

## THE LAND DIVIDED ~ THE WORLD UNITED

Engineer, Mr. John F. Wallace, entered upon his duties on June 1, 1904. Mr. Wallace resigned as Chief Engineer on June 25, 1905, after serving one year, and was succeeded by Mr. John F. Stevens on July 20, 1905.

Mr. Wallace, who had become dissatisfied with the working methods of the first Commission was made a member of the Commission under an Executive Order dated April 1, 1905, which reorganized it, and gave to him full control in the department of construction and engineering. This reorganization was brought about by the Secretary of War who, by direction of the President in March, 1905, requested the resignations of the commissioners, which were at once tendered. It was believed that this change would make a more effective force for doing the required work, and do away with the long delays occasioned in purchasing material and supplies and in the accomplishment of work by government "red tape" which had become so irksome to Mr. Wallace. His resignation shortly after this change, six days after his return to the Isthmus from Washington, was hard to understand, but it is possible that the question of health entered considerably into his decision, for it was at this time that the first outbreak of yellow fever among the Americans had occurred and the first victim was Mrs. Frank Seager, the wife of Mr. Wallace's private secretary.

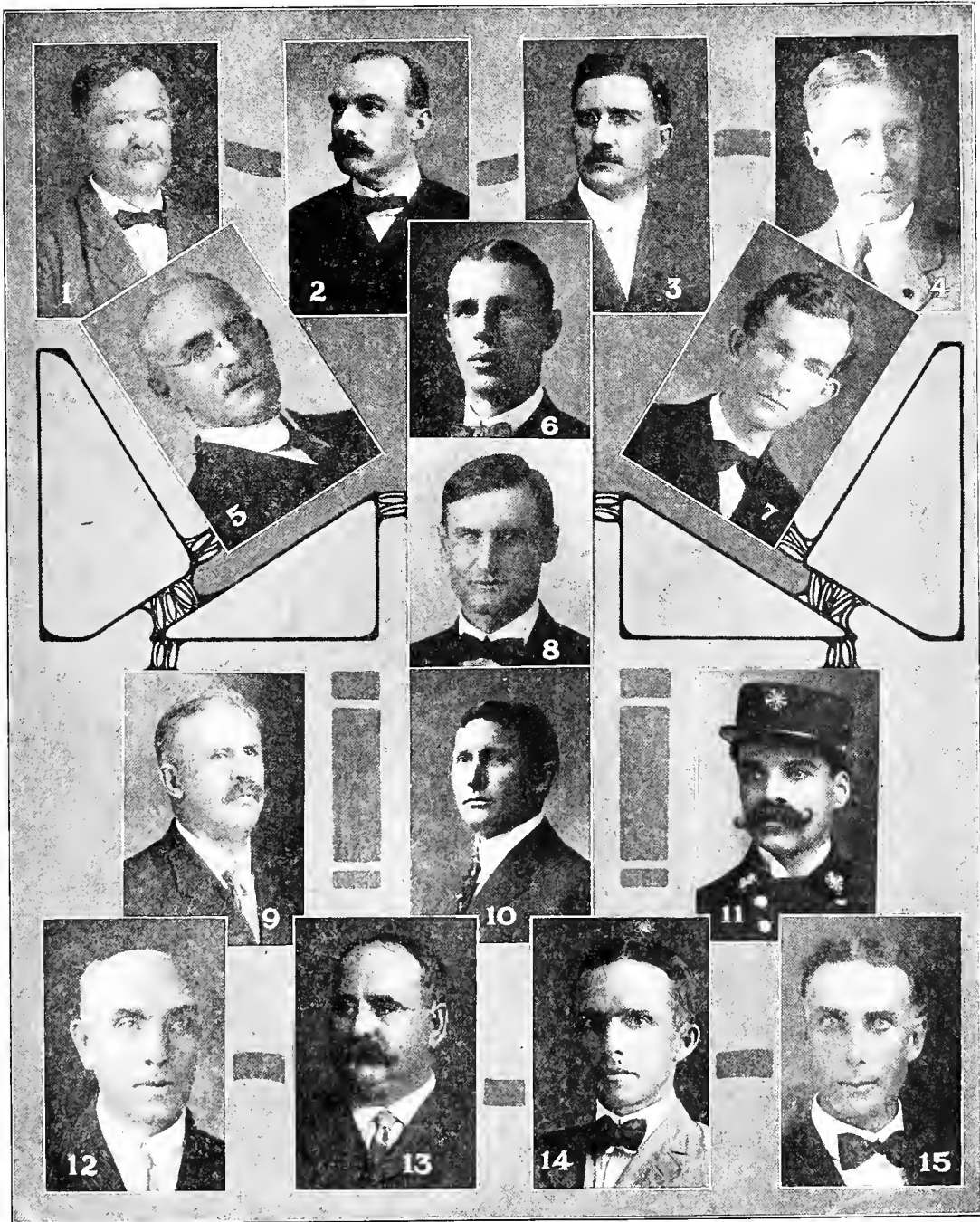
### THE NEW COMMISSION

The new Commission created under the above mentioned Order consisted of the same number of members, seven, but full power was practically vested in three members who were placed in charge of the three executive departments created. One department was under the direction of the Chairman of the Commission, Theodore P. Shonts, and took charge of the fiscal affairs, the purchase and delivery of material and supplies, the accounts, bookkeeping, and audits, and the commercial operations in the United States of the Panama railroad and steamship lines, with headquarters in Washington; another, under the Governor of the Zone, Charles E. Magoon, which looked after the administration and enforcement of law in the Zone, the sanitation of the Canal Zone and the cities of Panama and Colon, and the custody of all supplies and construction necessary for sanitary purposes, and the third, under the Chief Engineer, John F. Wallace, which had charge of the work of construction, the custody of all supplies and plant on the Isthmus and the practical operation of the railroad on the Isthmus with special view to its utilization in the Canal construction work.

An executive committee of not less than three members, a majority of whom constituted a quorum was also created to act in place of the full commission, which had heretofore only met quarterly, during the intervals between meetings, in order to secure the uninterrupted course of the work. This executive committee met twice a week in the office of the Governor on the Isthmus until it was abolished on November 17, 1906.

The new department of Government and Sanitation was placed in charge of Mr. Charles E. Magoon, as a member of the Commission, vice Major-General Geo. W. Davis, who returned to the United States on May 9, 1905, in accordance with instructions received from the Secretary of War, on account of failing health. When General Davis left the Isthmus he turned the work over to Col. W. C. Gorgas, the Chief Sanitary Officer, who acted as Governor until May 25, when Governor Magoon assumed the duties of his office.

The new Commission now consisted of seven members, as follows: Chair-



