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THE WASHING PLACE AT TABOGA

Taboga, site of the Commission sanitarium, is the most picturesque point readily accessible from Panama City. The laundry place is the gathering point for the women of the village.

lation hospitals. The malignant mosquitoes, couriers of the infection, were pursued patiently by regiments of men who slew all that were detected and deluged the breeding places with larvacide. The war of science upon sickness soon began to tell. June showed the high-water mark of pestilence with sixty-two cases, and six deaths. From that point it declined until in December the last case was

reaching New York he met the then Secretary of War, afterwards President, William Howard Taft, to whom he expressed dissatisfaction with the situation and asked to be relieved at the earliest possible moment. Secretary Taft declined to consider his further association with the canal, for a moment, demanded that his resignation take effect at once and reproached him for abandoning the work in words



THE FUMIGATION BRIGADE

When the members of this command finished with a district in Panama the mosquito was done for

registered. Since then there has been no case of yellow fever originating on the Isthmus, and the few that have been brought there have been so segregated that no infection has resulted.

It was, however, when the epidemic was at its height that Mr. Wallace returned from Washington to the Isthmus. Almost immediately he cabled asking to be recalled and the President, with a premonition of impending trouble, so directed. On

that stung, and which when reiterated in a letter and published the next day put the retiring engineer in a most unenviable position. From this position he never extricated himself. Perhaps the fear of the fever, of which he thought he himself had a slight attack, shook his nerve. Perhaps, as the uncharitable thought and the Secretary flatly charged, a better position had offered itself just as he had become morally bound to finish the canal work. Or

men! Forward"! was to be the rallying cry in the attack on the hills of Panama.

Despite the unfortunate circumstances attending Mr. Wallace's retirement, his work had been good, so far as it went. In office a little more than a year he had spent more than three months of the time in Washington or at sea. But he had made more than a beginning in systematizing the work, in repairing the railroad, in renovating the old machinery and actually making "the dirt fly". Of that objectionable substance—on the line of the canal, if anywhere, they applaud the definition "dirt is matter out of place"—he had excavated 744,644 yards. Not much of a showing judged by the records of 1913, but excellent for the machinery available in 1905. The first steam shovel was installed during his régime and before he left nine were working. The surveys, under his direction,



HOSPITAL BUILDINGS, UNITED, FRUIT CO.

were of great advantage to his successor who never failed to acknowledge their merit.

Mr. Stevens, who reached the canal, adopted at the outset the wise determination to reduce construction work

to the minimum and concentrate effort on completing arrangements for housing and feeding the army of workers which might be expected as soon as the interminable question of the sea level or lock canal could be finally determined. From his administration dates much of the good work done in the organization of the



STOCKADE FOR PETTY CANAL ZONE OFFENDERS



Photo by Underwood & Underwood

BEGINNING THE NEW DOCKS, CRISTOBAL

Commissary and Subsistence Department, and the development of the railroad. The inducement of free quarters added to high wages to attract workers also originated with him. At the same time Gov. Magoon was working over the details of civil administration, the schools, courts, police system and road building. The really fundamental work of canal building, the preparation of the ground for the edifice yet to be erected, made great forward strides at this period. But the actual record of excavation was but small.

One reason for this was the hesitation over the type of canal to be adopted. It is obvious that several hundred thousand cubic yards of dirt dug out of a ditch have to be dumped somewhere. If deposited at one place the dump would be in the way of a sea-level canal while advantageous for the lock type. At another spot this condition would be reversed. Already the Americans had been compelled to move a second time a lot of spoil which the French had excavated, and which, under the American plans, was in danger of falling back into Culebra Cut. "As a gift of prophecy is withheld from us in these latter days," wrote Stevens plaintively in reference to the vacillation concerning the plans, "all we can do now is to make such arrangements as may look proper as far ahead as we can see."

President Roosevelt meanwhile was doing all he could to hasten determination of the problem.

