CHAPTER VII.

A MINIATURE REVOLUTION.

It was not to be expected that Panama, one of the constituent provinces of the United States of Colombia, would be very enthusiastic about all this haggling and intriguing at Bogotá. Panama asked for nothing better than that a rich and powerful country like the United States should continue the French enterprise and carry it through. The canal would run right through the province, and would bring it into the main stream of the world's traffic and commerce. No doubt the central government at Bogotá would skim off as much as possible of this new wealth and prosperity at the isthmus; but even so, Panama would reap a great advantage from the running of this new and much-frequented highway of communication between east and west through its territory. The dealings of the
central government with the United States had roused a growing disgust and resentment at the isthmus.

The relations between the province of Panama with New Granada and its successor Colombia had been very chequered ever since the revolt of the Spanish colonies in Central and South America in the early years of last century. Panama declared her independence in 1821, and allied herself at once with New Granada. But troubles began forthwith. Again and again the isthmian province seceded from New Granada or Colombia, and was induced to return by promises of more favourable terms of union, these always remaining unfulfilled. In his annual message to Congress in 1903, President Roosevelt enumerated some fifty-three "revolutions, rebellions, insurrections, riots, and other outbreaks" that had occurred at the isthmus in fifty-seven years. Not long before these difficulties between the United States and Colombia, Panama had received a new constitution which was far from satisfactory to the people of the province. There was in truth little to be gained by a continued allegiance to the government at Bogotá. Some
idea of the depths to which Colombia had sunk through a long course of bad administration and corruption may be gathered from a passage in the official address of Dr. Marroquin on his becoming vice-president of Colombia in 1898. He said:

Hatred, envy, and ambition are elements of discord; in the political arena the battle rages fiercely, not so much with the idea of securing the triumph of principles as with that of humbling and elevating persons and parties; public tranquillity, indispensable to every citizen for the free enjoyment of what he possesses either by luck or as the fruit of his labour, is gradually getting unknown; we live in a sickly atmosphere; crisis is our normal state; commerce and all other industries are in urgent need of perfect calmness for their development and progress; poverty invades every home. The notion of mother country is mistaken or obliterated, owing to our political disturbances. The conception of mother country is so intimately associated with that of
political disorders, and with the afflictions and distrust which they engender, that it is not unusual to hear from one of our countrymen what could not be heard from a native of any other country: "I wish I had been born somewhere else." Could many be found among us who would feel proud when exclaiming, "I am a Colombian," in the same way as a Frenchman does when exclaiming, "I am a Frenchman"?

This was a cheerful pronouncement for a people to hear from the lips of a man who was just assuming high office in their midst. It suggests some further reasons why the Panamanians should have so readily asserted their independence once more when the negotiations between Colombia and the United States fell through.

Long before that happened, before the Colombian Congress which was to deal with the Hay-Herran Treaty had assembled, a much-respected citizen of Panama, Dr. Manuel Amador (Gur- rero), had written to the Colombian president warning him that serious consequences would
follow at Panama if that treaty were not ratified. For answer the central government foisted on Panama a candidate for Congress who was well known as an enemy of the United States and of the isthmian canal scheme. Representations to the government at Bogotá were useless, and Panama saw the prospect of a canal being constructed through her territory fading into distance.

Then it was that an eminent Panamanian, José Agustin Arango, a senator at the Colombian Congress of 1903, who had vainly urged the ratification of the Hay-Herran Treaty, conceived the idea that Panama might declare her independence and then make her own treaty with the United States regarding a trans-isthmian canal. It soon turned out that the same idea had struck many others, and a junta of zealous conspirators was quickly formed. Señor Arango chanced to meet Dr. Amador one day at the offices of the Panama Railroad, and unfolded his revolutionary design to that gentleman. The doctor proved highly sympathetic. There was indeed no difficulty in finding adherents. Señor Arango, Dr. Amador, and C. C. Arosemena undertook the
conduct of the movement, and among the other leaders were Señor Arango's sons and sons-in-law, Nicanor A. de Obarrio, Federico Boyd, Tomas and Ricardo Arias, and Manuel Espinosa. A very important person, General Esteban Huertas, commander of the troops in Panama, was easily enrolled, as were also alcaldes, chiefs of police, and other important officials.

The first thing to do was to sound official opinion in Washington as to what treatment the revolted province might expect from the American government. Moreover, revolutions cost money, and supplies must be obtained from somewhere. So Dr. Amador and Ricardo Arias were deputed to go to the United States. There they called on Mr. Cromwell, the counsel of the New Panama Company, who gave them very little encouragement. Moreover, they were carefully "shadowed" by Colombian agents, so that they were able to cable to their expectant friends at the isthmus only the single depressing word, "desanimado" (disappointed).

