WHO BUILT THE PANAMA CANAL?

W. LEON PEPPERMAN
Colonel Theodore Roosevelt
President of the United States during the Building of the Canal
What the Panama Canal?

By

Leon Pepperman

Administration of the Second Isthmian Commission

New York

W. Dutton & Company

581 Fifth Avenue
Who Built the Panama Canal?

By

W. Leon Pepperman
Chief of Office of Administration of the Second Isthmian Commission

New York
E. P. Dutton & Company
681 Fifth Avenue
TO ALL THE MEN WHO DID THE WORK AND HELPED, IN WHATEVER CAPACITY, TO BRING ABOUT THAT TRIUMPH OF AMERICAN ENTERPRISE AND AMERICAN ABILITY

THE PANAMA CANAL

THIS BOOK IS DEDICATED BY

THE AUTHOR
CONCERNING MR. PENNELL'S DRAWINGS

I feel that I cannot let this work go to press without a word of gratitude to Mr. Joseph Pennell for the use of his wonderful series of Canal pictures as illustrations for the volume.

These drawings are as beautiful as they are historically important, and in expressing my thanks to Mr. Pennell for his kindly offer, of which I have taken full advantage—as the reader will see—I am glad to know both that this story of the building of the Panama Canal is thus illustrated as no other man could have illustrated it, and that the work has the approval of one who has had every opportunity of knowing the truth of matters as they were in the Canal Zone in the days of the Second Isthmian Commission.

W. LEON PEPPERMAN.
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EXPLAINING THE AUTHOR’S CONNECTION WITH THE PANAMA CANAL


On April 3, 1905, the Isthmian Canal Commission, in full session, adopted the following resolution:

RESOLVED (2) That for greater effectiveness in the administrative work of the Commission there is hereby established at Washington an “office of administration” for the conduct of such operations as the Commission may, from time to time, determine to there conduct, and which shall include:

Records concerning all purchases and delivery of material and supplies (including commissary stores).

Fiscal affairs.

General books of account, containing details of all transactions of the Commission in the United States and adequate summary of all other accounts on the Isthmus, duplicate accounts in summary being regularly transmitted from the Isthmus to the Washington office; vouchers and contracts to be taken in sufficient number in
original to at all times furnish to the office at Washington a complete and original set thereof.

General auditing and accounting.
Correspondence of the Commission in the United States.
Orders and directions from the President and the Secretary of War.
Engineering reports and plans.
Reports from officials and committees of the Commission.
Reports of the Commission and its officers and committees to the Secretary of War, the President, and Congress.

Colonel Clarence R. Edwards, United States Army, was appointed Chief, and W. Leon Pepperman, Assistant Chief, of the Office of Administration. Colonel Edwards left Washington shortly after the office was opened to accompany Mr. Taft, the Secretary of War, to the Philippines, and Mr. Pepperman took charge. Colonel Edwards resigned from the service of the Isthmian Commission on his return to the United States, and Mr. Pepperman succeeded him as Chief of the Office of Administration, holding the position until the close of the railroad men's régime at Panama.
Who Built the Panama Canal?

FOREWORD

As preparations are going rapidly forward for a world-wide celebration of the opening of the Panama Canal, at the exact time determined nearly ten years ago under the Second Isthmian Commission, whose administration constituted what has come to be known as the "railroad régime" at Panama, in fancy I see many scores of men scattered over the forty-eight States and other scores still in the Canal Zone, who helped to make the work of that régime notable in the history of human achievement, scanning with perplexity the books that have been written about the new waterway and the articles concerning it in the public prints. "Is it a fact or is it a dream," in imagination I hear them say, "that it was the railroad men of the United States who created a modern state in that ten
Who Built the Panama Canal?

by fifty mile stretch of tropical wilderness across Panama, scourged by fevers and pestilence and practically uninhabitable by natives of other climes when we arrived? Is it true that we made possible and planned and began the construction of the mammoth duct that joins the Atlantic and Pacific oceans, over which feat the ends of the earth now unite in admiring clamor? Did we or did we not face death to bring order out of chaos that the men who carried out our plans might perform their labor unhindered by malign circumstance and unafraid of disease? Is it our delusion that we were the men who designed, purchased, and installed the machinery with which the wonderful ditch was dug, and started the digging; that we determined the character of the labor employed, recruited that labor, brought it to the Isthmus, built houses for it, and made the arrangements by which it was fed; that we reconstructed the railroad that was essential to the cutting of the famous channel?

"If, indeed, it was the railroad men who did these things, why is it that our arduous and successful labors are so soon forgotten?"

Who built the Panama Canal? That is, to
whom is the world most indebted for the realization of the dream of four centuries, that reduces the dimensions of the earth?

At the very outset I wish to accord full credit to Colonel George W. Goethals and his associates of the army and navy who have carried to a successful fruition the construction of the Panama Canal. The masterly manner in which he with their assistance completed the construction of the Canal after the plans had been formulated and the work begun by the railroad men, gives him world-wide eminence to-day. What qualities this great task called for, and the determination and capacity with which it was accomplished, are admirably set forth in the concluding words of Joseph H. Choate's speech at Carnegie Hall, presenting to the Colonel the medal of the Civic Forum. "For the patience and fortitude which carried you safely through it all," said Mr. Choate, "for the wisdom and skill that made the completion of the Canal possible, for the commanding personality which maintained discipline and order among the tens of thousands engaged in the work, without strikes, confusion, or delay; for the purity and integrity of char-
acter which you have imparted to the work itself, and for your never-failing hope and courage and constant patriotism, the Civic Forum has designed this medal, of which they beg your acceptance, as a slight token of the appreciation and gratitude of your fellow-citizens of all parties and of every creed.”

But, while according full credit to Colonel Goethals and the army administration for what they have so ably accomplished, I feel it my duty to call attention to the fact—which might easily be overlooked in the national exultation over the actual opening of the Canal—that the structure so ably carried to completion was built upon a foundation laid by the railroad administration. Colonel Goethals himself is quoted by William Joseph Showalter, in the *National Geographical Magazine*, as saying:

“The people talk about the success of the army engineer at Panama, but it was fortunate that Mr. Stevens preceded us. The real problem of digging the canal has been the disposal of the spoil and no army engineer in America could have laid out the transportation scheme as Mr. Stevens did. We are building on the founda-
tions he laid, and the world cannot give him too much credit."

It is doubtful if one American in a thousand is aware, moreover, that President Roosevelt in 1905 put the greatest national enterprise ever attempted by the United States into the hands of Theodore P. Shonts, now president of the Interborough Metropolitan Company of New York, who, as head of the Second Isthmian Commission, brought together and directed the splendid body of railroad men whose services made the Canal a certainty; indeed, so far as anything that has appeared in recent American publications is concerned (save for a brief outline of the work accomplished in 1905 and 1906, written by Mr. Shonts himself, that was published in the *North American Review* last February), there might never have been a railroad régime at Panama.

It is an astonishing fact that in the seven most recent books published upon the Panama Canal the authors practically ignore the services rendered to the nation in its construction by the chairman of the Second Isthmian Commission
—a circumstance which has been overlooked by Theodore Roosevelt himself, when dealing in his autobiography with the "Monroe Doctrine and the Canal." In the case of many of these writers the oversight is no doubt unintentional. Yet men in a position to know go so far as to say that had Mr. Shonts not possessed that rare faculty of being able to inspire others with his own enthusiasm that we call personal magnetism, as well as untiring energy and a positive genius for executive detail, the Panama Canal might still remain the mere potentiality that it had been for four centuries previous to the advent of Theodore Roosevelt. Colonel Gorgas, whose brilliant campaign against disease at Panama has brought him international fame, holds this view. "I believe that had not a man of Mr. Shonts' executive ability, foresight, force of character, and magnetism, who thought and acted in millions where we army and navy officers did in thousands, come to Panama at the time he did, the Canal would never have been built," said Colonel Gorgas during a recent visit to New York. "I would never have dared even to make application for the immense amounts
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of money he authorized me to spend for the sanitation of the Canal Zone, and I might not have been able to do the work afterward without the warm support he gave me."

It was during the administration of Mr. Shonts that the most important problem in connection with the whole Canal work was definitely settled, that is, the adoption of the lock-level type of canal, as opposed to the so called sea-level type, recommended by a majority of the Board of Consulting Engineers. The activity and resources displayed by Mr. Shonts in marshalling and organizing the campaign for the lock-level canal have been fully recognized by all those who were associated with him during this period of his service.

Mr. Shonts took charge of Panama in the midst of a yellow-fever epidemic, with the few skilled white workers deserting by hundreds. There were only 8000 colored men in the Canal Zone to perform the unskilled labor; the plans for the Canal had not yet been made, and it had not even been settled whether it was to be of the sea-level or the lock type; the railroad which was an indispensable instrument to the removal
Who Built the Panama Canal?

of the spoil\textsuperscript{1} from the excavation was practically useless; the only digging equipment on the Isthmus was the out-of-date machinery left by the French. When Colonel Goethals began his extraordinarily successful labors two years afterward, the Canal Zone was as healthful a place to live and work in as most parts of the United States; the plans for the Canal had been worked out and its construction was under way, with the machinery essential to its digging in operation, and the maximum of dry excavation almost reached; there were 10,000 white and 25,000 colored men on the Government's pay-roll, and the railroad was in as good running order and as well equipped as any in America or Europe. It is doubtful if so gigantic a task as that performed by the railroad men on the Isthmus of Panama was ever before accomplished in so short a time. So well qualified an observer as the historian Charles Francis Adams, in an article read before the Massachusetts Historical Society in 1912, declared that the work of preparation for the actual digging of the waterway

\textsuperscript{1} Spoil is the engineering term for earth and débris removed in excavating.
Foreword

across the Isthmus of Panama would "at no remote day be recognized as an epochal development much more impressive than one of mere canal construction."

One of the railroad engineers on the Isthmus described the situation thus: "We built the machine and started it going, and then gave the handle to Goethals, who turned the crank and ground out the results."

Mr. Taft made a useful suggestion in the Ohio Society address. "The history of the Panama Canal and the difficulties connected with it ought sometime to be written by one who knows," he said.

As Chief of the Office of Administration of the Second Isthmian Commission, I know what was accomplished during 1905 and 1906 in the Canal Zone, and I propose to write something about the period, neglected of letters, during which that as yet unrecognized epochal development outlined by Mr. Adams was effected. I propose to show that it was the railroad men, under the direction of Theodore P. Shonts, who rendered the paramount service in the construction of the Panama Canal. I shall demonstrate
Who Built the Panama Canal?

this proposition by facts and figures that are matters of governmental record. It is not only because I am anxious that justice should be done to the men who under my direct observation wrought the miracle in the Canal Zone; it is as well a duty I owe to the student of history.

Whether or not the Canal would have remained a conjectural project, had not Mr. Shonts concentrated his energies upon it in 1905 and 1906, I am able to bear witness to the fact that his advent galvanized into new life every American in the Canal Zone. Appointed chairman of the Second Commission in April, his first measure was the creation of an organization in Washington, the "Office of Administration," through which rapid communication might be had with the scene of action at Panama, after which he took personal charge on the Isthmus, where in a month he had transformed a little band of discouraged workers into the enthusiastic nucleus of a great industrial army, and apportioned to each department of the Canal construction its duties. Mr. Stevens, who accompanied Mr. Shonts to Panama as Chief Engineer, thus described the situation on
their arrival, in an address before the Oregon Society of Engineers:

"When I reached Panama in July, 1905, conditions could have been much worse, but they were bad enough. No real start had been made at any effective work on the Canal proper, no adequate organization had been effected, sanitary reforms were really just beginning, little new plant had been provided, and little that was absolutely necessary had been ordered. In the organization that existed no coöperation was apparent, and no systematic plans, as far as I could discover, had been formulated toward the carrying out of the work along the lines promising any degree of success. And—worse than all—over and above, in the diseased imagination of the disjointed force of white employés, hovered the angel of death in the shape of yellow fever, a number of cases of which were then prevailing, and from which several deaths had occurred. What many of the intelligent men seemed to expect was an order from Washington to abandon the work and go home. To provide housing for this army, to properly feed, to instil into them faith in the ultimate success of the work, to weed out the faint-hearted and incompetent, to create an organization fitted to undertake the
tremendous work, and to fill its ranks with the proper material, was a task of heroic proportions. No one will ever know, no one can realize, the call on mind and body which was made upon a few for weary months while all the necessary preliminary work was being planned and carried forward, and no attempt was or could be made to carry on actual construction until such preliminaries were well in hand. And the only gleams of light and encouragement were the weekly arrivals of newspapers from the States, criticizing and complaining because the dirt was not flying.”

The Second Isthmian Commission reached the conclusion soon after the arrival of Mr. Shonts at Panama that it would be a criminal as well as an uneconomic policy to begin the actual excavation of the Canal while sanitary conditions were such that the laborer did his work at the peril of his life; and, in spite of the clamor of the American newspapers, adhered to the determination to render the Isthmus habitable before beginning to “make the dirt fly,” rather than bring men there to die. In the meantime the only work done on the Canal itself was to put the various levels in the Culebra Cut into
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proper condition for the installation of the steam shovels, and the laying of additional railroad tracks; the task of the moment was preparation. During the following eighteen months the Commission, with the sanction of Mr. Shonts, spent on the Isthmus of Panama $30,000,000, of which about $5,000,000 was for government and sanitation; $7,000,000 for construction of quarters and other buildings, docks, wharves, railway employment, waterworks, and sewers; $12,000,000 for permanent plant; $4,500,000 in materials and supplies, and more than $1,500,000 in sewers, waterworks, and paving in the cities of Panama and Colon.

In November, 1906, President Roosevelt personally inspected the work accomplished in the Canal Zone by the railroad men, and sent a special message to Congress on the result of his investigation. The message concluded thus:

"Of the success of the enterprise I am as well convinced as one can be of any enterprise that is human. It is a stupendous work upon which our fellow-countrymen are engaged down there on the Isthmus, and while we should hold them to a strict accountability for the way in which
they perform it, we should yet recognize with frank generosity the epic nature of the task on which they are engaged and its world-wide importance. They are doing something which will redound immeasurably to the credit of America, which will benefit all the world, and which will last for ages to come. Under Mr. Shonts and Mr. Stevens and Dr. Gorgas this work has started with every omen of good fortune. They and their worthy associates, from the highest to the lowest, are entitled to the same credit that we would give to the picked men of a victorious army; for this conquest of peace will, in its great and far-reaching effect, stand as among the very greatest conquests, whether of peace or of war, which have ever been won by any of the peoples of mankind. A badge is to be given to every American citizen who for a specified time has taken part in this work; for participating in it will hereafter be held to reflect honor upon the man participating just as it reflects honor upon a soldier to have belonged to a mighty army in a great war for righteousness. Our fellow-countrymen on the Isthmus are working for our interests and for the national renown in the same spirit and with the same efficiency that the men of the Army and Navy work in time of war. It behooves us in our turn to do all we can to hold up their hands and
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to aid them in every way to bring their great work to a triumphant conclusion."

It is perhaps worth remarking—in view of the circumstances that a misapprehension as to actual conditions seems to exist, even among officials who ought to know better—that Mr. Shonts had the same power in the Canal Zone during the railroad régime that was invested in Colonel Goethals afterward, and in Mr. Stevens during the brief period that he was in control. Indeed, Mr. Shonts made it an indispensable condition of acceptance, when President Roosevelt offered him the Chairmanship of the Second Isthmian Commission, that he should have absolute authority as to both men and measures in the construction of the Canal.

It was in January, 1907, that, having perfected the machine which was to build the Panama Canal and started it going, Mr. Shonts reminded the President of his promise, made in April, 1905, that when the excavation of the cut between the Oceans was under full headway, the Chairman of the Second Isthmian Commission should be allowed to resign from the Government service. His conduct of Canal affairs, on the
Isthmus and in Washington, had enhanced his previous reputation for capacity made in the railroad world before he went to Panama, and the financiers who were planning the combination of the subway, surface, and elevated railway systems of New York into the gigantic organization that now exists as the Interborough Metropolitan Company, knowing of Mr. Shonts’ compact with Mr. Roosevelt, had requested him to accept the presidency of the proposed corporation. The position was one involving an infinitely greater demand on his peculiar genius as an organizer and executive than the mere digging of the Canal now that the work was begun, and in January, 1907, Mr. Shonts gave the President to understand that he was inclined to unite his fortunes with the new enterprise, and sent in his resignation as Chairman of the Isthmian Commission. Mr. Roosevelt’s response was as follows:


"My dear Mr. Shonts:

"I accept your resignation as Chairman of the Isthmian Canal Commission, to take effect on March 4, with extreme reluctance. I do so
merely because I do not feel justified in prevent-
ing your acceptance of the position you have been asked to take in New York—a position of such great consequence not merely to the people with whom you will be associated in the busi-
ness management of the enterprise, but to all the citizens of New York. You have shown throughout your association with the Isthmian Canal Commission such energy, administrative capacity, fertility of resource and judgment in handling men, together with such entire devotion to your work, that I hardly know whether most to regret the fact that the National Government is to lose you, or most to congratulate those who are to profit by your services in your new position.