Just before the appointment of Mr. Stevens he appointed an International Board of Advisory Engineers, five being foreign and nine American, to examine into the subject and make recommendations. They had before them a multiplicity of estimates upon which to base their recommendations and it may be noted eight years after the event that not one of the estimates came within one hundred million dollars of the actual cost. From which it appears that when a nation undertakes a great public work it encounters the same financial disillusionments that come to the young homebuilder when he sets out to build him a house from architect's plans guaranteed to keep the cost within a fixed amount.

Poor De Lesseps estimated the cost of a sea-level canal at \$131,000,000, though it is fair to say for the French engineers whose work is so generally applauded by our own that their estimate was several million dollars higher. The famous International Congress had estimated the cost of a sea-level canal at \$240,000,000. In fact the French spent \$260,000,000 and excavated about 80,000,000 cubic yards of earth! Then came on our estimators. The Spooner act airily authorized \$135,000,000 for a canal of any type, and is still in force though we have already spent twice that amount. The Walker Commission fixed the cost of a sea-level canal with a dam at Alhajuela and a tide lock at Miraflores at \$240,000,000. The majority of President Roose-



Photo by Underwood & Underwood

A BACK STREET IN COLON

This street is as clean and well paved as any in the United States

velt's Board of Advisory Engineers reported in favor of a sea-level canal and estimated its cost at \$250,000,000; the minority declared for a lock canal fixing its cost "in round numbers" at \$140,000,000. Engineer Wallace put the cost of a sea-level canal at \$300,000,000 exclusive of the \$50,000,000 paid for the Canal Zone. Col. Goethals came in in 1908, with the advantage of some years of actual construction, and fixed the cost of the sea-level canal at \$563,000,000 and the lock type at \$375,000,000. He guesses best who guesses last, but it may be suggested in the vernacular of the streets that even Col. Goethals "had another guess coming".

On all these estimates the most illuminating comment is furnished by the Official Handbook of the Panama Canal for 1913 showing total expenditures to November 1, 1912, of \$270,625,624 exclusive of fortification expenditures. The Congressional ap-

propriations to the same date, all of which were probably utilized by midsummer of 1913, were \$322,551,448.76.

The action of his Advisory Board put President Roosevelt for the moment in an embarrassing position. A swinging majority declared for a sea-level canal, and even when the influence of Engineer Stevens, who was not a member of the Board, was exerted for the lock type it left the advocates of that form of canal still in the minority. To ask a body of eminent scientists to advise one and then have them advise against one's own convictions creates a perplexing situation. But Roosevelt was not one to allow considerations of this sort to weigh much with him when he had determined a matter in his own mind. Accordingly he threw his influence for the lock type, sent a resounding message to Congress and had the satisfaction of seeing his views approved



STEAM SHOVEL AT WORK

by that body June 29, 1906. It had been two years and two months since the Americans came to Panama, and though at last the form of canal was determined upon there are not lacking today men of high scientific and political standing who hold that an error was made, and that ultimately the great locks will be abandoned and the canal bed brought down to tide water.

The Americans on the Isthmus now got fairly into their stride. Determination of the type of canal at once determined the need for the Gatun Dam, spillway and locks. It necessitated the shifting of the roadbed of

the Panama railroad as the original bed would be covered by the new lake. The development of the commissary system which supplied every thing needful for the daily life of the employee, the establishment of quarters, the creation of a public school system, were all well under way. Then arose a new issue which split the second Commission and again threatened to turn things topsy-turvy.

