THE GATUN LOCKS, WITH THE ATLANTIC ENTRANCE IN THE DISTANCE

OPENING THE LOWER GUARD GATES OF THE GATUN LOCKS
This method of treatment has not exterminated all mosquitoes on the Isthmus, but it has so materially reduced their number that one may stay in the Zone for weeks without seeing a single one. This is a freedom, however, that must be paid for by vigilance of the most painstaking and unremitting sort. The moment the work is relaxed the mosquitoes again spread over the territory.

The United States Government will have to continue with the utmost care its work of sanitation and quarantine at Panama. If, after the canal is completed, an epidemic of bubonic plague or yellow fever should break out, it might very seriously interfere with the operation of the canal in several ways. To begin with, it would demoralize the operating force. Further than this, India and China are afraid of yellow fever because in both of these countries the stegomyia mosquito abounds. If the disease should obtain a foothold there it would be difficult to exterminate. Europe, also, might be expected to quarantine against Panama under such conditions. A 10,000-ton freighter carrying cargo through the canal would lose at least a thousand dollars for every day it was detained in quarantine by reason of having visited the canal.

A shrewd observer has said that the successful sanitation of the Isthmus of Panama is a triumph at once of medical science and of despotic government. Probably this does not overstate the case. The methods employed at Panama were arbitrary, and had to be. They probably could not be enforced at all in a democratic community.
in ordinary times. The people would rebel against the severity of the regulations and against the incidental invasion of their privacy. But strike any community, however free, with the fear of a swift and deadly disease and it will submit—as witness the shot-gun quarantines that used to demark the northern limits of the yellow fever zone in our own Southern States, or the despotism that governed New Orleans in the terror of 1905. At Panama this fear is ever present, so there is little danger that a responsible majority there ever would resist the sanitary work on the grounds of outraged democracy. It may be that a popular government would become careless, or inefficient, but it would not renounce the pretension. This has been proved in Cuba.

The sanitarians at Panama gave to the workers there a sense of security that contributed no little to the spirit of determination so universally remarked and commended by visitors to the Zone during the era of construction. While there was no immunity from sickness and death, yet there was no panic, no constant dread, such as destroyed the morale of the French force. The Isthmus of Panama still remained hot, its inhabitants still were forced to take the precautions that aliens must take in the Tropics; but they were inspired with a confidence that if these precautions were taken they would not be in any greater danger than if they had remained in their northern homes.

Pestilence, the scourge of the on-sweeping epidemic, the plague of swift death that is only a little worse than the panic of fear it inspires—this was the thing that was stamped out.
Not since the Science of Healing opened its doors to the Science of Prevention have physicians scored a greater victory in their fight against disease and death than on the Isthmus of Panama. Not only did they help to build the canal; they demonstrated that tropical diseases are capable of human control and thereby opened up a vista of hope undreamed of to all that sweltering and suffering mass of humanity that inhabits the Torrid Zone.
CHAPTER X

THE MAN AT THE HELM

IN 1905, William H. Taft, then Secretary of War, made a trip to the Isthmus of Panama to look over the preparations for the construction of the Panama Canal, and at the same time to consider the question of the fortification of the big waterway. On that trip a member of the General Staff of the Army, who at that time was but little known outside of Army circles, went with him. He was a tall, broad-shouldered, bronze-faced, gray-haired man, 47 years old. He came and went unheralded. Few people knew of the engineering record he had made, and no one on the Isthmus dreamed that he was destined to become the commander in chief of the army that would conquer the Isthmian barrier.

He returned to the United States and wrote his report—a report which, from the deep mastery of the subject it revealed, attracted the favorable attention of the Secretary of War. Later when the board of consulting engineers came to make its report upon the type of canal which should be built—whether it should be a sea level or a lock canal—the Secretary of War asked this officer to prepare a draft of his report to the President recommending the lock canal.

Soon after New Year's Day, 1907, the chief
engineer of the canal, John F. Stevens, dissatisfied with the relations that existed between the Government and himself, came to the conclusion that he could not build the canal hampered as he was by red tape at Washington. It then became a question of whether or not the canal should be built by contract or by the Army. President Roosevelt asked for a preliminary report upon this proposition and the unheralded Army engineer who had visited the Canal Zone in 1905, made it. A few days later there was a conference between President Roosevelt, Gen. Alexander MacKenzie, Chief of Engineers of the United States Army, and the Secretary of War. After this conference Maj. George Washington Goethals was summoned to the White House and informed by the President that it had been determined to build the Panama Canal under the auspices of the Army, and that he was appointed chairman and chief engineer of the Isthmian Canal Commission. He was requested to keep the fact of his appointment a secret and to prepare immediately to go to Panama. A ship sailed for the Isthmus three days thereafter, and he was ready to sail when the President advised him that he might wait over and arrange affairs in Washington, leaving in time to get to the Isthmus to take charge on the first of April.

