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**The Americans In Panama**

**Story of the Panama Canal From Start to Finish.**

By Wm. R. Scott.

(Continued from last week.)



First Range Light at Pacific Entrance to the Canal.

Almost at the windup of operations the canal diggers made the highest records for excavation. On April 11, 1912, forty-four steam shovels took out 68,505 yards in the cut, which is the record for one day in that division. Steam shovel No. 257 working at Gatun took out 5,554 yards in one day, the highest record in the canal zone for one shovel, the date being May 2, 1912, and in August, 1912, the same shovel made a record by removing 80,844 yards in twenty-six working days.

That part of the central division which is little mentioned extends from the Gatun locks to the entrance of the Culebra cut, about twenty-three miles. Only about 12,400,000 yards had to be excavated to complete this channel, as it follows the Chagres river valley from about sea level to Bohio; then the level rises until it reaches forty-eight feet above sea level at the cut. From Gatun to Obispo the Chagres crossed the line of the canal twenty-three times. In the same distance the Chagres river has twenty-six tributaries, the more important ones being the Gatun and Trinidad rivers. All contribute to the great Gatun lake.

The slides, which have been accurately and inaccurately exploited in the press, represented the steep sides of the Culebra cut breaking off and falling down into the excavated part. Even where the cut has been sunk through solid rock these slides occurred, as the rock formations of the isthmus are brittle and dissolve to dust after exposure to the atmosphere. An attempt was made to prevent slides by plastering the sides of the cut with concrete, but the experiments were futile. There were between fifteen and twenty important slides on both sides of the nine mile cut, the largest being on the west side of the canal near the town of Culebra and embracing sixty-three acres. Around the town of Culebra and Empire were many smaller slides that gave much trouble to the engineers. Steam shovels, locomotives and flat cars have been caught in these slides, but, singularly, few lives have been lost.

Sometimes the pressure on the sides of the canal operated to make the earth bulge up in the bottom of the cut. Division Engineer Galliard devised the plan of terracing the sides of the cut to relieve this pressure, with the result that much extraneous material has been prevented from sliding into the cut. Engineers who formerly stood stanchly for the sea level type of canal after seeing the slides of the present eighty-five foot level lock type were forced to admit that the attempt to sink a cut through the isthmus for a sea level channel would be attended by such prodigious earth movements, necessitating such an inestimable additional excavation, as to make it well nigh impossible. For a sea level canal the Culebra cut would have to go eighty-five feet deeper than in the present plan, which would require both a wider bottom and indefinitely wider surface opening, and then the slides would be immeasurably greater than at present. The best year's work in the Culebra cut was 10,586,801 yards. Slides first and last have added more than that amount to the total estimate of excavation for the division. Yet the increase in efficiency of the organization has enabled the workers to handle the extra amount within the time and cost estimated for taking out the original yardage.

Three methods of excavation have been employed in digging the seven miles of sea level channel on the Atlantic side and the eight miles of similar channel on the Pacific side. Steam shovels dug down on the Atlantic side to forty feet below sea level with great slices to hold out the water, and dredges have done the remainder of the excavating. On the Pacific side, in addition to dredges and shovels, the hydraulic method has been used. This method consists of playing a powerful stream of water on the earth and driv-

ing the water with the soil in a fluid state to a selected dump which has been boarded, the water being drained off when the mud has deposited. The Atlantic entrance required an excavation of 47,523,000 cubic yards and the Pacific entrance 58,287,000 yards.

It is planned to take the great dredge Corozal through the channel and locks up into the Culebra cut for the work of handling slides and silt after the water is turned into the cut.

Terminal works at Balboa requiring more than 8,000,000 yards excavation and finishing details of the canal channel proper will bring the total excavation by March, 1914, when the canal is expected to be in regular commercial use, to 221,000,000 cubic yards.

In the late spring of 1912 the press in the United States exploited the discovery of volcanic formations in the bottom of the Culebra cut. The engineers have not been alarmed by these vaporous emissions, which were caused, according to the commission geologist, by the warm atmospheric effect upon pyrite material.

**CHAPTER XIII.**

**Labor.**

**S**AN FRANCISCO'S exposition in 1915, celebrating the formal opening of the Panama canal, will be the most truly international exposition ever held in this country or any other.

Not only is the object of the exposition international in interest, but there is not a nation under the sun, possibly, which has not contributed some of its citizens to the construction force of the canal. In the census of the canal zone taken in February, 1912, forty nationalities are listed.

At the beginning of the American occupation, in 1904, there were 746 men employed on the canal. According to the quartermaster's department, the highest force of record since then was in April, 1913, when the payrolls showed 44,661 employees.