**SOME OF THE MEN ON THE BIG JOB.**

(1.) Hezekiah A. Gudger, Chief Justice of the Canal Zone Supreme Court. (2.) Frank Feuille, Counsel and Chief Attorney of the Isthmian Canal Commission and the Panama Railroad. (3.) H. A. A. Smith, Examiner of Accounts. (4.) A. S. Zinn, Resident Engineer in the Central Division, who has been identified with the work in Culebra Cut since 1906. (5.) Henry Goldmark, designing engineer, in charge of the lock gates of the Canal. (6.) T. B. Monniche, designing engineer, in charge of the emergency dams of the locks. (7.) John H. McLean, Disbursing Officer of the Isthmian Canal Commission. (8.) Capt. Robert E. Wood, U. S. A., Chief Quartermaster of the Isthmian Canal Commission. (9.) W. G. Comber, Resident Engineer of the Sixth (Dredging) Division. (10.) Capt. Charles W. Barber, Chief of Canal Zone Police. (11.) C. E. Weidman, Chief of the Fire Department. (12.) Tom M. Cooke, Chief, Division of Posts, Customs, and Revenues. (13.) Lieut. Col. Eugene T. Wilson, Subsistence Officer. (14.) George M. Wells, Resident Engineer, Department of Municipal Engineering. (15.) Harry O. Cole, Resident Engineer, Fifth Division.

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man, Theodore P. Shonts, Charles E. Magoon, also Governor of the Canal Zone, Rear-Admiral Mordecai T. Endicott, Brigadier-General Peter C. Hains, U. S. A. (retired), Col. Oswald H. Ernst, U. S. A., Benjamin M. Harrod, and John F. Wallace, also Chief Engineer.

### COMMISSION AGAIN REORGANIZED

On November 17, 1906, the commission was again reorganized by Executive Order in order to promote harmony and to secure results by more direct methods and a centralization of power. In order to do this, the following departments were created under the new organization: Chairman, Chief Engineer, General Counsel, who took over the duties of the Governor, Chief Sanitary Officer, General Purchasing Officer, General Auditor, Disbursing Officer, and Manager of Labor and Quarters.

On September 25, 1906, Gov. Charles E. Magoon, was transferred to administer affairs in Cuba, and was succeeded by Richard Reid Rogers the General Counsel in Washington on November 19, 1906. While Mr. Rogers was in Washington, Mr. H. D. Reed acted as head of the department on the Isthmus until the arrival of Mr. Jo. C. S. Blackburn who was appointed as Head of the Department of Civil Administration on April 1, 1907. On April 2, 1907, the authority of the Governor, or Chief Executive of the Canal Zone, was transferred by order of the Secretary of War to the Chairman's office, so from that time the Chairman and Chief Engineer has in reality been Governor of the Canal Zone also.

Mr. Shonts resigned effective March 4, 1907, and the resignation of General Hains, Major Harrod, and Rear-Admiral Endicott, were accepted on March 16, 1907. Finally, Mr. Stevens resigned effective April 1, 1907. The resignation of Mr. Stevens was as great a surprise as that of Mr. Wallace. According to the report current at the time, the chief engineer became alarmed over the possibility of awarding the contract for the construction of the canal to the Oliver-Bangs combination, and wrote a letter to the President, setting forth that the canal organization had been pretty well perfected; that more dirt had been taken out during the previous 30 days than had ever been taken out before in the same length of time; that he did not care to share the work of building the canal with anyone, nor be hampered with men less familiar with the subject than himself. He intimated that if his wishes were not complied with he would quit. The letter is said to have caused ex-President Roosevelt something of a shock, but with his characteristic spontaneity of action, he cabled acceptance of the "resignation."

