

**The Panama Canal Zone; an epochal event in sanitation / by Charles Francis Adams.**

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The Panama Canal Zon

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# CANAL ZONE

AN EPOCHAL EVENT  
IN SANITATION

**RECAP**

BY

CHARLES FRANCIS ADAMS

BOSTON

1911

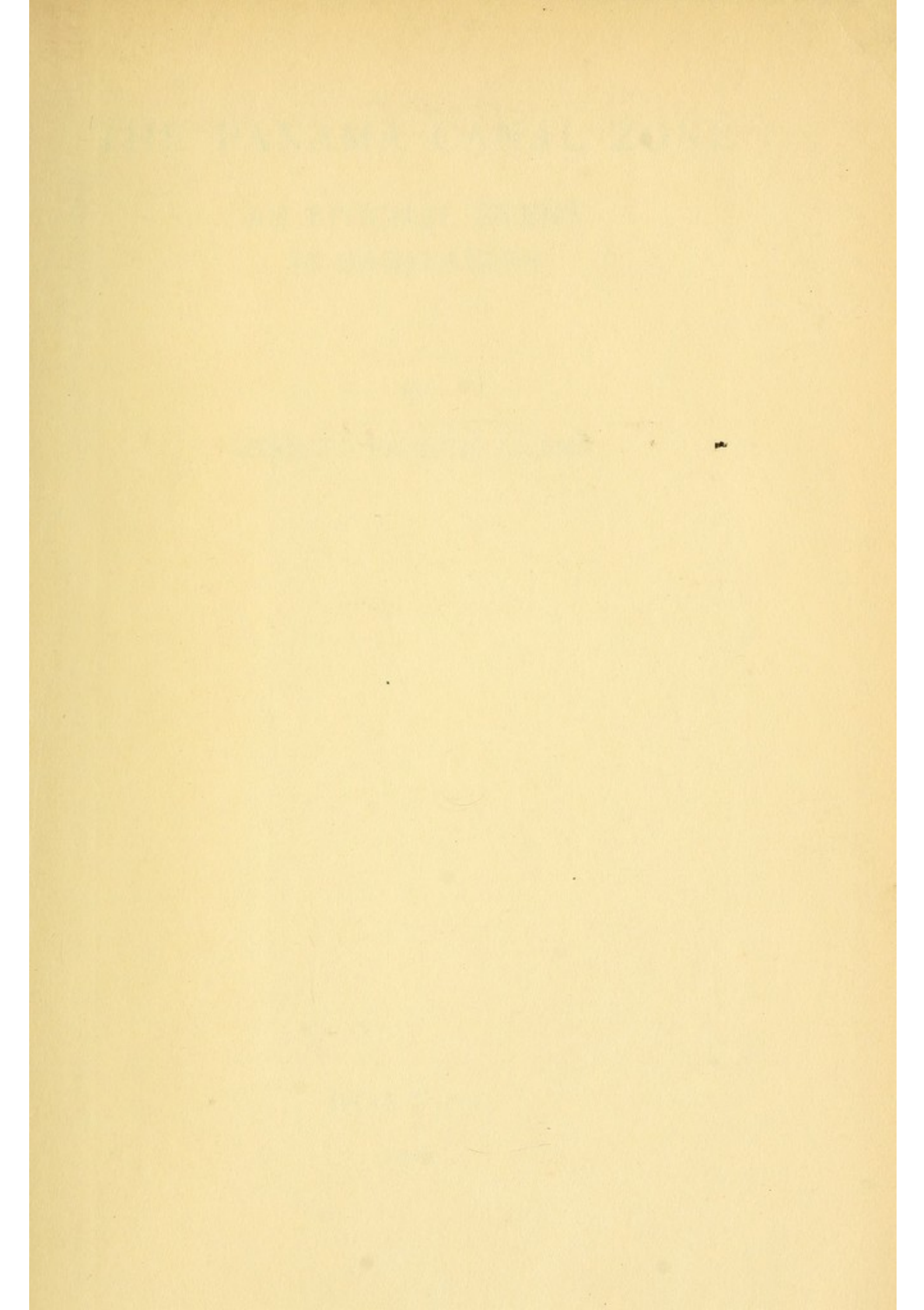
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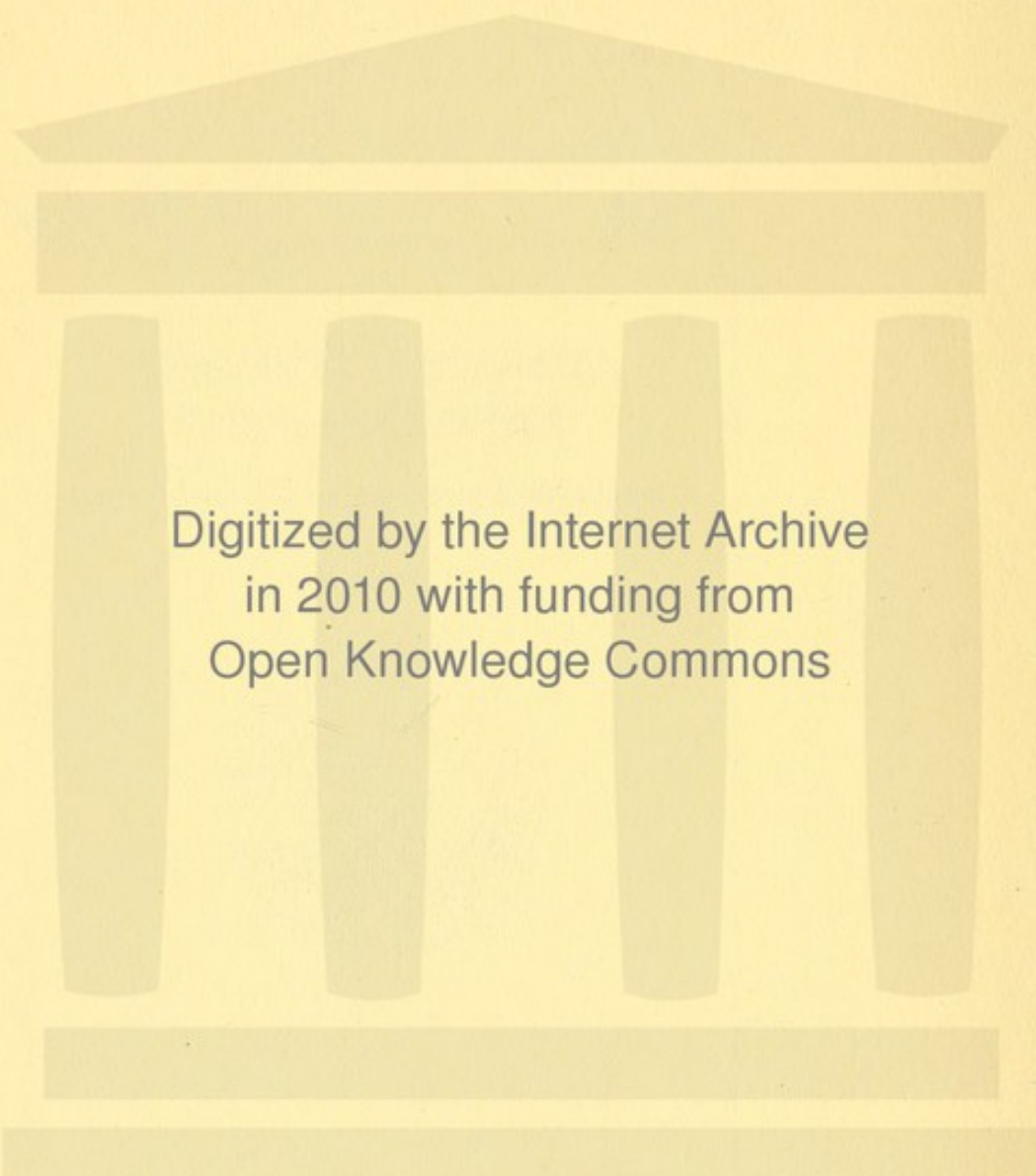
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# THE PANAMA CANAL ZONE

AN EPOCHAL EVENT  
IN SANITATION

BY

CHARLES FRANCIS ADAMS

BOSTON

1911

FROM THE  
PROCEEDINGS OF THE MASSACHUSETTS HISTORICAL SOCIETY  
FOR MAY, 1911

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## THE PANAMA CANAL ZONE.

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Leaving New York for Colon, Monday, March 6th, we landed in New York on our return Thursday, March 30th, having passed ten days (13th to 23d) on the Isthmus and in the so-called Canal Zone. A winter voyage to Caribbean waters and a brief stay on the Darien Isthmus are not now so unusual as, under ordinary circumstances, to justify record, much less to call for one. Scarcely more exceptional than going to the Mediterranean by way of the Azores and Gibraltar, I should not, under ordinary circumstances, any more care to put detailed mention of it in the *Proceedings* of this Society than I would make record there of one of the numerous trips I have, first and last, made across the Atlantic. There are, however, even in these days, trips — and trips; and five years ago a winter trip carried me into a region — that of the White Nile — not yet become wholly familiar to the tourist. What I there heard and saw also proved, if not altogether novel, so suggestive that I made it the subject of a communication which, finding a place in our *Proceedings*,<sup>1</sup> also at the time attracted a certain amount of general attention. Though less unusual, the Panama experience proved not less interesting and quite as suggestive as that of five years ago in East Africa. In Central America I found myself face to face with what I cannot but feel is going at no remote day to be recognized from the strictly historical point of view as an epochal development; and, thus feeling, I propose here to put on file some account of what I saw, and of what I feel assured will in time result therefrom.

<sup>1</sup> 2 *Proceedings*, xvii. 248.

Before doing this, however, I wish to forestall an obvious, though natural criticism. Ten days, it must be admitted, are a very insufficient space of time in which to make a study of so considerable and complicated an enterprise as this Panama Canal, — an enterprise with so many different aspects; much less would any observation possible to be made in that time, by one both a layman in engineering and a novice in tropical conditions, suffice for the drawing of inferences of value, or such as would be entitled to consideration. This is altogether undeniable; and yet, for reasons which will presently appear, I propose not only to tell what I saw and repeat what I was told, but to draw inferences therefrom; always, of course, subject to correction by those better informed. And I feel moved so to do by a conviction that what I have to say is at least not matter of general knowledge; and, further, that what was altogether novel to me cannot be wholly familiar to others.