Chairman Shonts, himself a builder of long experience and well accustomed to dealing with contractors, was firmly of the opinion that the canal could best be built by letting contracts to private bidders for the work. In this he was opposed by most of his associates, and particularly by Mr. Stevens who had been working hard and efficiently to build up an organization that would be capable of building the canal without the interposition of private contractors looking for personal profit. The employees on the Zone, naturally enough, were with Stevens to a man, and time has shown that he and



THE BALBOA ROAD

The trolley line shown will extend from Balboa, through Panama and Ancon to the ruins of Old Panama



Photo by Underwood & Underwood

A DRILL BARGE AT WORK

The sea and tidal waters are underlaid with coral rock necessitating much submarine blasting

they were right. There is something about working for the nation that stirs a man's loyalty as mere private employment never can. But in this instance Mr. Shonts was in Washington, convenient to the ear of the President while Mr. Stevens was on the Zone. Accordingly the President approved of the Chairman's plan, and directed the Secretary of War, Mr. Taft, to advertise for bids. Mr. Stevens was discontented and showed it. That his judgment would be justified in the end he could not know. That it had been set aside for the moment he was keenly aware, and that he was being harassed by Congress and by innumerable rules such as no veteran railroad builder had ever been subjected to did not add to his comfort.

His complaints to the Secretary of War were many, and not of a sort to contribute to that official's peace of mind. When the bids came in from the would-be contractors they were all rejected on the ground that they did not conform to the specifications, but the real reason was that the President at heart did not believe in that method of doing the work, and was sure that the country agreed with him. This should have allayed Mr. Stevens' rising

discontent. It certainly offended Chairman Shonts, who stood for the contract system, and when the bids were rejected and that system set aside promptly resigned. The President thereupon consolidated the offices of Chairman of the Commission and Chief Engineer in one, Mr. Stevens being appointed that one. Given thus practically unlimited power Mr. Stevens might have been expected to be profoundly contented with the situation. Instead he too resigned on the first of April, 1907.

About his resignation as about that of Mr. Wallace there has always been a certain amount of mystery. He himself made no explanation of his act, though his friends conjectured that he was not wholly in harmony with the President's plan to abolish the civilian commission altogether, and fill its posts by appointments from the Army and Navy. On the Isthmus there is a story that he did not intend to resign at all. Albert Edwards, who heard the story early, tells it thus:

"One of the canal employees, who was on very friendly terms with Stevens, came into his office and found him in the best of spirits. When the business in hand was completed he said jovially:



Photo by S. H. Elliott

PACIFIC ENTRANCE TO THE CANAL

“Read this. I’ve just been easing my mind to T. R. It’s a hot one— isn’t it?” And he handed over the carbon copy of his letter. His visitor read it with great seriousness.

“Mr. Stevens’, he said, ‘that is the same as a resignation’.

“And Stevens laughed.

“Why, I’ve said that kind of thing to the Colonel a dozen times. He knows I don’t mean to quit this job’.

“But about three hours after the letter reached Washington Mr. Stevens received a cablegram: ‘Your resignation accepted’”.

At any rate the Stevens resignation called forth no such explosive retort as had been directed against the unhappy Wallace, and he showed no later signs of irritation, but came to the defense of his successor in a letter strongly approving the construction of certain locks and dams which were for the moment the targets of general public criticism.

Two weeks before Stevens resigned the other members of the Commission, excepting Col. Gorgas, in response to a hint from the President had sent in their resignations. Mr. Roosevelt had determined that henceforward the work should be done by army and navy officers, trained to go where the work was to be done and to stay there until recalled; men who had entered the service of the nation for

life and were not looking about constantly to “better their conditions”. He had determined further that the government should be the sole contractor, the only employer, the exclusive paymaster, landlord and purveyor of all that was needful on the Zone. In short he had planned for the Canal Zone a form of administration which came to be called socialistic and gave cold chills to those who stand in dread of that doctrine. To carry out these purposes he appointed on April 1, 1907, the following commission:

Lieut.-Col. George W. Goethals, *Chairman and Chief Engineer,*

Major D. D. Gaillard, U. S. A.,

Major William L. Sibert, U. S. A.,

Mr. H. H. Rousseau, U. S. N.,

Col. W. C. Gorgas, U. S. A., Medical Corps,

Mr. J. C. S. Blackburn,

Mr. Jackson Smith,

Mr. Joseph Bucklin Bishop, *Secretary.*

A majority of this commission was in office at the time of publication of this book, and gave evidences of sticking to the job until its completion. Senator Blackburn resigned in 1910 and was succeeded by Hon. Maurice H. Thatcher, also of Kentucky; and Mr. Smith retired in favor of Lieut. Col. Hodges in 1908.* With the creation of this commission began the forceful and conclusive administration of Col. Goethals, the man who finished the canal.

