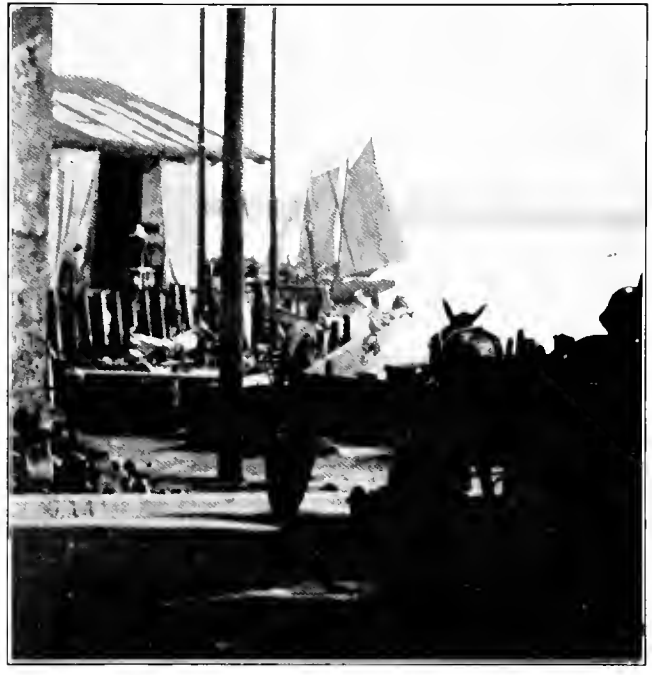
There were a few cabins fore and aft for first-class passengers, — miserable little cuddies designed to accommodate four persons. Brown and myself were fortunate in having what is called "the ladies' cabin," right forward by the wheel and next to the captain's room. The lower deck was open. It was devoted to second-class passengers, — who had no kind of shelter, — cattle, horses, pigs, chickens, and scattered packages of light cargo.

The passengers were all, excepting ourselves, natives, and included a number of generals and governors. The crew was a doubtful lot and the captain confessed that in an emergency they would be a hindrance, rather than a help. The steward was willing but idiotic. The skipper's monkey appeared to be one of the most intelligent creatures on board.

Captain Crawford is a Britisher who has had a varied and adventurous career, a sort of Captain Kettle. At the time I travelled with him he was planning to deliver two second-hand torpedo destroyers to Castro. The mate was a gigantic Italian who looked like an Algerine pirate. But, despite his hairy face and fierce demeanor, Beppo was a fine and likable fellow. The undersized crew were in mortal terror of

CAPTAIN CRAWFORD AND HIS PET MONKEY.



A GLIMPSE OF PANAMA BAY.

him. When he shot an order at one of them, the man jumped as though he had received an electric shock. Beppo had been a pearl fisher and had sailed these waters for twenty years continuously. His actual capacity was that of pilot, a highly important one on a trip which is all the way through narrow channels, among small islands and rocks, upon a poorly charted coast. (I had a better chart than the captain was furnished with.)

The engineer was, of course, a Scotsman, McMurray by name. In the evenings he would come up from the bowels of the boat, where his engines were constructed on the lines of a daschund, and, perching himself on the rail beside our cabin, would smoke his short, black pipe and tell yarns in a brogue that brought the smell of heather to your nostrils. He and Captain Crawford had brought this Noah's Ark from Liverpool round the Horn to Panama. The story of that voyage would make an epic of seamanship.

None of the officers ever wore a coat, or changed his shirt. They all started the voyage with dirty linen, which was soon filthy. Like the passengers, they wore slippers constantly, the company's cap doing duty for uniform, but

even this Captain Crawford only donned in the terminal ports. There was a pronounced absence of red tape. The quarter deck was contrived by shutting off a space about the wheel with a rope. Our cabin was by courtesy included in the enclosure.

The captain did not seem to keep any log, but I may have been mistaken about this. If he had one, it must have been interesting. I pumped him on the subject, hoping to get a chance to read the log, if such a thing was in existence, but he skilfully evaded the question.

The crew were merely cargo shifters. They didn't swab, much less holy-stone, and the decks were covered with dirt and pitch stains. The ship's bell was struck less than half a dozen times in two days.

The boat was fairly alive with ants and cockroaches. At night the latter would run all over one's face and body, so that the only way to secure sleep was by hanging a hammock on deck. But when the vessel happened to be anchored for the night in a river the mosquitoes put this out of the question.

One had to eat with great circumspection. The ants were in everything. My clothes, bag-

gage, camera, pistol holster, everything in short, was full of them.

It was dark by the time we had docked at Sona, and the unloading was carried on by lamp-light. We lay there all night devoured by mosquitoes and sand flies.

In describing the little discomforts of this trip I have no thought of intimating that it was anything but pleasurable. The man who does not enjoy roughing it, loses the spice of travel, and should never go beyond easy reach of Pullman cars and modern hotels. This journey up to Chiriqui was delightful. It involved no actual hardship, and every annoyance was relieved by a humorous element in the situation. Had the discomforts been twice as great, they would have been more than offset by the beauties of the scenery, the novel manifestations of human and animal life, the moonlit seas and the gorgeous sunsets. Furthermore, I was not lost to the fact that the National Navigation Company did not run its boat for my special benefit, and that the arrangements and conditions were doubtless well enough adapted to the tastes and requirements of the majority of persons patronizing the line. I often wonder why travellers do not more com-

monly bear this point in mind. The amusingly pettish criticisms of foreign hotels and customs which do not happen to tally with their ideas of the fitness of things, recorded by some of them, mark them for greenhorns and unreasonable beings.