Premising this, I come to my subject. From the moment I reached the Isthmus to the day I left it, what most impressed me was not the magnitude of the undertaking, the engineering and material difficulties encountered in carrying it to a successful issue, nor yet the administrative ability displayed in overcoming those difficulties; — of all these I shall later on have something to say; but it was not these which from start to finish interested me most. What did most interest as well as surprise me was the *morale* apparent in those I encountered, the high standard of their physical condition, and the energy, alertness and zeal with which amid tropical surroundings all, from highest to lowest, went at their work. This was unmistakable, and apparent from the day I left New York. On the steamer were various employes, or members of the families of employes, — both sexes and all ages, — people who had been in the Zone for years and were now returning from a visit to their homes, whether for purposes of business or recreation. Not one but was ready and even glad to go back; all looked forward to remaining there for the end — till, as the expression went, they “saw the thing through.” For them existence and labor in the tropics, on the Chagres River or in the Culebra Cut, had neither terrors nor deprivations, nor inconveniences even. They actually professed to like the climate and life, and to be more than satisfied with their jobs.

And this expression was uniform; nor, evidently, was it in any way forced or simulated. Those I met also were unmistakably healthy in aspect; in them and in their bodily movements no indication was to be seen of that lassitude and those anæmic conditions which we are accustomed to associate with any prolonged residence in the tropics, a region in the present case ten degrees only removed from the Equator. Young and old, they were a ruddy-faced, well-conditioned set, both in aspect and in action physically in good case.

So impressed from the start, as I went on these things more and more forced themselves on my notice, incessantly calling for explanation. I had heard vaguely of measures of sanitation enforced in the Canal Zone, and of a consequent decrease in the rate of mortality; but not the less the vicinage of the treacherous, death-dealing Chagres still in association remained the worst reputed region, "the foremost pest-hole," of the earth, infamous for its fevers, and interesting only because of the variety of its malarial disorders and pestilences. Its sanitary conditions might be less wholly bad; but that they should be positively, and in comparison with other places, good, surpassed reasonable belief.

If now, however, I were asked what single thing seen impressed me most of all I saw during my stay in the Canal Zone, I should reply, not the Gatun Dam nor yet the Culebra Cut, but the afternoon and evening of March 18 spent at Camp Elliott, as it is called, an elevation about equidistant from both Atlantic and Pacific, and supposed to be not far from the spot where Francis Drake, three hundred and thirty-eight years ago, caught from the branches of a lofty tree his first momentous glimpse of what men then called the South Sea. Camp Elliott, located on high ground in the midst of a tropical jungle, half a mile only from the banks of the Chagres, has for two consecutive years been the home of a detachment of U. S. marines under command of Major Smedley D. Butler. A large party of visitors had been invited there on this occasion to witness a drill, and be guests at an evening's entertainment. We went from Panama by train in the early afternoon, returning in the late evening. The force of marines at the camp numbered five hundred men, composing two

battalions. As I have said, they had been stationed there two years; yet a finer, healthier-looking, more active and better-conditioned body of men — “huskier” is the word — I do not remember to have seen; and, of the whole number (487) then there, I was assured by the post physician not one was that day sick in hospital. Such a record would be remarkable anywhere; but half a mile away from the Chagres, it was, I submit, well calculated to excite a special wonder.

My occasions for surprise were, however, not confined to the visit at Camp Elliott; the next almost equally striking incident was of a nature peculiarly pleasing. The following evening another social engagement carried me out, this time to Culebra, the site of the much advertised “cut,” or excavation. The local travel, especially the evening local travel, on the Panama railroad is heavy; surprisingly so, indeed. Trains of six coaches are crowded; and while many nationalities and all shades of color, from pure white to ebony, are represented, women and young children make up a larger proportion of the whole than is usual with us. Later in the evening we were to take the return train to Panama, a distance of perhaps a dozen miles. Coming on our way back to the Culebra station, at about nine o'clock, we found the platforms thronged much as is apt to be the case after sundown at all southern way stations, — people were there, some to take the train, others accompanying visitors about to take it, while a good many seemed to be idlers brought together by mere curiosity or to enjoy the evening's coolness. Moving along towards the point where the head of the train I was to take would probably stop, I there came across a group of American girls, eight or ten in number, and varying in age from perhaps ten to fifteen. Very nicely and neatly dressed in their thin white frocks, with heads uncovered, some of them, like ourselves, had come to take the train home, others to see their companions off. A more healthy, well-to-do and companionable group of children could not under similar conditions have been met at any station within twenty miles of Boston. Perfectly at home, and at ease sitting and standing, without a thought of malaria or any other danger, they were chatting and laughing under the glare of the station lights, about which not an insect was flitting; while the hum of the mosquito was noticeable from its absence. Not one was

to be heard. The material, social and meteorological conditions would in every respect have compared favorably with those to which we here are accustomed during the midsummer season; the single noticeable difference was the more complete absence of insect life, whether merely annoying or aggressively noxious. And this on the slope of the death-dealing Chagres!

I freely confess I could not understand it; nor, after a fairly intelligent effort at enlightenment from the most authoritative and best informed sources, do I really understand it yet. I questioned Colonel Gorgas, the head of the Sanitary Department, of whom and whose evidence I shall presently have more to say. I met and talked with Mr. and Mrs. C. C. Mallet; he a man of over fifty, English born, from youth a resident on the Isthmus, and, since 1908, British Minister Resident at Panama; she, of Spanish descent, born in Panama.<sup>1</sup> So far as the yellow fever was concerned, Madam Mallet, an Obarrio and so to the manner born, was, it may be inferred, immune, having presumably gone through the dread ordeal vicariously, as it were, in the persons of forbears more or less remote. Indeed, a belief, I was assured, exists that no child born within Panama town limits need later fear the *vomito*. Mr. Mallet, less fortunate in this respect, had, by the narrowest of possible margins, survived an attack. They both had lived in Panama before the French attempt at canal construction, all through the times of that attempt, and since during the American régime. Their reminiscences were vivid; at times, ghastly and pathetic. Very

<sup>1</sup> I had written Creole, but am given to understand that among the English-speaking people of Central America the designation Creole is, by general acceptance, now supposed to imply an infusion of African blood; that, vulgarly, it is taken to be somewhat synonymous with Mulatto. A grosser and more absurd misapprehension could hardly be imagined. It is next and elsewhere assumed that any person of European blood born in the West Indies is a Creole. This is little less incorrect than the African assumption. No one ever heard of a Scotch, or Dutch, or Irish Creole. On the contrary, as the *Century Dictionary* defines it, the word Creole signified originally one of West Indian or Central American birth descended from Spanish ancestors, "as distinguished from immigrants of European blood and from the aboriginal negroes and natives of mixed blood." Subsequently the significance was broadened to cover all West Indians of Latin descent. The Empress Josephine, for instance, was a French Creole. The freedom of the Creole's blood from any native or African admixture was a matter of pride. The mere suggestion of such an admixture would in old Creole days have been resented as an unpardonable insult. Under a correct acceptance of terms Mrs. Mallet would, therefore, be Creole *par excellence*; Madame Beauharnais was French Creole.

curious on the subject, I asked Madam Mallet as to the normal conditions at that period of the year; for though I remembered well both the stifling heat and the insect life I had encountered five years previous on the White Nile at the same period of the year (March) and in exactly the same latitude ( $10^{\circ}$  North), between the two environments there seemed nothing in common. The White Nile was a stagnant pest-hole swarming with insect life; the Chagres was to all appearance an agreeable winter health-resort. Even Pharaoh's old plague, the common house-fly, was noticeable only from his absence. Thus puzzled, I asked Madam Mallet as to the facts, and her explanation thereof. Was it a question of season? — and was this the off season? The reply I got was to the point, and given with Latin animation. Madam Mallet assured me that, had I found myself ten years before where I then was at the same season of the year, I would have been devoured by mosquitoes, while the flies would have been as ubiquitous as they were unbearable. To my further question of how she — born in Panama, and all her life a resident of the inmost quarter of the town of Panama itself — still in fact there domiciled — how she accounted for it, the response was quick and to the point, — a reply conveyed quite as much through the movements of the hands as by the mouth, — “I explain it in one word — Colonel Goethals!”

Though indisputably gratifying and to the last degree suggestive, this answer, besides being manifestly unjust to others, especially Colonel Gorgas, was, even to a layman like myself, not in all respects satisfactory. I was quite conscious that my informant was speaking somewhat metaphorically, and had no idea that what she said would be taken in a literal way; much less be repeated, and in print. Moreover, even when accompanied by these limitations, the explanation left much to be accounted for. For instance, we were then sitting at table, but behind the wire screens always prescribed by the officials in charge of sanitation for every place of abode; the following day, however, I chanced to meet at the hotel Dr. Morton Prince of Boston, there in company with some ladies from New York, all members of a large excursion party come into Colon the day before. They had been “doing” the Canal, and were to pass the night at Panama. Dining together, at

about nine o'clock we all went out on the broad verandah of the hotel, overlooking the Pacific. Not fancying the sense of enclosure within the screened part of the gallery, Dr. Prince suggested that we go outside, sitting and chatting in the open. We did so, a party of eight or ten, all new-comers and clad in the light thin garments customarily worn in the tropics. We sat there in the coolness of the early night for perhaps an hour, no screen or protection of any kind between us and the trees and shrubs before the hotel; a powerful electric light was flaring directly over our heads, and yet not an insect of any kind — fly, moth or gnat — was either visible or audible; the shard-borne beetle with his noisy hum was as noticeably absent as was the mosquito's sharp acrid note. All the same, when the next day I mentioned this performance to Colonel Gorgas, he shook his head with a disapproving look; he did not like that sort of thing — it was a reckless braving of danger; and, moreover, contrary to regulation. Indeed, I had myself to admit on better reflection that it was a somewhat ill-considered proceeding.

Again, and a more unaccountable experience than any I have yet described:—While at Ancon, the suburb of Panama in which are the United States government buildings, including the Tivoli Hotel, I drove out, as is the custom with all tourists, to visit the site and few remains of Old Panama, as it is called, — the original Spanish settlement on the South Sea side of Darien, the point from which Pizarro sailed forth, which Drake half a century later reconnoitred from both its land and water sides, and the stronghold which the buccaneer Morgan captured, sacked and practically destroyed in 1671. Once a busy and, for those days, populous and wealthy place, of Panama Viejo — in its way, I fancy, somewhat of an historical myth — I shall perhaps presently have something to say; meanwhile in this immediate connection I will only remark that the site, fronting an exposed tidal roadstead, is a wholly uninhabited jungle, rising in the midst of which, a landmark from sea or shore, is one lofty and well-preserved cathedral tower of solid masonry compact. A mile or so away on the landward side the remains of an old cobblestone road, or causeway, lead across a stone bridge, disappearing in the tropical jungle on either side of the muddy stream spanned by

a single arch of solid masonry. Facing the sea, or back from it, but hidden in the well-nigh impenetrable tropical growth, are yet other ruined foundations, walls and buttresses, and vaults in what once were cellars. These mark the sites of religious edifices or public buildings; while the ground adjacent is covered with shards or fragments of what once was rather solid masonry. As a seat of traffic, the locality was abandoned more than two centuries ago in favor of the site of present Panama. The reason for its abandonment is obvious. As a port, it was not only unprotected from gales, but its depth of water in no way met the requirements of even seventeenth-century maritime construction. So, its fate already sealed, the buccaneer Morgan, in 1671, dealt its death blow to the first Panama. From that blow it never rallied.