*In June, 1913, President Wilson announced the pending appointment of Richard L. Metcalfe of Nebraska to succeed Commissioner Thatcher, but at the time of the publication of this book the appointment had not been consummated.

CHAPTER IX

COL. GOETHALS AT THE THROTTLE



HE visitor to the Canal Zone about 1913 could hardly spend a day in that bustling community without becoming aware of some mighty potentate not at all mysterious, but omnipresent and seemingly omniscient, to whom all matters at issue were referred, to whom nothing was secret,

whose word was law and without whose countenance the mere presence of a visitor on the Zone was impossible. The phrases most in use were "see the Colonel," "ask the Colonel" and "the Colonel says". If there had been a well-conducted newspaper on the Zone these phrases would have been cast in slugs in its composing room for repeated and ready use. No President of the United States, not even Lincoln in war times, exerted the authority he daily employed in the zenith of his power. The aggrieved wife appealed to his offices for the correction of her marital woes, and the corporation with a \$600,000 steam crane to sell talked over its characteristics with the Colonel.

He could turn from a vexed question of adjusting the work of the steam shovels to a new slide in the Culebra Cut, to compose the differences of rival dancing clubs over dates at the Tivoli Hotel ballroom. On all controverted questions there was but one court of last resort. As an Isthmian poetaster put it:

"See Colonel Goethals, tell Colonel Goethals,
It's the only right and proper thing to do.
Just write a letter, or even better
Arrange a little Sunday interview".

Engineer Stevens in a speech made at the moment of his retirement before a local club of workers said:

"You don't need me any longer. All you have to do now is to dig a ditch. What you want is a statesman".

A statesman was found and his finding exemplifies strikingly the fact that when a great need arises the man to meet it is always at hand, though frequently in obscurity. Major George W. Goethals of the General Staff, stationed at Washington was far from being in the public eye. Anyone who knows his Washington well knows that the General Staff is a sort of general punching bag for officers of the Army who cannot get appointments to it, and for newspaper correspondents who



Photo by Underwood & Underwood

COL. GOETHALS AT HIS DESK

are fond of describing its members as fusty bureaucrats given to lolling in the Army and Navy Club while the Army sinks to the level of a mere ill-ordered militia. But even in this position Major Goethals had not attained sufficient eminence to have been made a target for the slings and arrows of journalistic criticism. As a member of the Board of Fortifications,

however, he had attracted the attention of Secretary Taft, and through him had been brought into personal relations with President Roosevelt.

Of course when a man has "made good" everybody is quick to discern in him the qualities which compel success. But Roosevelt must have been able to discover them in the still untested Goethals, for when the Stevens resignation reached Washington the President at once turned to him with the remark, "I've tried two civilians in the Canal and they've both quit. We can't build the canal with a new chief engineer every year. Now I'm going to give it to the Army and to somebody who can't quit."

John F. Stevens
resigned April 1,
1907, and on the



PRESIDENT TAFT ARRIVES

same day Col. Goethals became Chief Engineer of the Panama Canal, and the supreme arbiter of the destinies of all men and things on the Canal Zone. Everybody with a literary turn of mind who goes down there describes him as the Benevolent Despot, and that crabbed old philosopher Thomas Carlyle would be vastly interested could he but see how the benevolent despotism which he described as ideal but impossible is working successfully down in the semi-civilized tropics.

Before describing in detail Col. Goethals' great work, the digging of the canal, let me relate some incidents which show what manner of man it was that took the reins when the Americans on the ditch swung into their winning stride.