It was the morning of Easter Sunday when we steamed out of Sona River, and we expected before nightfall to be landed on Coiba, or rather Rancheria, a neighboring island. The agent of the steamship company had once been interested in pearl fisheries which had their headquarters on Rancheria. The enterprise had been abandoned some years before, but he assured us that we would find a village and some good huts on the island. The latter belonged to the company and the agent urged us to occupy them. This proved to be another of his wild flights of fancy. However, we had not entirely lost faith in him at that time and determined to follow his advice. The easternmost point of the island, Punta Marguerita, was the place from which it had been arranged that we should signal passing steamers when we were ready to be taken off, and it seemed to be wise to reconnoitre this island first, and afterwards get some of the natives to row us over to Coiba,

which is only about five miles distant from it.

It was about five o'clock in the evening when the "David" came to anchor, entirely out of its course and in the midst of a number of nasty rocks, about two miles from Rancheria. Beppo and one of the crew rowed Brown and myself and our belongings to the island. We landed on a patch of sandy beach, about two acres in extent. On the edge of this were two deserted huts, which the jungle would shortly take into its embrace. The little open space was entirely enclosed by heavy growth, quite impenetrable, except with the aid of the machete. Back in this wilderness somewhere the village that had stood in the open a few years before was now buried beyond sight.

Our first thought was to congratulate ourselves that we had not arrived after dark. In that case, trusting to the agent's report of conditions, we should probably have left the boat and sent it back to the ship without investigation. Our one chance for continued life would then have lain in the somewhat unlikely chance of attracting the attention of the people on Coiba. We would have been shut in on our little sand patch without water. The under-

growth came down thickly to the sea at every other part of the shore within view. We might have risked the danger of becoming meat for sharks by attempting to wade round to the point from which our signal was to have been given, but it is doubtful whether our state would have been bettered by success.

However, we did not waste much time in conjectures, but started, after a short delay, to row across to Coiba. On the way Beppo told us stories of pearl fishers' fights with sharks and drew our attention to the great shells of the pearl oyster, many of them larger than dinner plates, lying thickly at the bottom of the sea. It was difficult to believe that we were looking down over thirty feet, so clear and still was the water. A little uneasiness was occasioned in our minds by a school of young whales, through which we had to pass on our way. There was no fear of their intentionally harming us, but if one of them should happen to come up under the boat and give it a playful whisk with his tail we knew that the consequences would be tragic.

Suddenly we rounded a projecting rock and shot into a little cove. On a narrow beach running back to the *monte* were six or eight na-

ISLAND OF COIBA.

tives, stark naked. At the unexpected sight of us they ran for the shelter of their nearby hut and presently emerged in the garments which were reserved for rare trips to the mainland, thirty-five miles away. This family of old-time pearl fishers were the only inhabitants within miles. We learned from them that similar little groups were to be found at widely separated points around the coast, but that the total number of inhabitants of the island would not amount to one hundred. Asked what was the prevailing condition of the islanders, they answered: "Necessidad!" They were extremely poor, but their condition was probably not an unhappy one. They toiled not, neither did they reap. Nothing whatever was cultivated, but they had plenty to eat between fish, deer, bananas and cocoanuts.

President Obaldia had provided us with a letter addressed to alcaldes and other officials, but these people could not read. It was to meet such a contingency that we had manufactured a document that was calculated to strike awe into the ignorant breast. The basis of it was a certificate of admission to practice before the Supreme Court of the Canal Zone. This was signed in large characters and blood-red ink by

"Buster Brown," "Tommy Dodd," and "Weary Willie." A large red seal held down two yellow cigar ribbons in the left-hand corner. The document was punched and tied up with a piece of red tape and a brass employe's check of the I. C. C.

Impressed by the imposing appearance of this document, the Coibans told us all that they knew about their island, which was not much. It was too thickly covered with forest and undergrowth to be penetrable. No one, to their knowledge, had gone into the interior these many years back. They believed that there were Indians back among the central mountains, because gourds, hand-fashioned, and other articles of human use had come down from time to time in the streams to the coast.

President Obaldia had told us how, a generation ago, Coiba had produced the fattest cattle and the heaviest sugar cane in all Panama. An American, named Captain Harkness, had settled not far from the point where we landed and had set up a sugar mill. He died on the island and his place was abandoned. The remains of it have long since been swallowed up by the wilderness.

A lumbering operation on a large scale might

be established on this island with profit, and after the trees had been cleared, the extremely rich land would yield abundant crops of various kinds. The island is about thirty-five miles in length and from seven to ten in breadth. It is well watered and slopes in every direction from a small group of mountains that occupy the interior.

