West Point that he has to work in harmony with his superiors, with the President, the Secretary of War, and Congress. That is why we have been able to stay where men from civil life have thrown up the job."

Another remarkable characteristic of the Great Digger is his desire to do his work economically as well as to do it promptly. When he went to the Isthmus there was an insistent demand that the dirt be made to fly. Along with the administration in Washington he realized that the only way to gain the faith and confidence of the people in the work, a faith and confidence essential to its full success, was to measure up to their desire that the dirt begin to fly. It was not a time to consider economies then. But, as soon as those demands had been met and the people had been shown that the Army could make good, a cost-keeping system was introduced. Men doing identical work were pitted against one another; Army engineers were placed in command of one task here and civilian engineers in command of another task there; and thus a healthy rivalry was established.

As the late Colonel Gaillard, of the commission, and engineer of the Central Division, testified before a congressional committee, his early work in Culebra Cut was to get out as much dirt as possible, while his later work was given over largely to a study and comparison of cost sheets with a view to cutting down the expense of removing a yard of material, with the result that he was able to show a saving of $17,000,000 in a 9-mile section of the Panama Canal as compared with the estimates of 1908.
In other words, Colonel Goethals took that golden rule of all great soldiers, "get there first with the most men," and adapted it to read "dig the most dirt with the least money." He had ever in mind three things: Safe construction, rapid progress, and low costs. On these three foundation stones in his mind was reared the structure that stands as the highest example of engineering science, and as the proudest constructive accomplishment of the American Republic.

At the northern entrance to the Suez Canal stands a statue of de Lesseps, a beckoning hand inviting the shipping of the world to go through. Perhaps no such statue of Goethals ever will stand at Panama, but there is no need. The canal itself is his monument and its story will ever endure.
CHAPTER XI

THE ORGANIZATION

WHEN the United States finally decided to build the Panama Canal, the next question of gravity which pressed for consideration was the creation of the organization by which it was to be built. Many problems were encountered, and after repeated changes in personnel and rearrangements of duties, the situation finally resolved into an organization headed by one man, clothed with the necessary powers, and held responsible for the consequent results.

The completion of the preliminaries for the acquisition of title to the Canal Zone and to the property and rights of the New Panama Canal Company took place when Congress, on April 28, 1904, made an appropriation of $10,000,000, which was to be paid to the Republic of Panama. Six days later the United States formally took possession of the Canal Zone and of the property of the Panama Canal Company, when at 7:30 o'clock in the morning, Lieut. Mark Brooke, of the United States Army, took over the keys and raised the American flag. The following day President Roosevelt announced the appointment of John Findley Wallace, of Massachusetts, as chief engineer of the canal at a salary of $25,000 a year, the appointment to be effective on the 1st day of June.
The first ship to arrive at Panama carried Maj. Gen. George W. Davis, who was to govern the Canal Zone; Col. William C. Gorgas, who was to make it sanitary; and George R. Shanton, who was to drive out the criminal element. Governor Davis was a member of the Isthmian Canal Commission, Colonel Gorgas had proved his worth in the sanitation of Cuba, and Shanton had been a "rough rider" with Colonel Roosevelt in the Cuban campaign.

When Chief Engineer Wallace arrived on the scene he found there an all but abandoned project. There were hundreds of French houses, but nearly all of them were in the jungle and practically unfit for human habitation. He found millions of dollars' worth of French machinery, but almost none of it in condition to be put into service immediately. He knew in a general way the line of the canal, but surveys were lacking to determine its exact location at every point. With this situation in front of him, he found it necessary to concentrate his efforts upon the problem of getting ready for the work. While he was doing this the people at home began to demand that the dirt fly. Colonel Gorgas also found conditions which challenged his best efforts. Colon was a paradise of disease, Panama was no better. It was only by making both of these cities over again, from a sanitary standpoint, that any hope could be held out for reasonably healthy conditions.

During his stay on the Isthmus Mr. Wallace found himself handicapped at every turn by red tape, a new thing in his experience as a construction engineer. He could buy nothing without
asking for bids; every idea he sought to put into execution had to be submitted to Washington, and he found himself so harassed and handicapped that he wanted a new plan of organization.