Having, after tourist fashion and quite uninformed, made a hasty preliminary visit to the spot, a day or two later at the quarters of Admiral H. H. Rousseau and Lieut. Col. D. DuBose Gaillard — both more or less archæologically inclined — my companion, Mr. Frank D. Millet, and myself were shown an ancient and contemporary ground-plan of the vanished town, and descriptions of it from Hakluyt's *Voyages* and Esquemelin's *Narrative* were brought to our notice. So, better advised and with greatly increased interest, we determined on a second and more carefully considered visit. Leaving the hotel at half past six on the morning of Tuesday, March 21, we did not get back until eleven, having passed some three hours in going over every accessible portion of the site. In other respects most interesting, the point to which I now want to call attention was, and is, to me most interesting of all. Moreover, it is still inexplicable. Here was a tropical sea-shore locality, six hundred miles only from the Equator, undrained and densely overgrown; the day, slightly overcast at times, was yet reasonably clear; the time was between 7 and 10 o'clock, A. M.; no noticeable wind was blowing; apparently it was an ordinary day for the locality, towards the close of the dry season; yet, during those three hours of constant physical activity, the heat, though considerable, was in no degree oppressive, nor can I recall having been annoyed by fly or gnat. I heard, though I did not see them, just two mosquitoes. Limits had to be allowed to the achievements of Colonel

Goethals even; and it was not reasonable to maintain that he had extinguished the fly, the gnat and the mosquito not only in the Canal Zone, but throughout Panamanian limits. Quite unable satisfactorily to account for them, I merely state facts and report conditions as they came under my actual observation.<sup>1</sup>

Meanwhile, though American sanitation has not accomplished impossibilities, it has indisputably wrought wonders. Into its details I do not propose to enter. If not familiar now, they will soon become so; for the war on household disease disseminators — the fly, the mosquito, the flea, the bug and the rat — now systematically inaugurated in the Canal Zone, will at no remote day be taken up and vigorously carried on in all countries properly to be classed as civilized. In time, it will even extend to the New England tavern, boarding-house and railroad refreshment-room. The rules and directions for its conduct will then have been simplified, and be in the hands of every one; so I will not dwell upon them here and now in a paper designed for record only. Suffice it to say that, so far as the sanitation of the Canal Zone is concerned — my present thesis — it is a matter purely of drainage, screening, the free and systematic use of oils and disinfectants, and cutting and firing; the whole enforced by rigid and unremitting inspection and policing. In the case of disease also, everlasting vigilance is the price of liberty. The very considerable results already reached are due to no great engineering feat — the making of a lake where once was a morass, or the laying out and construction of a modern *cloaca maxima*; — they have, on the contrary, been brought about as the result of patient, long-continued observation, supplemented by a system of rigidly policed sanitary regulation. Very matter-of-fact, commonplace even in detail, about those results there is nothing dramatic; little that strikes the eye. The appeal, based largely on the noticeable absence of filth and a study of the bills of mortality, is to the senses rather than to the imagination.

<sup>1</sup> While correcting the final proof sheets of this paper, I am informed by Mr. J. B. Bishop, in a letter dated Ancon, May 24, that, during the previous ten days, "we have had a mosquito pest covering the whole zone. . . . During my four years of residence here I have seen nothing comparable to it. I have seen more mosquitoes in the last week than I have seen during the previous four years." He adds, "they are not poison-bearing; though in other ways as annoying as any specimens of the species I have ever seen."

This element of the commonplace and obvious is, however, one we are slow to recognize as always affecting the problem. In facing it we have, also, continually to guard ourselves against preconceptions. Take, for example, the dreaded Chagres fever, so-called. I endeavored to obtain from Colonel Gorgas something in the nature of a diagnosis of it as a classified disease. Naturally, the result was not satisfactory; indeed, it was quite the reverse of satisfactory. He spoke of it as an acute malarial disorder, wholly distinct from yellow fever, but in more malignant cases frequently reported as such. A moment's reflection sufficed to show me how ill-considered my query was. It is still called a fever and classified as such; but while it unquestionably is accompanied with febrile action, it is nothing more nor less than a poisoning — a poisoning exactly like that from the bite of a moccasin or rattlesnake. As such only can it properly be classified. Its cause, dramatic in a way and terribly insidious, is not far to seek.

As a river the Chagres is unique; it constitutes a class by itself. A mountain stream, a hundred and twenty miles perhaps in length, when I saw it, — towards the close of the dry season, — it was flowing sluggishly along, a yellow rivulet, meandering through a tropical morass. But the rainfall, when it comes, is in that country something of which we in New England have no conception. For instance, I was assured by no less an authority than Mr. J. B. Bishop, the Secretary of the Isthmian Canal Commission, that there was a well-established record of close upon nine solid feet of rain at a point in the Chagres water-shed, all within two successive calendar months, — or, to be more specific, a fall of one hundred and three measured inches in sixty-one days of the months of November and December, 1909. That under such conditions the Chagres has been known to rise twenty-five feet in a single day is no occasion for surprise. The conductor is simply choked. The natural result follows. The neighboring country becomes a morass; and, as the torrent rapidly recedes, the region which emerges from under it remains saturated and stagnant subject to tropical conditions, an ideal breeding-place for every noxious reptile or poisonous insect. Hence the so-called fever; for the bite of the Hindostan cobra was infinitely less to

be dreaded than was the sting of the Chagres mosquito. Formerly supposed to be of atmospheric origin, the disorder was classified as a miasmatic fever peculiar to a locality; now, under control, it is practically extinct. But, as the question I put to Colonel Gorgas showed, the name and recollection abide.

It is the same with the yellow fever; though that, as every one at last knows, has been traced down to a single one of the very numerous species of the genus mosquito — the comparatively noiseless but deadly *stegomyia*. Men fear the cobra and avoid the rattlesnake, — the moccasin is looked upon as very deadly, and the copper-head has become a simile; but, so far as those of the human race were concerned, cobra and rattler, moccasin and copper-head, taken separately or massed together, were mere negligible dangers as compared with the *stegomyia* mosquito. The cobra only bites, and in biting kills his single victim, and that is the end; the *stegomyia*, on the contrary, not only kills that victim but injects into countless fresh victims the deadly virus drawn as food from former victims. The next thing inferred is obvious; and a theory is now confidently maintained that all other forms of tropical malaria, so called, are due to approximately identical causes. In no way contagious, and in only much less if in any degree of miasmatic origin, they are absolutely preventable; and this great result, if it in ripeness of time actually materializes, while elsewhere foreshadowed, has been brought to its demonstration in the Canal Zone of to-day. Its most dramatic and monumental achievement, the prevention, and the consequent practical extinction of the yellow fever, belongs exclusively to the Medical Department of the United States Army. It was the outcome of our Spanish War (1901), thereby made memorable. Thus the Canal Zone is an object lesson, and the Canal itself a monument; for the last was, humanly speaking, made possible by a medical triumph, the like of which in importance to mankind has not been equalled since the discoveries of anæsthetics and antiseptics.

And this it is which caused me at the outset to say that the great and most startling impression left on me by what I saw on my visit to the Zone was not the magnified ditch itself, nor the engineering feats accomplished; nor yet the construction

work in progress. These are remarkable; but solely, so far as I am competent to judge, because of their magnitude and concentratedness. I have frequently seen steam shovels at work; though never so many, nor quite so busily, as now in the Culebra Cut. So I have watched pneumatic drills as they bored into the rock, and heard the detonation of the dynamite; though at Panama more drills would be working at once and in closer proximity than I ever saw before, and the blasts when the day's work was done sounded like a discharge of artillery in battle. For centuries all civilized nations have been building canals and dams, though the Gatun Dam breaks the record for bigness; the locks, too, at Panama are larger and longer, and more elaborate and imposing than any yet designed. All this is true; and yet it failed deeply to impress me. After all, it was a mere question of bigness—the something more or something less; and, as a result of organized energy and systematic co-operation of forces for rapid daily accomplishment, I still think the construction of the Pacific railroads fifty years ago at the rate of half a dozen miles a day, every material, even water, having to be hauled to the moving camp which constituted the advancing front,—this was by far a more dramatic display than anything now to be seen on the Isthmus. Again, the Gatun Dam is a great conception; but as such the recent tunnelling of the Hudson and the subterranean honeycombing of Manhattan Island, combined with the bridging of the East River, impress me more. Finally, the locks at the entrance and outlet of the proposed Chagres Lake are imposing structures; but to my mind the terminal stations built, or now in process of building, in the heart of New York city, are more imposing. As I have said, all this is a mere question of degree, and time out of mind the world has been building roads and water-ways; moreover, behind this particular water-way is the Treasury of the United States. But when it comes to the sanitation which made all that is now going on at Panama humanly and humanely possible,—vanquishing pestilence and, while harnessing the Chagres, also making it innocuous to those both working and dwelling on its banks,—this is new; and the like of it the world had not before seen. Face to face with it, reading of it in the movements of the men and the faces of the children, I frankly admit what I saw smote the imagination. Seeing the

American at his very best, one felt — at least, I felt, as never before — a pardonable pride of race.

Moreover, in the Panama Canal Zone of to-day you do see the American at his best — individually and collectively. The region, and those living and laboring there, impress one coming freshly from without as singularly sober, orderly, well conducted, and policed. There is a noticeable absence of that roughness, drunkenness and immorality, — that carelessness of life and defiance of its decencies traditionally associated with our American improvised communities pushing to rapid completion some great enterprise involving lavish expenditure, both inevitable and incessant. In the building of the Union Pacific, the town of Julesburg boasted of its wickedness. Hell was at Julesburg always equalled, and not unusually or infrequently outdone. Panama once, and that not so very long ago, bade fair to perpetuate the Julesburg tradition in this particular.<sup>1</sup> There is to-day no Julesburg in the Canal Zone. The impression in this respect made on the newly arriving stranger is curious; but, though instinctive, quite unmistakable. It is in the air; you are at once conscious of its presence. It was silently evidenced by the issuance during the month I was there (March) of over 20,000 postal money orders, representing a little short of half a million dollars of savings, \$370,000 of which was payable in the United States. Along the banks of the Chagres the workman to-day lives cheaper, enjoys apparently better health, and saves more than he can in Massachusetts. And for all this — order, thrift, temperance, health — credit is due to someone.