"With all good wishes for your future, and with the heartiest thanks on behalf of the Government for what you have done in the last eighteen months, in the vitally responsible position you have held, believe me,

"Ever sincerely yours,

"Theodore Roosevelt."

It was during the eighteen months following Mr. Shonts' first visit to Panama that the hitherto insurmountable obstacles in the way of the construction of the Canal were overcome
and the work begun. The same difficulties that beset the railroad men had confronted the First Isthmian Commission, with the late Rear-Admiral John G. Walker as Chairman, and Major-General George W. Davis, of the retired list of the Army, as Governor of the Canal Zone (constituting what was known as the Army and Navy régime), and it is not minimizing the result of its efforts to say that it did not accomplish as much toward the solution of the Canal problem during the fourteen months of its existence—from February, 1904, to April, 1905—as had been effected by the railroad men within a few weeks of their arrival on the Isthmus, and this in spite of the fact that John F. Wallace, the chief engineer under the earlier administration, was a railroad engineer of the first rank and that Colonel Gorgas was on the spot.

One reason, no doubt, for the success attained by the railroad administration in laying the foundation for the construction of the Panama Canal was that they approached it from the correct point of view, the point of view familiar to their training and experience. They looked upon the Panama Canal as primarily a con-
struction task, a work of excavation and trans-
portation, and one requiring primarily the
application of methods of practical adminis-
tration. From this aspect of the case it was
an undertaking of the highest order, but when
properly examined, it will hardly be seen to be,
at least from a technical view point, the greatest
engineering achievement of history, as seems to be
the universal belief, and in spite of the fact that
we are thus informed by so accurate a scholar
and man of affairs as James Bryce, the historian
and former Ambassador from Great Britian to
the United States. What Mr. Bryce probably
meant was that the Canal is the greatest, in
that it is the most significant, engineering
achievement of history, because of the momen-
tous world-potentialities, foreseen and unfore-
seen, to arise out of new conditions created by
the short cut between the Atlantic and Pacific
Oceans at Panama.

As an engineering achievement the con-
struction of the Panama Canal was one of
magnitude rather than complexity. Had it
been carried out in a temperate clime the fact
would have been clearly understood. That it
is the most expensive construction of its length ever completed is due to the fact that conditions approximating modern civilization had to be brought into existence in a tropical wilderness 2000 miles from the base of supplies for the work itself and the men performing it. Merely as a feat of engineering the construction of the Canal was perhaps less intricate and involved than many other less conspicuous works executed during the same period in the United States. Once given conditions approximating modern civilization in the Canal Zone—sanitation, homes, markets, and entertainments; the necessary supplies to keep the working forces contented and in good health; an organization for gathering and augmenting these forces—all that remained of the Canal construction problem was to "make the dirt fly," in the language of President Roosevelt. How free from complications was the problem may be gathered from the fact that as soon as the railroad men had determined the capacity of the plant they were assembling on the Isthmus, which was early in 1906, they fixed the time for the completion of the work.

The distance from deep water in the Atlantic
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to deep water in the Pacific at Panama is fifty miles. There were no great property rights
to be protected along this stretch of territory; there was no possibility of damage to private
property or other interests; there was no outside traffic to take cognizance of, no thought of trains
that must move on schedule time with the alternative of throwing the business of a com-
munity into disorder; there were no contracts, no specifications, no estimates to be lived up to,
no supervisory control as in ordinary engineering operations. If a slide occurred it only signi-
fied the removal of more earth and rock, which in the end meant a few additional days’ labor and
the cost of moving the material. The added width of the cut at the slide did not affect the
completed Canal, or the value of the adjacent land. The men at work on the drills, steam-
shovels, cars, and locomotives, in the ships and storehouses, and on the tracks, lived and
were provided for much nearer their work than, for instance, similar forces employed in the
building of the subway in New York. Thirty minutes would be a liberal estimate of the time
necessary for a Canal employé to go from his
living quarters to his daily labor. Few of the men employed on construction in our larger cities work under as favorable living conditions. The problem at Panama was merely to dig, and keep on digging.

It is interesting to compare in this connection the engineering difficulties on the Isthmus with those which have had to be met in some familiar undertakings in the United States. Take the construction of the subways in New York City for example. The subways occupy a width of from 50 to 52 feet between the walls on either side, and only a few feet removed are the foundations of towering buildings of masonry and steel, that have cost immense sums and must be protected. An engineering error or miscalculation in the work on the subways would mean damage to these buildings that might amount to millions of dollars, to say nothing of peril to human life. But a few feet above the laborers on the subway, street cars are moving, and above them are the elevated railroads, whose foundations must be carried below the subway level without interfering with trains running on a minute and a half headway. Conduits and wires
that involve protection from fire, the distribution of gas and electric light and power, the employment of the telephone and telegraph, the removal of sewage, must be handled by the subway engineers without curtailing the effectiveness of these instruments in the transaction of the business of a great city. Perhaps the most difficult and dangerous piece of engineering work ever attempted on the subway is one that is yet to be accomplished at Times Square, where the connection between the present underground system and the new Seventh Avenue line will be made. During every three-minute period for eighteen hours every day, in the ordinary course of travel, more than 5000 passengers will be within the zone of danger incident to this work, which includes the removal of the subway roof while trains are passing, and in spite of the fact that the steel structure and concrete arches over the cars leaves a clearance too small for the insertion of one's fingers between the car tops and the roof.

As an engineering achievement in the strict sense of the word (defined by Webster as "the art or science by which the mechanical properties
of matter are made useful to man in structures and machines"), the rebuilding of the Grand Central Station in New York is perhaps the most difficult ever executed. Within an area 3902 feet long with a maximum width of 945 feet, from one to three thousand men labored continuously for nine years working in rock to a depth of fifty feet, and removing 2,500,000 cubic yards of material and transporting it from 22 to 40 miles for disposal. Within this area 187,000 cubic yards of concrete have been mixed and laid, and a station with 12 tracks removed. In its place has been erected a marble palace that comprises a station with 58 tracks, capable of handling a daily traffic of 250,000 passengers, all of this having been erected without interrupting the operations of one of the busiest railway terminals in the world and without inconvenience to the traveling public. Statistics show that during the final year of the rebuilding of the Grand Central Station, 1911, there were 138,000 train movements on the site of the work, an average of one every three minutes and forty-seven seconds throughout the entire 12 months, which means 387 trains
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per day, handling 40 passengers per minute every hour of the 24—more than 20,000,000 during the year.

The development of the largest water-power plant in the world, at Keokuk, Iowa, on the Mississippi River, required no doubt the application of a higher degree of technical engineering skill than the Panama Canal. Here the flow of the Father of Waters had to be dealt with, a concrete dam 4649 feet long and 50 feet high, containing 198,000 cubic feet of concrete and tied bed rock being built from bank to bank, the work being carried on summer and winter, during low water and at flood periods, and subject to ice packs and jams. This dam, with a lock 110 feet wide with a lift of 40 feet (the width being the same as the Panama Canal locks, while the greatest lock height at Panama is only 30 feet and 3 inches), and a dry dock 463 feet long and 150 feet wide, forms a navigable lake 65 miles long, effecting a possible saving of two hours in navigating this reach of the river. This work was done by private enterprise to harness the Mississippi River for power conservation, and the plant becomes the property of the
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United States without having cost the Government one dollar.

Other illustrations of this thought will no doubt readily occur to the learned civil engineer. The real problem at Panama was that of making the country habitable, assembling a plant, and a force to work it, and providing an adequate system for their effective working. That problem solved, nothing remained but straight-ahead work and capable management of affairs—a task requiring a high order of administrative ability, which fortunately has never since been lacking.

Amongst the possible future improvements to the Canal will be the building or rather digging of the “Tiger Hill cut off”—as it is known amongst the engineers. This is a tangent or straight sailing line extending from the head of the Gatun Locks to the Culebra Cut. It would shorten the distance by $3\frac{1}{2}$ miles over the present route by a substitution of a single straight route 16 miles long for one composed of 5 short courses, having a total length of $19\frac{1}{2}$ miles.

It would not only reduce the time of passage
by shortening the distance but would add to the safety of navigating a vessel through the Canal.

Had the railroad engineer remained in charge, it would not require a bold man to predict that such a line would now be in operation, as the education of the railroader is to lessen distance and straighten out his route, and he would more than likely, as the plans of the Canal developed, have seen the advisability of this change that is so strikingly shown when the published maps of the route are studied as a whole.

Another possible change that it is believed time will remedy is the doing away with the Pedro Miguel Lock and duplicating the Gatun flight at Miraflores. When it was determined to move the locks back from La Boca to Miraflores, then the Pedro Miguel Locks should have been also moved. As a combined flight they would have cost less to build, maintain, and operate, having less masonry, and fewer lock gates. Such an arrangement would cause a ship to make one less stop and start in passing through the Canal. It would have done away with the little Miraflores Lake extending from the lower gate
it afterwards." Had the debate come first Mr. Roosevelt might not have "taken" Panama at all. His part in the great enterprise is already a matter of history.

Had it not been for the railroad men (chosen, brought together, and directed by Theodore P. Shonts, who is deserving of credit for their success in the same manner that a general is deserving of credit for the victory of his army), the conditions under which the Canal was dug would never have been brought about on the Isthmus of Panama, for it would imply a bolder Congress than has yet met in Washington to finance a third attempt to subjugate the tropics had the railroad men proved unequal to their task after the failure of the Army and Navy régime, following that of the French. It is because no more competent historiographer has arisen for the railroad men that I venture into the breach.

W. Leon Pepperman.

New York, July 20, 1914.

Since writing this Foreword I have seen a letter written to a friend in New York by Congressman
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Oscar W. Underwood, who has been either majority or minority leader in the House of Representatives since the Canal was started, in which he says:

"I concur in what you say in reference to the civilian engineers, for although Col. Goethals and his corps of engineers are entitled to the credit for the final construction of the work, there is no doubt about the fact that the plans and organization of the original civilian engineers constitute the base on which the Canal was built."
CHAPTER I

THE FRENCH AND THE FIRST COMMISSION

For 400 years—ever since the early Spanish explorers, whose number included Christopher Columbus himself, gave up the search for the "hidden strait" across Central America the existence of which was a tradition among the native Indians—the project of uniting the Atlantic and Pacific Oceans by the construction of an Isthmian Canal has agitated the minds of men. The first plans for such a channel are said to have been made by a Spanish engineer named Saavedra, one of Balboa's followers, between 1517 and 1529; but, when, after his death, Charles V of Spain ordered surveys of the Isthmus, the scheme was reported to be impracticable—as, indeed, it would have been with the tools for excavation then in use. Philip II revived the idea in 1567, sending an engineer to survey a route across Nicaragua, but he
The French and the First Commission

piously gave up the project when his spiritual advisers pointed out to him the probability that the Creator had an Isthmian Canal in mind when he issued the admonition: "What God hath joined together, let no man put asunder." Philip's God-fearing successors were held in check, possibly, by this same ecclesiastical revelation until 1814, when Spain decreed the construction of a canal between the Oceans with a view to reviving her prestige with her Central American colonies—only to have them achieve their independence before that purpose was attained.

Meanwhile, stone-paved highways across Panama, preceding the Panama Railroad that in turn preceded the Canal, for more than three centuries served the pack-trains carrying treasure that made Old Panama the richest city of her time in the world. Spain, England, Portugal, and France have each contemplated a waterway across Central America, and nineteen different routes have been discussed, of which Tehuantepec, Nicaragua, and Darien were the most important after Panama. In 1869 President Grant appointed an inter-oceanic canal commis-
sion, and the following year this country and the United States of Colombia entered into a treaty to build a canal provided a satisfactory route might be found. This commission, respecting the rights of the Panama Railroad (as set forth in another chapter), which had been opened to traffic in 1855, investigated such routes as the Caledonia, the San Blas, and the Atrato, and in 1876 reported favorably on the route across Nicaragua.

It was the French, however, who began the actual work of cutting a channel across Central America, and it was not until 1880 that the work began at Panama, with Ferdinand de Lesseps, famous as the builder of the Suez Canal, at the head of the construction company. It is due to the fact that the work was already begun at Panama that the United States adopted this route instead of the one across Nicaragua; for, when the French company failed, its property—which included the Panama Railroad and nearly 30,000,000 cubic yards of excavation available for our use in a cut twelve miles long—came upon the market.

The Universal Inter-oceanic Canal Company,
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which began the construction of the Panama Canal, was organized by de Lesseps in Paris in 1879, after a body he had convened, known as the International Congress of Surveys for an Inter-oceanic Canal, had pronounced in favor of a sea-level canal from Limon Bay to Panama Bay, which was to be completed in twelve years at a cost of $240,000,000. In 1889 the company failed, after having spent more than $260,000,000 and having excavated—according to M. Bunau-Varilla—72,000,000 cubic yards of earth and rock. Five years later the New Panama Canal Company was formed in Paris, which, according to the same authority, excavated 8,000,000 cubic yards, and continued to do sufficient work to maintain its franchise until it was bought out by the United States in 1904.

Every American engineer—as well as every engineer of any other nationality—who has visited Panama since the United States began work on the Canal, has marveled at the splendid work done there by our predecessors before science conquered yellow fever and modern machinery made possible accomplishment unheard of only a few years before. Chief
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Engineer Stevens, in his evidence before the International Consulting Board in 1905, said: "I cannot conceive how they (the French) did the work they did with the plant they had."

A correspondent of the London *Standard*, who visited the Canal in 1910, referring to Colonel Sibert, one of Colonel Goethals' leading assistants throughout the military régime on the Isthmus, says: "He, and all other officials I met, emphasized, not in any spirit of generosity, but with sincere professional appreciation, the excellence of the work done by the French engineers. According to most of the American officers in charge of the great Canal departments, the foresight, skill, and ability displayed by the French under the Lesseps régime have never received the praise they deserve."

Nevertheless, the general impression seems to be that the French accomplished practically nothing on the Isthmus of Panama, and that the $40,000,000 we paid them was money thrown away. The fact is that we got more in value than we paid. According to an estimate made by a board of engineers in 1908 the work done in the twelve-mile excavation by the French
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was worth to us more than $25,000,000 at our own yardage rates. The same experts valued the Panama Railroad at $9,500,000; the plant and material, used and sold for scrap, the buildings along the line of the Canal, the surveys, plans, maps, and records, at $6,000,000, and land, clearings, and roads with four years' use of the ship channel in Panama Bay at another $1,500,000. The maps on which we built the Canal were made by the French, the surveys on which they were founded having previously been verified by our engineers. And, in addition to the twelve miles of excavation in the present waterway, the French had completed two thirds of the fourteen-mile canal that was to divert the water of the Chagres River under the sea-level plan.

Without considering the ravages of yellow fever, that claimed every third white man who worked on the Canal previous to the discovery that the mosquito was the sole cause of that fearful malady, the French labored under an enormous handicap as compared with the Americans, in that their tools were those of an earlier century. The modern rock drill as used to-day
had not yet been perfected. At the height of our construction work we had over 300 drills at work, one drill runner and four laborers to each four drills. The use of dynamite during the French régime on the Isthmus had not reached the point it has to-day. The Frenchman sank an old-fashioned shaft, put a few pounds of dynamite in it, lighted his fuse, and ran. To-day we can put from 15 to 18 tons of dynamite in one blast, and as much as 30 tons may be fired at once. There were 31 tons in the blast touched off by President Wilson at Washington, when the last barrier between the Atlantic and Pacific sections of the Canal was blown up. During our period of Canal construction at Panama we used 105-ton steam-shovels, which, with a 5-yard dipper, picked up from five to seven tons of spoil every two or three minutes and swung it into a car. The modern steam-shovel was at that date unknown and its capacity undreamed of. The French ran trains of from 12 to 15 cars, carrying from 6 to 12 cubic yards of spoil to the car, while we ran from 30 to 35 cars, carrying from 35 to 40 cubic yards of spoil
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each, drawn by one big American consolidation engine. At our dumps we employed a Lidgerwood unloader, which unloaded one of our 30-car trains in 30 minutes, as against 45 minutes required to unload a French 15-car train. The Frenchman had to push by hand the spoil away from the tracks, whereas we came along with a Mann or Jordan spreader and by steam power ploughed the spoil away from the tracks and down an embankment 15 feet from the rails.