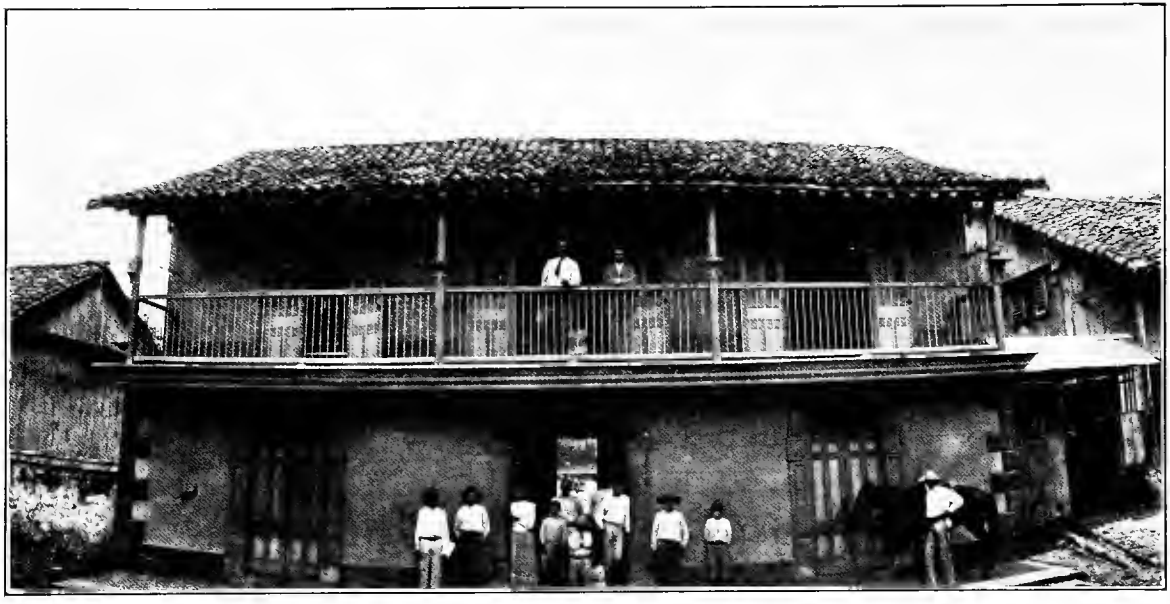
Without machete men it would not be possible to make an excursion across the island as we had intended and it was evident that machete men in sufficient numbers could not be had. So, after buying some fruit and a pet deer from the islanders, we rowed back to the ship in the light of the moon, arriving at about ten o'clock.

The remainder of our journey did not differ in any important respect from the former part of it. We arrived in due course at Pedragal, the port of David, and there we were met by Don Lorenzo Obaldia, the manager of his father's Chiriqui ranch, and one of the most genial and hospitable gentlemen it has ever been my good fortune to come in contact with.

CHAPTER X

DAVID AND THE INTERIOR

DAVID is an old town. There was a settlement where it stands at least two centuries back. The country thereabouts contained several fine estates, occupying large tracts of land, that had been granted to members of distinguished Spanish families by the Crown. In the Obaldia town house is a portrait of Don Lorenzo's great-grandfather, a stately old gentleman in the stiff and formal costume of the day, which the gentlemen of that time wore, to their great discomfort, in the most remote foreign countries. This first of the Obaldias in Chiriqui built, after the manner of his people, a substantial mansion and great stone gateways, remains of which are to be seen about the place at the present time. He was one of the pioneers of the Chiriqui cattle business. His good lady planted wild fig trees on the large expanse of llano before the house, and many



DON LORENZO OBALDIA AND THE AUTHOR ON THE BALCONY OF THE OBALDIA HOUSE, DAVID.

travellers before us have found grateful rest in the shade of their giant branches. Don Lorenzo's mother was a Jovenet, a member of another old family of Chiriqui which owns tens of thousands of hectares of the richest land.

Some day these Chiriqui properties will represent great wealth. At present they yield only a few thousand dollars a year from the sale of the cattle raised upon them. The land-owners of Chiriqui, like the old-time planters of our South, have long since fallen into confirmed habits of ease, which they could not shake off, if they would. It must be left to another generation to apply enterprising methods to the development of their lands.

Another deterrent to improvement has been the constantly disturbed condition of the land since the wars of independence began, early in the last century. Revolutions have been frequent in the past hundred years, and each was the occasion for destruction and confiscation of property. In one of these uprisings, which occurred shortly before our occupation of the Canal Zone, the late President Obaldia was forced to flee for his life from his Chiriqui estate. The insurrectos seized his youngest

son and, in the belief that the father had hidden a large sum of money somewhere on the ranch, subjected the boy to the most inhuman treatment, in the attempt to make him reveal the supposed hiding place.

There is a half-sunken boat in the river at Pedragal, immediately opposite the wharf. At the time of the revolution in question it was afloat. On this the insurgents kept young Obaldia prisoner for weeks. He was scantily fed, and only half clothed. The mosquitoes and sand flies drove him to the verge of insanity. His captors constantly threatened him with death and kept him for long periods without water. But they failed to break down the youngster's fortitude and, if there was any truth in the story of hidden money, he maintained his determination not to reveal its whereabouts.

David is a picturesque city of from four to five thousand inhabitants. Of these, perhaps, five per cent are well-to-do, the majority being poor, but having all their actual needs supplied, which, after all, is a condition approximating wealth. Most of the dwellings are one-storied structures of frame or mud, with thatched roofs and small courtyards, or patios. The

streets are in excellent condition and the town is remarkably clean and orderly.