Until I landed at Colon, I had never met either Colonel Goethals or Colonel Gorgas; nor, indeed, with a single exception, any one of the small but very able body of officers and civil officials in charge of the Canal work. Mr. Bishop I had known long, and his connection with the *Canal Record* afforded

<sup>1</sup> "In 1882, actual construction was commenced [under the French], and several thousand laborers were put to work along the line. Then graft, extravagance, immorality and disease began to pervade the scene. Froude, describing conditions after a visit to the seat of French operations, declared: 'In all the world there is not, perhaps, now concentrated in any single spot so much swindling and villainy, so much foul disease, such a hideous dunghheap of moral and physical abomination, as in the scene of this far-famed undertaking of the nineteenth century.'" Forb-Lindsay, *Panama and the Canal To-day*, 69.

easy access to a vast store of information not otherwise accessible, and at once interesting and reliable. His was a veritable *vox clamantis in tropico*. But, subsequently, I found reason to regard all these gentlemen with ever-increasing respect; and on what I have come to consider the best of grounds. In the course of a fairly long and somewhat varied life it has been my fortune to be brought in contact with many men — men prominent politically, and in administrative and professional work; generals in command of great armies in active warfare; executives in the direction of large enterprises; financiers; notables of the market-place. The one thing in these contacts which has always insensibly but most impressed me has been the presence or absence in individuals of that element known as Character. Whether there or not there, the sense of its being there, or not being there, is instinctive. If there, in the man at the head, the thing permeates. You are conscious of it in every part; and I think Madam Mallet was right. Her female instinct guided her straight to the central fact. It is so in Panama. The individuality and character of Colonel Goethals to-day permeate, and permeate visibly, the entire Zone; — unconsciously on his part, unconsciously on the part of others, his influence is pervasive.<sup>1</sup> Nor, in expressing this opinion of Colonel Goethals, do I for a moment wish to depreciate, much less to ignore, the zeal and fidelity shown by the heads of department in the present Canal organization. Gorgas, Hodges, Gaillard, Devol, Rousseau, Bishop, one and all, so far as my brief stay afforded me opportunities of reaching an opinion, were stamped by the same die. Of some, of course, I saw but little; others I did not meet at all: but indications of the influence of Goethals were, I thought, perceptible everywhere. Quiet, reserved, unassuming, known to every one engaged on the work but noticed, as he quietly moved around, by no one, he gave the impression of conscious because innate but unobtrusive force. He was a natural diplomat as well as an educated engineer; and, whether dealing with labor conditions or Latin-American officials and races, the Panama situation of to-day stands in quite as much need of a skilful diplomat as of a trained engineer.

<sup>1</sup> On this point, see the paper entitled "The Panama Canal," in the report of the *Am. Inst. of Mining Engineers*, for November, 1910, pp. 83, 84.

Especially was I impressed, moreover, and most favorably so, by a certain modesty of attitude and expression observed by all I talked with towards those who had preceded them in the enterprise, especially the French. Far from any tendency to a depreciatory tone, open or covert, or to an attitude of self-glorification, all I saw and heard seemed almost to seek occasion to express their sense of the advantage they had derived from the work done and the experience gained by those who had initiated the enterprise, but failed to carry it to completion. Indeed, their testimony went at times further than was justified by the facts, as I saw them. Not only did they warmly commend the French engineering, but they admitted that much of the French material, and some of the French machinery, was more durable and, considering its date, better than what now came to them from the United States. The French mechanical appliances were also pronounced most valuable. Of De Lesseps they spoke with uniform respect; even going so far as to say that the French hospital organization and efforts at sanitation had contributed very materially to the remarkable results since attained.

Listening sympathetically, and appreciating to the fullest extent the fineness of feeling which inspired these utterances, I yet found myself unable in some respects to accept them at face value. There was, on the contrary, as it seemed to me, evidence everywhere that the French had involved themselves in the enterprise, and, when in it, gone about their work in a way most ill-considered and wasteful. With preconceived ideas altogether wrong, they provoked set-backs and invited ultimate failure. The material they bought and used may have been of the best quality; their engineering was probably, as our engineers admit, of the most approved sort; some of their machinery and more or fewer of their appliances may still be in use; none the less the fact stands forth plain even to the layman that, taken altogether, De Lesseps was peculiarly ill-fitted to carry to a successful close what he so confidently undertook. From the beginning to the end he was obsessed. He had, so to speak, Suez Canal on the brain. Yet it may broadly be asserted that there was not a single lesson derived from the Suez experience applicable to Panama conditions. This sweeping generalization, moreover, held true at

every point, — from the sea-level structure to rainfall, from the sandy soil on the Red Sea to the rocky, mountainous range above the Chagres River. In their essential features — political, geological, racial, industrial or sanitary — the two problems were unlike; and every lesson of experience drawn from the one was well calculated to lead to disaster if applied to the other. Yet De Lesseps invariably applied them all. As respects labor and sanitation, for instance, he apparently looked at the problem from a French point of view, — a military standpoint, and one quite the reverse of humanitarian. The work would cost lives as well as money; unquestionably it would: but, as Marshal Pélissier observed in the Crimea, “One cannot make omelettes without breaking eggs.” The Suez Canal had been carried to completion by Egyptian forced labor, regardless of human sacrifice; just as it is still asserted, though with most absurd exaggeration, that every tie on the Panama railroad represented the life of a man employed in its construction. It would probably approach more closely to historic truth to say that every hundred ties was in this case the unit of representation; even that, however, would mount up to a very respectable holocaust. But, after all, the greatest possible death rate involved in the digging of a sea-level canal would be small in comparison with that always and necessarily incurred in the conduct of a war of even the second or third class. In view of the result to be secured, the loss of life was from the De Lesseps and Suez point of view a somewhat sentimental consideration, and one altogether negligible.

Passing over other factors in the situation, — financial, material, industrial, in regard to all of which the methods of the French seem to have been open to obvious criticism, — passing over all these, it was their sanitary and hospital arrangements which interested me most. Colonel Gorgas spoke of them with apparent respect; the French work had, he said, been carried on before the mosquito theory and observations had led to their results, and we had profited largely by the French experience. This was doubtless true; but, none the less, the stories still told of that experience, while extremely pathetic, were undeniably gruesome, — in fact, I may say, ghastly. It appears to have been nothing less than a travesty on nursing leading to a dance of death. At Ancon, just outside of Panama,

they still point out a building in the American hospital grounds in which it is asserted five thousand patients died. French clinical attendance, as it is called, has never been good; it is not good to-day even in Paris, and much less so in the Provinces. In no respect is it up to our American standards. It is suggestive of the Sairey Gamp and Betsey Prigg period and methods. In the hands of so-called Sisters of Charity, the rules by them observed at Ancon were, to say the least, peculiar; and over the gates of that Ancon hospital, I was assured by those whose testimony might not be disputed, could properly have been inscribed Dante's familiar *Lasciate ogni speranza voi ch' entrate*. Friends or acquaintances of those taken ill dreaded to obtain a hospital permit; it was looked upon as a graveyard billet.

As then conducted, a dollar a day was paid the Sisters by the French Company for each patient admitted to the hospital. The practice with the Sisterhood was to attend the sick during certain prescribed hours, leaving the wards at night. In the morning duty was resumed; the corpses of those who had died during the night were removed, and the places thus made vacant were filled by others newly admitted. During the night absences of the Sisters, the only care the patients received was from convalescents, not yet discharged. At that time it was the usual practice for those journeying to and fro across the Isthmus to carry with them more or less gold; and, in the case of such as died, this gold was a perquisite of the convalescent attendants. They divided it among themselves. It was the dead man's parting "tip."

Nor was this all; ignorance then came with its contribution, disguised in most deadly fashion under the mask of neatness and beauty. The following is from a chapter in a recently published book on the Canal:

In the state of ignorance that prevailed as to the sources of yellow and malaria fever, the hospitals soon became known as foci of the former disease, as we can easily understand now, when we know that their verandahs and wards were filled with large plants in pots that stood in earthen basins filled with water. The French cultivated flowers extensively about their dwellings and buildings, and each flower pot afforded an ideal breeding-place for mosquitoes, that conveyed the yellow fever and malaria germs.<sup>1</sup>

<sup>1</sup> Forbes-Lindsay, *Panama and the Canal To-day*, 69-70.

In other words, acting in perfect good faith and according to their lights, the French medical staff unwittingly established a well-designed and arranged breeding-school of the deadly *stegomyia*, they being systematically propagated, and regularly supplied with non-immune subjects on which to feed. The only cause for present surprise is that under such conditions the yellow fever in that climate and locality did not become epidemic as well as endemic, and that any even temporary sojourner on the Isthmus should have escaped it. To me, a confessed layman, it seems as if the natural laws regulating both the propagation and dissemination of the mosquito are not yet fully understood; but, in the still recent days of the De Lesseps dispensation, the death-dealing insect was looked upon as a torment but a harmless one, and the phantom of miasma was at all times invoked as a final, if not sufficient, explanation of the injuries he inflicted.

Almost a century before, the French under the lead of a greater than De Lesseps had ventured on another great West Indian enterprise. In 1801 Napoleon, he also fresh from Egypt and Suez, had sent to Hayti an army some twenty-five thousand strong, commanded by his brother-in-law, General Leclerc, the husband of his sister Pauline. Of that large force it is said not one man in three ever saw France again. For, more to be feared than the liberated African resisting a return to bondage, the then wholly unsuspected *stegomyia* put in his deadly work.<sup>1</sup> Leclerc himself fell a victim, and of the twenty-five thousand sent out to Santo Domingo under his command in 1801, only four thousand were fit for duty in 1802. Napoleon never liked to waste time or thought upon his failures. They were, in so far as possible, by him treated strictly as alms for oblivion. The investigator now, consequently, searches in vain for statistical reports of the experiences of the French in Santo Domingo, and the number of deaths to be there attributed to yellow fever. In Metral's *Histoire de L'Expédition des Français, à Saint Domingue*, the whole of the third book (pp. 105-164) is, for instance, devoted to a somewhat lurid account of the ravages of the disease, the narrative concluding with the death of Leclerc. The terror inspired by the fever, and the havoc it worked, are there dwelt upon with the habitual French

<sup>1</sup> The Panama Canal, *Inst. of Mining Engineers*, November, 1910, 50.

excesses of rhetoric; but from it no exact figures are forthcoming. It is, however, not unsafe to draw the conclusion that, taking into proportional account the size of the two expeditions — 40,000 in the first case, including the naval contingent, and 500,000 in the last — the mosquitoes of Hayti were more destructive to the Napoleonic venture of 1801 in West Indian waters than the frosts of Russia were to the memorable and colossal tragedy of 1812. There is no apparent reason why the experience in Hayti in 1801 should not have been repeated at Darien in 1901. No less subject to the infection, the French under the guidance of De Lesseps were as much in the dark as to either the origin or the prevention of the scourge as were those a century before under the command of Leclerc.