This is the way they tell one story on the Isthmus: A somewhat fussy and painfully perturbed man bustled into the office of Col. Goethals one morning and plunged into his tale of woe.

"Now I got that letter of yours, Colonel", he began but stopped there checked by a cold gaze from those quiet blue eyes.

"I beg your pardon", said the Colonel suavely, "but you must be mistaken. I have written you no letter".

"Oh, yes, Colonel, it was about that work down at Miraflores".

"Oh, I see. You spoke a little inaccurately. You



Photo by Underwood & Underwood

RAILWAY STATION AT GATUN

The Panama Railroad is being equipped with stations and rolling stock of the first-class.

meant you received my orders, not a letter. You have the orders, so that matter is settled. Was there anything else you wished to talk with me about"?

But the visitor's topic of conversation had been summarily exhausted and, somewhat abashed, he faded away.

And again: A high official of the Isthmian Commission had been somewhat abruptly translated from the Washington office to Ancon. There was no

He spoke of his fears to the Colonel at lunch one day.

"Let's walk over to the site and see", remarked that gentleman calmly. It may be noted in passing that walking over and seeing is one of the Colonel's favorite stunts. There are mighty few, if any, points on the Canal Zone which he has not walked over and seen, with the result that his knowledge of the progress of the work is not only precise but personal. But to return to the house a-building.



COL. GOETHALS REVIEWING THE MARINES AT CAMP ELLIOTT

house suitable for his occupancy and the Colonel ordered one built to be ready, let us say, October first. Meanwhile the prospective tenant and his family abode at the Tivoli Hotel which, even to one enjoying the reduced rates granted to employees, is no inexpensive spot. Along about the middle of August he began to get apprehensive. A few foundation pillars were all that was to be seen of the twelve-room house, of the type allotted to members of the Commission, which was to be his.

On arrival there three or four workmen were found plugging away in a leisurely manner under the eye of a foreman to whom the Colonel straightway addressed himself. "You understand the orders relative to this job"? he said to the foreman, tentatively.

"Oh, yes, Colonel", responded that functionary cheerfully, "it is ordered for October first, and we are going to do our very best".

"Pardon me", blandly but with a suspicion of

satire, "I was afraid you did not understand the order and I see I was right. Your order is to have this house ready for occupancy October first. There isn't anything said about doing your best. The house is to be finished at the time fixed".

Turning, the Colonel walked away, giving no heed to the effort of the foreman to reopen the conversation. Next day that individual called on the prospective tenant.

"Say", he began ingratiatingly, "you don't really need to be in that house October first, do you? Would a few days more or less make any difference to you"?

"Not a bit".

"Well, then", cheering up, "won't you just tell the Colonel a little delay won't bother you"?

"Not I! I want to stay on this Isthmus. If you want to try to get the Colonel's orders changed you do it. But none of that for me".

And the day before the time fixed the house was turned over complete.

It is fair to say however that peremptory as is Col. Goethals in his orders, and implacable in his insistence on literal obedience, he



PRESIDENT TAFT AND "THE COLONEL"

yields to the orders of those who rank him precisely what he exacts from those whom he commands. The following dialogue from a hearing before the House Committee on Appropriations will illustrate my point. The subject matter was the new Washington Hotel at Colon.

"The Chairman: Did you ever inquire into the right of the Panama Railroad Company, under the laws of the State of New York, to go into the hotel business?"

"Col. Goethals: No sir; I got an order from the President of the United States to build that hotel and I built it".