In order to get competent men who were used to working under Government regulations and orders, and who would "stick," ex-President Roosevelt resorted to the Army, with the result that three officers of the Corps of Engineers, U. S. A., the Chief of the Bureau of Yards and Docks, U. S. N., an officer of the Medical Corps, U. S. A., and two civilians were appointed in their places, thus practically abandoning the plan of carrying on the work under civilian direction. Under this new organization a combination of the positions of Chairman and Chief Engineer was effected, and the creation of the Department of Sanitation, distinct from Civil Administration was made. It was also required that the commissioners take their station on the Isthmus and thus be in direct touch



A feature of the Fourth of July celebration at Cristobal, in 1911, when Colonel Goethals delivered an address. A flag chorus of school children is seated back of him. The Fourth has been religiously observed by the Americans on the Isthmus every year since 1904.

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with the work under their charge. This new commission assumed its duties on April 1, 1907, and consisted of the following:

Col. Geo. W. Goethals, U. S. A., Chairman and Chief Engineer; Col. D. D. Gaillard, U. S. A., Head of Department of Excavation and Dredging; Lieut.-Col. Wm. L. Sibert, U. S. A., Head of Department of Lock and Dam Construction; Col. W. C. Gorgas, U. S. A., Chief Sanitary Officer; Civil Engineer H. H. Rousseau, U. S. N., Head of Department of Municipal Engineering, Motive Power and Machinery and Building Construction; Jackson Smith, Manager, Labor, Quarters and Subsistence; Jo. C. S. Blackburn, Head of Department of Civil Administration; Joseph Bucklin Bishop, Secretary.

The personnel of the above commission has remained unchanged with three exceptions. Jackson Smith resigned on September 15, 1908, and the department of labor and quarters is now a part of the Quartermaster's Department under direction of Captain R. E. Wood, U. S. A., and the Subsistence Depart-



John F. Wallace, first Chief Engineer of the Panama Canal. He entered upon his duties June 1, 1904, and resigned June 25, 1905.



John F. Stevens, second Chief Engineer. He was appointed July 20, 1905, and resigned April 1, 1907, Col. Geo. W. Goethals, taking his place.

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ment under direction of Major Eugene T. Wilson, U. S. A., as a separate department. Mr. Jo. C. S. Blackburn resigned, effective December 4, 1909, and was succeeded on May 13, 1910, by Mr. Maurice H. Thatcher, Mr. Rousseau acting as Head of the Department during the interval. Mr. Thatcher resigned, effective on June 14, 1913, and was succeeded by Mr. Richard L. Metcalfe, the present head of the department.

The Departments of Excavation and Dredging and Lock and Dam Construction were abolished and, on July 1, 1908, became the Atlantic Division, under Colonel Sibert, having charge of the dredging operations in the Atlantic entrance, and the lock, dam and spillway work at Gatun, and the General Division, under Colonel D. D. Gaillard, which has charge of the excavation in the Culebra Cut section. On July 15, 1908, the Pacific Division was organized and charged with the lock, dam and spillway work at Pedro Miguel and Miraflores, and the dredging work in the Pacific entrance under Mr. S. B. Williamson, Division Engineer. Upon the resignation of Mr. Williamson on December

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12, 1912, the Pacific Division was abolished and its work was placed under the immediate charge of the Chief Engineer, as the Fifth Division of the Department of Construction and Engineering. On May 1, 1913, the dredging work of the Atlantic and Pacific Divisions was consolidated under Mr. W. G. Comber, Resident Engineer, forming the sixth Division of the Chief Engineer's office. The Department of Municipal Engineering, Motive Power and Machinery, and Building Construction, was abolished on August 1, 1908, and became a part of the Department of Construction and Engineering with Mr. Rousseau, Assistant to the Chief Engineer in charge. The present commission consists of the following members:

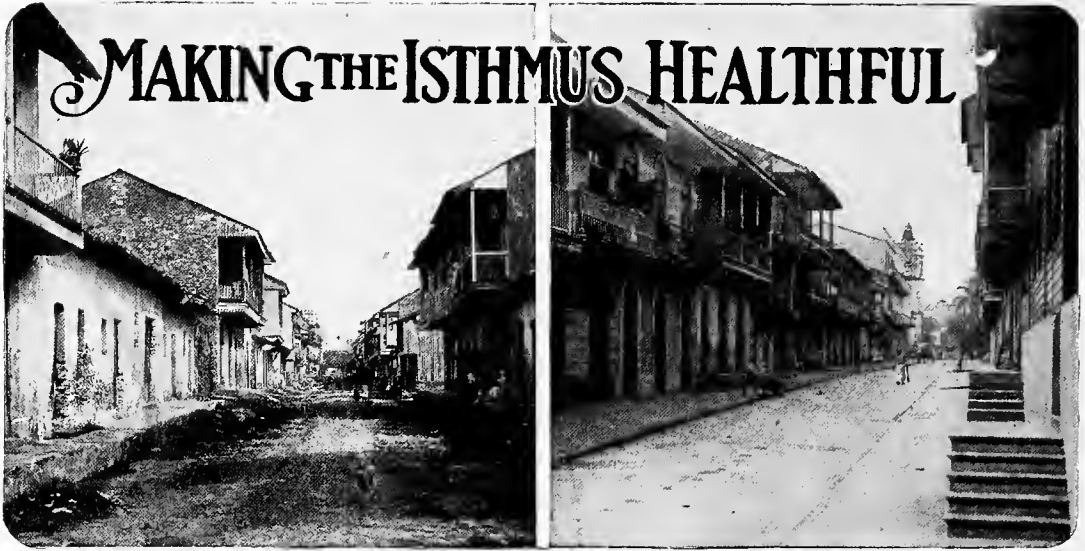
Colonel Geo. W. Goethals, U. S. A., Chairman and Chief Engineer; Colonel H. F. Hodges, U. S. A., Assistant Chief Engineer (Appointed July 14, 1908, vice Jackson Smith); Civil Engineer H. H. Rousseau, U. S. N., Assistant to the Chief Engineer; Colonel D. D. Gaillard, U. S. A., Division Engineer, Central Division; Lieutenant-Col. Wm. L. Sibert, U. S. A., Division Engineer, Atlantic Division; Colonel W. C. Gorgas, U. S. A., Chief Sanitary Officer; Richard L. Metcalfe, Head of Department of Civil Administration; Joseph Bucklin Bishop, Secretary.

Of these eight men, Colonel Gorgas is the only one who has been in the service since the inauguration of the work. Colonel Gaillard left the Isthmus on August 9, 1913, on special leave of absence, suffering from a nervous breakdown, due to his long service on the Isthmus, and it is probable that he will not return.

### THE PURCHASING END

The Commission maintains an office in Washington in charge of Major F. C. Boggs, U. S. A., who fills the positions of Chief of Office, and General Purchasing Officer. The work is apportioned among the following divisions: General Office, Disbursing Office, Office of Assistant Examiner of Accounts, Appointment Division, Correspondence and Record Division, and Purchasing Department. The Appointment Division has to do with filling requisitions for American employes, and during the fiscal year ending June 30, 1913, 2,065 persons were tendered employment on the Isthmus in grades above that of laborer. Of this number, 1,183 accepted and were appointed, covering 59 different positions. The purchasing branch was organized on August 15, 1907, and placed under the supervision of the Chief of Engineers, U. S. A., with an officer of the Corps of Engineers in charge. Additional offices for the purchase of materials are maintained at New York, New Orleans, and San Francisco. Medical and hospital supplies are purchased through the Medical Supply Depot of the Army in New York. Nearly all supplies are purchased under contract by means of advertising for bids and making awards thereon, and all material is carefully inspected before shipment, although the right is reserved of making final inspection on the Isthmus. As an illustration of the work of this department, a total of 7,087 orders were placed during the last fiscal year to the value of \$12,335,973.12.

# MAKING THE ISTHMUS HEALTHFUL



**T**HE high mortality among employes encountered by the builders of the Panama railroad and by the French during their operations indicated that, to keep a suitable working force on the Isthmus, the Canal Zone, and the cities of Panama and Colon would have to be made healthy. Realizing this, one of the first divisions of the canal work to be established was that of sanitation under Col. W. C. Gorgas, who, prior to his arrival on the Isthmus, had successfully stamped out yellow fever and substantially reduced the high malaria rate in Havana, Cuba. This division was at first a part of the Department of Government of the Canal Zone, but, on account of the importance of the sanitary work it was later made a distinct and separate department. That its work under the direction of Colonel Gorgas has been entirely successful, may at this day, be readily seen. Instead of a pest hole with an unsavory reputation as "a white man's graveyard," the Isthmus has become a winter resort for an increasing number of tourists each year. Not only was it necessary to free the Isthmus from pestilence in order that the canal work might be accomplished, but it was just as necessary that it be kept in that condition for all time.

Dr. Ronald Ross of the British Army in India is credited with the discovery, through successive experiments in 1898, that the *Anopheles* mosquito is the germ-carrier for malaria. This mosquito bites an infected person and carries the germ to other persons. In the same way another species of mosquito, the *Stegomyia*, was found to be responsible for yellow fever. The theory of yellow fever transmission by mosquitoes was exploited as early as 1883, by Dr. Carlos Finlay of Havana. The definite and indisputable test was made in July, 1900, at Quemados, Cuba, by four members of the United States Army Medical Corps, who had been appointed as a commission for the study of the disease. These four men were Doctors Walter Reed, Jesse W. Lazear, James Carroll, and Aristides Agramonte. One of these men, Dr. Lazear who allowed himself to be bitten by an infected mosquito, died from the resulting attack of yellow fever. Dr. Carroll also contracted yellow fever during the experiments, but recovered. A reward of \$200 was offered to encourage volunteers, and of the many enlisted men who took part in the experiments, the first to present themselves were John R. Kissinger and John J. Moran, both of whom stated that



One of the driveways in Ancon Hospital grounds. Ancon Hospital is world-famed, and the grounds are among the most beautiful in existence. The site covers about 80 acres, on the slope of Ancon Hill, and the environment is decidedly pleasing to the eyes of both the sick and well. Over 250 varieties of trees and plants are grown in the grounds.