But I propose in this connection to confine myself strictly to a statement of what I saw, and to inferences naturally to be drawn from it by any observing layman not wholly devoid of experience gained elsewhere. Such an experience, as I have already said, had been mine in Africa five years ago. I was there also at the same time of year, in March, and at the same latitude, 10° North. The English had then been for twenty years in control in Egypt, and for several years in control in Uganda. They had established their hospitals; the work of sanitation, as they understood it, was steadily going on. Yet the house-fly was accepted as an unescapable nuisance. He swarmed, ubiquitous. No apparent prevention was thought of. A strong north wind only brought relief from him. With those I accompanied, I was recently at the Hotel Tivoli, Panama, for ten consecutive days. During that time we took our meals in a public dining-room capable of accommodating three hundred guests at a sitting. The attendants were all African; just such as we are accustomed to find in Washington, or at the hotels of every southern winter resort. I kept a careful reckoning, and during those ten days I saw on the dining-room table around which our party sat, exactly three house-flies; and yet, at the same time, I found them abundantly in evidence, though not at all to the Egyptian degree, in the fruit stalls in the public market-place not a mile away. It was certainly not the off season for flies there.

In one of the extremely interesting occasional papers of

Colonel Gorgas on the canal, he refers to the "heroism" exhibited by the French employes in coming to Panama. Every Frenchman, he says, who came to Panama knew that he was going to have yellow fever, and he also knew that every second man would die with it. "To face such chances took no little courage." Elsewhere he gives some examples — cases in point. "The family of one of the chief engineers consisted of five; four died of yellow fever. . . . The family of the superintendent of the railroad consisted of five; three of these died of yellow fever. A party of seventeen engineers came on one steamer; sixteen of these died of yellow fever. Twenty-five Sisters of Charity came to Ancon Hospital at one time; twenty of these died of yellow fever. . . . I think it quite reasonable to say that one-third of the Frenchmen who came to the Isthmus during the French construction died of this disease." The testimony of both Mr. and Mrs. Mallet, fortified by piteous cases of bereavement within their personal experiences, was to precisely the same effect. Colonel Gorgas says that for these people, under such conditions, to come to the Isthmus "took no little courage." To one at all acquainted with French industrial conditions the going to Panama of these victims in advance would probably be attributed to another motive, — the *res angusta domi*. In France the avenues to bread-earning occupations or employment are choked. To earn a living, especially with the slightly superannuated, almost any risk will be incurred. The Canal afforded at least a chance; the rest followed. Thus the Ancon graveyard is suggestive of many domestic tragedies, not the less pathetic because not otherwise of record.

Very different conditions in this respect now prevail in the Zone. Of those there in steady employment, though in subordinate capacities, more than the ordinary proportion are somewhat superannuated, and others have manifestly sought refuge from a too rigorous climatic condition — bronchial exiles, or those threatened by tuberculosis. For such, the region of the Chagres is now a health resort; but, computed on the basis of the French mortality, Colonel Gorgas estimates that the American loss by fever during the first five years of our work in the Zone should have been over eight thousand; it actually was just nineteen. And to-day the American skilled

workman goes to the Isthmus with wife and children for the first time, or having been there returns to his work and his family, giving no more thought to the fever, whether yellow or Chagres, than we here in Massachusetts give to the small-pox, — not nearly so much as we give to bronchial affections or our annual epidemic of measles. Assuredly the world has seen nothing like it before; and, standing face to face with it, is not the American justified in a certain access of race-pride?

This is not the place nor am I the person to enter into the story of the gradual development of the mosquito theory, and its full demonstration. First advanced as a plausible suggestion, as I understand it, in 1881, not until 1901 was it at last accepted as proven. The question now is as to its further development, and the new fields into which it will lead the investigator and sanitarian.

And yet there was one aspect of the subject which in my talk with Colonel Gorgas moved my sense of humor, though in a way slightly cynical. It moved it also to such an extent that I had difficulty in preserving a proper degree of acquiescent respect for his presentation of the matter. Colonel Gorgas was obviously greatly concerned over the cost of a more perfect sanitation and the necessity of unremitting vigilance with endless precautions, all of which involved an outlay at best never less, and probably always tending to increase. To this I simply listened; for I did not care to enter into a discussion of that other aspect of the case which at once suggested itself. During my stay on the Isthmus I had heard more or less discussion of the armament proposition. Should the Canal be fortified by us, and the Zone properly garrisoned? With the Great Lakes and Suez precedents in mind, observing also the obvious world tendency to neutralization, such a policy on our part seemed to me personally a distinctly backward step. By taking it, America would be throwing away a great opportunity to stimulate by example a movement of world-advance at once obvious and impending. The drift of feeling, and consequently of opinion, was, however, even on the Isthmus, plainly the other way. Patriotism is invoked, and the sense of proprietorship makes itself felt. We built it; it will be ours; and we will not deserve to own it, or to continue to enjoy it, if we are not prepared to hold and defend it, if need be against a world in arms!

Are we not the greatest and richest nation on earth? — and so forth and so on, *ad infinitum* and *ad nauseam*. A most familiar line of appeal and argument, it is also one against which it is useless to contend, save by a silent recourse to time.<sup>1</sup> That Colonel Goethals strongly sympathized in it I was sure; for not only is he a professional soldier, but the evening before I listened to the plaint of Colonel Gorgas I heard Colonel Goethals, at the Hotel Tivoli, address the assembled representatives of the Society of American Engineers, and the one passage which had called forth the warmest and the most immediate expression of approval was that in which he lent his great authority to the armament proposal. So far as I could judge, sanitation and engineering were, in the thoughts of those present, considerations of quite secondary importance. I was also under the impression that Colonel Gorgas was similarly minded; I have uniformly found that all army circles instinctively so incline. I, therefore, did not care to provoke a useless discussion. None the less a comparison did not fail to suggest itself. Colonel Gorgas was gravely considering the unavoidable necessity of a continuing sanitation with the consequent expense thereby entailed. The price came high. Could those who had to provide the amount be counted on always to respond? The problem is serious; the outcome questionable. Fortification was a necessity; sanitation, a luxury. So be it!

<sup>1</sup> "With her great navy and immense standing army Japan could attack our Pacific coast to-day and we should be helpless to resist her. . . . It may be hard for the average American to appreciate the military weakness of his country at the present time, especially on the Pacific coast, and to understand in what an appalling situation the United States would be should the Panama Canal, being unfortified, suddenly be seized by Japan, a nation which has twice within the last fifteen years begun war without a declaration of war and by treacherous attacks. . . . It is difficult to speak calmly of the thick-headed, thin-blooded theory that would, in the face of these facts, persuade us to leave our coasts unprotected by using our navy to guard an unfortified canal. . . . With the great armed powers approaching a struggle for supremacy in Asia, and with a part of Asia already in arms and thirsting for conquest, it would seem as though none but a fool or a traitor could fail to see that to refuse to fortify the Panama Canal is to invite war and to make our destruction easy."

The foregoing extracts from a paper entitled "The Madness of an Unfortified Canal," by Mr. James Creelman, in the issue of a popular periodical (*The Cosmopolitan*) for the current month (May, 1911), may be not without historical interest. In a period of future development, probably not now remote, they will at least serve to illustrate the temper and discretion with which the discussion referred to in the text is now approached.

Yet even when looked at in this way, and conceding each proposition, there was, it seemed to me, something to be said in a comparative way in behalf of sanitation. In the first place it was an incident, but still a necessary one, to any really successful system of armament. That I had seen emphasized at Camp Elliott. The health of the garrison, and consequently the efficiency of the armaments, were involved. Sanitation was not therefore a matter of pure luxury. But even allowing that it was; as a luxury, is it not, comparatively speaking, one which may justifiably be indulged in? It is admitted — or, if not admitted, probable in the light of all experience — that a reasonable armament for the Zone, with a force sufficient properly to garrison the same, will entail an average annual expenditure of \$15,000,000; on the other hand, the most perfect sanitation could be provided for \$750,000, or five per cent of that amount. Was an expenditure of five dollars for luxury unreasonable on the part of a man, or a nation, which is spending one hundred dollars for necessities? The comparison is suggestive; but, as it presented itself to me in my interview with Colonel Gorgas, I could not but recall Prince Hal's wondering exclamation on a familiar occasion, — "Oh, monstrous! but one half-penny-worth of bread, to this intolerable deal of sack!"

One thing, and that the essential thing, is clear; the cost of sanitation is not prohibitive. On the contrary, as compared with that of armament, it is trivial. In these days, here and abroad, both men and journals liken, as continually as wearisomely, the war-budget to an insurance premium paid to avert actual war, — the way to avoid war, it is claimed, is to be prepared for it. Without wishing to appear learned, the insurance argument may, I believe, be traced back to classic times, and the *Qui desiderat pacem, præparet bellum*. More recently even Napoleon insisted, and perhaps himself believed, that his everlasting preparation and consequent perpetual wars were but preliminary to a solid and enduring peace. But, conceding the force of the argument, does not the insurance-premium figure of speech apply quite as forcibly to pestilence as to war? For instance, while preparing this paper I notice that in a recent official report Dr. L. O. Howard, the head of our Bureau of Entomology, estimates that malaria alone costs the United States one hundred millions annually,

and the insect diseases generally twice that sum. It will probably be conceded that, except in connection with the war-budget, such amounts are worth saving. In the present case, moreover, the insurance premium against pestilence, besides immunity under existing conditions, further implies the opening of vast regions to development by healthy generations of human beings. Looked at from this point of view, it is at least suggestive that to-day the entire cost of a complete sanitation of our Canal Zone, — heretofore the most pestilential region on earth, and, in that respect, incomparably worse than the proverbial Roman Campagna, — to completely sanitize this region and convert it into a practical winter health-resort may involve a yearly expenditure equal to one half only of the cost of maintenance of a single battle-ship, and, possibly, a sixth part of one per cent of the regular annual war-budget of the United States alone, if we include in that budget the cost entailed on us by wars the last and least of which occurred ten years ago.

Moreover, sanitation is, it must be remembered, as yet but in its infancy. In its present stage of development it is little more than a crude, somewhat clumsy demonstration; though as such, complete. Every method and every appliance are yet to be perfected. To illustrate by example: — sanitation is at this time where steam, as a source of power, was eighty years ago, — where electricity and anæsthetics were in the early memory of those not yet old. Looked at in this way, when some measurement of the possibilities of the future is attempted, the imagination, as I have already said, staggers; at least, when at Panama, mine did.