When the announcement was made to the country that the work of building the canal was to be put in the hands of the Army, the whole country began to inquire: Who is Major Goethals? that inquiry revealed the fact that he was a man who had accomplished much in his 49 years. Born in 1858, of Dutch parents, whose ancestors
had settled in New York when it was still New Amsterdam, he was appointed to the United States Military Academy at West Point where he was graduated in the class of 1880 with such honors that he was entitled to enter the Engineer Corps of the Regular Army.

In 1891 he rose to the rank of captain, and in 1898 became lieutenant colonel and chief engineer of the First Volunteer Army Corps in Cuba. On the last day of that year he was honorably discharged from the volunteer service, and, in 1900, became a major in the Engineer Corps of the Regular Army. For a number of years prior to 1898 he had been instructor in civil and military engineering at West Point. He had been in charge of the Mussel Shoals canal construction on the Tennessee River, a work which won praise from engineers both in civil and in military life. It was in a measure his record made on the Tennessee River work that led to his appointment as chairman and chief engineer of the Isthmian Canal.

When he took charge of the work at Panama he was promoted to lieutenant colonel. Arriving there he immediately informed all hands that while the work of building the canal had been placed under Army engineers, no man who was then on the job and faithfully executing his work need fear anything from that administration. From that time down to the last stages of the work that statement held good. Trained at West Point, brought up in the atmosphere of the Army, a lover of its traditions and in full sympathy with its spirit, he laid aside everything that might handicap the success of the undertaking and sought
at once to get the full benefit of all that was best in the Army and in civil life as well. He put his uniform in moth balls when he started to the Isthmus, and from that day to this no man has ever seen him on the Canal Zone wearing an Army uniform.

When he took charge of the big job, the foundations upon which he was to build the superstructure of his success had been laid by his predecessors, but there were many weak points in these foundations as well as many strong ones. With a spirit of utilizing to the fullest extent every advantage that the administrations of the former chief engineers had left on the Isthmus, he undertook to make only such changes as time demonstrated were necessary to the success of the project. At that time 6,000,000 cubic yards of material had been removed from the big waterway. Confronting him was the task of removing some 215,000,000 yards the while building a great dam containing 21,000,000 cubic yards, constructing a series of gigantic locks containing four and a half million cubic yards of concrete, and providing for the happiness and welfare of the sixty-odd thousand people who constituted the canal army and its camp followers.

In the years that followed his appointment he proved himself in every way worthy of his assignment as the managing director of the most stupendous piece of work ever undertaken by man. Furthermore, he established a claim to the title of the “Great Digger.” No other man in the history of the world has ever superintended the excavation of an amount of earth half as
great as that which has been taken out of the Panama Canal during his administration. Since he went to the canal to "make the dirt fly" the material excavated under his command, together with that placed in the locks and dams, equals the amount necessary to take out to cut a tunnel 13 feet square through the earth at the Equator.

No man ever carried to a great position less fuss and feathers than Colonel Goethals took to his work as chairman and chief engineer of the Panama Canal. When, during the construction period, one visited his office at Culebra, on almost any afternoon, he would find there an unpretentious little room in the corner of the administration building, about 18 feet square, containing four windows, overlooking the cut from two sides, its painted walls hung with maps, its floors uncarpeted, and in the center a large double-sided, flat-top desk covered with papers. A swivel chair at the desk and two or three other chairs constituted the furnishings of this room. The visitor walked directly into the office of his private secretary and the chief clerk, and if he had anything worth while about which to see the chairman and chief engineer he was detained only long enough for the man ahead of him to get out. With "no time like the present" as his motto in handling the business of his office, he, the busiest man on the Isthmus, and one of the busiest in the world for that matter, always seemed to have more time than many men of lesser responsibilities and far fewer burdens. He once declared that he had a contempt for the man who always tried to make it appear that he was too
busy to see his callers, because his callers were frequently as busy as he himself.

The fact is that he is a man with a very unusual gift in the dispatch of work. System has been the key-note of his success. With thousands of details every day to look after, he has always kept his work so well in hand that to the casual observer he seemed to be the most leisurely man on the Isthmus. He maintained a well-established routine all through his career on the canal. His mornings usually were spent going over the work. When the morning trains passed Culebra at 7 o’clock they found him up, breakfasted, and at the station.