CLEANING DRAINAGE DITCH



METHOD OF SUBSOILING



MOSQUITO BREEDING PLACE



METHOD OF OILING

Every square foot of swamp was a breeding place for mosquitoes. Draining swamps, subsoiling and burning grass, are some of the methods used in the prevention of mosquito breeding. The man in the upper picture is shown burning grass which grows along the open ditches and drains. In the lower picture he is shown spraying larvicide on the grass.

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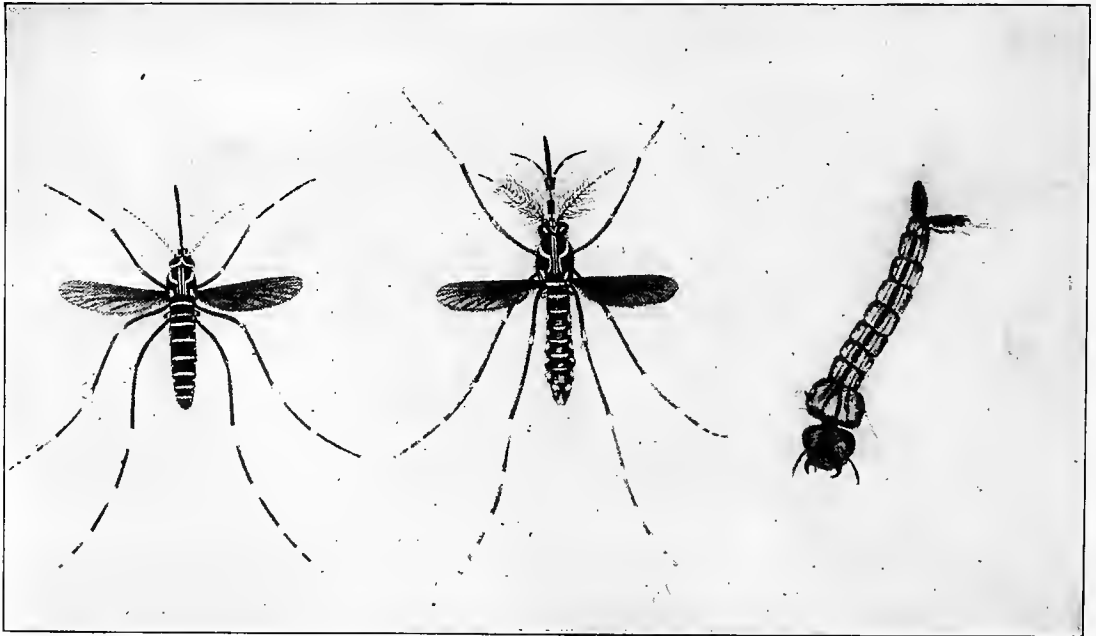
they would undergo the experiment only on condition that they should receive no reward for such service. They both contracted the fever and recovered; Moran is now in the employ of the Commission on the Isthmus. After extensive experiments, the mosquito transmission theory came to be fully accepted by experts on tropic diseases.

By this knowledge the work on the Isthmus was greatly simplified. The prophylactic method of fighting yellow fever and reducing malaria was found to be in the extermination of the mosquito as far as possible, and screening dwellings against them. As soon as wire netting could be brought to the Isthmus all buildings in the Canal Zone were properly screened. The destructive methods consist in the draining of low places, removal of vegetation, in the damp shade of which mosquitoes breed, and the killing of larvae by oiling pools and streams that could not be drained.

At the outset, Colonel Gorgas was hampered by the failure of the Commission in Washington to realize the immediate necessity for large expenditures



A mosquito disguise, which took first prize in the masquerade contest in Panama Carnival of 1904.