That the United States has built a canal where France has failed does not prove that the American is any more capable than the Frenchman, or that he has any more genius than the Frenchman in modern invention. No genius could have taken the American to Panama under the conditions that prevailed during the French régime, and made him remain long enough to produce the living conditions and erect the plant that the French did. The French engineers believed in forced labor, by which the Suez Canal was built, and they brought men to the Isthmus knowing that many of them were going to die there. In a more humane age American engineers would not have constructed the Canal
at the cost of so many human lives per mile, even if the American mechanic would have consented to take the risk, for however big a wage, with the odds on Death against him.

And it should not be forgotten that while the French were dying by scores of yellow fever at Panama, Americans were dying by the hundreds of yellow fever in our Southern States.

It has, unfortunately, been the custom of our American writers on the subject of the Panama Canal to treat achievements of the French on the Isthmus with unfairness, and to fling charges of graft and debauchery at the undefended heads of men who were fighting Fate, under the most terrific handicaps, to secure for their country the prestige of an engineering triumph even greater than that of the Suez Canal.

The French, according to the favorite version, left locomotives in the jungle and long rows of abandoned locomotives and other machinery elsewhere. A Board of Consulting Engineers was appointed by President Roosevelt in 1905, including some of the most eminent engineers in the world, to report to the President on this old French machinery. They found that the
French did not leave locomotives in the jungle. That French equipment is used on the Canal work even to-day is shown by the circular from Colonel Goethals’ office dated February 20, 1914, stating: . . . “No French scrap of any description will be loaded by anyone . . . and no parts will be removed for repairing other equipment”; and so far from Time having “made junk of all the French equipment,” as has been definitely asserted in an article in *Scribner's Magazine*, the official fact is that a large amount of French equipment is in the service of the Canal work even to-day, and more has been. What was not worked out either by the French or by the Americans in actual work became junk only after the Americans had stripped it of all the movable parts. What was finally left was sold even then by the Canal Commission for over a quarter of a million dollars. These facts are not usually mentioned by any of the self-appointed historians of the Canal in their books or descriptive articles.

The general tendency seems to be to endeavor to cast additional luster on the achievement of our own engineers by ignoring the remarkable
work done by the French. This is neither necessary nor just. And some writers go further, and attempt to disparage De Lesseps personally by magnifying every possible detail of debauchery and extravagance on the part of his men. The British Minister at Panama, Sir Claude Mallett, is quoted to show how quickly French Canal employees could die of yellow fever. That the French Canal officials invariably set their men an example by themselves staying away from and doing all that they could to keep the men away from the drinking and gambling houses is a fact the British Minister at Panama never failed to mention, though this and other statements of his, favorable to the French, are ignored by our journalists, as well the fact that Panama and Colon were free ports and not under the French police power. These details, so greatly modifying all the presumptions of debauchery and extravagance with which the memory of the French are disparaged should be recorded equally with the accusations, as a measure of simple justice.

The wild extravagances of the French form a staple subject of exaggeration.
The French and the First Commission

There was inefficiency and there was extravagance under the French régime undoubtedly, but the reports as to the enormous salaries paid French Canal officials—said to range from $50,000 to $100,000 per year—have been shown to be without foundation. M. Philippe Bunau-Varilla, who was Chief Engineer and General Manager in 1885 and 1886, has made public and unfututed statements, to the effect that the highest salary paid to a Canal official during the French administration was $20,000, that sum being received by M. Dingler, the first Director General of the work on the Isthmus. M. Bunau-Varilla’s own salary was only $10,000 per year at first, being later increased to $12,000.

Moreover, the fact that the official valuation of what the Americans obtained for the $40,000,000 paid the French Company shows it to be worth over $43,000,000 is seldom recorded; while the favorite theory that De Lesseps was a conscienceless grafter has been publicly rebuked by the War Department in giving the name “De Lesseps” to one of the two largest fortresses on the Canal. It should always be remembered,
therefore, that those writers who have attempted to enhance the work of the Americans by contrasting it with the failure of the French, have overlooked the fact that the Americans had the advantage of the French, first, in the development of sanitation and hygiene and the determination of the source of fever infection in the mosquito—thereby enabling the Americans to destroy this source of infection; second, in the improvement throughout the world in all mechanical appliances necessary in canal construction, which occurred since the purchase of the French plant; and, third, in the increased powers of discipline enjoyed by the Americans on the Isthmus, as compared with the French, which grew out of certain rights of sovereignty on the Isthmus which were not enjoyed by the latter. That the American Government has awakened to a realization of these facts—though many writers about the Isthmus have been successful in creating contrary impressions in the minds of the American public—is evidenced by the fact that the Congress has appropriated a sum of money to fit up as a present to the French people the launch *Louise*, used by both French and Amer-
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icans as an auxiliary to canal construction; and by the approval of the name of Fort De Lesseps, as already noted. As an interesting side-light on the adoption by the French Canal Company of the lock-type of Canal, as opposed to the sea-level type, it is worthy of note that Lieutenant (now Rear-Admiral) Robert E. Peary, of North Pole fame, in association with Lieutenant Menocal, also an officer in the American Navy, in 1884 and 1885 personally and under orders of the Navy Department, made a re-survey of the Nicaragua route. In their report of 1885 is described and illustrated the type of Canal along the lines of that now completed at Panama. Some engineers assure me that this was the first description in a public print of such a type.

Their report also described and detailed a feasible high-lift lock with water-ballasted gate. This gate was designed by Lieutenant Peary as a rolling caisson gate with all operating machinery above water-level.

It was not until after the report of Lieutenant Peary and Lieutenant Menocal was published in 1885 that the French Canal Company changed its plans from those calling for a sea-
level canal at Panama to the lock-level type. It is fairly certain, therefore, that the French were influenced in their resorting to the lock-level canal at Panama, to overcome their failure to carry out the sea-level plan, by this report of the discoverer of the North Pole and his associate, Lieutenant Menocal.

The First Isthmian Canal Commission, which took over the construction of the Canal from the French, was known as the Army and Navy Commission. It was appointed by President Roosevelt in February, 1904, and was headed by Rear-Admiral John G. Walker, U. S. N., while Major General George W. Davis, U. S. A. (retired), was made governor of the Canal Zone and the responsible head of the work at Panama, with John F. Wallace as chief engineer. The other five members of the Commission, like Mr. Wallace, were civil engineers of the highest standing, William Barclay Parsons and William H. Burr of New York, Benjamin M. Harrod of New Orleans, Carl E. Grunsky of San Francisco, and Frank J. Hecker of Detroit.

The failure of the Army and Navy Commission, according to one of its members, was due to
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a misconception on their part as to their duties, in that each attempted to fulfill a joint obligation instead of together constituting an organization and formulating a policy. More than one of the seven members of the Commission felt himself individually responsible for every barrel of crude oil and every typewriter purchased for the Canal Zone. In the septemvirate were men who thought that every document issued by the Commission should be read by each of its members, with the result that not infrequently a letter of instructions—for, perhaps, the chief engineer—that had been prepared by the Chairman, would be a week or more in passing across the desks of the other six commissioners before getting started for Panama. There were seven able men on the First Commission, to whom duties seem to have been assigned without regard to their vocational training. The commission that controlled the construction of the canal sat at Washington, General Davis being the only member on the Isthmus. At these headquarters 2000 miles from the site of the work, five eminent engineers estimated the number of grains of quinine per capita that might be
required in the Canal Zone, or debated the wage to be paid a cook. Mr. Wallace, the chief engineer of the Canal, on the ground at Panama, was not permitted to make the appointment of an employé at a salary exceeding $1800 per year without the formal approval of the Commission at Washington; and, most preposterous proposition of all, he was restricted in the use of the cable in making recommendations or requisitions, although eight days were required for the transmission of a letter between Canal headquarters and the Canal Zone. Work involving the expenditure of hundreds of millions of dollars subjected to delay, in order to save the trifling expense of telegraphic communication!

Army and Navy methods were followed on the Isthmus as in Washington. A Navy paymaster was appointed general storekeeper, and another disbursing officer, while an Army officer was made quartermaster in charge of furnishing labor and providing for its maintenance. The administration of the ramshackle Panama Railroad, an indispensable instrument to the construction of the Canal, was left by the com-
mission as it had been found. The delivery of track supplies requisitioned by Mr. Wallace for the rehabilitation of the railroad, which could be purchased in New York and put aboard ship within six hours, was often delayed for six months by Washington red tape. The Army and Navy system of accounting was introduced on the Isthmus. By this system pay-rolls were made in duplicate, each of which had to be signed by a division engineer and the employé (provided he could write; otherwise he made his mark), and approved, sheet by sheet, by the chief engineer—with such results as to facility in mere physical handling that, in a not exceptional instance, the paper contained in two weeks' pay-roll of 1,500 laborers, drawing 20 cents an hour, registered a weight of 103 pounds. If an exploration party was sent away from camp, two methods of providing themselves with food were open to the men. Either each member paid for his own supplies, and was reimbursed by the Commission on handing in vouchers signed in quadruplicate for the cost of his alimentation, or the chief of the party paid for all supplies out of his own pocket, making out
six vouchers for each and every individual to sign, which vouchers being then approved by him, his advances would be returned by the Commission. Carts and wagons were hired by the week from Isthmian natives, six Government expense vouchers being essential in the payment for the use of each vehicle. Before the Army and Navy accounting system was superseded by that of the railroad men, after the inauguration of the latter in the Canal Zone, the division engineer in charge of the paving of the City of Panama, who had employed 200 carts during one week, found himself with 1200 vouchers to fill out on Saturday night for one part of the work alone.

In the operation of storehouses the First Isthmian Commission followed Navy methods. "Tie plates" that reached the Canal Zone bound together with wire for the purpose of easy handling and rapid use, would be cut apart and neatly piled up like bolts of cloth. Right and left angle bars for rails were unbolted and piled up in the same manner, with the result that when they were needed for use the storekeeper usually sent out all rights or all lefts,
The French and the First Commission

this being the cause of many delays, particularly on the Culebra Division. On one occasion, when the water system in the City of Panama was in course of installation, a hurried requisition was made on the storekeeper for a couple of hundred of what are known as "service cocks"; and, as he professed to be unable to supply them, they were cabled for to Washington. A day or two after sending the cable, the division engineer in charge of the work happened to visit the storehouse, when to his surprise he found some 2000 service cocks such as he had made requisition for, and inquired why his demand had not been complied with. The storekeeper's explanation was entirely adequate from the Navy point of view. It was to the effect that the rule was that 2000 service cocks always be kept on hand, "stock" never being allowed to run below that number. There is little doubt that what was called the "water famine" in Colon was due to the inefficiency of the storekeeper's department, which proved unable to supply material that might have been obtained in any of the larger cities of the United States. It was sometimes almost impossible for the Canal employés to
obtain food, even when they had money and there were ample supplies in the commissary storehouses, because of Navy methods. Just after the inauguration of the Second Isthmian Commission, the men at Empire and Culebra once faced starvation, a condition due to an order from the auditor directing that on a certain day the system at that time employed for the delivery of supplies to Canal employés be discontinued and a new system inaugurated. On the day specified, the new system was not in operation at Culebra and Empire; and, as the old system had been superseded, under Navy regulations the storehouses at these points remained closed. On this occasion actual suffering from hunger was averted by Chief Engineer Stevens, who took a special train from Panama to Culebra, overruled the auditor, and opened the storehouses.

General Gorgas, who extirpated yellow fever from the Canal Zone under the railroad men's administration, was also chief sanitary officer on the Isthmus during the entire Army and Navy régime. During this period he accomplished practically nothing in his battle against
Surgeon-General William C. Gorgas
Chief Sanitary Officer of the Canal Zone from 1904
The French and the First Commission

disease, although a plan for the sanitation of the Zone and the cities of Panama and Colon had been reported by the sanitary experts, appointed by President Roosevelt, who accompanied the Commission on its first visit to Panama in March, 1904. Colonel Gorgas’ efforts were also hampered by the circumambient red tape of the Navy; and, so little headway was he able to make under those conditions that June, 1905, the month before Mr. Shonts reached the Isthmus, was that of the greatest mortality from yellow fever at Panama in many years. Four months after the arrival of Mr. Shonts, yellow fever was a thing of the past in the Canal Zone.

Both Mr. Wallace and General Gorgas were bitter in their complaints to the Secretary of War as to the inefficiency of the Army and Navy Commission, their requisitions for supplies being either disregarded altogether or granted only in part and after long delays. In an address two years ago before the Chagres Society, composed of the white workers on the Canal who have been in the service for six years, General Gorgas made a humorous reference to Admiral Walker
which nevertheless throws some light on the situation. "The Admiral was a very able and capable man," said General Gorgas, "but he had a few set ideas in regard to the administration of the Canal which he was determined to carry out. The principal of these was economy. Day after day I would go to the Admiral with requisitions for various things needed, and we would talk the matter over. He would always get on the subject: 'Gorgas, there is one thing certain; whether we build that Canal or not we will leave things so fixed that those fellows up on the hill can't find anything in the shape of graft after us.' He would then take my requisition and stick it in a drawer, and there it would remain for an indefinite time." To add to the difficulty of the 1904 situation, the Commission made the tactical error of yielding to the clamor of the American newspapers that has taken up Mr. Roosevelt's phrase about "making the dirt fly." Mr. Wallace was ordered to go on with the work of excavation on the Isthmus with the out-of-date machinery left by the French, even though the type of canal had not yet been decided upon; the railroad that
was essential to the disposal of the soil was practically useless; and there was no suitable food supply or quarters for the few laborers on the ground.

Mr. Taft summed up the situation at Panama in 1904 and the early part of 1905, in his testimony before the Senate Committee on Inter-oceanic Canals in April, 1906, thus: "The chief defect of the old Commission, if I may say so, became apparent when it essayed the tremendous executive task of perfecting an organization to furnish the equipment, the material, and the supplies required in increasing quantity on the Isthmus as the work expanded, with promptness and dispatch."
CHAPTER II

PANAMA IN 1905

It was a rather gruesome jest that greeted five Panama Canal Commissioners, who arrived at Colon before the sanitation of the ten-mile strip of American territory across the Isthmus, after a week on shipboard en route from New York, during which period almost the only topic of conversation, participated in by passengers who had visited that part of the world before, had been those manifold diseases by reason whereof Panama and the Chagres River connoted death by fever and pestilence the world over. It so happened that five mahogany burial caskets near a consignment of plain cherry coffins—the trade in mortuary paraphernalia being brisk on the Isthmus at that time—were by chance piled on the wharf close to the baggage of the Commissioners, when they came down the gangplank from the ship.
"Why those coffins with our trunks?" one of the new arrivals inquired of the American baggage-man in charge.

He was a facetious American, this baggage-man, and his organ of veneration seems to have been as rudimentary as his sense of veracity for he replied blandly:

"Five commissioners, five superior coffins—a speculation on the part of an undertaker."

That, at least, is a story that was told at the time, and it fitted existing conditions in the Canal Zone. Indeed, John F. Wallace, who was Chief Engineer of the Canal from June, 1904, to June, 1905, brought his personal coffin with him from New York when he came to Panama—a precaution the significance of which did not tend to encourage the rank and file of the men employed on the big ditch.