Then Dr. Amador called at the office of a Panamanian friend and sympathizer, Joshua Lindo, and asked for counsel in his difficulties. Mr.
Lindo at once suggested that the likeliest person to help was Mr. Bunau-Varilla, who had been chief engineer under the French Canal Company. It is interesting to know that this gentleman had been a fellow-student of Alfred Dreyfus, and had given effective help in the campaign which ended in that officer's liberation from the island prison not so very far from the isthmus of Panama. Unfortunately, said Mr. Lindo, Mr. Bunau-Varilla was in Paris; but even as the friends deplored his absence the telephone rang, Mr. Lindo answered the call, and lo! Mr. Bunau-Varilla announced his return to New York. Such a coincidence might well seem providential, for Mr. Varilla proved a friend in need and in deed. He promised the necessary funds as well as other practical help, and asked for only one return—that he might be appointed minister of the reconstituted Panama to the United States for just so long a time as was necessary for the arrangement of the new treaty between the two countries for the construction of the isthmian canal.

It is not surprising, therefore, that the next telegram sent home by the revolutionary agents
was more cheerful. It consisted of the single word “esperanzas” (hopes). Dr. Amador now made some efforts to ascertain the sentiment and intentions of the United States government. He called on Mr. Hay, the Secretary of State, at the state department. Now it is obvious that when a gentleman calls at a foreign office and announces himself as a conspirator against a government with which that office has friendly relations, the visitor cannot expect much practical help and sympathy. But the authorities at Washington, whose nerves were raw from the prolonged struggle with Colombia, would scarcely have been human if they had not felt a secret joy at a movement which promised such an ample retribution on Colombia and so easy a settlement of the Panama problem. Dr. Amador was politely informed that he must pay no more calls at the department. But he had seen and heard enough to assure him that the United States would at least remain neutral, and, if the revolution succeeded, would conclude a canal treaty with the new republic. He felt that there were two very important conditions to be fulfilled. Firstly, the revolution must be effected without
bloodshed, for public sympathy in the United States would be alienated by any fighting or violent disturbance. The conspirators were also not without a certain natural solicitude for their own skins. Secondly, there must be a brand-new government ready to take the place of the Colombian administration so soon as this was abolished.

The scene now changes to the isthmus. The conspirators were inclined at first to be sceptical about Dr. Amador’s report of the probable attitude of the United States, but on November 2, 1903, the arrival of the American gunboat Nashville at Colon reassured them. The Nashville had come, as American men-of-war had frequently come in the past to Colon or Panama, not to take sides with any party in a scrimmage, but calmly and impartially to maintain order and keep transit open at the isthmus, in accordance with treaty obligations. The orders to the Nashville, as subsequently to the Boston and the Dixie, were these:—

Maintain free and uninterrupted transit. If interruption threatened by armed force, occupy line of railroad. Prevent landing
of any armed force with hostile intent, either government or insurgent, either at Colon, Porto Bello, or other point.*

A similar order was sent to Rear-Admiral Glass at Acapulco, who was to proceed to Panama with the same object.

But the coming coup d'état was known at Bogotá as well as at Washington. The date fixed for the outbreak was November 4. General Huertas was to be ready with his troops, and the signal to be given by the blowing of bugles by the firemen. But the Colombian government at last decided to act, and on November 3 the steamer Carthagena arrived at Colon, having on board General Tovar with a force of about four hundred and fifty men. The commander with three other resplendent warriors, Generals Castro, Alban, and Amaya, at once took train for Panama; while their troops, many of whom had brought their wives, camped out in the streets of Colon. These events were duly telephoned to Panama. The news

*See "Four Centuries of the Panama Canal," p. 188 (W. F. Johnson).
reached Dr. Amador and his friends at ten o'clock, just an hour before the arrival of the Colombian officers. It was "a crowded hour of glorious life" for the conspirators, some of whom found the excitement too much for their nerves, disappeared from the scene, and gave up the conspiracy business altogether. But the leaders were of better mettle, and while the trans-isthmian train was rapidly bringing the representatives of the established government to Panama a good many plans were discussed. The desperate nature of the occasion may be gathered from the fact that one of the proposals was to drug the Colombian officers, and when thus disabled convey them to durance vile. In great perplexity Dr. Amador sought General Huertas; but he had put on his dress uniform and gone to the station to meet his superiors. So matters were to be allowed to take their own course.