Acting in accordance with his recommendations, President Roosevelt decided to accept the resignation of the existing Canal Commission, and to appoint a new one, in which, instead of having independent departments, with the governor independent of the chief engineer, and the chief sanitary officer independent of both the governor and the chief engineer, there should be a more united relation, in which all questions were to be decided by the commission as a whole, the final authority being vested in an executive committee composed of the chairman, the governor of the Canal Zone, and the chief engineer.

Under this plan, the second Isthmian Canal Commission was organized. It consisted of Theodore P. Shonts, chairman; Charles E. Magoon, Governor of the Canal Zone; John F. Wallace, chief engineer; Mordecai T. Endicott; Peter C. Hains; Oswald H. Ernst; and Benjamin A. Harrod. Following the suggestion of Chief Engineer Wallace, the control of the Panama Railroad was also vested in the new commission.

While these changes were being made Chief Engineer Wallace was in Washington. There was dissatisfaction on the Isthmus with an accompanying spirit of unrest, and, to make matters worse, a yellow-fever epidemic broke out. Only a few days after Mr. Wallace reached the Isthmus, he cabled the Secretary of War that he wished to return to Washington, hinting that he might re-
sign. Secretary Taft cabled to Governor Magoon for an opinion as to the motives which were behind this step on the part of Mr. Wallace, and was advised that it was brought about by the offer of a better salary and the fear of the yellow-fever epidemic. When Mr. Wallace reached New York he had a stormy interview with Secretary Taft, who roundly denounced him for quitting at such a critical time. Mr. Wallace declared his lack of confidence in the ability of Colonel Gorgas to control the yellow-fever epidemic, and asserted that the continual interference of red tape was so distracting to him as to make new employment attractive. President Roosevelt upheld his Secretary of War in his denunciation of Mr. Wallace, and promptly appointed John F. Stevens chief engineer at a salary of $30,000.

John F. Stevens arrived on the Isthmus on July 27, 1905. He found the Panama Railroad almost in a state of collapse. He declared that the only claim heard for it was that there had been no collisions for some time. "A collision has its good points as well as its bad ones," he observed, "for it indicates that there is something moving on the railroad."

Mr. Stevens immediately set to work to build up the road, and to provide the means for housing and feeding the canal army. But like his predecessor he found Government red tape hampering, and in his first annual report begged for "a thorough business administration unhampered by any tendency to technicalities, into which our public work sometimes drifts." He protested against civil-service requirements on the Isthmus,
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and against the eight-hour working day; and President Roosevelt met his protests by exempting all employees except clerks from the operations of civil-service rules, and by abrogating the eight-hour day.

It was under the régime of Mr. Stevens that the question arose as to whether the canal should be built as a sea-level channel through the Isthmus, or as a lock canal with the water in the middle section 85 feet above the level of the sea. President Roosevelt thereupon appointed a board of consulting engineers, made up of 14 members, to visit the Isthmus and determine what type of canal should be built. Five members of this board of consulting engineers were foreigners appointed by their respective Governments at the request of President Roosevelt. They included the inspector general of Public Works of France, the consulting engineer of the Suez Canal, the chief engineer of the Manchester Canal, the chief engineer of the Kiel Canal, and the chief engineer of the Dutch dike system. Three of the American engineers and all five of the foreign engineers voted in favor of a sea-level canal. Chief Engineer Stevens and all but one member of the Isthmian Canal Commission concurred in the vote of the minority, made up wholly of American engineers in favor of the lock canal. President Roosevelt sustained the minority report, and Congress sustained him in the law of June 29, 1906.