In the spring of 1905 an epidemic of yellow fever occurred on the Isthmus, and among the earliest victims were two of the highest of the Canal officials under the First Commission, Morris O. Johnson, the Supervising Architect, and Robert R. West, the Deputy Auditor. Their deaths brought about a stampede among
the white men of lesser stamina. Some 500 of the American employés resigned their positions and left Panama during April, May, and June. At the height of the epidemic Chief Engineer Wallace secured leave of absence from the Secretary of War and sailed northward. The fact that he took his coffin with him gave rise to the surmise (soon proved to be correct) that he did not intend to return, and something like a panic ensued. It is probable that many hundreds more of the Americans in the employ of the Isthmian Commission would have gone back to the United States than did actually return, save for the fact that the steamship fare was prohibitive. The trip to New York cost $75 when a man traveled as a private citizen, whereas Canal employés were allowed a special rate of $20 when going home on leave. Many of them took leave of absence at this period, and left the Canal Zone with no intention of ever coming back, and even the loyal employés who remained worked under a strain that showed in their faces. However, depression never reached a point where the American sense of humor was entirely crushed. A clerk in the
Panama in 1905

Commissary Department, on an afternoon when the fever was at its worst, under nostalgic influences suddenly struck up the familiar prayer-meeting hymn that begins:

"There's a land that is fairer than day,
And by faith we can see it afar——"

That he had the United States rather than the celestial regions in mind was apparent when he paused at the end of the second line to observe: "Add $75 to faith and you can get there by a United States Fruit Company boat."

Disbursing Officer Edward J. Williams, who came to Panama that summer (and remained until the practical completion of the canal in 1913), described the situation as it appeared to him briefly: "Everybody here seems to be sitting on a tack," he remarked.

Writing afterward of the yellow-fever outbreak of that season, Col. William C. Gorgas, who was subsequently to make an international reputation by the sanitation of the Canal Zone and who had been on the Isthmus a year when the epidemic in question began, said: "Our people very generally looked upon the mosquito
theory as a failure. The natives laughed at us."

It was not only on the Isthmus that the possibility of an inter-oceanic canal seemed remote. News of depressed and alarming conditions reached the home newspapers by every steamer from Panama arriving at a United States port. In May the *New York Herald* published an interview with John Barrett, on his return to this country after resigning the post of Minister to Panama, in which the diplomat declared: "Despite the efforts of the present sanitary staff under the skillful guidance of Colonel Gorgas, yellow fever seems no nearer being stamped out than it was a year ago. We have had more cases of the dread disease during the last thirty days than any other corresponding period for ten months." About the same time an article appeared in the *New York Tribune* that began: "It appears that the yellow-fever scare on the Isthmus of Panama has not abated and that conditions are serious there. This appeared yesterday in the return by the Panama Line steamship *Segurancar* of thirty young men who went down to work for the Canal Commis-
sion. All were coming home because they were alarmed over the fever scare.” The same week the New York Times published the following dispatch from Pittsburg:

“‘Tell the boys to stay at home if they get only a dollar a day,’ is the advice of a McKeesport boy now working with the construction gang on the Panama Canal.

“Charles L. Carroll, son of Mrs. Sadie Carroll, of 604 Ridge Avenue, McKeesport, was one of the first to go to the Isthmus to work. In a letter to his mother, received yesterday, he says he is thoroughly sick of the country and everything connected with the Canal.

“‘Everybody is afflicted with running sores all over the body,’ the letter goes on. ‘We are compelled to sleep in an old shed, six in a room, on cots. Rain water is drunk more than the river water, because it is the better. The meals provided, would sicken a dog.’”

Carroll’s statement that every person (presumably in Panama) was afflicted in the manner of Job was something of an exaggeration, doubtless promulgated with a view to exciting the sympathies of Mrs. Sadie Carroll, and perhaps
of inducing her to send him the wherewithal to remove himself from his pustulous environment, but it was accepted as hideous truth by the large number of unthinking people that helps to populate this and other countries. The "running sores" of which the young man complained were doubtless due to that non-respecter of persons, the tick, which creeps under the skin of, and battens upon, the genus *homo* in most parts of the world, impelling him to scratch himself violently at points of contact, thus producing minute ulcers with a watery discharge. Carroll's observation as to the potential effects of Zone food on the canine epigastrium had also some foundation in fact.

Newspapers in other cities than New York contributed tales of disaster at Panama to the current record. For instance, the Cincinnati *Enquirer* published a letter received by "John J. Wenner, clerk of the County Board of Control," from a former resident of Cincinnati in the Canal Zone, who propheesied that at the rate work on the Canal was then progressing the big ditch might be opened in 1950, and declaring that Panama was a cesspool, with yellow fever claim-
Panama in 1905

ing a white victim there every ten days. The Washington Times cited Canal employés returning from Panama because of the high cost of living, as well as by reason of the yellow fever epidemic; and it is probable that every newspaper in the United States printed interviews with the returning members of the committee appointed by the Japanese Government to investigate labor conditions on the Isthmus, who reached New York in May, and were unanimous in the view that Panama was no place to which to send workingmen who did not court death.

On the Isthmus during the spring and summer of 1905 Memento Mori, albeit not in the written word, everywhere stared the visitor in the face. Yellow fever was epidemic, as has been stated, and to its ravages were added those of bubonic plague and many minor disorders. In the cities of Colon, Panama and Ancon, funeral processions were continually passing in the streets, and groups of mourners were gathered at the doors of the churches from morning until night. Coffins consigned to undertakers in the various working camps were piled up at the stations of the Panama Railroad in such numbers
that the authorities ordered them to be stored out of sight, for fear of their effect upon the public mind.

At Ancon a building was pointed out in the Hospital grounds, where, it was asserted, 5000 patients had died under the French régime on the Isthmus. A structure on Ancon Hill in 1905, known as "La Folie Dingler," or Dingler's Folly, which has since been razed to make room for the work of the Canal, stood for years a yellow fever memorial. This was the residence of Jules Dingler, which overlooked La Boca (now Balboa), and the Bay of Panama. Dingler was the first Director-General of Canal Construction under the French régime, and he brought his family consisting of wife, son, and daughter to Panama with him. After his house was completed and furnished, but before he could occupy it, the wife, son, and daughter fell victims to yellow fever. Dingler returned to France, where he soon died—of a broken heart, it was said. His successor, Leon Boyer, arrived at Panama in January, 1886, and succumbed to yellow fever the following May. Every white man who came to work on the
Panama in 1905

Isthmus during the French régime, as General Gorgas has said, knew that he would have yellow fever, and he knew that every third man would die. There were actual figures on record to show that of a family numbering five of one of the chief engineers during the French régime, four had died; that of the family of a French official of the Panama Railroad also numbering five, three had died; that of seventeen French engineers who had arrived on the same steamer, sixteen had died; that of twenty-five Sisters of Charity who came to the hospital at Ancon at one time, twenty had died. It was on record that in September, 1884, an outbreak of yellow fever in the Harbor of Colon cost the lives of twenty sailors, a British brig losing all her crew save one, while among the white men in the city itself there were 160 cases of the dread disease with a mortality of more than two thirds. Estimates of the total number of victims of yellow fever during the nine years the French were excavating on the Isthmus vary, but often reach large figures. Colonel Gorgas fixes the number at approximately 22,000, and according to so high an authority it is reasonable to say
that one third of the Frenchmen who came to Panama during the period from 1882 to 1891 died of this disease. In the summer of 1905 every American in the Canal Zone was speculating as to whether the United States Government would attempt to build the Canal at a possible like cost in human lives, for there were as yet no indications that our sanitary department would be able to cope successfully with the death-bearing mosquito—the "cobra of the air."

During his first week on the Isthmus, Chief Engineer Stevens had the actuality of the yellow-fever peril brought home to him forcibly. A clerk in his office, who had seemed perfectly well when he went home one night, did not report for duty in the morning, but sent word that he was not feeling well. He died of the fever in the afternoon. Having myself gone unscathed through the smallpox epidemic of 1898 and 1899 in North China, one of bubonic plague in South China the next year, and the cholera epidemic in the Philippines that claimed many thousands of victims the year following, I was inclined on reaching the Canal Zone to
regard the apprehension of my associates as to contracting current maladies without any overflow of sympathy. Consequently, when I was bitten by a mosquito on the back of the hand one evening soon after my arrival, I decided to forget the incident. However, I found myself unconsciously making a computation. Besides the stegomyia that conveys yellow fever, there thrived in Panama the anopheles mosquito, the conductor of malaria, and the common black, and several other breeds, contact with which was conducive to nothing more serious than violations of the Third Commandment. Wherefore there was only one chance in three that I had been bitten by the mosquito most to be dreaded. Even if the creature had been a stegomyia, yellow fever need not of a certainty follow, since in order to convey the disease it must have punctured the integument of someone afflicted with it, and I had a further chance of escape in that this perforation must have been effected within three days of the patient’s coming down with the malady. The odds, therefore, were five to one against my going to the hospital. The period of
incubation of yellow fever is five days, and I am willing to admit that when I wakened without any symptoms of disorder on the sixth morning after being bitten, I was somewhat relieved—I may even say, considerably so.

Mr. Shonts retains to this day a vivid recollection of a mauvais deux heures of his own soon after his arrival on the Isthmus in July. He recalls that on the morning of his first day the sight that greeted his eyes on looking from the window of the cottage where he was quartered in Colon was the passing of ambulances carrying yellow-fever patients; and, as that disease was the main topic of conversation among the Americans in the Canal Zone, one of the earliest bits of information imparted to him there was that the period of development of yellow fever is five days. When, therefore, he awoke on the fifth day after his arrival with his temperature considerably above normal and announced the fact at breakfast, the others at the table insisted on sending for a doctor. When the man of science had taken a blood sample from Mr. Shonts and gone to make an analysis, an old-timer on the Isthmus remarked:
"He'll be right back, if his first examination is favorable. If there is any evidence of infection, however, he'll be a long time coming to a decision."

Half an hour, an hour, two hours, passed, and the men with Mr. Shonts began to show signs of nervousness. Then the doctor ran into the room with many apologies for his prolonged absence.

"Your blood is in perfect condition," he told his patient. "There are not even any malarial symptoms. I should have brought you the information immediately, only that I received an urgent summons to a man just stricken down with the real fever, and could not leave him until now."

Isthmian statistics seemed to show that yellow fever found its victims only among those not natives of the tropical coast towns. White men from the temperate zone, and natives from the hills and mountains were subject to the disease, but the negroes from Jamaica and Trinidad and the Caribbean Sea, as well as the Panamanians themselves were immune. The field of attack by yellow fever was somewhat limited,
therefore, and the disease could not be propagated without a yellow fever patient. The stegomyia was a delicate and short-lived creature withal; in captivity it rarely lived more than five weeks, and out of captivity probably not more than ninety days; furthermore its range of flight was seldom more than a thousand feet from its point of nativity. It was not often hatched in the open air, however, but generated in stagnant water in forgotten corners of cellars and dark rooms of tropical houses, in neglected household utensils and closets and puddles in back yards. One of the horrors of the situation on the Isthmus before the discovery that the mosquito was the sole transmitter of yellow fever, lay in the fact that the stegomyia was actually bred in the hospitals. The French physicians put the legs of the hospital beds into water-filled receptacles in order to prevent insects from crawling up to annoy the occupants, and in these very receptacles were born the mosquitoes which with the minimum of labor carried the disease from the hospitals to the world outside. It was found that if there was no new case of yellow fever sixty days after
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an epidemic, the assumption that the disease had been stamped out was safe, since all the carriers would be dead of old age by that time—this would certainly be the fact after ninety days. At the end of this ninety-day period the stegomyia would be harmless so far as yellow fever was concerned, since it could secure no germs with which to inoculate a potential patient without a real patient to supply them.

The anopheles mosquito, which carried the malaria germ, was a hardier creature; it bred in the country districts, in marshes, in pools of stagnant water anywhere and everywhere. Examination for scientific purposes under the direction of Colonel Gorgas in 1904 and 1905 showed that at least 70 per cent. of men and women picked up at random on the Isthmus of Panama had the malarial microbe in their blood. A victim of malaria seldom died of the malady, but he was capable of supplying its germ to any anopheline mosquito making integumental borings within three years of first infection.

Even leaving disease out of consideration, the Canal Zone was not a cheerful place in 1905. Chief Engineer Stevens expressed his opinion of
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the two principal cities on the Isthmus, as he found them on his first visit, to the Oregon Society of Engineers several years afterward. "Colon at the northern, and Panama at the southern, terminus of the Canal, were, up to 1907, two of the most forbidding, dirty, and from a white man's point of view, unhealthy places on earth," he told his auditors. A visitor to the Isthmus as late as February, 1906, described the impression produced on him during the journey from Ancon Harbor to the City of Panama, without much enthusiasm. "We went ashore and were loaded into a dusty, ancient, ramshackle train into which a self-respecting cow would have refused to be driven, in the United States; we were man-handled by violent negro train-hands and a conductor who wore a large diamond in his necktie and who thrust his cash-fare collections into his trousers pocket without ringing a bell punch or giving a receipt," he said. "We were unloaded on the outskirts of Panama at a baking-oven of a station, surrounded by a dust field with a fringe of flea-bitten horses, tumble-down hacks, and saloons which were likely to fall in at any moment upon
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the wrecks of humanity which crowded the bars. We were driven through streets as rough as any Maine woods lumber roads, past houses where naked mongrel children, tow-headed and kinky-haired together, screamed under the chastisements of slatternly mothers; we were housed in a hotel where a meek request for the interpolation of sheets between the counterpane and the mattress ticking was met with a smile of amused though contemptuous compliance. In all the world there is not another city so depressing as Panama. Natives and aliens go through its streets with dragging feet and saddened faces. I saw a cab-horse, standing in front of the dismal public square, move a few inches forward so that he might lean against a telegraph pole—and the action was so much in the spirit of the town that it did not jar upon my perceptions as remarkable until long afterward. We wondered how American white men of decent tastes could stay more than six weeks in such a hole and keep their reason."

The most pretentious edifice in the City of Panama is the palace of the Roman Catholic Bishop, the first floor of which is occupied by the
Panama Lottery and those above by the prelate himself. Up to the time of the sanitation and sewering of the city by the railroad men, the cellar of the Bishop's palace was devoted, half and half, to a cesspool and a cistern, from the latter of which was drawn all water, for drinking and other purposes, used in the sacerdotal ménage, the two receptacles being divided by a thin wall.

Colon was called by the French, "the white man's graveyard." Its founders selected for the site of the town a morass on which eleven feet of water fell annually, and its streets—which were almost waist deep in mud during the rainy season lasting eight months of the twelve—served the functions of a sewer as well as that of a thoroughfare, the householders conveniently disposing of their garbage and offal through the front door. The other settlements of the Canal Zone were as lugubrious as Panama and Colon. The people depended largely on unprotected cisterns for their water supply, filled during the wet season, and on barrels filled from neighboring streams, all breeding places for mosquitoes. The filth of ages had accumu-
lated around the dwellings and in the streets, undisturbed except when washed away by torrential rains. Pools of stagnant water had existed for years in proximity to dwellings, and insect-breeding swamps lay undrained adjacent to the cities and many of the towns. Owing to the fact that the Panama natives never looked beyond their present necessities, no food ever accumulated on the Isthmus, and in the summer of 1905 this disastrous condition was augmented by an almost total failure of the crops for the two preceding years, by the abandonment of agricultural laborers of the farms back in the hills for work on the Canal at better pay for shorter hours, and by quarantine of the port of Panama because of bubonic plague, which prevented the delivery of foodstuffs from neighboring provinces.

Such were the physical conditions at Panama when the railroad men, under the direction of Theodore P. Shonts, Chairman of the Second Isthmian Commission, assumed control.
CHAPTER III

THE RAILROAD MEN TAKE CHARGE

I first heard the name of Theodore P. Shonts, who that year became a national figure, in March, 1905, at which time I held the position of assistant chief of the Bureau of Insular Affairs which dealt with civil matters in the War Department. The President had some time before reached the conclusion that the First Isthmian Commission, of which Rear-Admiral Walker was Chairman, had not—to use the language of Mr. Taft—"so developed itself into an executive body as to give hope that it might be used successfully as an instrument for carrying on the immense executive burden involved in the construction of the canal," and it was a matter of common knowledge that the formation of a new commission was under consideration. President Roosevelt had wisely decided to select a railroad man to head this
commission, for, after all, the big problem of the Canal was one of transportation—the moving of the excavated material from the cut to the spill banks, and the moving of sand, rock, cement, and iron to the points for the location of the locks along the route.

On March 18th, Secretary Taft prepared a letter, identical copies of which were sent to leading bankers and railroad and transportation men of the United States, whose assistance and advice the President solicited in the selection of a chairman for the proposed new commission—he having this Mr. Shonts, whom I had never heard of before, in mind for that all-important position.