Although these trains carried parlor cars, one would seldom see the chairman and chief engineer riding in them. Rather, he consistently chose to ride in the ordinary day coaches with his sub-engineers, with the steam-shovel men, and with the rank and file of the Americans who made possible the success of the work at Panama. There were few of these Americans whom he did not know by name, and with whom he did not pass a pleasant word whenever he chanced to meet them.

A morning trip over the work with this presiding genius of the big ditch reveals perhaps better than anything else the makeup of the man and the secret of his success.

"Meet me on the early train to-morrow morning at Miraflores," said he to one of his visitors in the early summer of 1913, "and we will go over the Pacific end of the work."

This meant that both the chief engineer and the visitor had to leave comfortable beds at 5
o'clock in the morning to keep the appointment. At 7 o'clock they met at Miraflores. "We will walk through the tunnel if you don't mind," said he, "as I don't want to hold up a dirt train if it can be avoided."

At the other end of the railroad tunnel, the only one on the Isthmus, a railway motor car stood on the siding ready to pick up the distinguished engineer and carry him to the Miraflores Locks. This motor car is something like a limousine on railroad trucks, and was affectionately known by the people on the Isthmus, as "the yellow peril" and "the brain wagon." The first stop was at the concrete work on the spillway dam at Miraflores.

"How soon do you expect to have this dam up to its full height?" he asked of the division engineer who joined him there. "Can't you find room to operate another temporary concrete mixer down there?" he queried further. "Is there anything else you need to keep the work moving forward so as to be certain to complete the dam by the time you promised?"

Going a little farther he came to a place where one division was doing some work for another division. "Don't you think it would be more satisfactory to keep both parts of that work under one division? Why don't you allow it all to be done by the other people?"

Walking across the locks on the temporary bridge the chief engineer and his assistant came to a point where the concrete lamp posts for lighting the locks were being set up. "Don't you think that it would better avoid any settling
if you were to place beams of railroad iron across those spaces and rest the posts on them?” he queried.

A little farther on he met the engineer in charge of the work of the company erecting the gates. “When do you think you will have the gates in the west chambers completed so that we can put the dredge through?” he inquired of Mr. Wright.

“Well, sir,” replied Mr. Wright, “if we have good luck I hope to have them done by the first of September; if we have fair luck we ought to have them completed by the middle of September; but at the lowest calculation I can promise them to you by the first of October.”

“But have you taken into consideration all of the time you are likely to lose as the result of heavy rains?” queried the chief engineer.

“I have made full allowance therefor, I think,” responded Mr. Wright.

Walking on, the watchful eye of the chief engineer fell upon a new baby railway track which was being laid through the eastern lock chambers. “What are you planning to do there?” he asked of the division engineer.

“We wanted to get some additional material through the locks and Mr. Wright informed us that if we would furnish the timbers, he would make it so that we could run these little engines through there,” responded the engineer.

“But did you have a definite understanding with him that this should afford no excuse for any further delay in completing the gates?” queried Colonel Goethals.
“We did, sir,” responded the division engineer. “All right then, go ahead.”

At this point the party boarded the motor car again and was taken to the big dike which was to hold the Pacific Ocean from flooding the locks after a dike a mile farther down had been blown out. “How much water do you have in the stretch between the two dikes?” he asked of the division engineer. He next wanted to know how many million cubic feet they were able to pump and siphon in, and how much the Rio Grande was bringing in per day. Then he wanted to know if every possible precaution had been taken to insure the watertightness of the new dike; how many thousand pounds of dynamite had been placed under the one to be blown up; how many holes this dynamite was placed in; and a large number of other bits of information which would tell him whether every safeguard had been thrown around the plan to insure its success.

Going up on the other side of the canal the party came to the earth dam joining the west lock walls with the hills, so as to impound 58 feet of water in Miraflores Lake. “How soon do you expect to get that connection made between the lock walls and the dam proper?” he queried of the engineer in immediate charge.

“In four weeks, sir.”

“All right,” answered Colonel Goethals, “you can’t get that done any too soon to suit me.”

And so he went over the work around Miraflores from beginning to end, talking now with an Irishman in charge of dumping the material on the inside of the dam, now with a man in charge of some
concrete work, and now with the division engineer himself. By 11 o’clock he had inspected every part of this division and was ready to take his car back to Culebra. In four hours he had seen every man responsible for any important work around Miraflores; had offered a suggestion there, a word of encouragement here, and had obtained a bit of information at another place.