But, a layman at best, I feel I am now venturing on somewhat dangerous ground, — the domain of prophecy. For, on the other side, tradition holds; nor, it must at once be conceded, is the case yet fully proved, and time alone — sixty years at shortest — can effect a complete demonstration. It is argued, and plausibly argued, that, so far as human life in the tropics is concerned, and continuance of energy there through successive generations as well as its extension to both sexes and all ages, the problem is to-day much where it was heretofore. It is merely proven that the adult male can, by following a prescribed mode of life and observing strict precautionary rules, live, and do a man's work, where he could not

live safely or work effectively before. Existence in a high, steady and monotonous temperature, without impairment of vitality, is still, to say the least, questionable as a possibility. Men may perhaps stand the test; can women and children, much more successive generations of women and children? In other words, was insect poison from time immemorial the root of all tropical evils so far as the human race was concerned, and to what extent do miasmas, temperature and climatic conditions generally still remain to be reckoned with? Moreover, does the presence of the mosquito, that cobra of the air — and here the thought suggested becomes even more startling — explain such enigmas as Greek deterioration and the decline and fall of Rome's empire? Was it an imported, and then domesticated insect, which after all avenged a conquered world? But, then again, why not? The tsetse-fly is to-day depopulating eastern Africa.

Suggesting the problem, I withdraw from its discussion. Confessedly a layman, I make no pretence at the prophet's rôle. So, stating the next and most startling proposition of all on the authority of Colonel Gorgas, I shall there leave it. In the reports put by him in my hands while at Ancon I find him on record to the following effect:

But I do not believe that posterity will consider the commercial and physical success of the Canal the greatest good it has conferred upon mankind. I hope that as time passes our descendants will see that the greatest good the construction of the Canal has brought was the opportunity it gave for demonstrating that the white man could live and work in the tropics, and maintain his health at as high a point as he can, doing the same work, in the temperate zone. That this has been demonstrated none can justly gainsay. . . .

I therefore expect in the course of years to see a very large and wealthy population grow up at the Isthmus in the neighborhood of the Canal. In other words, I expect this Panama Canal to turn out to be one of the greatest commercial successes that man ever brought about. . . .

The figures (here submitted) prove that in the case of the unacclimated foreigner, women and children, as well as men, health conditions have been so changed at Panama that one can live about as well here as in the healthy parts of the United States. That in the case of the native and negro, who make up the bulk of the total population, his sanitary surroundings have been so changed that he

now enjoys at Panama about the same degree of health as the ordinary inhabitant of the United States. If this can be accomplished at Panama, the same may be accomplished anywhere else in the tropics. . . .

We therefore believe sanitary work on the Isthmus will demonstrate to the world that the white man can live and work in any part of the tropics and maintain good health, and that the settling of the tropics by the Caucasian will date from the completion of the Panama Canal.

It will be noticed that in these extracts Colonel Gorgas is speaking not of acute and malignant diseases, such as the yellow or the Chagres fevers, but of the incapacity caused by malaria, so-called, generally; a manifestation not at all confined to the tropics, but, in this country, familiar to those dwelling in the neighborhood of Boston, as well as of Rome, of Philadelphia or of New York. This "incapacity" Colonel Gorgas asserts is an indication of an underlying evil to which must be attributed more fatalities than are due "to all other diseases combined." "Yellow fever," he says, "has a great effect on the death rate of a non-immune population, but it is not a noticeable cause of debility. On the other hand, malaria is a disease which may affect the individual for years; and, in a locality like Panama, is responsible for a widespread condition of debility throughout the population."

The yellow fever Colonel Gorgas dismisses almost with words of contempt, relegating it to an historic past:

It seems to me that yellow fever will entirely disappear within this generation, and that the next generation will look on yellow fever as an extinct disease having only an historic interest. They will look on the yellow fever parasites as we do on the three-toed horse — as an animal that existed in the past, without any possibility of reappearing on the earth at any future time.

Finally Colonel Gorgas closes with this inspiring trumpet-note, at once a challenge and a prophecy; in it he fairly throws down the gauntlet:

I dare to predict that after the lapse of a period, let us say, equal to that which now separates the year 1909 from the Norman conquest of England, localities in the tropics will be the centers of as powerful and as cultured a white civilization as any that will then exist in temperate zones.

This paper has already extended far beyond the limits originally proposed for it; and, purposely, I have in it said nothing of many of the subjects most discussed in connection with the Canal, — for example, the much mooted question of a sea-level or a lock construction. On this point, one of opinion purely, I see no reason why I should commit myself, or waste time and spoil paper over it. I have my own opinion on it, and a decided one; visiting the work, it could not well be otherwise. But, not being an expert on canal construction and at best a mere casual visitor of the Zone, that opinion could, if expressed, carry no weight, and would be undeserving of consideration. But there is another aspect of the subject more appropriate to this place, and to me of greater interest; and I cannot close this paper without reverting to the purely historical side of my experience, already more than alluded to. I refer, of course, to Old Panama, so called to distinguish it from the present city of that name, — the Panama of Pizarro, of Drake, and of Morgan. I have said that, greatly interested in it, its location and remains, in company with my artist friend, F. D. Millet, I visited the site of the original Panama twice, and made of it as complete an examination as was practicable under tropical conditions and in so brief a time. I have also said that, as a result of an examination, the place, while vastly interesting and historically suggestive, impressed both my companion and myself as being somewhat of a myth. There hangs about it an atmosphere of exaggeration curiously suggestive of Herodotus and early Greece. For myself, I freely confess that, having visited both localities, I no more believe in the tradition of Old Panama, its size, its population, its commerce and its wealth, than I believe in the accepted traditions of the battle of Marathon. In each case I am persuaded it is in large part an historical fake. As respects Marathon I am, in the *Proceedings* of this Society,<sup>1</sup> already on record; as respects Old Panama, I propose now to put myself on record. Turning back to the fountain head, Hakluyt was, I find, to Old Panama much what Herodotus was to Marathon. What he records, the modern investigator implicitly accepts and then proceeds to elaborate. For instance, in the recent work of Mr. Forbes-Lindsay, from which I have already quoted, is the following somewhat highly wrought description:

<sup>1</sup> 2 *Proceedings*, xvii. 252.

The ruins of Panama Viejo are overgrown with dense vegetation and a considerable portion of them has not been seen by the eye of man in two hundred years. Enough is, however, accessible to make the place unusually interesting, and to attest to the substantial manner in which the Spaniards of old erected their buildings. The tower of the Cathedral of St. Anastasius rises above the tangle of tropical jungle and affords a prominent landmark. In the days of Panama's prosperity and pride, this was the focal point of the city, for the Church was more powerful than the temporal authority. A fine old stone bridge, in a good state of preservation, is a picturesque reminder of the period when the "Gate to the Universe" stood on this spot. There are remains of fortifications and dungeons; and the famous "paved way," which was, in reality, no more than a road of cobble-stones, may be seen where the forest is not too dense to penetrate.

So far all is not unfairly set down and in reasonable accord with ascertainable facts; but the imagination next assumes control:

In its palmy days Old Panama was the seat of wealth and splendor such as could be found nowhere else in the world than the capitals of the Orient. At the court of the Governor gathered noblemen and ladies of gentle birth. There were upwards of seven thousand houses in the place, many of them being spacious and splendidly furnished mansions. The monasteries, convents and other ecclesiastical edifices were numerous, and contained vast amounts of treasure in their vaults. There were fine public buildings devoted to various purposes, among them pretentious stables in which were housed the "King's horses."

But, as matter of fact, a remark might here not improperly be interjected to the effect that the horses in question were in reality mules, and the stables — Latin-American shacks!

To much the same effect Mr. Hubert Howe Bancroft, or his *pro hac vice* ready writer, grows poetical as he lovingly dilates on the seventeenth century metropolis and trade-centre:

Two or three piers of a shattered bridge, a fragment of wall, a single tower, and a few remnants of public buildings, half buried under a dense growth of creepers, still mark the spot where, in 1671, stood a city with fine streets and beautiful edifices, among which were stately churches richly adorned with altar-pieces and rare paintings, with golden censers and goblets, and tall candelabra of native silver. There were the abodes of the merchant princes of the New

World, some of them the descendants of men who had fought under Cortés when he added the empire of the Montezumas to the realm of the Spanish crown. There were vast storehouses stored with flour, wine, oil, spices, and the merchandize of Spain; there were villas of cedar surrounded with beautiful gardens, where fair women enjoyed the cool evening breeze as they gazed seaward on the untroubled waters of the Pacific.<sup>1</sup> . . .

There the raw adventurer who at the opening of his career pressed forward with eager expectation into a dark uncertain future met the returned fortune-seeker elated with success or broken-spirited through failure. Into the lap of this great central city poured untold wealth. Her merchants were princes; her warerooms were filled with rich merchandize of every kind and from every quarter of the globe. There were to be seen stacks of yellow and white ingots from the mines of Peru, the cochineal and dye-woods of Mexico, the richest wines of Spain and Portugal, the silks, velvets and laces of France and Italy.<sup>2</sup>

G. W. Thornbury<sup>3</sup> is equally imaginative, but a trifle more specific:

The buildings were all stately, and the streets broad and well-arranged. There were within the walls eight monasteries, a cathedral, and an hospital, attended by the religious. The churches and monasteries were richly adorned with paintings, and in the subsequent fire may have perished some of the masterpieces of Titian, Murillo, or Velasquez. The gold plate and fittings of these buildings the priests had concealed. The number of rich houses was computed at 2000, and the smaller shops, etc., at 5000 additional. The grandest buildings in the town were the Genoese warehouses connected with the slave trade; there were also long rows of stables, where the horses and mules were kept that were used to convey the royal plate from the South to the North Pacific Ocean. Before the city, like offerings spread before a throne, lay rich plantations and pleasant gardens.

Of course, the writer meant from the South Pacific to the North Atlantic; but that is a mere detail. And of such stuff is what passes for history made up! Padding, pure and simple!

Now for the facts, as inferred from observations made in person and on the spot.

<sup>1</sup> *History of Central America*, II. 502.

<sup>2</sup> *Ib.* 249.

<sup>3</sup> *The Monarchs of the Main*, II. 158.

The report of Baptista Antonio, made in 1587, to Philip II, King of Spain, is the base on which these historical figments rest. Antonio's report is in Hakluyt's principal narrative; and, in connection with this paper, I reprint such portions thereof as relate immediately to Panama. Matter of fact and to the point, they are also quaint and refreshing. Antonio describes the geographical situation exactly as it exists to-day; and the ruins of the structures he refers to can even now be seen, or traced, in the jungle. In view of the exceptional interest which at just this juncture attaches to the place, the extracts have a distinct historical interest as well as value. Well worth reproduction, therefore, it is nevertheless difficult to make them in all respects conform to facts and appearances.

