEING DONE AT PANAMA.

This is what the canal commissioners and the chief engineer are doing today. They are making the tests which will form the basis of all estimates and contracts for the work of the future. There are now gangs of men all along the line of the canal under the charge of skilled engineers looking into every cost element of the canal construction. Some parties are at the headwaters of the Chagres and others at various places along its course making borings for tunnels and dams. Others are preparing the way for the harbor excavation at the Atlantic and Pacific ends of the canal and others are testing every foot of dredging to be made through the lowlands and on the rises to the Culebra cut.

Here at Culebra there is a small army at work, a part of it using the old French machinery and others working the great steam shovels, testing the different sections of the pass and ascertaining to a cent and a minute just what it will cost in time and money to get each kind of rock and earth out. This work is experimental, but at the same time practical. Every day takes out and carries away a mass of material which will not have to be handled again, and this while the work is being organized and tested for the great undertaking of the future.

In addition to this the sanitation projects are going rapidly on. The vegetation has been cut away from the score of more towns which lie on both sides of the Panama railroad and drains made off into the bushes. The streets of Panama City are dug up for the new sewers and waterworks, and a great reservoir for a supply of fresh water has been made in the mountains.

The architects and carpenters are everywhere preparing quarters for the men. Hundreds of the old French buildings are being remodeled, and the heard from one end of the isthmus to the other. The old French materials have been chopped out of the bushes and machine shops have been erected at Panama, Colon, Bas Matichin, Empire and at other places along the route. Indeed, the whole canal zone

runs through river valleys, the Chagres on the Atlantic, and the Rio Grande on the Pacific. Here the ground is low and swampy and the excavation will not be more difficult than that of Suez. A little farther inland the land begins to rise, but there is plenty of room to pile the excavated materials on the banks, and the work can be handled much like that of the Chicago drainage canal. Farther still you come to the mountains, and you are in the Culebra pass, where lies the great problem of the work, which forms the chief subject of my letter today.

THE CULEBRA CUT.

The Culebra pass is in fact, one of the lowest passes of the Andes, those mighty mountains which in South America rise more than four miles above the sea, and which drop down as they cross the isthmus on their way north to join hands with our Rockies. In this country these mountains are on the average only about one-third of their highest peaks are just 300 feet above the sea.

This height the French have cut down 150 feet, leaving us in round numbers 150 feet more to cut before we reach sea level and about 200 feet before we get to the bottom of Uncle Sam's ditch, which will have to be dug 40 feet below sea level to accommodate the big ships of the day. In this statement I assume that we will have a sea level canal. That is the general opinion here at Panama, although no one is willing to make that statement for publication. This cutting at Culebra will be on the average eight or 10 miles long for the upper levels, but it lengthens as it goes down, and it will be 25 miles long when it approaches the level of the sea. It is composed of rock and earth, which will have to be gouged out and carried away to let the oceans flow through. In other letters I shall describe the problems of the Chagres, the construction of the harbors and the other engineering works now planned. They are all, however, subordinate to the big part of the job, which is the digging out and carrying away of this great mass in the center of which I sit.

A DITCH TWICE AROUND THE WORLD.

I wish I could make you see it as it rises about me, the rock and earth extending in strata of various kinds up the sides of the mountains, with car tracks running along the levels, and the machinery and men working away. Here the rock is hard, there it looks like coal, and farther on it seems as soft as clay. Some of the upper levels are clay, and now and then a landslide occurs, covering both men and machinery. An enormous amount has been done, and the chief engineer tells me there are yet more than 100,000,000 cubic yards to be gotten out before the canal prism can be made. This 100,000,000 cubic yards is from the Culebra cut alone.

One hundred million cubic yards! The figures convey nothing to minds below those of the chief engineer or an Isaac Newton, and I doubt if even they could tell you what they mean. Let us figure the matter out for ourselves. A cubic yard of earth is a block of earth a yard wide, a yard long and a yard thick. Take 100,000,000 such blocks, and suppose them to be the sections of a ditch yard wide, a yard deep and 100,000,000 yards long, and you begin to see what the Culebra cut means.

But stop. One hundred million yards is 300,000 feet. That's the length of our ditch. Now in round numbers

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