Each day’s morning program was like this one except as to the place he visited and the people with whom he talked. One morning he might be tramping over Cucaracha Slide, studying the prospects of its future. Another morning he might be down at Gatun watching an official test of an emergency dam. On these trips he usually wore either a most unmilitary-looking blue serge or gray cheviot, with a somewhat weather-beaten sailor straw hat, and carried a cheap dollar umbrella.

When Colonel Goethals went to the Isthmus he promised that every man with a grievance should have a hearing. Each Sunday morning he had at his office at Culebra what he termed his Sunday “at homes,” the best attended functions on the Isthmus, where the blackest Jamaica negro on the job found as much of a welcome as the highest official. These functions were for the purpose of hearing the canal employees who had grievances. Once a visitor was congratulating him upon the smooth manner in which the canal-building machine seemed to be working. “You ought to attend one of my Sunday ‘at homes,’” he replied. “You would think that there was no smoothness at all to its running.”
Here is the wife of one of the engineers: She wants to find out why it is that she cannot get bread from the Ancon Hospital bakery. She informs Colonel Goethals that Joseph B. Bishop, secretary of the commission, gets bread from the hospital bakery and wants to know why she cannot. "I will look into the matter for you," says the chief engineer, and a note of this complaint is made. Later the telephone bell rings and Mr. Bishop is asked if he gets bread at the hospital bakery. He replies in the affirmative, explaining that about three years ago he had breakfasted with Colonel Gorgas who arranged for him to buy his bread there instead of at the commissary, this bread being more to his liking. "Can't any other employee of the Canal Commission get bread there under the same terms?" queries the chief engineer. "I will see, sir," responds the secretary of the commission. "If they can not," answers the chief engineer, "you must have your bread stopped at once." And it was stopped.

The next person received is the representative of the Kangaroos, a fraternal order. "The Spanish American War veterans get free transportation on a special train on Memorial Day," he is informed, "and the fraternal orders on the Zone are crowded out." "Let a committee of all the fraternal orders appear next Sunday and talk it over with me and we will see what we can do," responds the chief engineer.

Here comes a negro who says that his boss is a tyrant and abuses his men: "I will look into that," responds the presiding genius of the canal, and the Jamaican goes away with an expansive smile on his face.
And so it went. Small affairs, big affairs, and indifferent ones were brought to his attention. In perhaps 80 per cent of them he could not do what was requested, but when able he did it so promptly, and in such a positive, straightforward manner, that his "at homes" have been compared, by the French ambassador to the United States, to the court of justice held by Saint Louis beneath the oak at Vincennes.

A railroad engineer on one of the dirt trains got drunk and ran over a negro. He was sent to the penitentiary. The railroad men issued an ultimatum saying that if he were not released by a certain hour on a certain day, every dirt train on the canal would stop. A committee conveyed this ultimatum to Colonel Goethals and asked his decision. "You will get it at the penitentiary," he replied. "This man will remain in prison and every man who quits work on that account will be dropped from the rolls. There was no strike of engineers.

At another time the waiters at the Tivoli Hotel went on strike. The whole force was promptly discharged, and the official paper of the Canal Commission carried their names with the announcement that thereafter they would not be eligible to employment in any capacity on the Canal Zone.

If the chairman and chief engineer of the canal is just and firm in his relations with his men, he is no less generous in giving credit where credit belongs. Upon one occasion he was talking about the success of the canal project with a friend, and declared that the world would never give to John F. Stevens the credit that was due him in the
construction of the canal. "You know," said he, "the real problem of building this canal has been that of removing the spoil; that problem was preeminently the problem of a railroad man and to solve it demanded the services of one of the best men in the railroad business. We have extended the facilities laid out by Mr. Stevens, and have modified them as experience and conditions have demanded, but they have been operated from that day to this under the general plan of transportation laid out by Mr. Stevens. I do not think that any Army engineer in the United States could have laid out such excellent transportation facilities."

At another time, in discussing this same matter, he declared that it was his firm opinion that the canal could have been built by either of the former chief engineers, John F. Wallace or John F. Stevens, if they had been allowed a free hand. "You see," said he, "they were men who were accustomed to handling big construction jobs. They would outline their project and the cost of executing it to a board of directors who would pass upon it and then leave them absolutely unhampered in the matter of personnel and method, with results as the only criterion of their success. When they came to the Isthmus they found their hands tied by red tape. They had never dealt with a President, a Secretary of War, a Congress, and the public at large. Naturally, they grew restive under the conditions which confronted them and resigned.

"The whole difference is largely that of training. The Army officer knows from the time he leaves