In the first place, the topography of the site and surroundings is as Antonio described it four centuries ago; but the foundations and ruins still remaining of the structures — fortifications, ways, bridges and edifices — are at variance with the statement that the town, as such, was ever of considerable size. Limited to an area of at most two hundred and fifty to three hundred acres, the ruins now remaining and the scattered fragments of tile show conclusively that Panama Viejo never could have contained within its limits either the buildings and dwellings, or the avenues, streets and ways described. Both the public edifices and the private houses were limited in size — of modest dimensions, as we would phrase it — and, apparently, packed closely together. In place of the fifty thousand sometimes credited to them, they never, on any reasonable estimate, could have sufficed to accommodate a population in excess of seven thousand. Ten thousand would be a maximum. The foundations of "the royal houses builded upon a rock" are still there; so also those of the "audience or chancerie," as likewise the prison; all "adjoining together one by another along upon the rocks." But those foundations afford proof positive of the dimensions of the superstructures. By their proximity to each other, also, they show that there never could have been any "broad streets" or wide thoroughfares in the town or approaching it; and the bridge, of which we are informed that "two or three piers" only remain, never had but a single span, both short and narrow, thrown across a contemptible mud-creek, almost devoid of water in the dry season or at low tide; and that

single span — a very picturesque one, by the way — is still there. That a great store of wealth for those days annually passed through Old Panama, there can be no question. The place was, however, merely a channel; and, after a fairly close inspection, I do not hesitate to repeat that the stories of its art, its population and its treasures — generally of its size and splendor — constitute about as baseless an historic fabric as the legions that fought at Marathon or the myriads that followed Xerxes. Old Panama, as seen through the imagination of modern investigators, bears, I believe, just about as much resemblance to the sixteenth century reality as Francis Drake's *Golden Hind* would bear to a present-day Atlantic liner, say the *Lusitania*.

#### PANAMA <sup>1</sup>

PANama is the principall citie of this Dioces: it lieth 18. leagues from Nombre de Dios on the South sea, and standeth in 9. degrees. There are 3. Monasteries in this said city of fryers, the one is of Dominicks, the other is of Augustines, and the third is of S. Francis fryers: also there is a Colledge of Jesuits, and the royall audience or chancery is kept in this citie.

This citie is situated hard by the sea side on a sandy bay: the one side of this citie is environed with the sea, and on the other side it is enclosed with an arme of the sea which runneth up into the land 1000. yards.

This citie hath three hundred and fiftie houses, all built of timber, and there are sixe hundred dwellers and eight hundred souldiers with the townesmen, and foure hundred Negros of Guyney, and some of them are freemen: and there is another towne which is called Santa Cruz la Real of Negros Simerons, and most of them are employed in your majesties service, and they are 100. in number, and this towne is a league from this citie upon a great rivers side, which is a league from the sea right over against the harbour of Pericos. But there is no trust nor confidence in any of these Negros, and therefore we must take heede and beware of them, for they are our mortall enemies.

<sup>1</sup> From a "Relation of the ports, harbors, forts, and cities in the West Indies which have been surveied, edified, finished, made and mended, with those which have bene builded, in a certaine survey by the king of Spaine his direction and commandement: Written by Baptista Antonio, surveyour in those parts for the said King. Anno 1587. It was printed in Hakluyt's *Principall Navigations*, III. 554, and in the edition of 1904, in X. 148.

There are three sundry wayes to come to this citie, besides the sea, where the enemy may assault us. The one is at the bridge which is builded upon the river: and on the one side of this, there lieth a creeke: so on this side the citie is very strong, because it is all soft muddie ground, for in no way they cannot goe upon it. And right over against it there lyeth a river which is in maner like unto a ditch or moate; and on the other side of the River there lyeth a great Lake or Pond which is full of water all the Winter, and part of the Sommer, so that on this side the city is very strong, for with very small store of souldiers this place might bee kept verie well.

The greatest danger for the surprising of this citie is the way that doth come from Nombre de Dios: for all this way is playne ground and no woods: and 2000 yardes from this citie there lyeth a river called Lavanderas, where the women doe use to wash their linnen: and this river doth goe into the creeke, according as I have certified your majestie: and being once past this river, there is a causey which goeth directly unto them. The other way which doth go towards the citie is lower downe towards the sea at a stone bridge lying upon the way which goeth to the harbour of Perico. These two wayes cannot be kept nor resisted, because it is all plaine ground and medowes.

Upon the East side of this citie there are your majesties royall houses builded upon a rocke joyning hard to the Sea side, and they doe aswell leane towards the sea as the land. The royall audience or chancerie is kept here in these houses, and likewise the prison. And in this place all your majesties treasure is kept. There dwelleth in these houses your majesties Treasurer, the Lord President, and 3. Judges, and master Attorney. All these doe dwell in these houses, and the rest of your majesties officers: which are sixe houses besides those of the Lord President, the which are all dwelling houses, and all adjoyning together one by another along upon the rockes. And they are builded all of timber and bourdes, as the other houses are. So where the prison standeth and the great hall, these two places may bee very well fortified, because they serve so fitly for the purpose, by reason they are builded towardes the sea, and that there lye certaine small rocks, which at a lowe water are all discovered and drie, and some of them are seene at a high water. Right over these houses to the Eastwardes there lyeth an Island about five hundred yardes from these houses, and the Island is in forme of a halfe moone; and in this order it runneth all alongst very neere the maine land: so over against these houses there lyeth the harbour where all the shippes doe use to ride at an anker, after that they have discharged and unladen their marchandize. For when they have their lading aboard, there can come in none but small Barkes, and

at a lowe water the shippes are all aground and drie, and so is all the space some thirtie yardes from those houses. Right over against them standeth the citie.

When newes were brought to this citie of those Pirates which were come upon this coast, the Lord President and Judges commanded that there should a sconce bee made, and trenched round about, made all of timber for the defence of this citie against theemie, and to keep your majesties treasure. So your officers caused Venta de Cruzes to be fortified, and likewise Chagre, and Quebrada, and fortified the garrison of Ballano: for all these are places where the enemy may land, and by this meanes spoyle all this countrey.

There are three sundry places where this citie may without difficulty be taken, and spoyled by the Pirates. The first is on the North seas in a certaine place which lyeth foureteene leagues from Nombre de Dios, the place is called Aele to the Eastwards, where once before certaine men of warre have entred into those seas. The other place is Nombre de Dios, although this is a bad place and naughtie wayes, and full of waters and a very dirtie way: for three partes of the yeere the countrey people doe travell upon those waters, and an other very badde way, which is the going up of certaine rockes and mountaines which they must climbe, called the mountaines of Capira, which are of height three quarters of a league, so in this place with very small store of souldiers wee can defend our selves from the fury of theemie, so these dwellers doe say that in Sommer the wayes are very good without either dirt or water.

The other entrance is up the river of Chagre, which rivers mouth lyeth eighteene leagues from Nombre de Dios to the Westwards falling into the North sea, and this is the place which the citizens of Panama doe most feare, for they may come up this river to Venta de Cruzes, and so from thence march to this citie, which is but five leagues off. So up this river there goe boates and barkes which doe carry 320. Quintals waight. These are they which carry the most part of the marchandize which doe come from Spaine to be transported to Peru, and from Venta de Cruzes it is carried to Limaret which is three leagues off that place, and the dwellers doe report that it is a very good way: and if any men of warre will attempt to come into these seas, they may very easily come up this river as farre as Venta de Cruzes, and from thence march unto this citie, and if the enemy will, they may bring their pinnesses ready made in foure quarters, and so taken in sunder, may afterwards set them together againe: as it is reported that Francis Drake hath used it once before when he came that voyage; and so he may attempt us both by sea and land. And forasmuch as the most part of these people are marchants, they will not fight, but onely keepe their

owne persons in safetie, and save their goods; as it hath bene sene heretofore in other places of these Indies.

So if it will please your majesty to cause these houses to bee strongly fortified, considering it standeth in a very good place if any sudden alarms shoulde happen, then the citizens with their goods may get themselves to this place, and so escape the terrour of the enemy: and so this will be a good securitie for all the treasure which doth come from Peru. So all the Pirats and rebels, which have robbed in these parts, have gone about what they can to stoppe this passage, and so by this meanes to stoppe the trade of Spaine, and to set souldiers in this place, for to intercept and take your majesties treasure, whereby none might be caried into Spaine. Therefore it behooveth your majestie to fortifie these places very strongly.

These places being fortified in this maner, your majesty shal have al your gold and silver brought home in safetie which cometh from Peru. And all those commodities which are laden in Spaine may come safe to this place. And if perchance any rebels should rise in these parts, which would rebel against your majesty, which God forbid, & if they should chance to joyn with any of these pirats, having this place so wel fortified, & Puerto Bello in ye North parts, & so to send some garrison your majestie needs not to feare: for here in this harbor are alwayes 10 or 12 barks of 60 or 50 tunnes apiece, which do belong to this harbor. So if any of these places shalbe intercepted, then your majestie hath no other place fitter then this to land your majesties souldiers, for then they have but 18. leagues to march by land, & presently they may be shipped to supply these places which shal stand in most need of them. In al the coast of Peru there is no harbour that hath any shipping but onely this place, and the citie of Lima, where there are some ships and barks. The harbour being thus open without any defence, a man of war may very easily come to this place, as I have certified your majestie, thorow the streits of Magellane, & arrive at that instant, when those barks, do come from Peru with your majesties gold & silver, for sometimes they bring 5 or 6 millions in those barks; so the enemy may come and take al their treasure, & not leese one man, because here is not one man to resist him, therefore this place being thus fortified, the treasure may be kept in the fort. There is a trench made round about your majesties houses which are builded of timber: the President and Judges did cause it to be made, for that here was newes brought that there were certaine men of warre, & pirats comming for these parts. So this trench is thus maintained until such time as your majesties pleasure is to the contrary, & in such wise that your souldiers may fight lying behind the trench; so there is order given to build a platforme upon the plaine ground,

and so to plant such ordinance in those places, as shall be thought most convenient.

If it wil please your majestie, here we may make a sconce or fort toward the land side, & so trench it round about and build it with stone, because here is a place and al things readie for the same purpose; and by this meanes the citie would be securely kept: as for the sea there is no danger at al, by reason that the water doth ebbe & flow twice a day, and then when it is ebbing water it wil be all ozy & muddy ground and rocks, so that in no wise at a low water the enemy can wade over the mud to come to this city, and it reacheth from the Island til you come to the bridge called Paita. Two leagues from this city there lieth a harbor called Perico downe to the Westward: this is a very sure harbour by reason of 3. Islands which do joyne in manner of a halfe moone, they lie halfe a league from the maine, the Islands do enclose the harbor round about, the harbour is a very high land, and the Ilands are but reasonable high, there is good store of fresh water: also there hath never any ship bene cast away in this harbour, for there is 7. fathome water at ful sea, and 3 or 4 fathome at lower water, and very good ground for their ankering, and when they will trimme their ships, they may hale them ashore. All those ships and barks which come from Peru with gold, silver or any other kind of commodities, do first come to an anker in this harbour, and if they have a contrary weather they cannot come into the harbour of Panama; and for so much as the harbour hath no defence for the safegard of the ships, if a man of warre should chance to come into the harbour, all the barks with the treasure may be very easily taken. And likewise these barks & ships which do navigate in the South seas carrie not so much as one piece of ordinance or a rapier to defend them withall. From this place to Venta de Cruzes is not passing 5 leagues; so that if any pinnesse should happen to arrive there, no doubt but they might robbe and take al your treasure which is in those barks, by reason that from the shore they cannot be rescued nor holpen, because it is an Island and refuge for all ships and barks. If it would please your majestie here might some fort or defence bee made in the middlemost Island, and some ordinance planted, and this might bee made with little charges, because in the said Island there are all kinde of necessaries fit for that purpose, so by this meanes your majestie may have both the harbour and the citie very well kept.