There are two or three hotels, the principal being that which has been conducted for years by Señor Lombardi, a descendant of one of several Italians who came to this country many years ago. Lombardi runs a general store, and does considerable banking business. I was present one day when a band of Indians, who had come many days' journey to sell a few dollars' worth of their products, — chiefly straw hats, — carried on the negotiation with the proprietor. Several hours were consumed in disposing of goods, for which the Indians were glad to get about ten dollars. They insisted on putting up one article at a time. The price of this would be haggled over for half an hour. At short intervals, Lombardi produced a bottle of aguardiente and poured out a glass, which was passed round among the vendors. After four or five treats, the selling proceeded a little more briskly. When they had received their money, the Indians proceeded to spend the greater part of it in the cantinas about town, and ultimately started on their long tramp home with about two dollars' worth of salt and other necessities.

The rooms for guests are ranged along a low wing to the main building. Each room has large double doors opening on the street, for the admission of bulky goods. In other words it is constructed to serve as a warehouse, as well as a bedroom. It is open at the top up to the peak of the roof and a partition terminating half way to the ceiling divides it from the next compartment. The floor is of stone and the walls whitewashed. All things considered, this arrangement is well adapted to cleanliness and coolness. With the mosquito bars which we had brought, the nights were passed comfortably enough on camp cots.

There is not much to detain the traveller in David, but the town is a convenient headquarters from which to make excursions to various parts of the Province, and it should yield historical material of interest, but the carelessness displayed all over Panama toward records and archives has resulted in the loss and destruction of many valuable documents. I could not find anything of the sort at David, either in the church or the municipal building. At Alanje, when we went there, the cura showed us a miraculous painting in the interesting old church, and some yellow, leather bound docu-

MUNICIPAL BUILDING, DAVID.

ments which, judging from the scraps that could be read, would have been extremely entertaining, but they were more than half eaten away by worms and badly damaged by damp.

I arrived in Chiriqui suffering from an intestinal trouble, which is about the worst thing one can take into the interior. It had not been contracted in the country, but on shipboard. It speaks volumes for the climate of Chiriqui and the water, that I was able to hold up for two weeks, riding from twenty-five to fifty miles a day, and living on milk and eggs.

The day after our arrival at David, we rode out about twenty-two miles and returned to the town in the evening. I was barely able to get back and felt so ill that I decided to go down to Panama on the boat that had brought us up. Early the next morning our baggage was piled on a bullock cart in front of the door and a hack stood ready to take us to Pedragal. At the last moment, I could not bring myself to the point of abandoning our project on which more than mere pleasure depended. I had the things put back in our room and rested for the remainder of that day.

The next day we went out to Divala, a village

toward the Costa Rican border. The settlement consists of the homes of the laborers employed on the cattle ranch of Mr. Leslie Wilson, an American, whose experience affords a good illustration of what may be done with energy and calculation in this country. Mr. Wilson and three or four other Americans started coffee planting in the vicinity of Divala about twelve years ago. They discovered, after a while, that they had chosen a poor location. The coffee *fincas* were abandoned and the others went up to Boquete, where they prospered. Wilson decided to turn his land into a cattle ranch. He had but a few hundred dollars, which would have gone but a short way toward employing the labor necessary to clear the land and make *potreros,* not to mention the matter of stocking them. As luck would have it, a revolution broke out at about that time and Wilson shrewdly conceived the plan of offering the protection that would attach to employes of an American citizen to as many men as cared to give him their labor in consideration of it. In this way he contrived to get a great deal of work done for practically nothing. The Divala ranch is now one of the finest and best cared for in the Province. It is well worth

HOME OF MR. LESLIE WILSON, AT DIVALA.

the price that the owner puts upon it, which is $50,000.

As cattle raising is the principal and the most promising industry of the Province, it may be well to give some details of the Divala ranch, which is representative of well-kept property of the kind. There are fewer than half a dozen cattle ranches of similar proportions in the entire territory of the Republic and their aggregate stock is less than ten thousand head. If the figures were ten times as great they would not represent a quantity sufficient to supply the existing demand.

A number of factors combine to make the prospect for the cattle raiser in Chiriqui particularly bright. Epidemic diseases are unknown. Pleuro-pneumonia and anthrax have never been heard of. Black-leg once made its appearance but was readily combatted by vaccination.

The number of lean cattle is much greater than that of the *potrero* fed animals. Many natives keep small herds on the commons, which will support them during the rainy months. These cattle can be bought at eighteen and twenty dollars a head, gold, on the range, and after six or eight months' fattening in the

potrero they sell at from thirty to thirty-five dollars in David.

At Divala, about fifteen hundred acres are in fattening pastures. In the States, three acres, at least, are considered necessary to support a steer; here one acre per head is sufficient for fattening. Mr. Wilson stated: "As to the cost of feeding cattle, I can tell from a careful record kept by me, that it is nine cents per head per month, including cattle large and small, as well as horses and oxen. The amount includes the yearly cleaning of pastures, repairing fences, salt, tar, and acid, wages of cowboy and helper."

The natural increase of cattle in Chiriqui is thirty per cent per year. The cost of making *potreros,* including planting, fencing, etc., is less than six dollars per acre and this might be considerably reduced by the employment of machinery in the work. From these and the foregoing facts it is easy to calculate that cattle raising in Chiriqui is an extremely profitable business.