Mr. Taft's inquiry was worded thus:

"I am charged by the President with making some inquiries concerning Mr. Shonts, at present the President of the Clover Leaf Railroad, with a view to learning his qualifications for carrying on, as the chief executive, the great work of constructing the Panama Canal.

"I am informed that Mr. Shonts has had much experience in works of construction, and has shown the capacity for pushing things and making
work go that is so much needed in an enterprise like that of building the Canal.

"Would you be good enough to give me your estimate, confidentially and privately, for reference to the President, of Mr. Shonts' capacity for this work? Mr. Shonts is not an applicant, and I am not certain that he would accept the appointment if tendered him, but before tendering it I should like to get the judgment of men who know him.

"An immediate answer to this would greatly oblige me."

The men to whom transcripts of this letter were sent were William H. Newman and William C. Brown, then respectively President and Vice-President of the New York Central and Hudson River Railroad Company; the late Corwin Spencer, at that time connected with the Louisiana Purchase Exposition at St. Louis; the late Edwin Hawley, President of the Iowa Central Railway; Wm. A. Read, of Wm. A. Read & Company, and the late Gordon MacDonald, of Speyer and Company, New York bankers; Oscar G. Murray, President of the Baltimore & Ohio Railroad; the late Robert Mather, Chairman of the Executive Committee of the
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Chicago, Rock Island & Pacific Railroad; Gen. Thomas H. Hubbard, of the International Banking Corporation of New York; and the late H. S. Redmond of New York.

The replies to Secretary Taft's letter¹ gave me a lively interest in the personality of Mr. Shonts, for it had been my observation that when a confidential inquiry is made among men as to the ability and integrity of an individual, at least two thirds of the responses are what is known in the vernacular as "knocks"—a condition due not solely to temperamental biliousness but also to the circumstances that the endorser of another's character is in the same mortal position as that in which he would find himself pecuniarily if he had endorsed his note, in the event of a default. In the instance of Mr. Shonts, however, every one of the men to whom the Secretary of War addressed his inquiries made reply that the President of the Clover Leaf was exactly the man to build the Panama Canal.

On the day the last one of the responses was received, Mr. Taft at once went with them to

¹ See Appendix, page 363, "Some Letters about Mr. Shonts."
the White House. On his return half an hour later I learned through Colonel Edwards, the Chief of the Insular Bureau, that Mr. Shonts had been offered the job.

The offer of the chairmanship of the new Isthmian Commission was cabled by President Roosevelt to Mr. Shonts, and reached him on March 25th while he was cruising in West Indian waters on the United States dispatch-boat, Dolphin, with Senator Hale of Maine, and Representatives Cannon of Illinois and Meyer of Louisiana, as guests of the late Paul Morton, Secretary of the Navy. The message was delivered on board the Dolphin at Guantánamo, our naval station on the southeast coast of Cuba. The offer came as a complete surprise to Mr. Shonts, for Mr. Roosevelt had requested him only a short time before to give an opinion as to the respective merits of two candidates for the chairmanship of the Commission he was himself now asked to accept. However, there was ample opportunity to consider the proposition during the several days that elapsed before Secretary Morton and his guests went ashore at Fernandina, Florida, where they took train for Washington.
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The President's message being in no sense a confidential one, the pros and cons of the Canal project were a frequent topic of conversation among the *Dolphin*'s passengers during the last week of their cruise. The President of the Clover Leaf, who had previously confined his activities to the construction and operation of railroads, was a novice in politics; and what the sophisticated politicians on the dispatch-boat told him about the deadly handicap upon efficiency that bureaucracy and red tape proved to be in the transaction of governmental business, did not tend to engender within him any lust for the Panama job. The day before the *Dolphin* reached Fernandina, Mr. Shonts told the others on board that he had about decided to decline the President's offer.

"You are dead right," said Mr. Cannon. "Unless you can get assurances from the President that you shall have absolute control at Panama; that you are to conduct operations exactly as if the Canal were a private enterprise of your own, you couldn't get the work done in twenty years. Politics is the greatest menace to the Panama project, and you can't keep it
out of politics—unless, as I say, the President will give you absolute control of every detail of its construction and of the affairs of the entire Canal Zone."

The Morton party reached Washington on the morning of April 1st, and Mr. Shonts went immediately to the White House to keep an appointment with Mr. Roosevelt made by telegraph the previous day. The President greeted his visitor with even more than his usual cordiality, and then got right down to business.

"Well, Mr. Shonts," he said, "I hope that you have come to tell me that you are prepared to accept the chairmanship of the Isthmian Commission."

"I have an idea, Mr. President," Mr. Shonts replied, "that when you learn the conditions under which I am willing to accept your offer, you may withdraw it. One of the troubles with the present Commission is that it has too many heads, for there is bound to be friction so long as responsibility is divided. I cannot accept the chairmanship of the new Commission, therefore, unless it is understood that I am to have absolute authority as to both men and
measures in the work of the construction of the Canal—subject only to your approval. Under other conditions I do not care to assume the enormous burden or responsibility involved in the great enterprise you have undertaken.”

The President listened to his visitor, nodding his approval of every sentence he uttered, and as soon as he had concluded threw open the door of his office and invited in the newspaper correspondents, representing the Fourth Estate of the Nation, whom he had summoned with the promise of important news that morning.

“Gentlemen,” he said to them in tones that indicated a high degree of satisfaction, “allow me to introduce the Chairman of the Second Isthmian Commission, who is to have absolute control in the construction of the Panama Canal.”

When the correspondents had hurried away to send to the afternoon newspapers the information that the task of excavating the waterway between the Oceans, with absolute authority as to men and measures, had been assigned to a railroad man of the Middle West, Mr. Shonts told the President that there was another
condition under which he entered upon the undertaking.

"Of course," he said, "it is at a material sacrifice that I give myself up to the Canal enterprise, for I shall be compelled to neglect weighty interests of my own. On the other hand, I appreciate the compliment implied in choosing me to head a project in which the national honor may be said to be involved, and, indeed, consider the performance of the task I have assumed to be a patriotic duty. Nevertheless, I must ask you to allow me to return to the conduct of my own affairs as soon as the work of the construction of the Canal is under full headway, with all mechanical problems solved and an organization effected capable of carrying the scheme to its consummation."

Mr. Roosevelt was inclined to object to Mr. Shonts' second condition, but he finally consented to it. Mr. Shonts lost the glory that now pertains to Colonel Goethals by asking the President to release him from the Canal organization after its construction was under full headway early in 1907, but he did not surrender control at Panama until convinced that the
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completion of the work was merely a matter of routine that might be accomplished by any highly competent executive.

It may be mentioned incidentally that nine months after Mr. Shonts' acceptance of the chairmanship of the Second Isthmian Commission, when under his energetic administration it had extirpated yellow fever from the Canal Zone; provided the workers of all grades with suitable and sanitary quarters; converted the Panama Railroad from an antiquated, inadequate, and dilapidated relic of an earlier century into an up-to-date system; built new wharves, equipped with modern mechanical appliances at both terminals; erected extensive warehouses and machine shops, and expended some $10,000,000 in the assembling of an operating plant for the actual work of excavating the Canal, certain members of Congress began to interest themselves in the fact that he was in receipt of a salary as President of the Clover Leaf Railroad, in which he was a large stock-holder. In spite of the fact that he was doing fourteen hours' work per day for the Government as Chairman of the Isthmian Commission, and that he had
delegated his duties as President of the railroad to his associates, our sapient legislators seem to have believed that he might accomplish more if his nominal connection with the Clover Leaf was terminated. Mr. Roosevelt mentioned this circumstance to Mr. Shonts with many apologies, but asked him how he felt about discontinuing his railroad salary.

Mr. Shonts remarked—with an element of logic, it will be admitted—that it was the Clover Leaf people who ought to object to continuing his salary.

"However," he said, "I shall do nothing to embarrass you in the construction of the Canal, and if it becomes necessary I will drop the Clover Leaf salary. I will even dispose of my holdings in the railroad if that will facilitate matters at Panama. The paramount issue with me at present is the Canal."

The President suggested that the matter be left in abeyance a few weeks. It was never brought up again, and Mr. Shonts remained the nominal President of the Clover Leaf during his connection with the Isthmian Commission.

On the same day that Mr. Shonts accepted
the chairmanship of the Second Isthmian Commission, April 1, 1905, and after a conference with him, President Roosevelt announced the names of the other six members. They were Charles E. Magoon, who was assigned to the governorship of the Canal Zone; John F. Wallace who, in addition to retaining his post as chief engineer of the Canal, was elevated to membership in the Commission; Rear-Admiral Mordecai T. Endicott, U. S. N.; Brigadier General Peter C. Hains, U. S. A. (retired); Colonel Oswald H. Ernst, Corps of Engineers, U. S. A., and Benjamin Harrod, the New Orleans civil engineer, who was the only member of the first commission to be named on the second.

The building of the Canal was nominally under the direction of the Secretary of War during the railroad régime, as it was in actuality afterwards. However, while Mr. Shonts was chairman of the Isthmian Commission, he consulted directly with the President on all matters pertaining to the Canal. Indeed, the Secretary of War began his famous trip to the Philippines simultaneously with Mr. Shonts’ taking charge at Panama.
Who Built the Panama Canal?

On the unexpected resignation of John F. Wallace as chief engineer, in June, John F. Stevens was selected by Mr. Shonts for the vacant position. Mr. Stevens had just resigned the vice-presidency of the Chicago, Rock Island, & Pacific Railroad, by reason of the fact that he had made a contract with the Insular Bureau at Washington to go to the Philippines and supervise for the Government the construction of a thousand miles of railway, bids for the building of which were to be opened the following December. The Government was glad to release him from his Philippine engagement, in order that he might accept the position of higher responsibility at Panama. Mr. Stevens ranked then, as he does now, among the foremost civil engineers in the United States.

There is no one of his associates in the Canal Zone during the railroad régime, who will not to-day talk about John F. Stevens by the hour—given the opportunity. His previous professional achievements were known to every engineer on the Isthmus, from the heads of divisions to the tyros just out of college, and he immediately demonstrated his capacity there by devising
the spoil-removal system, which Colonel Goethals declared no Army engineer would have been capable of, whereby all tracks leading from the cut were so located that the excavated material moved on a down grade to its final disposition. Under the personal direction of the Chairman of the Commission, Mr. Stevens, as chief engineer, was in charge of the important department of engineering and construction. He was a man of serenity and calm, who never hurried and was always ahead of his work, qualities that captured the fancy of the workers under him, skilled and unskilled. It was his personality that inspired the industrial army at Panama with the enthusiasm that Colonel Goethals was so fortunately able to retain in it, and which has made it the best working force ever got together in a tropical country. It was Mr. Stevens who began the practice that Colonel Goethals has wisely continued, of allowing access to him of the humblest laborer who had, or thought he had, a grievance. It was Mr. Stevens also who showed how to deal with a strike on the Isthmus, using the arbitrary power of the United States Government in the Canal Zone to deport those
steam-shovel engineers who, in 1906, attempted to take undue advantage of the labor situation.

Upon the resignation of Mr. Shonts as Chairman of the Isthmian Commission, Mr. Stevens was appointed to succeed him, while he still held the position of chief engineer. However, he resigned both offices after a short time for reasons best known to himself, having during the two years of his administration demonstrated beyond question that the successful construction of the Canal was an assured fact. There are engineers living to-day who believe that Mr. Stevens' resignation cost the United States Government millions of dollars. When Mr. Stevens resigned from the Isthmian Commission, he was given a "send-off" at Panama such as few men have ever received from others employed under them, the skilled workers on the Canal uniting in a testimonial that included an album containing 10,000 signatures.¹

In an address before an audience of engineers in Chicago last winter, Lorenzo D. Cornish, who worked on the Canal as designing engineer under both Mr. Stevens and Colonel Goethals,

¹See Appendix, page 358, "Farewell to Mr. Stevens."
John F. Stevens.
Chief Engineer of the Panama Canal, 1905-1907
paid a tribute to the chief engineer during the railroad régime at Panama, that is the more valuable in that it was a disinterested testimonial at a period when the fashion was to render praise only to his successor. "Much has been said of the loyalty and esprit de corps shown by the men of the organization on the Isthmus, and to the speaker none of the achievements of John F. Stevens was of greater value to the work as a whole than that of having engendered so deeply in his men that spirit of pride and loyalty to himself and the work that it has endured and grown, until now loyalty to the job comes first in the hearts of every Canal employé," said Mr. Cornish. "The love of his men for John F. Stevens is past understanding, and the greatest regret of hundreds of the old-timers on the Canal is that he has never returned there to give them the opportunity of welcoming him by an ovation never yet accorded to any other personage."

On leaving the Canal organization Mr. Stevens was made vice-president in charge of operation and maintenance of the New Haven railway lines, and subsequently president of a railroad
Who Built the Panama Canal?

William Grant Bierd, to take charge as general superintendent of the operation of the Panama Railroad. It was Mr. Bierd who invented the track-shifter—now in use throughout the world in railroad construction where "filling in" is necessary—which saved the expenditure of some $8,000,000 in the construction of the Panama Canal, and increased the output of the steam-shovel battery at least fifty per cent. The speed with which a steam-shovel can work is measured by the rapidity with which the spoil trains are unloaded. The disposition of the spoil at the dumps requires the constant shifting of the tracks, which, previous to Mr. Bierd's invention, was done by hand by labor gangs, while the trains waited, and the steam-shovels waited for the trains' units, the cars. It would have required fully 4000 additional laborers daily to do the track-shifting on the Canal for the seven years that the mechanical track-shifter was in use, and their wages alone would have amounted to more than the amount I have mentioned as saved by Mr. Bierd's invention. Mr. Bierd to-day is President of the Chicago & Alton Railroad.
The Railroad Men Take Charge

The Oregon Railway and Navigation Company, a part of the Harriman system, contributed its general auditor, Ernest S. Benson, to the Canal organization, where he assumed control of the accounting department. Walter G. Tubby, for years general storekeeper of the Great Northern Railroad, left that position to perform the same duties at Panama. He has recently gone into business in San Francisco, after having for several years held the position of manager of the marine department of the Union Oil Company of California. The late Jackson Smith, whose death occurred soon after he left the Canal Zone in 1908, had had a very extensive experience as railroad contractor and in other capacities with construction labor, and he took charge of the department of labor and quarters.

Joseph G. Holcombe, who at the time Mr. Shonts was recruiting his captains for Panama had just returned from the Philippines was then executing an engineering commission for a firm of railroad contractors, and who had previously done work for the Government at Nicaragua, was made head of the division of municipal
engineering in the Canal Zone, carrying through and bringing to completion the work initiated in 1904, as well as all engineering operations connected with the work of sanitation of the Isthmus. He is now practicing his profession as civil engineer in New York. Richard Reid Rogers, a specialist in railroad law, practicing in New York, was made general counsel to the Isthmus Commission and the Panama Railroad; he still holds the latter position, and is also general counsel to the Interborough Rapid Transit Company of New York.

Three other engineer appointees of Mr. Shonts, who worked on the Canal until its completion, are responsible for the greatest mechanical achievement in connection with the big ditch. They are Lorenzo D. Cornish of Chicago, who designed and supervised the construction of the lock chambers; Henry Goldmark of New York, who designed and supervised the construction of the miter gates for the locks, and Edward Schildauer of Wisconsin, who designed and supervised the construction and installation of the machinery for the operation of the gates and the towing of the vessels through the locks.
Some of our national legislators made strenuous objection to the $10,000 per annum salaries paid to the heads of departments at Panama under the railroad régime, as well as to the $30,000 salaries paid to the chairman and the chief engineer. Senator Bacon, of Georgia, insisted that no Canal official ought to be paid more than a Chief Justice of the United States, whose salary was $15,000 a year—that of a Senator being $7,500. "Ten thousand dollars a year," complained Mr. Bacon, "is paid the auditor of Canal expenditures, and his work comes here for supervision and correction and approval by an auditor of the War Department, an officer who gets $4,000 per annum under the Government. The auditor of Canal expenditures gets $10,000; the Secretary of War at the head of all this business gets $8,000." Senator Bacon and the others of his way of thinking were somewhat surprised when they learned that Mr. Wallace, whose salary as chief engineer of the Canal was $25,000 per year, was being paid $75,000 per year by the Westinghouse Company; they were enlightened as to what might constitute a man's value to his employers.
when Mr. Shonts, before a committee of the Senate, showed them how Mr. Ross, the purchasing agent of the Isthmian Commission at $10,000 per year, had saved the Government of the United States more than $240,000 in a few weeks in three purchases of material. The incident is thus reported in the *Congressional Record*:

Mr. Shonts. I will say that he (Mr. Ross) saved $193,000 in one purchase from the lowest bidder after he had the bids in and opened.