And likewise there is another entering into the South sea which is called the river of Francisca, which lieth on this side of the Cabeça de Cativa, and this river doth come into another river which is called Caracol, and is five leagues from this citie; and once before these Simerons brought into this place certaine Frenchmen.

## THE RIVER OF CHAGRE

THE river of Chagre lieth in 9. degrees and one tierce. The mouth of this river is in the North seas 18. leagues from Nombre de Dios, and 13. leagues from Puerto Bello: there is caryed up this river certaine quantitie of those merchandize which are unladen at Nombre de Dios which come from Spaine. From the mouth of this river to Venta de Cruzes are eighteene leagues. From this place where the barkes unlade their commodities, they are carried upon mules to Panama, which is but five leagues off from this place.

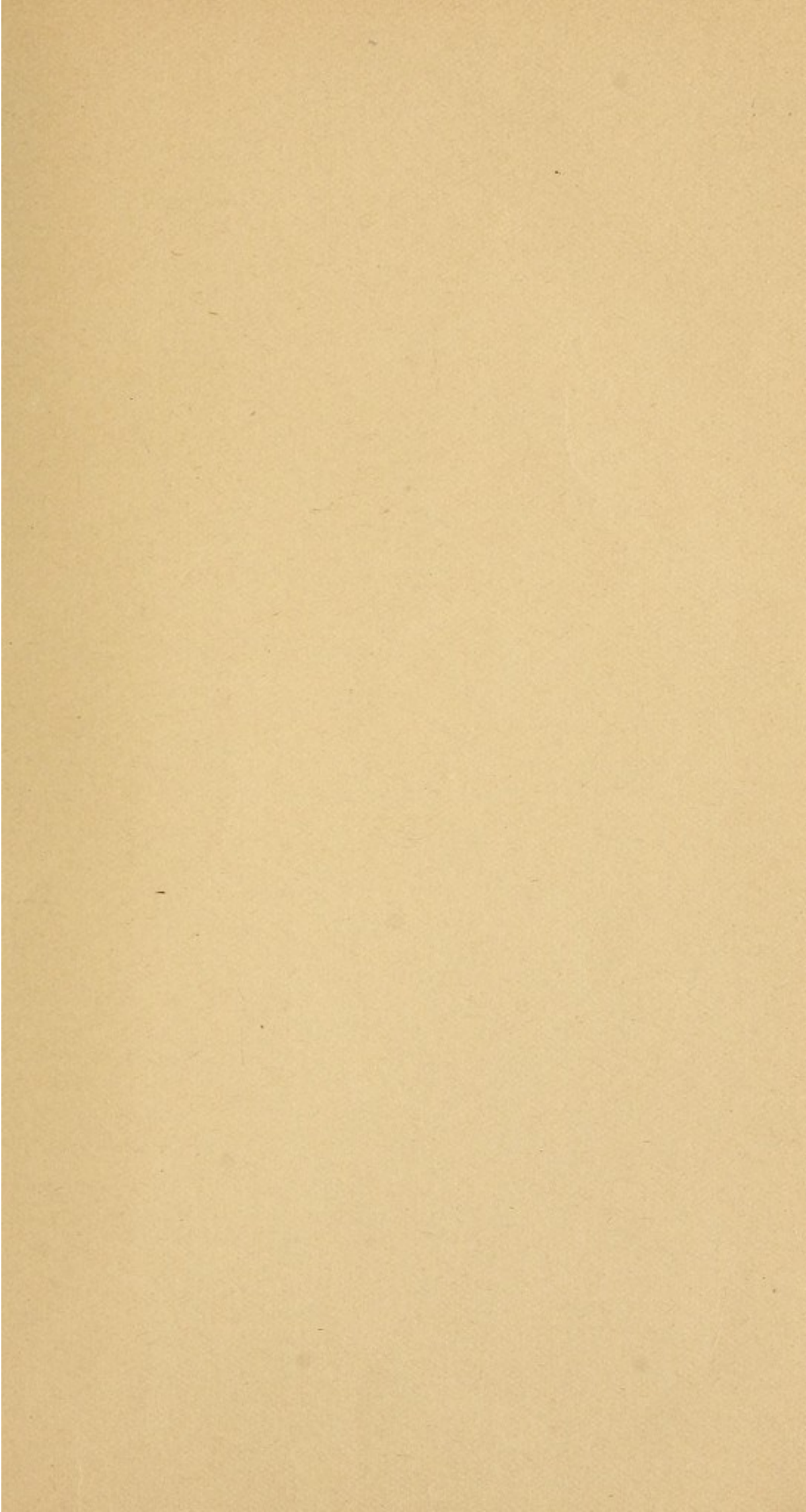
This river hath great store of water in the Winter. And the barkes which belong to this river are commonly of 320. Quintals that is of 16. tunnes in burthen: but in the Summer there is but small store of water: so then the barkes have much to doe to get up this river: and in many places these barks are constrained to unlade their commodities; and are drawn by mens strength and force a good way up the river, and therefore if it would please your majestie to command that all those goods may bee first unladen in Puerto Bello, and there to build a litle castle in the mouth of the said river, and at the foote of the castle to build a storehouse to unlade and keepe all the sayd goods, and there to build other barks of lesse burthen; then these would serve for Sommer, and the great barks for the Winter.

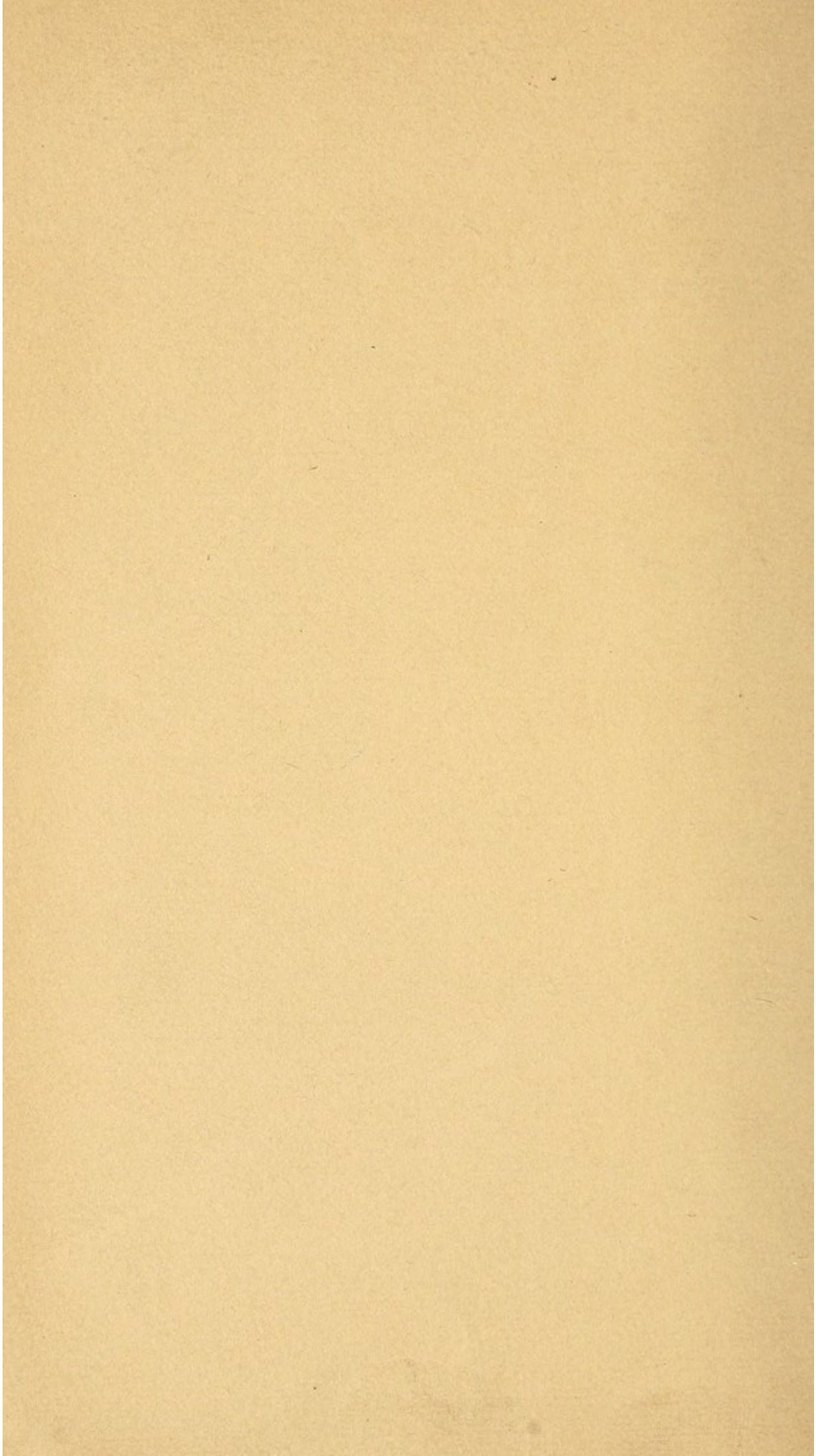
If it would please your majestie, there might a very good high way be made on the one side of the river, and so they might bee towed, for it may bee made and not with much cost because it is all plaine ground, and there is growing upon the sayd river great store of timber and trees which doe lie over-thwart the said River; so that they are very cumbersome and great annoiance unto the said boates, as well those that go up the said River, as also that doe come downe the said River.

And therefore if it might please your majestie to command, that Puerto Bello might be inhabited, and the towne made neerer the Rivers side, every thing would be a great deale better cheape, if the commodities were caryed up the River; for it is a great danger to cary them up by land, for it is daily seene that the mules do many times fall and breake their neckes with their lading upon their backs, as well the treasure as other kinde of commodities, because it is such a bad way. And your majestie might be at this charges and spend your revenewes of Nombre de Dios and Panama, which do yerely yield 12 or 14 thousand pezos, & this being once done it would be a great ayd and benefit to those, which doe trade and trafficke, and to those merchantes which doe send their goods over-land, and ease them much of paine and purse. because the other is a most filthy way, as any is in the world.













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