At Boquete, situated in a mountain gap, at an altitude of about eleven hundred meters above sea level, is a colony of Americans, Britishers, French, and Germans. They are chiefly

engaged in the production of coffee, and ship a very high grade berry to Panama, where it fetches fifteen cents gold per pound. A good quality of sugar cane and superior tobacco are also raised in the valley. The new railway, which will pass close to Boquete, will be of great benefit to the section.

The settlers here have achieved prosperity in the face of great difficulties. In the past ten years they have made great advances. Heavy machinery is employed and the most approved methods of culture are followed. In fact, the valley is far ahead of any other portion of the country in agricultural development. The climate being so near temperate that the fruits and vegetables of the temperate zone are grown, makes work possible to a much greater degree than it is on the plains.

There is little difficulty in passing from one point to another in Chiriqui. Pukha roads are not numerous, nor are they necessary. The long stretches of level llano would be passable for a baby carriage. When the *monte,* or forest growth, occurs, a fairly good trail is always open through it. Crossing the rivers, where no bridges exist, is sometimes a little difficult, but buggies and ox-carts manage to make their way

over all the principal roads. The Government is carrying out improvements in the matter of better roads, more bridges, and extensions of the telephone line.

The interior of Panama is very sparsely inhabited. In Chiriqui, miles intervene between the little hamlets, and the larger settlements are far apart. Despite this fact, travel is not attended by any danger. One hears tales of banditti, but it is doubtful whether such gentry are at all numerous. It is customary to go armed upon the plains and it is possible that by omitting this precaution one would incur a risk of being robbed. It is my impression that the Chiricanos are exceptionally peaceable and law-abiding. Nor are they given to thieving as are the natives of most Latin-American countries. In fact, the only complaint that I could justly make against the people of the interior is on account of their stupidity. It is almost impossible to get an intelligent answer from one of them to a question bearing upon his everyday life. One day we asked the way of a man, who had, doubtless, lived in the district all his life, and following his direction, lost the road and our mozo, and went ten miles astray.

We returned to David one evening, our trav-

T I N TI HUTS.

MR. WILSON'S PET TAPIR.

els ended, with the prospect of going back to Panama on the Pacific Mail boat the following night. After dinner at the hotel, a young doctor who had just arrived from the Zone, came into my room and confided the startling intelligence that he had been sent up in response to an alarming telegram from the municipal physician, stating that a number of cases of small-pox had occurred at Bugaba and in the vicinity.

I did not credit this statement, because if anything of the kind had happened, we should surely have heard of it. But the circumstance was disturbing in any case, for it promised quarantine at the other end of our journey, rather than submit to which I would have remained another week in Chiriqui, although I was anxious for rest and medical attention. We decided to go in to Bugaba the next day and ascertain the truth of the report.

Bugaba is the outpost of Chiriqui, near the border of Costa Rica and about thirty miles from David. It has the reputation of being a settlement of outlaws, who have fled from justice in Panama and Costa Rica. But, like many another place, its reputation is worse than it deserves. As we approached the vil-

lage we began to inquire of scattered countrymen whether they had heard anything of small-pox thereabouts. None of them ever seemed to have had acquaintance with the disease, and I may say, that I do not recollect to have seen a pock marked person in Chiriqui.

The Alcalde of Bugaba enjoys the reputation of being the worst cut-throat in the community. He is said to have killed seventeen men in private quarrels. However, he treated us very decently and we enjoyed a good breakfast at his house. The crowd that surrounded us at the Alcalde's office was rather a rough looking lot, but probably just as harmless as other Chiricanos.

As we started to ride up to the Alcalde's residence, a German, named Christian Wahl, joined us. He, I learned, filled the self-constituted position of local physician.

"Any small-pox about here?" I asked.

"Oh! yes, lots," was the alarming reply.

"Where?" I cried. "Show me some?"

"Oh, dem small pots. We have to dig for dem."

It transpired that Mr. Wahl was referring to the Chiriqui pottery, of which a great deal has been found in the neighborhood of Bugaba.

When I made him understand the true import of my inquiry he laughed at the idea of smallpox anywhere thereabouts.

He said that he sometimes had to treat natives for an eruption which was caused by drinking too much of a beverage produced from corn. This was the nearest approach to smallpox in Chiriqui that he had ever heard of.

During the brief rest before starting back Christian Wahl gave us an interesting account of his history. It appears that his father, a German physician of Cincinnati, had migrated to Chiriqui at the outbreak of our Civil War, to escape conscription. Wahl's father married the daughter of one of his fellow settlers and Christian was born at Bugaba and had never been farther away from the place than Panama. He had inherited his father's medical library and seemed to be a pretty fair self-made doctor. His children were growing up in the wilds, without education of any sort and bid fair to become, in all but complexion, ordinary Chiricano peasants.

The companions of the elder Wahl married native women and probably sank to the social level of their wives. Reminders of them are to be seen about Bugaba in the shape of tow-

haired children, dirty and half clad, who cannot understand a word of German and do not suspect that their grandfathers were other than native Panamans.

Late in the evening we reported the result of our investigation to the commission's doctor and went on board the "Taboga" without fear of detention at the end of our voyage.