This military habit of absolute command and implicit

obedience is not attended in Col. Goethals' case with any of what civilians are accustomed to call "fuss and feathers". On the Zone he was never

seen in uniform, and it is said, indeed, that he brought none to Panama. His mind in fact is that of the master, not of the martinet. If he compels obedience, he commands respect and seems to inspire real affection. In a stay of some weeks at Panama during which time I associated in-



Photo by Underwood & Underwood

The upper part shows a 16-inch rifle being tested at Sandy Hook. The gun, which is of the type adopted for the Canal defenses, throws a 2,400 pound shell to an extreme range of 22 miles. It could drop a shell into Wall Street from Sandy Hook. One shell striking a battleship fairly would put her out of business. The lower part of picture shows comparative size of the gun

associated in-



COL. GOETHALS ENCOURAGES THE NATIONAL GAME

timately with men in every grade of the Commission's service I heard not one word of criticism of his judgment, his methods or even his personality. This is the more remarkable when it is considered how intimately his authority is concerned with the personal life of the Isthmian employees. If one wishes to write a magazine article pertaining to the Canal Zone the manuscript must be submitted to the Colonel. If complaint is to be made of a faulty house, or bad commissary service, or a negligent doctor, or a careless official in any position it is made to the Colonel. He is the Haroun al Raschid of all the Zone from Cristobal to Ancon. To his personal courts of complaint, held Sunday mornings when all the remainder of the canal colony is at rest, come all sorts and conditions of employees with every imaginable grievance.

The court is wholly inofficial but terribly effective. There is no uniformed bailiff with his cry of "Hear ye! Hear ye"! No sheriff with jingling handcuffs. But the orders of that court, though not registered in any calf-bound law books for the use of generations of lawyers, are obeyed, or, if not obeyed, enforced. Before this judge any of the nearly 50,000 people living under his jurisdiction, speaking 45 different languages, and citizens in many cases of nations thousands of miles away, may come with any grievance however small. The court is held of a Sunday so as not to interfere with the work of the complainants, for you will find that on the Zone the prime consideration of every act is to avoid interference with work. The Colonel hears the complaints patiently, awards judgment promptly and sees that it is enforced. There is no system

of constitutional checks and balances in his domain. He is the legislative, judicial and executive branches in one—or to put it less technically but more understandably, what the Colonel says goes. It is, I think, little less than marvelous that a man in the continual exercise of such a power should awaken so little criticism as he. It is true that those who displease him he may summarily deport, thus effectually stilling any local clamor against his policy, but I am unable to discover that he has misused, or even often used, this power.

A young man comes in with an important problem affecting the social life of the Zone. His particular dancing club desires to use the ball room at the Tivoli Hotel on a certain night, but the room was engaged for that date and the other nights suggested did not fit the convenience of the club, so there was nothing to do but to put it up to the Colonel, who put aside the responsibilities of the head of a \$400,000,000 canal job and President of the Panama Railway to fix a date whereon the young folk of that aspiring social club might Turkey trot and Tango to their hearts' content. So far as I know the Colonel has not yet been appealed to by the moralists of the Zone to censor the dances.

Troubles between workmen and their bosses of course make up a considerable share of the business before the court. Once a man came in with an

evident air of having been ill-used. He had been discharged and the Colonel promptly inquired why.

"Because I can't play baseball", was the surprising response of the discharged one, who had been a steamshoveler.



Photo by Underwood & Underwood

THE COLONEL'S DAILY STROLL

It appeared on inquiry that the drill men had challenged the steamshovelers to a match at the national game, and dire apprehensions of defeat filled the minds of the latter because they had no pitcher. At this juncture there providentially appeared a man seeking a job who was a scientific twirler whether he knew much about steamshoveling or not. The American sporting spirit was aroused. The man with the job who couldn't pitch lost it to the man who could but had no job. So he came to the Colonel with his tale of woe.