The percentage of Americans in the total working force usually has been one-sixth or one-seventh. Their work is of a supervisory character, or skilled labor, such as mechanics, carpenters, plumbers, masons, electricians, etc. They also are the steam shovel, locomotive and marine engineers, railroad conductors, time inspectors, firemen, policemen, all branches of civil administration, office forces, sanitary and hospital officers, foremen, civil engineers, and the like.

Laborers did not come to the canal zone in sufficient numbers during the early years, necessitating recruiting offices in Europe, the West Indies and the United States. A total of 43,000 men were imported under contract with the commission from 1904 to 1910.

Spain furnished the largest number of European laborers to the canal until the government of that country in 1908 forbid further emigration to Panama. Out of a total of 11,707 European laborers imported to 1910, 8,222 were Spaniards, and the others came principally from Italy, France and Armenia.

The colored labor predominates in the canal zone and was obtained in the islands of the West Indies. Barbados furnished the largest number, 19,448. The largest immigration for one year was in 1907, when 14,942 laborers were imported.

The color line has been drawn in the canal zone by dividing the employees into "gold" and "silver" men. In the first category are the Americans and in the second the common and unskilled laborers. Wages are paid in silver to the laborers, and salaries to the Americans are paid in gold. This distinction is not a hard and fast one, and the idea was adopted as the best means for the government to draw the color line. Second class coaches are provided on the trains; special windows in the postoffices, special clerks in the commissary and separate eating places for the silver employees.

Many labor saving devices have been born of necessity in the canal zone. The honor for inventing the greatest of these belongs to W. G. Herd, formerly general manager of the Panama railroad and the man who most largely was responsible for bringing that archaic system from chaos to order under Chief Engineer Stevens. He originated a track shifter which does the work of 500 men in one day and requires only nine men to operate it.

Strikes have never been successful in the canal zone. In 1904 President Roosevelt gave the commission the power to expel anybody from the canal zone who, in his discretion, was not necessary to the work of building the canal or was otherwise objectionable for any reason. No such power resides in any American state executive, but the supreme court held that the canal zone was not under the constitution and was subject to the regulation of a military reservation.

The canal employees are the most hampered set of workers in the world—an eight hour day with a two hour intermission at noon, first class board

energy than in the United States, free quarters, free medical service on full pay, nine holidays on pay, reduced railroad rates, wages and salaries from 30 to 80 per cent higher than in the United States, an annual vacation of forty-two days on full pay for gold employees and the necessities of life for sale at lower prices in the government commissary than in the United States.

No one realizes how generous the government has been to its employees at Panama more than the employee who leaves the service to return to work in the United States. Over and over again such employees have returned to the canal zone to take work at wages or salaries less than they were receiving when they quit. One foreman drawing \$250 a month in Panama decided he could do as well at home. In a year he returned to the canal zone and gladly took a position at 65 cents an hour, or about \$132 a month. The cost of living and standard of pay in the United States made him repeat his action.

Any employee on a monthly salary basis may take eighty-one days off at full pay in every year. He has a vacation of forty-two days on pay, a sick leave of thirty days on pay and nine holidays on pay, a total of eighty-one days that the government voluntarily deprives itself of the employee's services. The sick leave, too, is pretty generally used up by the employees, who have little trouble in persuading a district physician they need a rest at Tuboga sanitarium or Ancon hospital. It is apparent that the government has invested some of its millions in a way no private contractor could follow, except into bankruptcy. If an employee does not take his vacation one year he can accumulate it for the next year and so get eighty-four days at full pay, and his trip to the United States will cost him only \$20 or \$30 a one way passage.

Pay days until Oct. 1, 1907, were semi-monthly. Since then monthly pay days have been the custom. The disbursement office at Empire is a great bank, handling nearly \$3,000,000 a month. Payments for wages have increased from \$600,000 monthly in 1905 to nearly \$2,000,000 a month as a maximum in 1910-11-12.

Silver employees or common laborers earn 5, 7, 10, 13, 16, 20 and 25 cents an hour, with a few exceptions at 32 and 44 cents an hour, and a maximum monthly silver rate of \$75.

Gold employees, which includes all the Americans, are paid from a minimum of \$75 monthly to a maximum of \$400 monthly, not including in this classification heads of departments, Colonel Goethals, as chairman and chief engineer and president of the Panama railroad company, receives \$21,000 annually; the other members of the commission, \$14,000 annually; clerks, from \$75 to \$250 monthly; draftsmen, \$100 to \$250; engineers, assistant, special and designing, \$225 to \$400; foremen, \$75 to \$275; inspectors, \$75 to \$250; marine masters, \$140 to \$225; master mechanic, \$225 to \$275; physicians, \$150 to \$300; district quartermasters, \$150 to \$225; hotel steward, \$80 to \$175; storekeepers, \$90 to \$225; (Continued next week)

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