At eleven o'clock a gush of glittering uniforms, fifteen in all, counting the generals and the staffs, descended upon the Panama platform. One might almost have expected them to advance to the footlights and announce their arrival and
intentions in a four-part chorus. Here obviously were the properties, the stage scenery, and the artistes, principals and chorus, of a first-rate comic opera. In the harbour lay three Colombian gunboats whose political views were not fully ascertained, though it was thought the commanders had been won over to the revolutionary cause. The new arrivals were welcomed by General Huertas and conducted to headquarters, while the conspirators, no doubt with quickened pulses, awaited subsequent events from a distance.

The Colombian officers wished to be conducted forthwith to the fortifications and the sea-wall. Now this was precisely what General Huertas, whose heart beat loyally under his official gold braid to the cause of freedom and independence, wished to avoid, and for two reasons: firstly, it would have been easy for the federal generals to signal to the gunboats in the harbour and thus get command of the entire situation; secondly, on that same sea-wall there were some modern quick-firing guns, behind which even fifteen men might quickly get the whole city at their mercy. So General Huertas determined that on the whole
he would conduct his guests anywhere but to the sea-wall. He suggested that there were better ways of spending the hot hours of the day than in going round fortifications in stiff and sweltering uniforms. After luncheon, followed by a little siesta behind sun-shutters, would be a better time for the business of inspection. The generals were probably both hot and hungry, and they allowed themselves to be persuaded.

But even as they lunched their suspicions seemed to have awakened. Some one, it is said, warned them of the trap into which they had walked. And moreover, why did the Bogotá troops not arrive from Colon? What exactly happened is not recorded, but it is a fact that the generals suddenly insisted on the Panama troops being paraded and themselves being conducted to the fortifications.

General Huertas made some excuse for leaving the luncheon room, and outside the door found Dr. Amador, the respectable physician of Panama, now an arch-conspirator, though without the black mantle and stiletto. "The contrast between these two men," writes Mr. Johnson, "was most striking. The one was advanced in
years, venerable and stately in aspect, and yet impetuous as youth. The other was only a boy in stature and scarcely more than a boy in years, yet at the time deliberate and dilatory. The latter, however, quickly responded to the zealous initiative of the former. 'Do it,' exhorted Dr. Amador in an impassioned whisper, 'do it now.'"

The business was soon over. Huertas ordered out his soldiers, who knew well enough what was going to happen. Then, as the military swells from Bogotá came on the ground, the little general gave the order, the rifles were levelled on the Colombians, and they were walked off to police headquarters and safely locked up. Then Governor Obaldia was also arrested and taken to prison, but this was only a formality. He was an ardent conspirator, but as he represented the central government, it was thought desirable to perform the symbolical act of arresting and deposing him. He was at once released.

There was now no going back. The next step was to announce the fact of the revolution to the gunboats in the harbour, which were still a
doubtful factor. Two of them, the Padilla and the Chucuito, remained silent; but the third, the Bogotá, sent word that if the generals were not released by ten o'clock it would turn its guns on to the city. The generals were, of course, not released, so at ten o'clock the Bogotá launched three shells into the city. One of these killed an unfortunate and innocent Chinese coolie near the barracks, and that was the only casualty that occurred during the whole course of the great Panama revolution. Then the Bogotá, that deed of slaughter accomplished, steamed out of the harbour.

The next morning the gunboat Padilla, which had been considering the situation during the night, suddenly made up its mind, steamed in to a snug anchorage under the fortified sea-wall, and hoisted the flag of free and independent Panama. The Padilla might have been called upon to make good its new allegiance, for a report was spread that the terrible Bogotá was returning to bombard, this time to good purpose. So a letter was drawn up by the consuls of the United States, Great Britain, France, Germany, Italy, Spain, Holland, Ecuador, Guatemala, Salvador,
Denmark, Belgium, Cuba, Mexico, Brazil, Honduras, and Peru, protesting against the bombardment of a defenceless city without due notice to the consular corps as contrary to the rights and practices of civilized nations. What answer the justly enraged commander of the Bogotá would have returned to this rather representative address cannot be known, for the Bogotá, no doubt unnerved by the sensation of casting three live shells into a live town, never returned to witness the devastation it had wrought.