Senator Tillman. Will you explain that, please?

Mr. Shonts. He did that by pointing out to them where they were charging us more than they would for different items entering into the construction of the cars and engines that were concerned. The bidder himself—the lowest bidder—came down in his bid and saved the Government $193,000.

Senator Hale. Which you would have spent if simply taking the figures of the lowest bidder as they came in?

Mr. Shonts. That is it, exactly.

The Chairman. In case an unskilled man had been purchasing agent?

Secretary Taft. Yes, sir; in case an unskilled man had been purchasing agent.
The Railroad Men Take Charge

Mr. Shonts. Or a skilled man, if he had not known all these items and the relation they should bear to each other. In three items, in three purchases, we have saved, according to an account I have kept, over $240,000.

Mr. Ross saved the country another three quarters of a million dollars—$751,124.61, to be exact—by introducing into his department the American railroad purchasing system, whereby a deduction of one tenth of one per cent. per day, as liquidated damages, is made on payment for material and supplies, delivery of which is delayed beyond a specified time.

Another conspicuously valuable investment on the part of the Government, in the services of a railroad man, concerns the achievement of Mr. Williams, disbursing agent of the Canal from November, 1905, to October, 1913, during which period he paid out $250,000,000—the largest sum ever expended in the same time, unless for the expenses of a government—without making an error. Mr. Williams saved the United States approximately $750,000 during his eight years with the Canal, on a salary of $10,000 per annum. At my request he has
written the following brief sketch of his successful essay in finance:

"I found in existence, on my arrival on the Isthmus, what was known as 'the bankers' agreement,' made by Secretary of War Taft, in which four banking houses in Panama City were concerned. This agreement required the disbursing officer of the Isthmian Commission to obtain all his money from these four firms, the Panama silver being taken at its par value of two for one in United States money, to be exchanged for drafts on the United States Sub-Treasury at New York, where my account was then kept, while for each dollar of United States money required for payment on the Canal, also to be obtained from these four banking firms, we were required to pay three quarters of one per cent. premium. During this year, from April 1, 1905, to April 1, 1906, this premium amounted to $24,409.95. Had the bankers' agreement been continued up to the present time, it would have cost the United States approximately $700,000, while at one per cent. it would have cost us more than a million dollars, while the gold rolls would have cost us $5,000 per month, or $60,000 per annum.

"I at once saw the disadvantage of this agree-
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ment from the point of view of the United States, and did my best to prevent its renewal at the end of the year, when it was to expire. To my great surprise I found that the bankers had so worked on the fears of Mr. Taft that when they refused to entertain a renewal of the three quarters of one per cent. contract, he was considering its renewal with the premium increased to one per cent. on gold in United States money needed by the Isthmian Commission. I immediately placed the matter before Mr. Shonts, the chairman of the Commission, and explained to him that by ordering gold coin from the United States, to arrive at the expiration of the bankers' agreement, and by loading up on Panama silver in advance and using Panama silver only for the payment of claims in amounts of less than five dollars, I would soon have the bankers, who were ill-supplied with vault room to care for the silver, on their knees begging me to take the silver off their hands. After they had had their own troubles on this account they 'came across' and were ready to supply me with all their surplus funds, taking in exchange the disbursing officer's drafts on the Sub-Treasury at New York at par, thus removing absolutely every charge for the payment of the premium on all disbursements, money itself being delivered by them at their own expense.
vaults in Panama. This arrangement is still in force. I might add that the Panama bankers also had a scheme to have the Panama silver retired and to use only United States gold. If they had succeeded in getting the new contracts they desired, they would have forced us to pay a premium on all disbursements."

With Mr. Williams reducing expenditures in the construction of the Canal by $750,000 in the disbursing department; Mr. Ross reducing them by approximately $1,000,000 in the purchasing department; and Mr. Bierd reducing them by $8,000,000 in the cost of excavation, it may be observed that the heads of departments on the Isthmus during the railroad régime at least paid their own salaries.

The fact has been mentioned that one of the first measures of Mr. Shonts after his appointment as Chairman of the Second Isthmian Commission was the creation of an organization in Washington, the Office of Administration, of which I was chief during the greater part of the railroad régime at Panama. Under the first Commission the Washington offices were located in cramped quarters in the Evening Star Build-
The Railroad Men Take Charge

ing at Pennsylvania Avenue and Eleventh Street. The office organization was entirely inad- adequate, and the failure of Admiral Walker's administration was largely due to the fact that the headquarters in the United States did not meet promptly the demands that came from Panama for material, supplies, and men. It is a fact, as has been stated, that the members of the Canal organization on the Isthmus were without sufficient authority or funds to carry on their work, but even with authority conferred and funds in hand the Washington office proved an ineffective instrument in responding to demands from the Canal Zone. Therefore, with the coming in of the railroad men, whose policy was to centralize responsibility and work on the Isthmus, it was essential to have a competent force of men in Washington to act on instructions from Panama. In looking over the field from which officers experienced in such work might be recruited, Mr. Shonts naturally turned to the newly created Insular Bureau of the War Department, which had been developed as a result of our war with Spain. This Bureau was the home office of the governments of
Cuba, Porto Rico, and the Philippine Islands, charged with their representation in the various branches of the Government at Washington, and also with such duties as the shipment of materials and supplies, recruiting of their civil-service employés, and their fiscal affairs in general.

This being similar to the work to be done for Panama under the new policy, Mr. Shonts, after a conference with the President and the Secretary of War, made an arrangement whereby the chief and assistant chief (respectively Colonel Clarence R. Edwards and myself) of the Bureau of Insular Affairs should act in the same capacity for the new Office of Administration of the Canal, but this disposition of control proving unsatisfactory, Colonel Edwards devoted himself exclusively to the conduct of the Insular Affairs and I to those of Panama. We now took a long lease of a newly constructed eight-story office building opposite the State, War, and Navy building in Washington, and an adequate and efficient office force was organized. Here Mr. Ross, the purchasing agent, with his two assistants, C. E. Dole and Mansfred Fuhrer, and
Theodore P. Shents
Chairman of the Second (The Railway Men's) Canal Commission. 1905-1907
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and he was making preparations for the inauguration in the Canal Zone of the several administrative departments as they existed in Washington, with a view to a secretary of state, an attorney general, a postmaster general, and the others, his thought being the enlightenment of those Latin-Americans who might visit the scene of Canal construction. Mr. Shonts had been made aware of Governor Magoon’s proposed educational propaganda, as of nearly everything else that was going wrong in the Canal Zone, before his arrival. Nevertheless, things as he ascertained them to be during the first few hours after he reached the Isthmus were so much worse than he had anticipated as to rouse the ire of the veteran railroad builder, who had made concentration of effort and efficiency in the use of men and materials his first principles. However, Mr. Shonts did not begin to “talk business” until after dinner, when General, then Colonel, Gorgas having been summoned, the two, with Mr. Stevens, Mr. Ross, and Governor Magoon, held a conference on that official’s porch, protected from mosquitoes by three thicknesses of wire netting.
"Governor, what's the matter down here?" Mr. Shonts inquired, abruptly, when cigars had been lighted.

Mr. Magoon replied that everything was the matter; that all the American employés who were able to get away had left the Isthmus by reason of yellow fever and because of doubt as to whether the Canal was really to be built; that those who remained had most of them left the United States originally for the United States' good; and that none of the employés were able to make enough to buy food.

"Why haven't their wages been raised then?" the Chairman asked.

"We have raised their wages twice," Mr. Magoon answered, "but each time the Panama merchants have raised the price of supplies."

"If that's the situation, we will have to sell supplies on our own account," responded Mr. Shonts.

"We can't do that," explained Governor Magoon, "because, under an executive order of the War Department, we are obliged to purchase our supplies from the Panama merchants."

"Nevertheless," repeated Mr. Shonts with
emphasis, "if the Panama merchants are taking advantage of the Canal employés in the manner you have stated, we will have to establish commissaries of our own."

"Mr. Chairman," said the Governor, "it will be impossible to establish commissaries to sell supplies, as you suggest, because it will be in violation of an order of the War Department."

Mr. Shonts refused to be impressed by the other's argument. He laid aside his official manner when he said:

"Judge, it's evident that you haven't heard the news."

"What is the news?" inquired Governor Magoon, with some perplexity.

"What do you suppose I've come down here for?" was Mr. Shonts' reply. "I've come down here to build the Canal and you'll excuse me for saying that if there is anything in that War Department order that is going to hinder or hamper us in building it, why, so much worse for the order."

Now he turned to the chief engineer. "Stevens," he said, "you take an engine and a car to-morrow morning, and load up all the food
supplies from our commissary in Colon; then go along the line and condemn a building where you can find one satisfactorily located, and plan to distribute these supplies to the Canal employés at cost. I am going to organize immediately for a permanent supply of food stuffs, which we will sell regularly to our men for what it costs us to have it delivered here."

"Why!" exclaimed Mr. Magoon, aghast, "you'll have every merchant in Panama up in protest."

"You just let your Panama friends protest all they want to," Mr. Shonts advised him. "When they begin, I'll give you something to do. You can listen to their protests and refer them to Washington, and I am willing to go to the mat with Congress whenever it is necessary, on this proposition—that we have a right to sell our own supplies to our own men.

"There's another thing, Mr. Magoon," the man continued. "I see that you have a duty that one of your duties here is to build a government for the edification of our own neighbors. Now, I'm going to tell something: That is not one of your duties
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at all. We are not going to have any more government here than is absolutely necessary to preserve order. Our sole purpose on this Isthmus is to build the Canal, so 'keep your eye on the ball.' We are only going to do the things that are absolutely necessary to get the work done we came here to do."

Mr. Shonts now turned to General Gorgas and asked:

"Are you making progress in stamping out yellow fever?"

"No," said the General, despondently. "I'm not making much progress. In fact conditions are getting worse than ever."

"How are you going about the work?"

"We are disinfecting the houses in which patients die of the fever; sometimes the houses on both sides also."

"Have you done anything toward cleaning up the Isthmus?"

"No. You know that filth has nothing to do with the spread of yellow fever. It is transmitted only by the female of the stegomyia."

"Now, Dr. Gorgas," said Mr. Shonts, with some heat, "you heard what I just told Magoon
—that we are not down here to build model governments for educational purposes. We are not here to demonstrate any theories in medicine, either. I don’t care whether filth has anything to do with this disease or not, but I come from the Middle West and we have a notion out there that cleanliness is next to godliness, and I believe that at times it may have some little effect on health. You are a soldier, and you know how to obey orders. How many men are there in your department?”

“About 200,” replied the General.

“We can’t build the Canal until Panama is made a safe place for men to work in, and I am going to build up your force ahead of everything else,” Mr. Shonts announced. “I am going to give you 2000 men in place of your 200 to start with, and will increase the number to 3000 or 4000 if that becomes necessary. I don’t care how many are required, or how much it costs, but this Isthmus is going to be cleaned up as quick as God will let us do it. Now, I want you to begin to disinfect, not only the houses in which yellow fever patients die—and when you are liberal, the houses on each side,—but I want
you to commence with the Palace in Panama and disinfect every house in that city and in Colon down to the lowest hovel. And when you get through begin at the Palace again, and repeat the process until I tell you to stop. I want you to clean out every cesspool on the Isthmus and fill them up, and take the rain water barrels away from the houses. We are going to build a chain of reservoirs and connect them up, and put in modern sewers, and we are going to pave the streets of Colon and Panama. And just because we own the old French administration building in Panama is no reason why we should occupy it as an administration building. The headquarters of this Commission is going to be on the line of the work along the route of the Canal.

"Colonel Gorgas," the Chairman continued, returning to the original topic of his conversation with the head of the sanitary department, "I understand that yellow fever may be wiped out by the destruction of one generation of the stegomyia mosquito. What is the life of the stegomyia?"

"From three to four months—four months is the outside limit," the chief sanitary replied.
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"Very well," Mr. Shonts responded, "I notify you now that by the time the present generation of the stegomyia die, yellow fever must be stamped out on the Isthmus of Panama. Make your requisitions for whatever you require at once. They will go to Washington by cable, and your materials sent here by the first steamer leaving New York for the Isthmus after their purchase. Don't consult me as to the stuff you need; that's your end of the business. And don't consider expense. Any requisitions you make as chief sanitary officer will be honored immediately and without question."

Before he retired that night Mr. Shonts issued orders for a meeting of the heads of departments in the Canal organization, in the chief engineer's office in Panama, at two o'clock the next afternoon. Information that this meeting had been called spread throughout the Canal Zone, accompanied by a rumor that it was to be the occasion for announcing the abandonment of the Canal project.

To the surprise of the onlookers before the chief engineer's office the next day, the men who came into the street when the meeting was over,
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instead of wearing doleful faces and shaking despondent heads, were clapping one another on the back and shaking hands. A thrill traversed the Isthmus. The news was that the Canal was a liver proposition than ever; that the new head of the Commission, with full powers guaranteed to him by the President of the United States, had pledged himself to a business administration of Canal affairs with politics and red tape eliminated, and that the sanitation of the Canal Zone and the welfare of the employés were to be the initial features of the new program.

There was, however, one point in the address delivered to the heads of departments in the chief engineer’s office that they did not talk much about except among themselves; that point was team work. The new Chairman of the Commission had laid considerable stress upon the urgent necessity for all members of the Canal organization to pull together, and his intimation that the room of those unable to comprehend that necessity would be preferable to their company in the Canal Zone did not fail to have effect.

Mr. Shonts devoted a week to familiarizing
himself, so far as was possible in that limited time, with the situation on the Isthmus before beginning actual activities, the primary task of the railroad men, as has been stated, was to create a modern state in a ten by fifty mile stretch of tropical wilderness, scourged by deadly fevers and pestilence, and practically uninhabitable by natives of other climes. The magnitude of this task did not diminish on intimacy with its details. Before the Canal Zone could be made a place fit to live and work in, three hitherto insoluble problems had to be solved—that of the thorough sanitation of the Isthmus; of suitable habitations for all classes of employés, from heads of departments to negro laborers; of a food supply that would afford to all the workers opportunity to obtain fresh meat and vegetables at reasonable cost.

Perhaps the most pleased member of the Canal organization over the inauguration of the new and vigorous administration of the affairs of the Zone was the chief sanitary officer. General Gorgas, as has been mentioned, had been on the Isthmus a year when the railroad men arrived. He had been present in Cuba in 1900
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when the experiments were made that proved the stegomyia mosquito to be the only medium for the transmission of yellow fever, and he had himself rid Havana of the dread disease in 1901, but the Army and Navy Commission had refused to allow him the sinews of war for the fight on the mosquito at Panama. As the result of the instructions given by Mr. Shonts to General Gorgas on the night of the Chairman's arrival in Colon, the sanitation machinery on the Isthmus was set in motion. While malaria and Chagres fever were venomous ills at Panama, yellow fever was the paramount obstacle to the construction of the Canal.

Under the direction of General Gorgas 3500 men were put to work on sanitation. Panama, Colon, and the towns, villages, and labor camps in the Canal Zone were fumigated over and over again, at first house by house, to stop the spread of the disease, and afterward as units, one city, village, or camp at a time. In June, 1905, there were 62 cases of yellow fever on the Isthmus; in July 42; in August 27; in September 7; in October, the worst month of the year for the disease, 5; in November 3, and in December 1.
Since December, 1905, there has been no case of yellow fever in the Canal Zone that originated there. There have been a few sporadic cases on the Isthmus since that time; but only where the disease was brought in from the outside, and in every instance the patient has been segregated and there has been no infection. The method of fumigating was to give the occupants of a house a few days' notice, when a brigade of sanitary workers in charge of an inspector would appear on the scene. The house would be made as nearly smoke-proof as possible, all cracks and openings in the structure being sealed with strips or sheets of paper, attached with paste. Iron pots on brick supports containing pyrethrum powder or sulphur were placed in each room, ignited, and left to smolder from two to four hours. The doors and windows were then opened, and as soon as the smoke cleared sufficiently for the laborers to remain in the house the floors were swept, and the sweepings, containing the dead and dying mosquitoes, were carried into the street and burned. All paper pasted upon the house was then removed, and it was usually left in a much
cleaner condition than before the fumigation took place.