In the fall of 1906 Chairman Shonts came out in advocacy of a plan to build the canal by contract. Here arose a difference between Mr. Shonts and Mr. Stevens, and Chairman Shonts
shortly thereafter resigned. A few months later Chief Engineer Stevens also resigned. It is said that his resignation was mainly due to his objection to the appointment of Army engineers as members of the Canal Commission, and to a letter he wrote the President in which he scored the limitations of red tape and Government methods generally. When Mr. Stevens quitted the Isthmus he left behind him the nucleus of the general organization for building of the canal. He saw housing conditions brought up to the required standard, established the necessary commissary where canal employees could supply their needs at reasonable prices, and aided Colonel Gorgas in his fight to make the Isthmus healthful.

At this juncture the organization destined to build the canal was put into effect, with Colonel George W. Goethals at its head. Colonel Gorgas, the chief sanitary officer, was the only important official of the old régime held over. The other members of the commission were Maj. D. D. Gaillard and Maj. William L. Sibert, of the United States Engineer Corps; Civil Engineer H. H. Rousseau, of the United States Navy; and Messrs. J. C. S. Blackburn and Jackson Smith.

Under former commissions the Governor of the Canal Zone had ranked above the chief engineer, and the chairman, the chief engineer, and the governor had had rival powers, which resulted in a great deal of friction. Under the new order the offices of chairman and chief engineer were consolidated, and the governor was reduced to the title of "head of the Department of Civil Administration," reporting to the chairman, as did the
chief sanitary officer and all of the division engineers.

This commission, in personnel, remained intact during the long period of construction, except for the resignation in 1908 of Jackson Smith, who was succeeded by Lieut. Col. Harry F. Hodges; and for the resignation in 1910 of Mr. Blackburn, who was succeeded by Morris H. Thatcher. Mr. Thatcher, in turn, was succeeded in 1913 by Richard L. Metcalfe as head of the Department of Civil Administration.

During the construction period there were several rearrangements of the duties of the Army engineers associated with Colonel Goethals. From June, 1908, Major Gaillard, afterwards promoted to a lieutenant-colonelcy, was in charge of the ditch-digging work between Gatun and Pedro Miguel, which included the entire Gatun Lake and Culebra Cut sections. It is everywhere admitted that so far as difficulties were concerned, he had the hardest job on the Isthmus, next to the chief engineer. Colonel Gaillard entered the United States Military Academy in 1884 and was graduated with honors entitling him to appointment in the Corps of Engineers. Before being selected as a member of the Canal Commission, he had had much experience in important work. For two years he was in charge of all river and harbor improvement in the Lake Superior region. When he first went to the Isthmus he was assigned as the supervising engineer in charge of harbors, the building of breakwaters, etc.

Lieut. Col. William L. Sibert, another of the Army engineers who was made a member of the
Canal Commission, was graduated from West Point in 1884 and was made a lieutenant of engineers. From 1892 to 1894 he was assistant engineer in charge of the construction of the ship channel connecting the Great Lakes. The four years following he was in charge of the river and harbor work in Arkansas, and following that, spent one year teaching civil engineering in the Engineering School of Application. He then went to the Philippines as chief engineer of the Eighth Army Corps and became chief engineer and general manager of the Manila & Dagupan Railroad. From 1900 to 1907 he was in charge of the Ohio River improvements between Pittsburgh and Louisville. As division engineer of the Atlantic division of the Panama Canal he was in charge of the construction of the Gatun locks, Gatun Dam, and the breakwaters at the Atlantic entrance to the canal.

Civil Engineer Harry H. Rousseau, of the United States Navy, was appointed a member of the Isthmian Canal Commission at the same time that Chief Engineer Goethals was selected to head the organization. He had had much experience in engineering work prior to the appointment and was a personal appointee of President Roosevelt, with whom he had come in contact when he was serving in the Bureau of Yards and Docks of the Navy Department when Mr. Roosevelt was assistant secretary of that Department. He entered the employ of the United States through the civil service, having been appointed a civil engineer in the Navy with the rank of lieutenant, after a competitive examination in 1898. For four
years he was an engineer of the bureau of which he afterwards became chief, and for four years following, from 1903 to 1907, he was engineer of the improvements of Mare Island Navy Yard, California. The duties of Commissioner Rousseau were changed from time to time, and he was finally given charge of the work of constructing the terminals at the ends of the canal. At the same time he was made assistant to the chief engineer, having charge of all mechanical questions arising on the canal.