What in the meantime was occurring at Colon? Why had the 450 Colombian soldiers not flown to the rescue and vengeance of their captured officers? The explanation is simple, though perhaps unexpected—they could not pay their railway fares! After the departure of the generals for Panama on November 3, Colonel Torres, who had been left in charge of the government troops, demanded a "special" to take them across the isthmus. The superintendent of the line intimated that specials were procurable, but that fares must be paid. And the fares of 450 persons ran into money, in fact nearly $2,000 in gold, or quite a little wheelbarrowful of
the depreciated Colombian silver. Anywhere but in Panama or Ruretania the plea of state necessity, which in presence of the 450 needed no demonstration, would have procured some concession from the railway authorities. But the railway rules provided for no such emergencies. No fare, no journey—that was the immutable railway law, and Colonel Torres had to lead his men back to their street encampments. It is one of the many remarkable coincidences at this juncture that the telegraphic and telephonic system also broke down, the wires refusing to transmit any messages from Colon to the officers at Panama.

At last, on November 4, Colon received the news of the revolution and the impounding of the Colombian officers. Some little impatience then appeared among the Colombian troops. They actually threatened to seize the railway and go across in spite of regulations. Also it was rumoured that Colonel Torres, losing for a moment his self-command, threatened to kill every American citizen in Colon unless his fellow-officers were at once liberated. At any rate, that rumour was duly reported to the commander
of the Nashville, who, on the strength of it, at once landed fifty bluejackets to preserve the peace of the town. The commander also wrote to the alcalde of Colon and the chief of the police, giving the gist of an official order he had received from Washington. The order pointed out that to allow the passage of Colombian troops from Colon to Panama would excite a conflict between the forces of the two parties, and would thus interrupt the free and open transit of the isthmus which the United States was bound to maintain. The commander had therefore instructed the superintendent of the railways to afford carriage to the troops of neither party. Never was officer so outrageously impeded in the performance of his obvious duty as Colonel Torres. And right in the middle of the situation thus created the Carthagena, which had brought the Colombian troops to Colon, sailed demurely home.

In a few days there assembled some nine or ten vessels of the United States navy at Colon or Panama. On November 4 it was announced that the United States would permit the landing of no forces hostile to Panama within fifty miles of the city of Panama or anywhere at all on the 4a
Caribbean coast. Was not the United States government compelled by treaty obligations to preserve peace, the paying of fares, and "free and uninterrupted transit" at the isthmus? How unreasonable to suggest that the great and grown-up republic was protecting and taking the side of the little baby republic which had just been born at Panama!

But the 450 soldiers encamped with their wives in the streets of Colon were becoming an inconvenience, and it was highly desirable to remove this substantial lump of grit from the machinery of revolution. The commander of these troops himself helped to effect that object. He, in fact, offered to take his little army away in return for a satisfactory honorarium. The Panama treasury fortunately contained at that time a sum of $140,000 in debased Colombian coinage, worth about $56,000 in gold. A little of this might well be expended on clearing the country of the Colombian troops. The commander accepted $8,000 in gold, and quickly bundled the loyal troops and their spouses on board the Royal Mail steamship Orinoco for passage homewards. He himself did not propose
to return home and report himself. His scheme was to go to Jamaica and spend his suddenly acquired wealth in "that loveliest of the Antilles." Then a cruel thing happened. The 450 got wind of the bargain their commander had made with the Panama government, and by a swift logical process concluded that the $8,000 which had been paid for their departure belonged to themselves as well as to their commander. So they laid hands on the hapless officer and took all the money from him. We may imagine the annoyance of the gentleman who had betrayed his country, dishonoured his name, and then lost the "tip" which had made it all worth while. His subsequent proceedings are nowhere recorded.

Just after the Colombian troops had set sail homewards a special train arrived at Colon bringing the captive generals, who had promised to go home without further fuss. They left Colon on November 12, so that they had plenty of time to contemplate the beginnings of the new régime in Panama. All kinds of reports began to arrive about the intentions of the government at Bogotá. A naval expedition was said to be on the way from Buenaventura, but the United
States navy had instructions to take care of any experiments of that sort. Then the news came that a land expedition was approaching along the isthmus. That would have implied a real triumph of original exploration. It would have meant clearing a road for troops through impenetrable jungle, through which it is hard to cut the narrowest track by means of the machete or the long Spanish cutlass. The untamed San Blas Indians, who permit no white man to spend a single night in their territory, would have mobilized against the invasion, and so would the wild cats and anacondas and monkeys, who share with the Indians the sovereignty of that tangled wilderness.