The people of Panama, themselves immune to yellow fever, submitted patiently and uncomplainingly to the annoyance and inconvenience of these sanitation operations, but the fact that there were outbreaks of bubonic plague at La Boca in June and August—which were promptly stamped out in the initial stages—had something to do with their accepting the situation calmly. The diplomacy of Mr. Magoon, who, as Governor of the Canal Zone, was looked upon by the Panamanians as the embodiment of the power of the United States, had considerable influence in inducing the people to put up with what many of them considered to be a foolish and useless, as well as an annoying, proceeding. Big of stature and imposing in manner, Governor Magoon was just the man to impress the somewhat simple natives of the Isthmus, and their respect for him and his office was of no slight value in the reconstruction of conditions in the Canal Zone, other than in the work of sanitation.

Illustrative of the persistence and care with
which Yellow Jack was followed up on the Isthmus; new foci of infection discovered, and
the disease stamped out before it assumed serious proportions, the following extract from the
1905 report of the Commission seems worth reproducing:

"Whenever a fever case is reported, the house in which it occurred is immediately fumigated, as
is the adjacent property. In addition to this, every effort is made to trace the movements of
the patient during the days immediately preceding the contraction of the disease, and if it
seems probable that he became infected in any other house or building it is also fumigated.
This work of tracing the previous movements of patients in order to discover the centers of
infection is often hampered by extraordinary difficulties, in overcoming which much ingenuity
has been displayed. In one instance a man was reported ill at a hotel where he was regis-
tered. When search was made for him he had disappeared. The next day he was found drunk
on the street and sent to the hospital, where, after his case had been diagnosed as yellow fever,
he became delirious and died. He had stated that he had been at the hotel all the time, but
there it became evident that he had contracted
the fever elsewhere. The man was dead, nobody knew him, and apparently no information was obtainable. It was known, however, that other men of the same nationality as the deceased were in the habit of visiting a certain café. Everyone of his countrymen in this establishment was questioned. At last a man was found who stated that he had seen him with an Italian. Then every Italian who could be found in town was interviewed, and finally one was discovered who said he had seen the deceased with the bartender of the theatre on two occasions. The bartender was looked for and could not be found. After a hard search he was located the following day. He was in bed and had yellow fever. He stated that the man who died of yellow fever, although registered at the hotel, had been sleeping all the time in the same room as himself in the theatre. It appeared probable that the theatre had been the center of infection, and it was accordingly fumigated. A few days later a third case was discovered, that of a little girl, who had been in the theatre every evening with her mother, thus confirming the indications which had already been acted upon. No other cases appeared."

Having banished yellow fever from Panama, General Gorgas devoted his entire energies to
the restriction of the ravages of malaria, since its abolition was impossible with seventy-five per cent. of the population of the Canal Zone carrying the germs of the disease in their systems, and the ten-by-fifty-mile area of territory breeding the anopheles mosquito in every part. He was so successful that before the railroad régime on the Isthmus was ended mosquitoes were so nearly exterminated along the line of the proposed Canal that during the dry season their number was negligible. During the rainy season, however, it was more difficult to keep the anopheles under control, for they reappeared as soon as efforts for their suppression were relaxed, and the fact was established that the cost of keeping them down would be a permanent annual expenditure. The 1907 report of the Isthmian Commission shows that up to the time the railroad men left the Isthmus the sanitation department had cut 16,000,000 square yards of brush; filled and drained 1,000,000 square yards of swamp land; burned 30,000,000 square yards of grass; dug 217,000 linear feet of ditches; laid 50,000 feet of tile ditches, and cemented 50,000 linear feet of ground. For a
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The Cut at Bas Obispo
distance of 200 yards around all settlements, marshes and swamps were drained, stagnant pools were oiled regularly to kill mosquito larvæ, and the doors and windows of all buildings in the Canal Zone were screened.

The work of the Sanitary Department under General Gorgas' able direction, which resulted in the extermination of yellow fever and a material reduction in the extent of malaria, comprised the necessary medical work, including the operation of hospitals, quarantine, and like measures, and the direction of a sanitary brigade charged with the duties of fumigation, cleaning of buildings and streets, and the elimination of localities for mosquito breeding. The other branch of the sanitation work, the municipal engineering construction, was carried on, under the direction of the successive chief engineers of the Canal, by an engineering division which had charge of the construction of aqueducts, sewers, roads, and pavements, while the sanitary engineering construction within buildings—that is, the installation of plumbing, previously unknown on the Isthmus—was carried on by the department of buildings, also under the direction of
the chief engineer. The two branches of work were entirely distinct, and, while the Sanitary Department could not have attained its final success without the installation of modern water supplies and sewers and the construction of paved streets and storm-water sewers, which prevented the collection of stagnant water, it should not be credited with the conception or direction of this work, which was planned by the First Isthmian Commission and carried on by the railroad men as part of the engineering construction in accordance with specific arrangements contained in the treaty between the Republic of Panama and the United States.

The erection of living quarters for the employés and supplying them with good food and pure water was accomplished during the same period that the sanitation of the Canal Zone was carried on. Employés of every grade, white and black, were given, free of rent, with free light and fuel, comfortable furnished houses. While many hundreds of these houses, of various classes and capacities, were taken over from the French, all of them had to be rebuilt and made sanitary, and in addition new dwelling houses
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and living quarters, hotels, restaurants, club-houses, schoolhouses, courthouses, post offices, jails, commissary buildings, fire-engine houses, shops, and railway buildings had to be provided.

Never in the history of the world has any government or any corporation made such comprehensive and exhaustive arrangements for the health and comfort of its common laborers as did the United States on the Isthmus in 1905 and 1906, and nowhere else on earth have rules of sanitation been so rigidly enforced, with such successful results. And in addition to all else, the railroad men established a system of government for the preservation of law and order with the result that, notwithstanding the fact that the Canal Zone contained a mixed population drawn from all quarters of the earth, serious crime was unknown, and arrests were mainly for petty offenses and violations of the sanitary laws. Aside from courts, schools, and places of religious worship, the Commission established such other essential appurtenances of civilization as bakeries and steam laundries.

Jackson Smith, head of the Department of Labor and Quarters, was, for a considerable period
during the railroad régime, the most unpopular man on the Isthmus among the white workers, this circumstance being due to his solution of the housing problem, whereby he became known as "Square Foot" Smith, a sobriquet that stuck to him during the five years he was at Panama. When Mr. Smith took charge of his Department, the assignment of quarters to the Canal employés was based upon influence or favoritism, which resulted in friction and jealousies. He decided to re-allot the housetoom completely, basing the amount of room given each man upon a ratio of one square foot of floor space to each dollar of his annual salary. Aware that this plan would arouse opposition, he submitted it to the chief engineer and to the Governor of the Canal Zone, both of whom approved it. Notices were then posted that on certain days certain houses would be evacuated by certain tenants and taken possession of by certain others; and, as this proceeding would naturally dispossess most of the favorites, a wail of consternation was heard across the Isthmus. The cable companies are the richer to-day by reason of the protests transmitted by wire to senators and
representatives in Washington on this occasion. However, "Square Foot" Smith gave no heed to opposition, and on the dates fixed the Department of Labor and Quarters carried out the plan for re-assignment, with squads of negroes in charge of American foremen, using force where force was necessary. From every source influence was brought to bear upon Mr. Smith to revoke his order and restore the favorites to their larger quarters, but without avail, and eventually the term "Square Foot" before his cognomen became one of respect rather than derision, for once in operation his housing plan worked perfectly and everyone recognized its equity.

"Square Foot" Smith never made a concession to anyone, no matter what his rank or position might be, with regard to the assignment of quarters. The story is told that just before he left the Isthmus, where he remained for a year after the railroad régime ended, a member of the Third Commission came to him with the information that a particular friend of his (the commissioner's) had just been assigned to duty on the Canal.

"There is a nice house near mine," he went
on, "which is something larger than he is entitled to under the rule. I think you can overlook the rule in this instance and give him that house."

"Mr. Commissioner," responded Mr. Smith, "I am leaving the department of Labor and Quarters next Tuesday. Your friend would better not apply for that house before Wednesday."

Another anecdote concerning Mr. Smith is told at the expense of a Member of Congress visiting the Isthmus, to whom the chief of Labor and Quarters had explained the square-foot theory of housing.

"I see," remarked the legislator. "Then if I were employed on the Canal I'd have 7500 feet of house room, based on my $7,500 salary."

"Scarcely," replied Mr. Smith, dryly, "I'm afraid they wouldn't pay you as much as $7,500 a year down here."

To create in the Canal Zone that essential of a modern state, a financial system, was the task of Mr. Williams, who has told in a previous chapter, how, by terminating the so-called "bankers' agreement," made by Secretary Taft with Panama bankers, and importing gold direct from
the United States, the Government was saved something like $750,000 during the eight years he was disbursing officer on the Isthmus.

Mr. Williams was one of the busiest men of the Canal organization. In March, 1906, he received a cable dispatch from Mr. Shonts, who was then in Washington, instructing him to take over the office of local auditor in addition to his duties as disbursing officer. These duties Mr. Williams continued until October, when another local auditor was appointed and a small part of the duties of the previous holder of the position assigned to him, while Mr. Williams was left most of the duties of the local auditor and all of those of the disbursing officer and treasurer of the Canal Zone. Later other duties of the local auditor were transferred to Mr. Williams, until he was in charge of all the general books of the Commission, classification of expenditures, property accountability and time and other inspections, in addition to the onerous responsibilities of disbursing officer and treasurer.

The expenditures made by Mr. Williams from the accession of the Second Isthmian Commission up to the end of the fiscal year, 1913, when
he left, by years, are as follows: For the fiscal year 1905, $6,070,320.02; 1906, $15,502,682.12; 1907, $26,012,594.13; 1908, $26,719,965.22; 1909, $28,352,528.26; 1910, $29,433,567.15; 1911, $29,673,032.99; 1912, $31,812,016.14; a total of $193,576,706.03, an average of approximately $24,000,000 annually.

This whole amount was paid by the importation of about $6,000,000 in gold. The money was paid out to the employés as wages and for supplies, and in a short time—three to four days—found its way back to the disbursing officer through the bankers and the post office money-order department, when it would be used again. Some of it was bound to get into other channels so that the supply had to be renewed from time to time. Great quantities of American money were carried off into the surrounding small republics because it had a staple value; but, although their money was very cumbersome, it was with great difficulty that we were able to introduce the gold from the United States at first. This was finally accomplished by calling our five-dollar gold piece the American pound. As it was worth forty cents in silver more than
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the English pound, it soon became very popular. With this as a wedge we were soon able to bring about the general use of our money down to the nickel. After the tramways were started in Panama the nickel was used quite generally. Our one-cent pieces are still very little used. Panama silver was cumbersome, each thousand dollars weighing about fifty-five pounds, so that when the pay train was loaded up to go over the line, the weight of silver needed to meet the payments for a day would be about forty tons.

At times Mr. Williams was forced to make payments at some remote spots. For instance up the Chagres River, the Commission maintained stations where the velocity of the river's current was being measured and the trips to pay the men were made by clerks who endured great hardships and had many adventures. One of the most striking of these adventures was encountered by a French pay-clerk named Page, who had performed the same service through the occupancy of both French canal companies. In shooting some rapids, miles from human assistance, his boat was overturned and got away from him, the money he had in charge
going overboard. After he had recovered the money from the bottom of the river, he was forced to wade the stream for three days, for the jungle was so thick on either side that it was impossible for him to make his way through.

During their first eighteen months on the Isthmus, the Second Commission, with the sanction of Chairman Shonts, spent $30,000,000 on the construction of the Canal, of which about $5,000,000 was for government and sanitation; $7,000,000 for construction of living quarters and other buildings, docks, wharves, railway enlargement, waterworks, and sewers; $12,000,000 for the permanent plant; $4,500,000 in materials and supplies, and more than $1,500,000 in sewers, waterworks, and paving in the Cities of Panama and Colon. The purchases by the Commission included not only the material entering into the permanent plant, but also that required for the preliminary work, and an idea of their magnitude may be gathered from the following principal items: 61 steam-shovels, 1300 flat cars, 12 rapid unloaders, 22 unloading plows, 13 earth spreaders, 324 dump cars, 12 hoisting machines, 120 locomotives, 5000 tons
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steel rail, 125,000 cross ties, 12,000 pieces of piling, 14 air compressing machines, 3 cranes, 152 rock drills, 30,000,000 feet of lumber (approximately), 2 dipper dredges, 646,000 pounds blasting powder, 617,500 pounds of dynamite, 7,000,000 paving bricks, 3,500,000 building bricks, 500,000 square feet roofing tile, 36,000 barrels of cement (approximately), 3 steel water tanks and towers, 12 stand pipes, and 2 ocean steamships.
CHAPTER VI

SOLVING THE LABOR PROBLEM

An anecdote related by a visitor to the Canal Zone early in 1906 gives negative expression to the American view of the West Indian negroes, who had been the mainstay of the French in the manual labor of canal digging, and remained the sole source of labor supply until after the railroad régime on the Isthmus began. This visitor was watching an ant-run, a four-inch-wide, insect-trampled, brown strip through the grass, near the bank of the Chagres River. Tens of thousands of ants were scurrying along this road, laden with bits of green leaves; they were staggering under their loads, pushing and helping one another, frantically energetic in making traffic move.

"Where do they all come from?" the visitor asked Division Engineer Holcombe.

The engineer looked at the ants and sighed
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wearily. "They don't come from Jamaica, I know that," he said.

And it was upon the Jamaican negro and others like him that it seemed at first as if the United States would have to depend absolutely for the excavation of an amount of dirt and rock at Panama, that it had been estimated would be sufficient to cover the whole of Manhattan Island to a depth of twelve feet.

Tales of the laziness and incapacity of the West Indian negroes seem incredible. The only reason that they came to Panama to work at all was because they regarded the Canal as a get-rich-quick scheme, since they were paid four times as much for a day's labor as they could earn at home. The big wages brought negro school-teachers, barbers, shoemakers and dry goods clerks, as well as men who had never done anything else than manual labor—and very little of that—from Jamaica, Barbados, and others of the West Indian islands, all determined to do as little as possible for the money they received, aside from which circumstance they were constitutionally incapable of the performance of what would be considered a day's work in the
United States. The best that railroad contractors have ever been able to get out of a colored day laborer in the tropics is one third of what the average white man will accomplish in the Temperate Zone, but Mr. Dauchy, the Division engineer of the Culebra division of the Canal, estimated that the West Indian negroes under him did only one fifth of a white man's work per day. An American magazine writer epitomized the colored laborer at Panama in 1905, as having all the childish irresponsibility of the negro, all the procrastination of the Spaniard, and all the stolid self-sufficiency of the Briton—under whose rule he had been reared.

Mr. Shonts tells a story, illustrative of the congenital lassitude of the colored man and brother in the Canal Zone. A foreman of laborers sent one of his men to the upper deck to disengage some tackle used in the unloading of a steamer at Colon. This accomplished, work went on. Ten minutes later the foreman noticed the laborer recumbent on the upper deck, at the point where he had liberated the tackle.

"What are you doing there?" the foreman demanded.
tie, and twenty-five of them to move an empty freight car on a level track.

The capacity of the black men of the West Indies for grandiloquent English was in inverse ratio to their ability as manual laborers, and they were very proud of their status as Britons.

“Don’t you dare to expurgate language of a blasphemous basis to me, I’m a British object,” protested one Jamaican laborer to a foreman, who had taken him to task in words that were perhaps unjustifiably forceful.

Disbursing Officer Williams, who was continually traveling over the Isthmus in his pay car, relates many instances of dictional achievement among these West Indians.

“I expediated my departure because I was subjugated to unessential domestic inconvenience,” an old Jamaican cook said to him, explaining why she had left her mistress.

A smart Barbados darky, who went home for the announced purpose of getting married, and returned to the Isthmus in a state of single blessedness, offered a sufficient excuse.

“I was prevented by circumstances over which self-control lays absolutely dormant,” he said.
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One day while Mr. Williams was making an inventory in an old French building at Ancon, he was warned by a West Indian carpenter against going too close to a wasp's nest under the rafters.

"Beware, sir," said the carpenter. "The wasp has a very warm bite."

On one occasion a negro ran along beside the pay-car that had left Gatun for Mindi and was gradually increasing its speed, when Mr. Williams asked him where he was going.