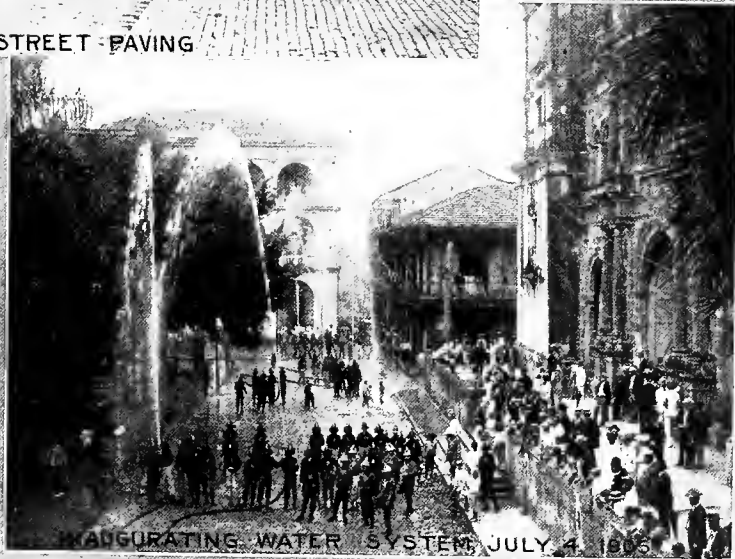
The genus *Stegomyia* mosquito, male and female. The female on the left, the male in the center and the larva on the right. The species has distinctive markings, and the harp-shaped design near the head is found on no other mosquito. The male does not bite, and is, therefore, harmless; it is the female that causes all the trouble.



FUMIGATION BRIGADE



STREET PAVING



INAUGURATING WATER SYSTEM, JULY 4, 1905

It took months of labor, and sortie after sortie, before the mosquito horde began to thin. A gang of about 900 natives was at one time engaged with ladders and paste, sealing all the crevices in the houses in Panama, prior to fumigation. Streets were paved, a water system installed, and a general clean-up was made.

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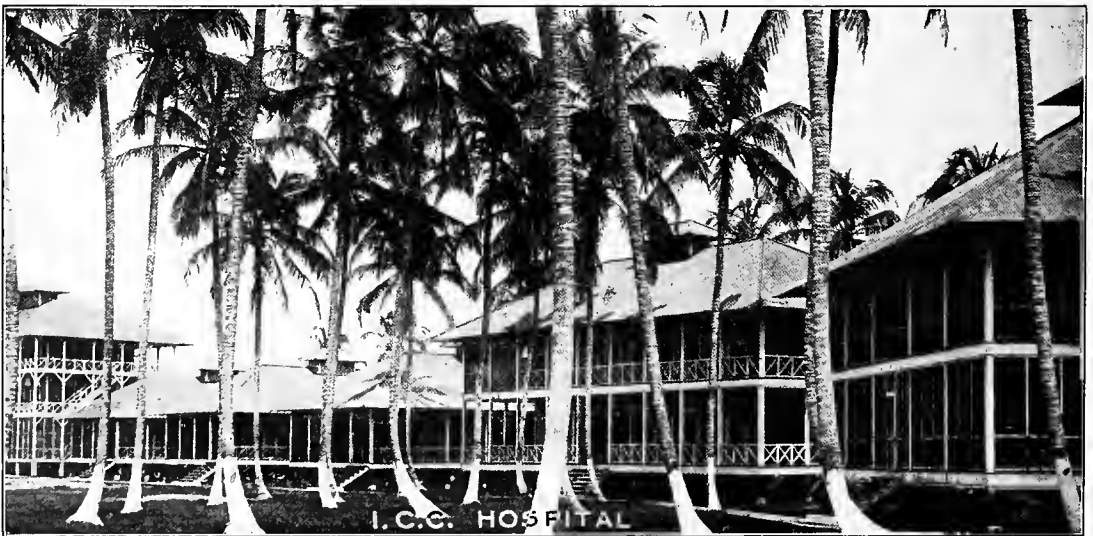


The quarantine station on Culebra Island in Panama Bay. Owing to the fact that the Isthmus is hemmed in on both sides, by plague-infected ports, the most rigid precautions are observed, and steamers from these ports are held in quarantine, unless they have been seven days at sea.

for the purpose of exterminating the mosquito. This was later remedied, and the purse strings were loosened. An outbreak of yellow fever among the recently unacclimated Americans began in December, 1904, and lasted until December, 1905. During the epidemic there were in all 246 cases and 34 deaths. Of this number, 134 of the cases and all of the deaths were among canal employes. The constantly increasing headway made by the disease in the early months of 1905 caused a panic among the employes. A great many of them left the Isthmus as soon as they could obtain accommodations on the overcrowded steamships. This was an object lesson, and resulted in a partial suspension of actual canal construction work until the eradication of yellow fever was effected. In addition to a rigid quarantine, a relentless fight was waged against the mosquito, with the result that the last case of yellow fever occurred in May, 1906, two years after the work started.

### THE FIGHT ON THE MOSQUITO

When a case of yellow fever was reported or found by one of the corps of



Colon Hospital, on the Atlantic side of the Isthmus. It stands on the sea beach, and some of the wards are built over the water.