Now that sagacious Chief Engineer knows that the American sporting spirit is one of the great forces to be relied upon for the completion of the canal. The same sentiment which led the shovelers to use every device to down the drillers at base-

ball would animate them when they were called to fight with the next slide for possession of Culebra Cut. Some employ-



OLD FRENCH LADDER DREDGES STILL USED



THE COLONEL'S FIRE WORKS

A big blast in Culebra Cut. In one year 27,252 tons of dynamite were used

on him formally by the order of Jan. 6, 1908, giving the Chairman authority to reorganize the service at his own discretion, subject of course to review by the President or Secretary of War. The first effect of this was the abolition of a large list of departments with high sounding names, and concentration of their functions in the quartermaster's department with Major C. A. Devol at its head. The Colonel developed in fact a rage for abolishing and concentrating departments. He did not go quite as far as Nero who wished that Rome had but one neck that he might strike off its head at a blow, but he certainly reduced the number of responsible chiefs to such a point that it was easy to place the fault if work lagged or blunders multiplied.

Col. Goethals' first annual report was issued after he had been in command only three months,

covering therefore nine months of the Stevens administration, and was dated at the end of the fiscal year, June 30, 1907. He reported that 80 per cent. of the plant necessary for completing the work was on the ground or had been ordered. When he arrived the high watermark for excavating in Culebra Cut was 900,000 cubic yards a month, and since his rule began it has never fallen below the million mark, except in May, 1908. It may be noted in passing, that during the first two years of his administration the average for excavation

along the whole line exceeded three million cubic yards a month. During the whole administration of Messrs. Wallace and Stevens only six million yards had been removed. The contrasting figures are given not as reflecting on the earlier engineers, but as indicating the rapidity with which the equip-



Photo by Underwood & Underwood

A HEAVY BLAST UNDER WATER

ment and efficiency of the canal organization were increased when the battle of the levels was ended and the civilian commission done away with.

In this report Col. Goethals argued vigorously against turning over the canal work to private contractors—a matter which the President had asked him to report upon in detail. He pointed out that the canal required special equipment for which no contractor could find use after the expiration of his contract and which therefore the government might just as well buy and own itself. The force of this argument became particularly apparent as the work approached completion. Projects for the utilization of the plant were sent into Congress from every section of the country. It was strongly urged that the plant be sent *en bloc* to Alaska to build railroads and open that rich, but long shut-in territory to settlement and development. Other friends of the reclamation service urged that it be employed in draining semi-submerged lands in the Mississippi Valley and digging irrigating ditches in the Southwest. The floods of the spring of 1913 caused an active demand for its employment on Ohio rivers.

It is fair to note that Mr. Stevens made the first energetic fight for the establishment of the system under which the government owns this colossal and almost invaluable plant, while Col. Goethals' recommendation put upon it the final



Photo by Underwood & Underwood

THE COLONEL'S DAILY MEAL

in the world, erect the mightiest locks that ever raised a ship, and dig a channel through the backbone of a continent, but is quite able to perform the lesser functions incident thereto. It can, and did, successfully conduct hotels and a railroad and steamship line, maintain eating-houses and furnish household supplies. After the Panama exhibit it will take either a brave or a singularly stupid man to preach

stamp of official approval.

This act has importance which will long outlive the construction period of the canal. By the time that work is completed it will have demonstrated beyond doubt that the United States government is perfectly capable of doing its own construction work without the intervention of private contractors; that it not only can build the biggest dam



"THE GOETHALS' OWN" IN ACTION

Attacking a stronghold of the Culcra Slide with a regiment of men and a battery of machines

the ancient dread of a paternalistic government.

Early in Col. Goethals' régime the great department of engineering and construction was split into three subdivisions, namely,

The Atlantic Division, comprising the canal from

deep water in the Caribbean to, and including, the Gatun locks and dam. In all this covered about seven miles of the canal only, but one of its most difficult and interesting features.

The Central Division, including Gatun Lake and the Culebra Cut to the Pedro Miguel lock, or about 32 miles of canal.

The Pacific Division, including the Pedro Miguel and Miraflores locks, and the canal from the foot of the latter to deep water in the Pacific.