"I beg—to—inform you—sir," responded the wayfarer, gasping for breath in his effort to keep up with the train, "that—I am—going forward."

We cannot fail to sympathize with the Jamaican, who, picturing himself first as a spider and then as a grape, complains of conditions on the Panama Railroad, as follows:

"On the 13th of April of this Mounth and year I took the Train from Corozal. The Train was so compact that I could not even as a spider could sling on the step. I managed to hold a few chain But I have to let go on reaching Diablo. and then my hands begins to get tired. A Contract is an agreement between two or more
party to do and not to do a thing. I paid for the seven o’clock train to take me to Panama and the train fail to took to Panama. And there I have to walk my hat for three dollars and 75 cents was blown off my head, and one man pushed me and hit me on the head. Honorable sir then don’t you think that a passenger should ride on the train without standing on the step. And as God is in Heaven do you take a coach and have to stand on the step, as for the whole truth there was not enough coach accommodation for passengers. Suppose a wreck came what would become of those men that hangs like grapes outside sir. I have related the matter to the station Agent at Corozal from saturday night. While I beg you for your answer.”

The problem of labor for the construction of the Canal was almost the paramount one, that of the unskilled labor the most perplexing. Mr. Shonts and Mr. Stevens agreed that if the Canal was to be completed within any reasonable limit of time or expense, some other source for manual labor than the West Indies must be developed, not only to obtain a better grade and a surer supply, but to eliminate the sense of security the West Indian negroes possessed
in the assurance that they controlled the situation by virtue of a labor monopoly. There was no precedent for the assembling and caring for of the gigantic industrial army essential to the digging of the ditch across the Isthmus, and a field from which labor might be recruited without opposition did not exist. The United States was being developed in a vast and unending progression of great construction, mining, and agricultural enterprises that not only demanded all of our own labor, but was bringing workers from Europe at the rate of hundreds of thousands per year. The Southern cotton fields were demanding all of our own negro labor and more. Various complications rendered inadvisable the importation of Chinese or Japanese labor under contract, which was the only method that could have been applied in the use of that class of labor.

Under the rules of the Federal Civil Service, which governed the acquisition of the skilled labor for the Canal, absolutely unqualified men were sent down to take important positions at Panama. These incompetents were thus described by a magazine writer at
the beginning of the railroad régime on the Isthmus:

"The skilled laborers and the foremen immediately in charge of the laborers are men of sound sense, of somewhat adventurous spirit—of which their going down to the Isthmus is the best evidence—and of skill in their trades. But there is a set of men variously called 'superintending foremen' or 'superintendents' who are, for the most part, utterly incompetent. They apparently sought employment on the Isthmus because they were not worth their salt at home, where they were known. They are the laughing stock of the under-foremen and the skilled laborers and the despair of the engineers. When jacked up to make some sort of bluff at working, they moon around with an under-foreman, owlishly trying to learn from him the things in which they ought to be instructing him."

An anecdote of the Civil Service Commission of 1905, related by Mr. Cornish, the designer of the Canal locks, in an address before an audience of engineers in Chicago, last winter, probably seemed more amusing to him then than at the time the incident occurred. "In
the early days boiler-makers were badly needed, and a request for twenty was made in the regular way," said Mr. Cornish. "Some time elapsed, and the following cables passed between the Isthmus and Washington:

"'Why have you not sent boiler-makers, as per my cable?'

"The reply came: 'Forty applicants examined. All failed account of defective hearing.'

"Isthmus to Washington: 'Never knew of good boiler-makers that could hear. Send twenty of the deaf applicants as soon as possible.'"

At the beginning of the railroad régime at Panama the Civil Service Commission was holding examinations in different States for prospective Canal workers, and those applicants who made a satisfactory showing were sent to the Isthmus, and it was upon them that the mechanical, railroad, and engineering departments of the Canal organization had to depend for practical work. It was after Chief Engineer Stevens had received the second consignment of these Civil Service selections that he sent a cable to Washington: "I am not running a
training school to teach boys engineering and construction,” the message read. “What I want is men who can go to work when they get here.”

About this time eighteen men arrived on the Isthmus, who had been sent by the Civil Service Commission in response to a requisition for that number of track foremen. At the Culebra division they were examined by one of the resident engineers, who reported to the division engineer that he might possibly be able to use two of them. It turned out that only two of the eighteen had ever done any track work, and that had been done on the street railways in New York City. Sixteen of the “track-foremen” were returned on the same steamer by which they came, and the other two were retained as clerks in the medical department.

Civil Service methods of selecting labor, however wise in Governmental work, were entirely foreign to the railroad men’s methods; but in my opinion the weakness in that method at that time was due to the fact that the right sort of skilled railroad laborers would not voluntarily submit themselves to the Civil
Service Commission for examination. It was at that time not a question of sifting out candidates by examination or otherwise, but of persuading the right sort of men to accept the employment; and it was necessary to go out and look for labor,—a proceeding not contemplated under Civil Service regulations. Therefore the United States Civil Service Commission, after many conferences with the writer, exempted the skilled labor on the Isthmus from the requirements of Civil Service examination, and vested the selection of that labor in the Office of Administration of the Canal. Unskilled labor on the Canal never was subject to Civil Service requirements.

The securing of more and better skilled workers was the first step taken, the Department of Labor and Quarters at Panama cooperating with the Office of Administration at Washington and sending recruiting agents throughout the country. Upon the receipt at the Office of Administration of a requisition indicating the number and kind of men with regard to vocation needed on the Isthmus, one of these special agents would open an application bureau where trade conditions
were calculated to bring together the sort of artisan required, and advertise big wages for workers on the Canal. The names of the men the agent selected would be sent to the appointment bureau of the Canal Commission's office in Washington, when they would be sent direct from their homes to the Isthmus, the Government paying all expenses from the port of departure.

It was not an easy matter to get good men to go to Panama, even with the advantage of a big wage and a month's vacation with pay each year. Ambitious young mechanics, who looked ahead, realized that the Canal job could only last a few years at most, and that the great majority of the workers would have to come back to the United States to seek employment when the ditch was completed. Naturally the stories of death by fever and pestilence on the Isthmus that reached this country, exaggerated beyond the actual horrors of the situation, proved an effective deterrent. Often the mothers, wives, or sweethearts of men who had agreed to go down to work on the Canal would come to the employment agencies to beg
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tearfully that their appointments be revoked. On the other hand the adventurous feature of the Canal enterprise was the appeal to many a capable young artisan, and patriotism in the sense of a desire to be connected with the great national enterprise was a powerful motive in many instances. As the new men began to arrive on the Isthmus, to ascertain that disease was rapidly being eradicated and that conditions of work were agreeable, they were encouraged to send this information back to their former fellow-workers in the United States. In labor centers all over the country during the latter part of 1905 and the year 1906 skilled workmen whose names had been given by acquaintances on the Isthmus, were receiving from Panama such cables as this: "Come here by next boat and bring two more good men with you. Telegraph office of Isthmian Commission at Washington for transportation." Hundreds of men were recruited in this manner, railroad engineers, trainmen, blacksmiths, carpenters, steam-shovel men, from practically the entire United States. If they proved to be good men, they were encouraged to send for their families, and the
American birth-rate in the Canal Zone during the construction of the new waterway discourages the race-suicide idea.

The records in the Washington office of the Isthmian Commission show that during the first year of the railroad régime on the Isthmus 2311 skilled laborers were carried from the United States to Panama, and 3927 the second year. The greatest number taken down any year since was 1907, during the first year of Colonel Goethals' administration. The Isthmian Commission's fiscal year ends on June 30th, and the railroad régime terminated on March 31, 1907, but it was the railroad men's employment machine that continued to furnish what additional labor was needed until the Canal was completed.

To end the West Indian negro's monopoly of unskilled labor was a problem by itself. Chinese labor not being available, for the reasons already stated, in August an Italian syndicate offered to furnish all the manual labor for the Canal from Italy under an arrangement approved by the Italian Government, the syndicate to secure its compensation through the deduc-
tion of a percentage, fixed by itself, of the wages of the laborers. It was considered, however, that to accept the Italian proposition would mean a stronger labor monopoly than already existed, in that it would be controlled by a foreign government, aside from which it would introduce peonage at Panama.

Like other American railroad men, Mr. Shonts was aware of the success met by Sir William Van Horne in the use of Spanish labor in railroad building in Cuba, and he sent Leroy Park, one of the most active and successful of the special agents of the Department of Labor and Quarters, whose linguistic attainments made him particularly useful in the recruiting of foreign workmen, to reconnoiter on that island.

Mr. Park found that President Palma was strenuously opposed to his taking any Spanish laborers away from Cuba. Several interviews between the two took place; and, as Mr. Palma remained obdurate, Mr. Park, who realized that the Spaniards were just the men to break the labor monopoly on the Canal, decided to hire 500 of them without the presidential consent. The harbor of Havana, in which city he found his
men, being under the authority of the United States Marine Hospital service, to transport them in an American ship would doubtless have led to diplomatic representations and delay. Consequently Mr. Park chartered an English ship that lay in the harbor, and put 300 of the Spaniards abroad when local labor agitators managed to disaffect them with the Panama enterprise. Mr. Park, who believed that it was sometimes worth while in an emergency to subordinate means to an end, sent the vessel out from shore, with his men still aboard; and, to prevent their being taken off by harbor craft, hoisted the yellow flag. The United States official in charge of the harbor was inclined to order the flag down, but a cable sent by Mr. Park to Washington brought him immediate orders not to interfere, and the 300 Spanish laborers were duly landed on the Isthmus of Panama.

The Spanish workmen proved so satisfactory to the Canal organization that Mr. Park was dispatched to Europe to procure more of them on their own soil. It now became necessary to consider what attitude the Spanish and other governments might take in the matter of allow-
ing their subjects to cross the seas to dig the American ditch across Panama. The sanitation of the Isthmus had not been accomplished; and, conditions being only potentially better than when the French workmen were dying in their tracks, no guarantee could be given that the mortality would be any less in the Canal Zone then than it had been in the 'eighties. In ordinary circumstances our consular or diplomatic machinery might have been used to sound other governments on the subject, but that would have meant almost certain refusals to negotiate, and hence put out of the question the recruiting of European labor for Panama. Consequently Mr. Park was constituted envoy unextraordinary and bidden to feel his way for himself, the difficulties of his mission being increased by the fact that its nature became public in Italy and Spain before his arrival, and that both of these governments had determined when he reached their capitals to have nothing to do with him. Neither did the representatives of the United States in Europe greet Mr. Park with any notable enthusiasm, lest acknowledgment of him or his mission might create a diplo-
matic situation difficult of handling. The labor agent was forced to play a lone hand, fortified by a cable from Jackson Smith which read: "I have just these instructions to give you and no more: send men."

Nothing daunted, Mr. Park went to Madrid and put the situation before Señor Moret, the President of the Spanish Cabinet. The minister listened with profound courtesy to Mr. Park's argument, which was that the Canal at Panama being constructed by the United States for the benefit of the commerce of the entire world, it was a high privilege Spain was offered in the opportunity to pay her part of the universal debt of gratitude by allowing her people to assist in its excavation. Señor Moret's reply was, however, disconcerting. "Why should Spain allow her people to do America's labor?" he asked. "If America needs common labor, let her seek it among her own people. The American is too proud to work with his hands! He must work with his head, and Spain must be his hands! Spain refuses to be hands for the American head."

An interview with Señor Rios, the leader of the Spanish Liberals, was not
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The Cut from Culebra
much more satisfactory. He assured Mr. Park of his entire sympathy with the Canal enterprise, but declared that of his own initiative he could do nothing in the matter of securing Spanish labor for Panama.

The fact was impressed upon Mr. Park about this time that the Spaniards did not object so much to the emigration of Spanish laborers as to the existence of an American labor agency in Spain, and he therefore established headquarters in Paris, using the Spanish agents of the French steamship lines to recruit workers for Panama, who sailed thither from French ports. He attempted to make a similar arrangement in Italy; and, failing to do so, created a propaganda among French steamship agents whereby laborers from Piedmont and Lombardy, as well as from Greece, Russia, Hungary, Bulgaria, and elsewhere came into France and sailed for the Isthmus from Marseilles or Bordeaux. By this time information had reached Europe that General Gorgas had driven yellow fever from the Canal Zone, and fear of disease ceased to deter workers from seeking big wages there. The transportation expense by rail and water of the
European laborers was advanced by the Isthmian Commission, and deducted from their wages when they began work. Each man underwent a physical examination before he was allowed on board ship by physicians appointed by the Commission. The effect of the European invasion upon the West Indian labor market was most salutary, and the immigrants proved to be such capable workers that ten per cent. of them were allowed to bring their families, also at the Commission's expense. This resulted in the creation of Spanish and Italian colonies in the Canal Zone, and when the railroad régime on the Isthmus terminated workers and their families were going and coming from Spain and Italy, traveling at their own expense and relieving Colonel Goethals' administration of the burden of recruiting labor and of advancing transportation expenses.

Some 8000 laborers went from Spain to work on the Canal, though there were never more than 6000 of that nationality there at the same time. There were 3000 Italians among the manual workers on the Isthmus; 500 Greeks; 500 Bulgarians and Hungarians, and 150 Russians, be-
sides enough other Europeans—English, French, and German—to bring the total up to 10,000. When the railroad régime at Panama ended there were 37,000 men on the Canal pay roll,—10,000 skilled and 27,000 unskilled,—within 5000 or 6000 of the maximum number employed, which means that ninety-nine per cent. of the white labor, eighty-four per cent. of the European labor, and seventy-four per cent. of the West Indian labor was brought to the Canal Zone during the railroad régime.¹

These were the men who built the Canal, and it was to them that Colonel Goethals thus referred at the farewell reception to his predecessor in Corozal, on March 19, 1907: "I fully realize that Mr. Stevens has perfected an organization, which, if maintained, will carry this Canal through to completion. I want to say here that it is my intention to keep that organization as he has established it." Of that organization Mr. Roosevelt wrote in his autobiography six years later: "A finer body of men has never

¹A list of the names of the white employés on the Canal, whose annual salaries were more than $2000, with their positions, as the organization was turned over by the railroad men to Colonel Goethals, will be found in the Appendix, page 375.
been gathered by any nation than the men who have done the work of building the Panama Canal.”

The food supply proved a serious corollary of the labor problem at Panama. If the men could not be fed, the Canal could not be built. Owing to the fact that the natives never looked beyond their present necessities, no food ever accumulated on the Isthmus, and in the summer of 1905, this disastrous condition was augmented by an almost total failure of the crops for two preceding years, by the abandonment by agricultural laborers of the farms back in the hills for work on the Canal at better pay for shorter hours, and by quarantine of the port of Panama because of bubonic plague, which prevented the delivery of foodstuffs from neighboring provinces. The Commission was thus brought face to face with the problem of feeding 12,000 men and their families, and the nearest available market was 2000 miles away.

Arrangements were immediately made to open local commissary stores at every important

1 See Appendix, page 400, "President Roosevelt's Endorsement of the Railroad Men."
labor camp, to provide mess-houses, and to furnish food, both cooked and uncooked, at cost. Orders were cabled to have the steamers that ran in connection with the Panama Railroad equipped with refrigerating plants; a cold-storage plant was erected at Colon, and refrigerator cars were purchased for immediate shipment to the Isthmus, thus establishing a line of refrigeration from the markets of the United States to the Commissary stations along the line of the Canal. The net result of these efforts was that all employés were afforded opportunity to obtain an abundant supply of wholesome food at reasonable prices. It was learned from experience that no price for food was sufficiently small to induce the West Indian laborers to eat enough to keep them in good physical condition. They were offered cooked food at ten cents per meal, and the uncooked material at a price reduced by the cost of cooking and service. Both plans resulted unsatisfactorily. The experiment was even tried of giving them uncooked food free; they declined to go to the trouble of cooking it. Then it was cooked and offered to them free, when for the first time they ate
heartily. The plan was then adopted that is followed in railway and other construction work in this country, and we paid the West Indians a fixed wage per day, which included their meals.

When I visited the Canal Zone in 1912, I found that contact with the Spanish workmen under American supervision had considerably improved the efficiency of the West Indian negro since the organization of the labor forces in 1905 and 1906. Not only had he been "speeded up," but he had developed to a point where he could handle a drill,—with a white man in charge of, say, a battery of rock drills.