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inspectors in the course of a house-to-house search for cases, the patient was immediately taken to the hospital and placed in a room protected by screening. The next step was the thorough fumigation of the house from which the patient had been removed, in order to kill any infected mosquitoes that might remain. Finally an endeavor was made to locate and fumigate the source of infection. When the epidemic of 1905 was at its height, the plan of fumigating every house in the cities of Panama and Colon, whether or not there had been cases of yellow fever in them, was carried out. The native residents at first submitted to the fumigation with poor grace, as they are immune and could not see the necessity



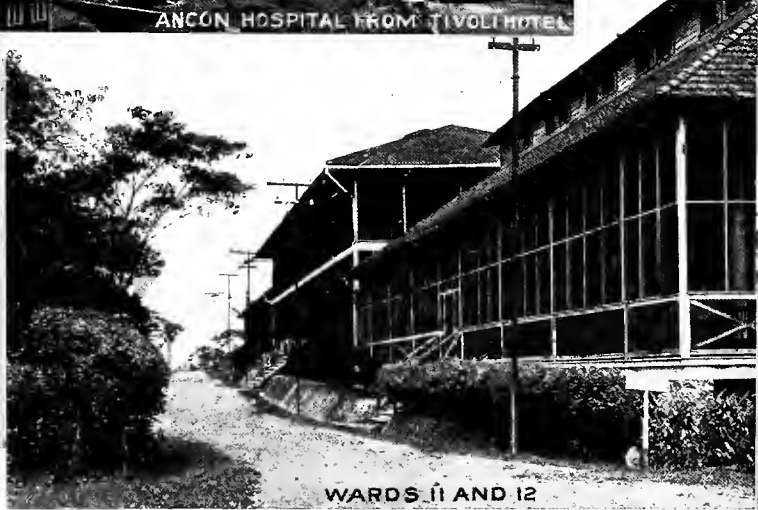
The Dispensary at Ancon. Dispensaries and Field Hospitals are maintained at all the important Canal Zone settlements for first aid treatment.

for it. Later, they became more reconciled, but complaints were numerous. There is now pending in Congress a claim for \$50,000 to cover damages due to a fire in the Malambo district of Panama in the spring of 1905, which is claimed to have been started by the overturning of a fumigating oven.

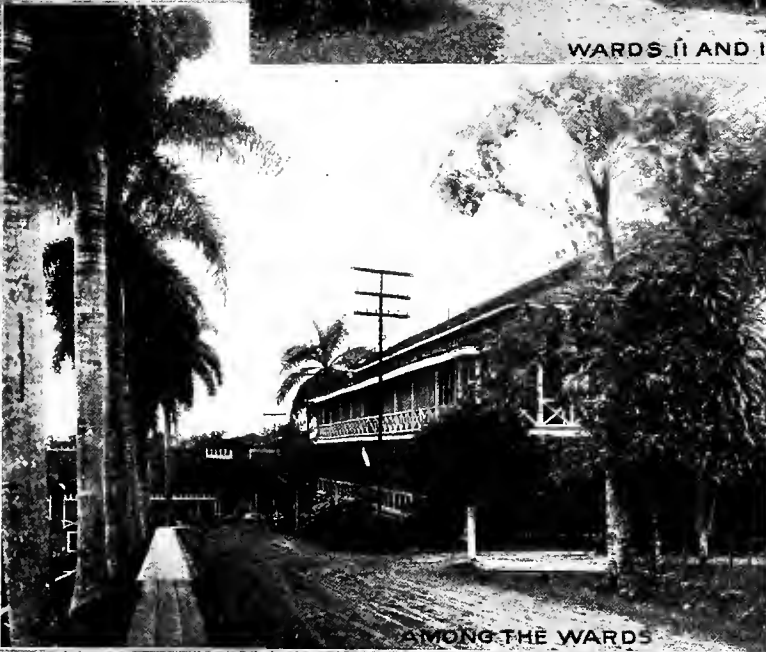
The fight against the *Anopheles*, the malaria-carrying mosquito, has been continuous, for it is next to impossible to eliminate it entirely. This species, unlike the *Stegomyia*, is strong on the wing and is, therefore, able to enter the cities and villages after breeding in the swamps and stagnant pools in the outskirts. To counteract this as much as possible, miles of drainage ditches have been constructed in the vicinity of the canal towns; small streams are kept cleaned out to facilitate the flow of water; swamps have been filled in and grass and rank vegetation kept cut. Regulations are also enforced against allowing



ANCON HOSPITAL FROM TIVOLI HOTEL



WARDS 11 AND 12



AMONG THE WARDS

The Government operates two main hospitals. One at Ancon and the other at Colon. The Ancon Hospital is the larger and best equipped, with a reputation in the Tropics second to none. It was begun by the French in 1883, but many improvements have been made by the Americans.

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There are 47 wards in the Ancon Hospital, and this is the interior of one of them. The white American employes, European laborers and the negroes, are cared for in separate wards. There are private wards also, and one for charity cases. The Canal Commission furnishes free medical treatment to all of its employes.

any water receptacles, like tin cans, etc., being thrown into the bush where they might fill during a rainstorm and make ideal breeding places for the mosquito larvae. Such possible breeding places as cannot be eliminated by draining and filling are sprayed with a form of oil, called larvaecide, which destroys the mosquito larvae as they come to the surface of the water to breathe. In spite of all these efforts there are many cases of malaria, but the number has been rapidly reduced, and the type of disease has been reduced from a virulent to a comparatively mild type. While the mortality from malaria was never so high as other forms of tropic disease, Colonel Gorgas always considered it one of the most important on account of the heavy sick rate. Medicinally, the disease is treated by quinine, many thousands of pounds of which have been used in the hospitals and issued from the dispensaries maintained in each canal zone village.