When Jackson Smith, one of the two civilian members of the Canal Commission, resigned, he was succeeded by an Army officer, Col. Harry F. Hodges, who would have been a member of the commission from the first, upon the request of Colonel Goethals, had not the United States Engineer Corps required his services. Colonel Hodges was graduated from the United States Military Academy in 1881, and immediately entered upon seven years of duty on river and harbor improvements in the United States. This was followed by four years' service as assistant professor of engineering at West Point, and that duty, in turn, by six years of work on rivers and harbors and fortifications. During the Spanish American War he served in Porto Rico, and then returned to river and harbor duty for two years. In 1901-02 he was chief engineer of the Department of Cuba, from which duty he was transferred to the War Department, where he became assistant to the chief of engineers. His experience in river and harbor work, coupled with his success as the designer of the locks of the American Sault Ste.
Marie Canal, fitted him for the work at Panama. He became assistant chief engineer and purchasing agent of the canal in 1907, and the following year was chosen a member of the commission to succeed Mr. Smith. The work of designing the locks and the lock machinery fell upon his shoulders.

When President Roosevelt wanted a man to handle the delicate problems arising out of the peculiar relations with the Republic of Panama and the United States, he selected Joseph C. S. Blackburn, of Kentucky, who had just finished a long term of service in the United States Senate. Senator Blackburn was well equipped for such a position, combining that suavity indicated by the velvet glove with that determination of purpose which lies in the iron hand.

The service of Col. William C. Gorgas, the chief sanitary officer on the Isthmus, began earlier than that of any of the higher officials. He went to the Isthmus immediately after it was taken over by the United States. He has been described as a man "with a gentle manner, but with a hard policy toward the mosquito." He was born in Mobile, Ala., in 1854, the son of Gen. Josiah Gorgas, of the Confederate Army. He became a member of the Medical Corps of the United States Army in 1880, and since his work at the head of the Cuban health campaign his name has been a household word in the United States.

In establishing the Isthmian Canal Commission, which was destined to make the Panama Canal a reality, President Roosevelt selected Joseph Bucklin Bishop as its secretary. Mr. Bishop was made the editor of the Canal Record, a weekly paper
which was the official organ of the Canal Commission. He is a born investigator and when any matter arose concerning the work on the canal, about which the chief engineer desired an impartial report, he usually referred it to Mr. Bishop.

When the matter of organizing the work arose it was decided to arouse a spirit of emulation and rivalry, and S. B. Williamson, a civilian engineer, was put in charge of the Pacific end of the canal, with duties similar to those of the Army engineer on the Atlantic side. Mr. Williamson proved to be a master of the art of accomplishing a great deal with a given amount of money, and the cost sheets of the Pacific end will ever stand as a monument to his efficiency.

The list of engineers and other officials who contributed to the success of the work at Panama is a long one, but among them may be mentioned: Col. Chester Harding, who was the resident engineer at Gatun; W. G. Comber, who headed the dredging work on the Pacific end of the canal during the early days of the American undertaking, of the entire canal during the final stages; W. G. Rourke, who was resident engineer in Culebra Cut for a number of years; Caleb M. Saville, who worked out the data for the construction of the Gatun Dam; H. O. Cole, who succeeded S. B. Williamson on the Pacific end work; Lieut. Frederick Mears, who relocated the Panama Railroad; John Burke, who had charge of the commissary; Maj. Eugene T. Wilson, the chief subsistence officer; Brig. Gen. C. A. Devol, who was in charge of the quartermaster’s department; E. J. Williams, Jr., the disbursing officer; and Col. Tom
F. Cook, the picturesque chief of the Division of Posts and Customs.

To all these, and to scores of others who are not mentioned here merely because of the limitations of space, the American people owe the great success at Panama. The organization was imbued with a spirit of loyalty to the great task, and having its accomplishment singly in mind there was little room for jealous bickerings and none at all for scandal and corruption.

Every man who had a part in it always will be proud of his share, and that pride will be supported and justified by all Americans.