CHAPTER XI

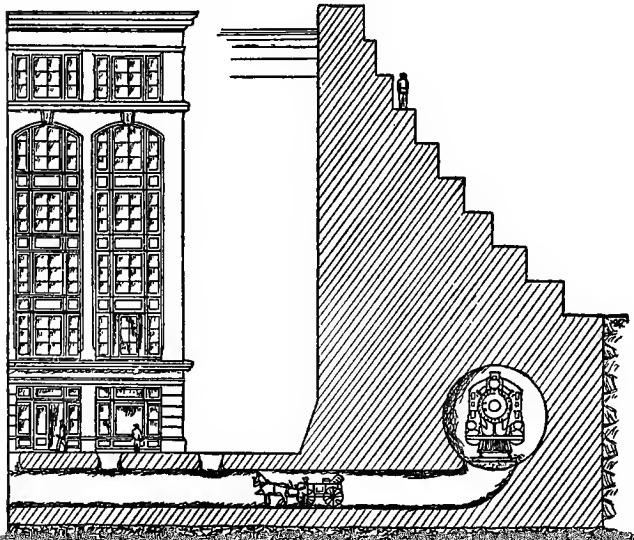
PREPARING FOR OPERATION[1]

THE progress that has been made in the construction of the Canal during the twelve months since this volume first appeared, is amazing even to one who has been familiar with the operation from the time when the French controlled it. At the close of the year 1911, the enormous lock chambers are almost completed and their great gates are in course of erection; less than ten per cent. of the excavation in the Culebra Cut remains to be done; the site of Lake Gatun is being cleared preparatory to letting the Chagres River into it.

In short, all along the line, work is in its final stage. Those who would see the Canal to the best advantage must do so within the next few months. Now, and for a little while hence, it will be possible to perceive what has been done, as well as to conceive the form of

[1] This chapter, and that following, have been added to the present edition in order that the very latest information may be given as to the progress of the canal and of the country itself.

the finished structure. Not so when the operation is completed. After the water is let into the works the gigantic proportions of the locks will not be appreciable to the full extent and



CULEBRA CUT, LOOKING SOUTH FROM CONTRACTOR'S HILL, SHOWING CUCARACHA SLIDE ON LEFT, MAY, 1911.

The Chief Engineer and his aides are confident that the waterway will be in a state to admit the passage of vessels from one ocean to the other at a date not later than July 1, 1913. It will not, however, be thrown open to general traffic until after several months of test and experiment.

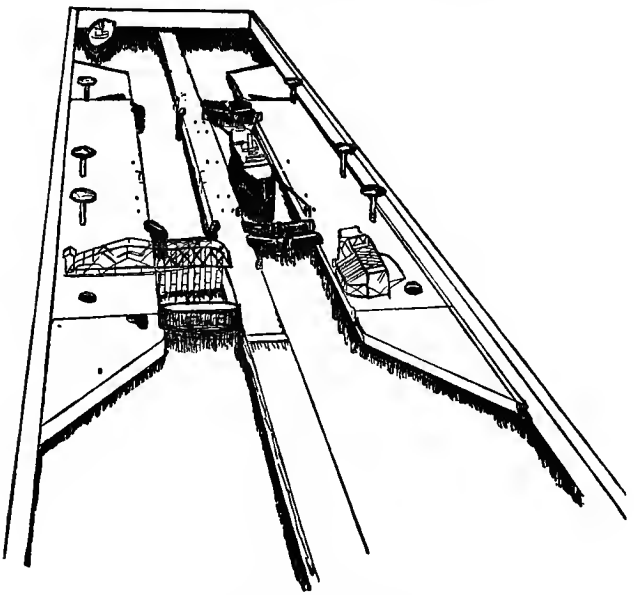
The attitude of the American press and public toward the undertaking has undergone a great change in the past few years. Shortly before the inauguration of President Taft a trivial slide at Gatun excited the country to such an extent that the Administration deemed it necessary to send a special commission to the Isthmus for the purpose of investigating the circumstances. Since that time several slides of more serious nature have occurred without attracting extraordinary notice, although the Commission frankly describes all such occurrences in its weekly publication, the *Canal Record*.

There are twenty-one slides of varying extent along the Culebra Cut, the largest being that at Cucaracha, covering an area of forty-seven acres. The movement here started in 1884, and is still active. Since July, 1905, over nine million cubic yards of extra excava-

tion have been necessitated by slides, and there are at present three million cubic yards of material in motion. A great deal of expense and trouble has been occasioned by these disturbances, but they are not to be considered as sources of future danger. It is highly improbable that any serious movements of the earth will take place after the Canal is completed.

The locks are the most essential and at the same time the most hazardous features of the waterway. It is believed, however, that the safety devices which will be installed and the precautions which will be enforced may be depended upon to prevent any serious mishaps. Experience proves that the great majority of accidents that occur in the operation of locks are due to mistaken signals. In the Panama Canal no vessel will be permitted to go through a lock under its own steam. Electricity, applied through locomotives operating on the walls, will be employed to tow ships through the locks. Protective chains, guard gates, caissons, emergency dams, and other contrivances will be available to minimize the effects of any mischance. Not content with these provisions for safety, the Canal administration is

seeking authority from Congress to place a pilot on board every vessel entering the Canal,



MODEL OF LOCKS

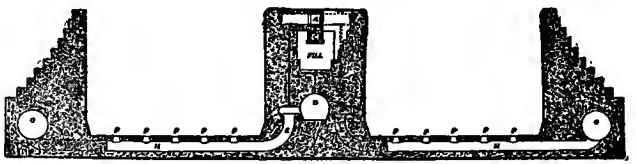
The lock on the right is nearly filled for an upward lockage. Four electric locomotives are shown securely holding a 10,000-ton ship, and ready to tow it out of the lock, so soon as the upper gates are opened. At the entrance to the lock on the left is shown a caisson in position and acting as a barrier between the high level above and the low level below the lock.