The revolution was an accomplished fact, and Colombia could do nothing but accept the inevitable and reflect on the disappointment of her golden dreams. The revolutionists had been ready with their constitutional arrangements. The municipal council of Panama had met immediately after the coup d'état. It was unanimously voted that Panama should be a free and independent republic, and a provisional ministry was at once appointed. These proceedings were
ratified the same afternoon at a mass meeting of the people of Panama held in the cathedral square. A formal manifesto was also issued, constituting a declaration of independence and a justification of the revolt. It opens magniloquently: "The transcendental act that by a spontaneous movement the inhabitants of the isthmus of Panama have just executed is the inevitable consequence of a situation which has become graver daily." It goes on to set forth the grievances of Panama under the Colombian connection and the events which had led to the revolution. It ends in an almost pathetic note: —

At separating from our brothers of Colombia we do it without hatred and without any joy. Just as a son withdraws from his paternal roof, the isthmian people in adopting the lot it has chosen have done it with grief, but in compliance with the supreme and inevitable duty it owes to itself—that of its own preservation and of working for its own welfare. We therefore begin to form a part among the free nations of the world, considering Colombia as a sister nation,
with which we shall be whenever circumstances may require it, and for whose prosperity we have the most fervent and sincere wishes.*

By November 7 the new government had settled down so steadily to its work, and so obviously commanded the adherence of the whole people, that it received formal recognition from the United States in these words:—

As it appears that the people of Panama have, by unanimous movement, dissolved their political connection with the Republic of Colombia and resumed their independence, and as there is no opposition to the provisional government in the state of Panama, I have to inform you that the provisional government will be held responsible for the protection of the persons and property of citizens of the United States, as well as to keep the isthmian transit free, in accordance with the obligations of existing treaties relative to the isthmian territory.

* For full text of declaration see Appendix ii.
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We need not dwell upon the desperate efforts made by the Colombian government to retrieve the situation. A respected Colombian, General Reyes, was sent to Washington to offer to revive the old Hay-Herran Treaty, with modifications greatly in the American interest, if the United States would help to restore Colombian sovereignty at the isthmus. But all was in vain. Colombia must lie on the bed she had made, and before the end of the year the new republic had been recognized by all the leading Powers of the world. The new government was true to the undertaking on the strength of which Mr. Bunau-Varilla had given his help and support to the movement. On November 7 he was appointed minister of Panama to the United States, and on November 18 the Hay–Bunau-Varilla Treaty* was signed at Washington, which finally placed the United States in a position to begin the work of canal construction at the isthmus.

* Appendix iii.
CHAPTER VIII.

THE BATTLE OF THE LEVELS.

By the Hay-Bunau-Varilla Treaty the United States guaranteed and undertook to maintain the independence of the Republic of Panama. The new republic granted to the United States in perpetuity the use, occupation, and control of a strip ten miles wide and extending three nautical miles into the sea at either terminal, with all lands lying outside of the zone necessary for the construction of the canal, and with the islands in the Bay of Panama. The cities of Panama and Colon were not embraced in the canal zone, but the United States assumed their sanitation and, in case of need, the maintenance of order therein. All railway and canal property rights belonging to Panama and needed for the canal passed to the United States, including any property of the railway and canal
companies in the cities of Panama and Colon. The works, property, and personnel of the canal and railways were exempted from taxation in the cities of Colon and Panama as well as in the actual canal zone. Free immigration of the workers and free importation of supplies for the construction and operation of the canal were granted. Provision was made for the use of military force and the building of fortifications by the United States for the protection of the transit. The United States were to pay $10,000,000 down on exchange of ratifications and an annuity of $250,000, beginning nine years from the same date. It will be noticed that the United States enjoyed in the canal zone all the rights, though not the name and title, of sovereignty.

The treaty was finally ratified on February 26, 1904, and four days later the first Isthmian Canal Commission, consisting of seven members, was appointed by President Roosevelt to arrange for the conduct of the great enterprise. Careful instructions were given to the commission. The Isthmian Canal Commission were authorized and directed:—
THE PANAMA CANAL.