Under this classification will be described the construction work on the canal, work which at the time of the author's visit was clear to view, impressive in its magnitude, appalling in the multiplicity of its details, and picturesque in method and accomplishment. With the turning of the water into the channel all this will be hidden as the works of a watch disappear when the case is snapped shut. The canal, they say, and rightly, will be Goethals' monument—though there are those who think it a monument to Col. Gorgas, while quite a few hold

that the fame of Theodore Roosevelt might be further exalted by this work. But whomsoever it may commemorate as a monument it was even more impressive in the building than in the completed form.

One Sunday late in my stay on the Isthmus I was going over the line from Ancon to Culebra. As we approached the little tunnel near Miraflores I noticed an unusual stir for the day, for on the Canal Zone the day of rest is almost religiously observed. Men were swarming along the line, moving tracks, driving spikes, ramming ballast. I asked one in authority what it all meant. "Oh", said he, "we're going to begin running dirt trains through the tunnel, and that necessitates double tracking some of the line. The Colonel said it must be done by tomorrow and we've got more than 1000 men on the job this quiet Sunday. The Colonel's orders you know".

Yes, I knew, and everybody on the Canal Zone knows.



Photo by S. H. Elliott

BAS OBISPO END OF CULEBRA CUT

CHAPTER X

GATUN DAM AND LOCKS



ENTERING the Panama Canal from the Atlantic, one finds the beginning of that section called by the engineers the Atlantic Division, four miles out at sea in Limon Bay, a shallow arm of the Caribbean on the shore of which are Colon and the American town of Cristobal. From its beginning, marked only by the outer-

most of a double line of buoys, the canal extends almost due south seven miles to the lowest of the

Gatun Locks. Of this distance four miles is a channel dredged out of the bottom of Limon Bay and the bottom width of the canal from its beginning to the locks is 500 feet. Its depth on this division will be 41 feet at mean tide. For the protection of vessels entering the canal at the Atlantic end, or lying in Colon harbor, a great breakwater 10,500 feet, or a few feet less than two miles long, made of huge masses of rock blasted along the line of the Canal, or especially quarried at Porto Bello, extends from Toro Point to Colon light. In all it will contain 2,840,000 cubic yards of rock and its estimated cost is \$5,500,000.

In the original plans for the harbor of Cristobal



ENTRANCE TO GATUN LOCKS

The rafts in the foreground carry pipes through which suction dredges discharge material removed



I. COLON: THESE PICTURES IN ORDER FORM A PANORAMA OF THE COLON WATER FRONT

a second breakwater was proposed to extend at an angle to the guard one, but the success of the former in breaking the force of the seas that are raised by the fierce northers that blow between October and January has been so great that this may never be needed. Its need is further obviated by the construction of the great mole of stone and concrete which juts out from the Cristobal shore for 3500

feet at right angles to the Canal. From this mole five massive piers will extend into the harbor, jutting out like fingers on a hand, each 1000 feet long and with the space between them 300 feet wide so that two 1000 foot ships may dock at one time in each slip. The new port of Cristobal starts out with pier facilities which New York had not prepared for the reception of great ships like the "Vaterland"



III. COLON: PANAMA RAILROAD AND ROYAL MAIL DOCKS



II. COLON: PART OF THE RESIDENTIAL DISTRICT ON THE WATER FRONT

and the "Aquitania" at the time of their launching.

From the shore of the bay to the first Gatun lock is a little less than four miles. The French dug a canal penetrating this section, a canal which forms today part of our harbor and which has been used to some extent for the transportation of material for the Gatun dam. Our engineers however abandoned

it as part of our permanent line, and it is rapidly filling up or being over-grown by vegetation. At its best it was about fifteen miles long, 15 feet deep as far as Gatun, and 7 feet deep thence to the now vanished village of Bohio.

The Canal from the seaboard to the Gatun locks was straightaway excavation, through land little higher than the water, with tidewater following so



IV. COLON THE DE LESSEPS HOUSE IN THE DISTANCE SHOWS LOCATION OF NEW DOCKS