On the right is shown an emergency dam in its normal position when not in use and on the left the other dam is shown swung in position across the lock with the wicket girder down in readiness to support the wickets or gates which complete the barrier.

with control over its navigation throughout the passage. Such a measure would be approved by owners and masters of merchant

ships, who would find in it relief from responsibility and ready indemnity for any damages that might be incurred during transit. On the other hand, naval officers will certainly oppose the measure as an infringement upon their dignity and a reflection upon their capability.

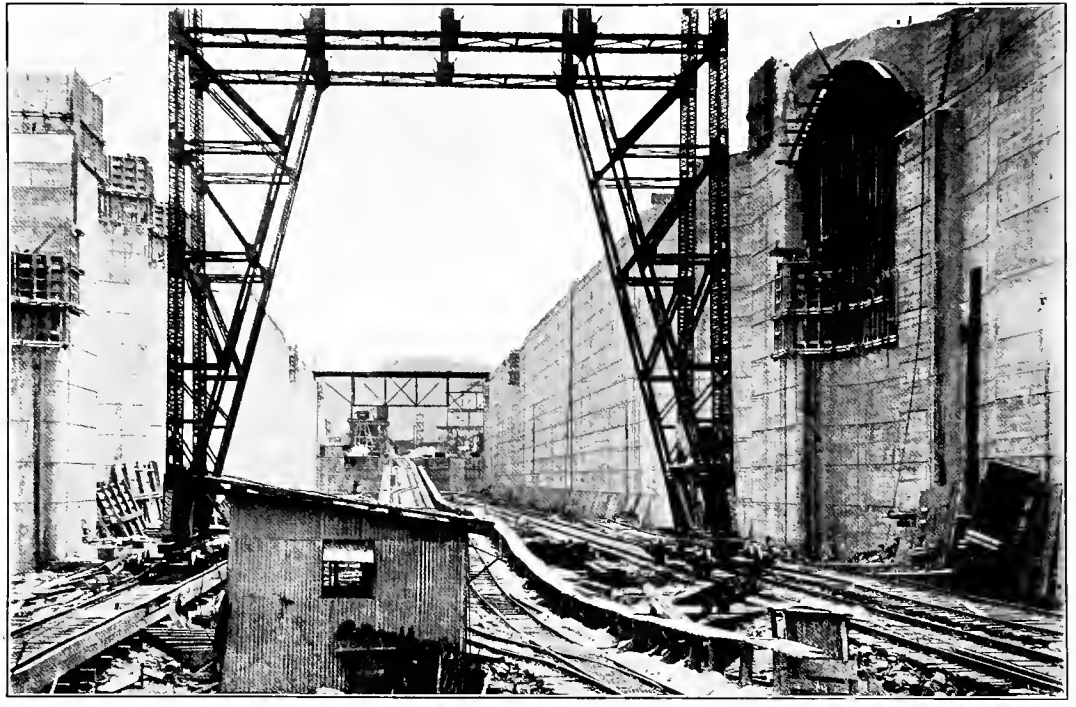
The locks will be filled and emptied through a system of culverts. One culvert, two hundred



CROSS SECTION OF LOCK CHAMBER AND WALLS OF LOCKS

A—Passageway for operators
B—Gallery for electric wires
C—Drainage gallery
D—Culvert in centre wall
E—These culverts run under the lock floor and alternate with those from sidewalls
F—Wells opening from lateral culverts into lock chamber
G—Culvert in sidewalls
H—Lateral culverts

and fifty-four square feet in area of cross section, about the area of the Hudson River tunnels of the Pennsylvania Railroad, extends the entire length of each of the middle and side walls, and from each of these main culverts there are several smaller ones which extend under the lock chambers and connect with them through holes in their floors. To fill a lock the valves at the upper end are opened and the lower valves closed. The water flows from



WEST CHAMBER OF PEDRO MIGUEL LOCKS, LOOKING NORTH, JULY 15, 1911.

the upper pool through the large culverts into the small laterals and thence to the lock chamber. In emptying the lock, the valves at the upper end are closed and those at the lower opened, permitting the water to flow into the lower lock. This system distributes the water as evenly as possible over the entire horizontal area of the lock and reduces the disturbance in the chamber when it is being filled or emptied.

The average time of filling and emptying a lock will be about fifteen minutes, without opening the valves so suddenly as to create disturbing currents in the locks or approaches. The time required to pass a vessel through all the locks is estimated at three hours; one hour and a half in the three locks at Gatun, and about the same time in the three on the Pacific side. The time of passage of a vessel through the entire Canal is estimated as ranging from ten to twelve hours.