First.—To make all needful rules and regulations for the government of the zone, and for the correct administration of the military, civil, and judicial affairs of its possessions until the close of the fifty-eighth session of Congress. Second.—To establish a civil service for the government of the strip and construction of the canal, appointments to which shall be secured as nearly as practicable by merit system. Third.—To make, or cause to be made, all needful surveys, borings, designs, plans, and specifications of the engineering, hydraulic, and sanitary works required, and to supervise the execution of the same. Fourth.—To make, and cause to be executed after due advertisement, all necessary contracts for any and all kinds of engineering and construction works. Fifth.—To acquire by purchase or through proper and uniform expropriation proceedings, to be prescribed by the commission, any private lands or other real property whose ownership by the United States is essential to the excavation and completion of the canal. Sixth.—
To make all needful rules and regulations respecting an economical and correct disbursement and an accounting for all funds that may be appropriated by Congress for the construction of the canal, its auxiliary works, and the government of the canal zone; and to establish a proper and comprehensive system of bookkeeping showing the state of the work, the expenditures by classes, and the amounts still available. Seventh.—To make requisition on the Secretary of War for funds needed from time to time in the proper prosecution of the work, and to designate the disbursing officers authorized to receipt for the same.

The work of this commission was not wholly satisfactory, and in April 1905 another was appointed, which was ordered to meet at Panama quarterly, the first commission having conducted its operations from Washington.

The first two and a half years of the American occupation were spent mainly in preparing for the great task. One very important question had now to be finally decided. The battle of
the routes was over, and now began the battle of the levels. We have seen that the French began with the idea of a tide-level canal. The New Panama Canal Company had changed to the lock or high-level plan, but the French had not advanced in their work to the point when the one or the other scheme must be definitively adopted. The excavation they had carried out was all available for either type of canal. But the Americans had now to come to a decision.

A few more words about the main physical features of the isthmus are necessary for the reader to understand the nature of the problem. The two most important factors in the problem, as we have seen, are, firstly, the river Chagres with its tributaries, the Trinidad, Gatun, and twenty others; and, secondly, the range of low hills on the Pacific side through which any canal from Colon to Panama must pass. The river Chagres is a great mountain torrent which enters the Caribbean Sea a little west of Colon. The canal follows its course inland for about 26 miles, when the river valley turns sharply north-east and the canal continues
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straight on to the Pacific. The Chagres is not a river to be despised. The rainfall on the isthmus is very heavy, especially on the Atlantic side, where 140 inches per annum have been recorded. The isthmian rivers are all liable to quickly-swelling floods, the Chagres at Gamboa having been known to rise $35\frac{1}{2}$ feet in twenty-four hours. The two different types of canal involve equally different methods of dealing with this formidable stream. It must either be harnessed to the work or firmly and finally shut off from any interference with the canal. De Lesseps, who had chosen the tide-level scheme, proposed to turn the Chagres and other rivers into diversion channels, so that they could get safely to the sea without crossing the line of the canal or having any connection with it. This would have involved a work of excavation and construction scarcely less gigantic than the building of the canal itself.

On the other plan, the Chagres and its tributaries would be made the feeders of the upper reaches of the canal. So far from being politely shown off the premises, the question rather was whether they would be able to supply sufficient
water all the year round for the needs of the canal. Then this harnessing of the Chagres meant the taming of its waters in a huge artificial lake, in which the impetuous current would be quenched and through which the dredged channel of the waterway would run. The New Panama Company had recommended the construction of a huge dam for this purpose at Bohio towards the Atlantic end of the canal, and this plan had been adopted by the first American Isthmian Commission, which issued its report in 1901. I may add that the Spooner Act, which authorized the construction of a canal, also contemplated a lock or high-level waterway. As we shall see, Bohio was not in the end adopted as the site of the big dam, but Gatun, where it is now constructed, with its concrete spillway carrying away the overflow waters of the lake down the old Chagres channel to the near Atlantic. I need not say that these were two very different ways of "caring for" the Chagres and its affluents. The tide-level canal would also, of course, be supplied with sea-water, while the high-level will be a fresh-water canal. Colonel Goethals, the chief engineer of the canal, anticipates rather a curious
result from this latter circumstance. He thinks the bed of the upper reaches of the canal will in course of time be quite paved with the barnacles washed by the fresh-water from the bottoms of the great ocean-going vessels passing through the canal.

The second physical feature is the hill country or the "Continental Divide" which the canal enters near the point where the Chagres River crosses its course. Here runs the famous Culebra Cut, the nine-mile-long artificial canyon, the biggest excavation in the world. Now the highest elevation of these hills along the centre line of the canal was 312 feet above sea-level. The bottom of the canal at the cutting is 40 feet, so that the vertical depth of the cut on the centre line is 272 feet. The engineers of the tide-level scheme would have had not only to excavate 85 feet deeper—that is, to 45 feet below sea-level—but to make the cutting immensely wider in order to avoid the danger of disastrous landslides. This would have meant an enormous amount of additional work, as well as expense. Nevertheless, the controversy between the two principles was very warmly and
equally sustained. It may be mentioned that Mr. Bunau-Varilla was an especially ardent advocate of the tide-level scheme. In fact, he was not for calling the waterway a canal at all; he would have christened it "the Straits of Panama."