### CLEANING HOUSE

While a war of extermination was being waged against the mosquito, it was also absolutely necessary to clean house, especially in the cities of Panama and Colon. The latter place, the site of which was partly a tidal swamp, had to be filled in. Proper sewer systems were installed in both cities, where none existed before, unless the open drains in the streets, filled with refuse and other filth, could be called sewers. Suitable water systems also had to be introduced, for up to July 4, 1905, the supply of water was drawn from the cisterns which were allowed to fill during the rainy seasons, or from wells, and afterward peddled from door to door by the *aguadores* or water cartmen. When the water was turned on, all cisterns were closed. Likewise the streets which became virtually mud holes in the rainy season were properly paved with brick or graded. A method of garbage disposal was also provided, for up to this time

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buzzards were the only scavengers. Now, the streets are kept swept and the garbage is collected every night from especially designed containers which every householder is supposed to have. It is then transported to low swampy places in the outskirts of the cities where it is burned, the ashes being used as a fill. In the Canal Zone, garbage is usually destroyed at incinerating plants. In Panama and Colon the collection is made by the health department of the Canal Commission. All the street, sewer and water improvements in these cities done by the engineering department of the Canal Commission will be paid for by the Republic of Panama from its water rates, on the amortization plan. The money advanced by the United States, about \$3,500,000, is to be repaid in 50 years from July 1, 1907, but at the present rate of payment, settlement will have been made much sooner.

The villages in the Canal Zone along the line of the Canal were not so filthy as Panama and Colon, but were without sewer and water systems. Since then several reservoirs have been constructed, and all houses are connected with sewer systems. Macadam roads have gradually replaced trails; garbage is collected daily and properly disposed of; grass and other tropic vegetation is kept cut down in the vicinity of dwellings, and well-kept gardens and hedges make the construction villages appear like model towns. Strict sanitary regulations are enforced in all the Canal Zone towns, as well as in the cities of Panama and Colon, and each place has its sanitary inspectors, or inspector.

### RESULTS HAVE JUSTIFIED THE COST

With cleanliness alone, however, the high sick and death rate could not be materially reduced. The successful war on the mosquito, which was started



Along the coast a few miles from Panama City, is a Leper colony of 24 persons, called Palo Seco. This is the colony house and surroundings. The lepers are well treated, and have all the creature comforts furnished free by the Government, and spend a part of their time growing vegetables for their own consumption.

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by Colonel Gorgas when the engineers were busy constructing water works and sewers, has freed the Isthmus of its reputation as a pest hole, and has made its sick and mortality rate compare favorably with cities in the United States, or any other parts of the civilized world. The following tables indicate the effectiveness of the preventive work of sanitation on the Isthmus:

COMPARATIVE STATEMENT OF DEATH RATES AMONG CANAL EMPLOYEES ON THE ISTHMUS OF PANAMA UNDER THE ORIGINAL FRENCH COMPANY FOR 1884, THE YEAR THE MAXIMUM NUMBER OF EMPLOYEES WERE WORKING, AND THE AMERICAN COMMISSION, 1904 TO 1912, INCLUSIVE.

Year.	Average No. of Employees.	No. of Deaths, Disease Only.	Death Rate per 1,000 Disease Only.	Lives Saved.
1884 . . . . .	17,436	1,198	68.69	. . . . .
1904 . . . . .	6,213	55	8.84	422
1905 . . . . .	16,512	412	24.96	722
1906 . . . . .	26,547	1,046	39.40	778
1907 . . . . .	39,238	964	24.57	1,731
1908 . . . . .	43,891	381	8.68	2,634
1909 . . . . .	47,167	356	7.55	2,884
1910 . . . . .	50,802	381	7.50	3,109
1911 . . . . .	48,876	374	7.65	2,983
1912 . . . . .	50,893	325	6.37	3,172
Total for nine years. . . . .				18,435

TOTAL POPULATION OF PANAMA, COLON AND CANAL ZONE AND DEATH RATES IN SAME.

Year.	Population.	Annual Average Death Rate per 1000	Lives Saved.
1904 . . . . .	35,000	52.45	. . . . .
1905 . . . . .	56,624	49.94	142
1906 . . . . .	73,264	49.10	299
1907 . . . . .	102,133	33.63	1,922
1908 . . . . .	120,097	24.83	3,317
1909 . . . . .	135,180	18.19	4,631
1910 . . . . .	151,591	21.18	4,740
1911 . . . . .	156,936	21.46	4,863
1912 . . . . .	146,510	20.49	4,682
1913 (June 30)	130,456	21.10*	4,090
Total for nine and a half years. . . . .			28,686

\*Computed on six months' figures, but averaged for a year.

Only two cases of bubonic plague have developed on the Isthmus since American occupation. These occurred in Balboa, the first in June, 1905.