However, a decision was necessary, and in 1905 a board of consulting or advisory engineers was appointed, mainly to consider whether the canal should be constructed at high-level or sea-level. Five members were appointed by European governments, and the president was Major-General George W. Davis, formerly of the United States army. The instructions given to this board by President Roosevelt will afford a very clear idea of the problem it had to solve:—

There are two or three considerations which I trust you will steadily keep before your minds in coming to a conclusion as to the proper type of canal. I hope that ultimately it will prove possible to build a sea-level canal. Such a canal would undoubtedly be best in the end, if feasible; and I feel that one of the chief advantages of the
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Panama route is that ultimately a sea-level canal will be a possibility. But while paying due heed to the ideal perfectibility of the scheme from an engineer's standpoint, remember the need of having a plan which shall provide for the immediate building of a canal on the safest terms and in the shortest possible time. If to build a sea-level canal will but slightly increase the risk, then, of course, it is preferable. But if to adopt the plan of a sea-level canal means to incur a hazard, and to insure indefinite delay, then it is not preferable. If the advantages and disadvantages are closely balanced, I expect you to say so. I desire also to know whether, if you recommend a high-level multi-lock canal, it will be possible, after it is completed, to turn it into or substitute for it, in time, a sea-level canal without interrupting the traffic upon it.

Two of the prime considerations to be kept steadily in mind are:

First. The utmost practicable speed of construction.

Second. Practical certainty that the plan proposed will be feasible; that
it can be carried out with the minimum risk.

The quantity of work and the amount of work should be minimized as far as possible.

There may be good reason why the delay incident to the adoption of a plan for an ideal canal should be incurred; but if there is not, then I hope to see the canal constructed on a system which will bring to the nearest possible date in the future the time when it is practicable to take the first ship across the isthmus—that is, which will in the shortest time possible secure a Panama waterway between the oceans of such a character as to guarantee permanent and ample communication for the greatest ships of our navy and for the larger steamers on either the Atlantic or the Pacific. The delay in transit of the vessels owing to additional locks would be of small consequence when compared with shortening the time for the construction of the canal or diminishing the risks in its construction.

In short, I desire your best judgment on all the various questions to be con-
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sidered in choosing among the various plans for a comparatively high-level multi-lock canal; for a lower level, with fewer locks; and for a sea-level canal. Finally, I urge upon you the necessity of as great expedition in coming to a decision as is compatible with thoroughness in considering the conditions.

The board went to the isthmus and investigated the subject with great care. In January 1906 they issued three reports. A majority of eight to five pronounced in favour of the sea-level scheme "as the only one giving reasonable assurance of safe and uninterrupted navigation."

"Such a canal," it said, "can be constructed in twelve or thirteen years' time; the cost will be less than $250,000,000; it will endure for all time."

The minority were just as confidently in favour of a high-level canal. They concluded:—

In view of the unquestioned fact that the lock canal herein advocated will cost about $100,000,000 less than the proposed sea-level canal; believing that it can be built in much less time; that it will afford a
better navigation; that it will be adequate for all its uses for a longer time, and can be enlarged, if need should arise, with greater facility and less cost, we recommend the lock canal at elevation 85 for adoption by the United States.

The third report was made by the chief engineer, Mr. Stevens, who, quite apart from all considerations of expense, was strongly in favour of the high-level plan.

The three reports were considered by the canal commissioners, a majority of whom ultimately agreed with the minority of the advisory board. They admitted that a sea-level canal was ideally the best, but considered that the cost of making such a canal sufficiently wide would be prohibitive. They declared therefore for a lock canal at an elevation of 85 feet above sea-level. They gave their decision thus:—

It appears that the canal proposed by the minority of the board of consulting engineers can be built in half the time and at a little more than half the cost of the canal proposed by the majority of the board, and that when
completed it will be a better canal, for the following reasons:

1. It provides greater safety for ships and less danger of interruption to traffic by reason of its wider and deeper channels.

2. It provides quicker passage across the isthmus for large ships or a large traffic.

3. It is in much less danger of damage to itself or of delays to ships from the flood-waters of the Chagres and other streams.

4. Its cost of operation and maintenance, including fixed charges, will be less by some $2,000,000 or more per annum.

5. It can be enlarged hereafter much more easily and cheaply than can a sea-level canal.

6. Its military defence can be effected with as little or perhaps less difficulty than the sea-level canal.

7. It is our opinion that the plan proposed by the minority of the board of consulting engineers is a most satisfactory solution of an isthmian canal, and therefore we recommend that the plan of the minority be adopted.
In February 1906 the president referred the question for final decision to Congress. In his message on the subject he spoke thus:

It must be borne in mind that there is no question of building what has been picturesquely termed "the Straits of Panama" —that is, a waterway through which the largest vessels could go with safety at uninterrupted high speed. Both the sea-level canal and the proposed lock canal would be too narrow and shallow to be called with any truthfulness a strait, or to have any of the properties of a wide, deep water strip. Both of them would be canals, pure and simple. Each type has certain disadvantages and certain advantages. But, in my judgment, the disadvantages are fewer and the advantages very much greater in the case of a lock canal substantially as proposed in the papers forwarded herewith; and a careful study of the reports seems to establish a strong probability that the following are the facts: The sea-level canal would be slightly less exposed to damage in the event
of war; the running expenses, apart from the heavy cost of interest on the amount employed to build it, would be less; and for small ships the time of transit would probably be less. On the other hand, the lock canal, at a level of 80 feet or thereabouts, would not cost much more than half as much to build, and could be built in about half the time, while there would be very much less risk connected with building it, and for large ships the transit would be quicker; while, taking into account the interest on the amount saved in building, the actual cost of maintenance would be less. After being built, it would be easier to enlarge the lock canal than the sea-level canal.

The law now on our statute books seems to contemplate a lock canal. In my judgment a lock canal as herein recommended is advisable. If the Congress directs that a sea-level canal be constructed, its direction will, of course, be carried out. Otherwise, the canal will be built on substantially the plan for a lock canal outlined in the accompanying papers, such changes being
made, of course, as may be found actually necessary.

In June 1906 Congress finally decided for a high-level canal, and the controversy was officially closed. But the friends of the sea-level scheme were by no means silenced. Whenever any serious difficulty occurred in the construction of the canal on the lock principle their voices were heard again. In fact, the conflict cannot be said to have ended until 1909, and even then it is not certain that the sea-levellers modified their convictions.
CHAPTER IX.

MAN AND THE GNAT.

Almost at the beginning of their great task the Americans were faced with a problem which involved the success or failure of the whole enterprise. I have said something about the climate and health conditions at the isthmus. It is fairly certain that yellow fever and malaria would have wrecked the French undertaking even if there had been no other obstacles to its success. It is not less probable that if the Americans had been in no better a position to wage war with these plagues, their work at the isthmus would also have been in vain. The French had built excellent hospitals and provided efficiently for the comfort and recovery of those who were stricken with these diseases. But being totally ignorant of the sources and method of transmission of malaria and yellow fever, they could
do nothing effectual in the way of prevention and eradication. They could only take the individual victim when they found him and do their best to cure him. They still believed that malaria was produced by climatic conditions, by marshy emanations, mists, and so forth. The fleecy clouds which gather round the isthmian hills in the rainy season were given the very undeserved title of "the white death" by the French workers at the isthmus. Yellow fever, again, was just as mistakenly attributed to the climate, and especially to filthy ways of living. It is not surprising that, with these misconceptions, medical skill should have been almost useless during the French occupation, and that the employees at the isthmus should have died in their thousands.

But since the days of the Lesseps company, science had thrown a flood of light on the nature of these tropical scourges and the secret of their transmission. As these medical and scientific pioneers made a Panama Canal possible, though their names are not directly linked with its construction, we may look back for a few moments at their triumphs of discovery. The credit for
first discovering that malaria is not due to poisonous emanations or contagion but is carried from people infected with the disease by the anopheles mosquito belongs to Major (now Sir) Ronald Ross, formerly of the Indian Medical Service, who devoted himself to this subject during the last years of the 19th century. By a series of experiments he proved that malaria is due to the presence in the human blood of an organism which is conveyed from person to person by this mosquito, and that the mosquito is harmless unless it has become infected with the germ by biting a person who has caught malaria. The value of this discovery was soon shown by practical applications. Major Ross was engaged by the Suez Canal Company to deal with the malaria which had become firmly established at Ismailia, a little town of 10,000 inhabitants on that canal. No fewer than 2,500 cases had been supplied in one year by this small population. The new methods founded on the new discovery proved so effectual that in three years the disease was stamped out, and there has been no relapse ever since. The same results were achieved at Port Said.