The Canal operation is highly creditable to those immediately connected with it, as well as to the nation at large. From beginning to end it has been singularly free from graft and corruption. Viewed in unprejudiced retrospect, the course of the work is seen to have been

characterized by wise plans, admirable achievements, and a remarkable absence of blunders. We have learned from it a striking lesson in administration. There can be no question about the fact that the main factor in the unqualified success which has attended the operation under Army Engineers is the one-man control of affairs. No one admits more readily than Colonel Goethals himself that, for lack of the advantage which he has enjoyed, his predecessor was hopelessly handicapped. The great good fortune lay in finding the right man at hand, — one not only capable of directing the great undertaking, but also willing to take the entire responsibility of it upon his shoulders.

The facts connected with this centralization of authority have never been truthfully recited, although many garbled accounts of them have been published. The belief that Colonel Goethals sought the power which was conferred upon him is general, but erroneous.

The seven-headed Commission was a cumbersome and inharmonious body from the outset. Each chief engineer found himself hampered by his associates, several of whom had little or no knowledge of the technical

questions involved in the operation. Mr. Stevens was compelled to report that he could not proceed without exemption from interference by the civil authority. This declaration was construed by the Administration as a resignation (contrary to the intention of Mr. Stevens), because the President and Secretary of War were eager to try the plan of construction under Army Engineers. Colonel Goethals assumed the duties of Chief Engineer under the same conditions as Mr. Stevens and experienced the same difficulties. In accordance with army training and traditions, he accepted his task as he found it, and neither complained nor asked for relief. It was Governor Blackburn, himself a member of the Commission, who represented to President Roosevelt the hopelessness of proceeding under the existing conditions and urged upon him the advisability of placing the direction of affairs in the hands of one man. The President sought the authority of Congress to effect his purpose and failing, carried his point by a characteristically Rooseveltian method.

The entire Commission was subordinated to the Chief Engineer. He was given a free and unhampered hand in the direction of affairs

in the Zone. From that time there has never for an instant been any question as to who was "boss of the job." There has been no misunderstanding as to the source of orders, nor any doubt about their execution. The work has moved swiftly and with precision, directed by one mind, and free from the disturbance of conflicting ideas and purposes. Colonel Goethals has used the power that was placed in his hands, fully and firmly, but without abusing it in any degree.

The Canal administration has no further anxiety regarding the construction. Every detail of the remaining work connected with it is planned and provided for, even to the final process of cleaning up the line. Consideration is now centred on the problems involved in the operation of the waterway. It is highly important that these should be solved immediately and preparations made without delay for meeting the demands that will grow out of them. But action must wait upon the approval and sanction of Congress.

The Canal administration has well-defined plans to meet all the exigencies that may be expected to arise from the prospective situation. These will be embraced in a bill to be

introduced to Congress at the earliest opportunity.

The principal sections of the Canal bill will provide for (1) determining rates of toll and methods of measuring tonnage; (2) the creation of a permanent organization; (3) the future occupation of the Canal Zone; (4) the control of vessels passing through the Canal; (5) the future status of the Panama Railroad.

The greatest conflict of opinions may be expected to arise over the vital question of tolls. The proposition that American shipping should be favored and fostered by exemption from toll charges when passing through the American waterway has many supporters. Others will recommend nominal tolls, without discrimination. It is the natural hope of European shipowners that Congress will adopt this view. They express the opinion that if our Government attempts to earn interest on the money invested in the Canal, it will lose the traffic to the Tehuantepec Railroad. It is difficult to believe, however, that, even with a toll of one dollar and a quarter, — the charge likely to be adopted, — the Isthmian land route can compete with the waterway.

Sir Owen Phillips, probably the leading

authority on shipping in Great Britain, in a recent public statement said: "America has the greatest opportunity before her to benefit the commerce of the world by making the Canal practically a free waterway, only charging sufficient to pay expenses. . . . It must be realized that the Panama Canal never can pay commercially." But it is precisely on this point that the Canal administration makes its strongest contention. The proposed legislation is based on the assumption that the Panama Canal is first and last a commercial enterprise. In a discussion of the subject with the writer, Colonel Goethals crystallized the idea in the following crisp sentence: "Having built the Canal, the next thing will be to secure to the people who have paid for it a fair return on their money." This would be beyond the bounds of possibility with a toll lower than one dollar per ton.[1]

The scheme of the Canal administration carries the idea of a commercial administration to the utmost extent. The Chief Engineer recommends the assumption by the Government

[1] The Suez Canal Company has just announced a reduction of toll from $1.68 to $1.32 per ton to take effect from January 1, 1912.

of a variety of business functions, such as supplying coal, oil, food, laundry work, repairs, ship chandlery; in short everything that a vessel in transit might require. It is his belief that under official management such utilities will be provided more cheaply and efficiently than they would be by corporations or private individuals, and at the same time at a profit to the Canal account.

The success of the Canal will depend largely upon the decision arrived at in the matter of tolls. Several lines are already projected to use the waterway provided conditions are favorable. A judicious conclusion will be of the greatest importance, but a mistake will not be irredeemable.

If he should receive early authority to do so, the Chief Engineer is satisfied that he can form an adequate force for the operation of the Canal from the Americans at present employed in the work, about one half of whom could be given positions. If, however, action is delayed until it becomes necessary to engage unseasoned and inexperienced men, the result will be considerably higher cost and lower efficiency in the maintenance of the waterway.

Throughout our operations on the Isthmus

there has been in progress a process of elimination of the unfit and steady improvement in the matters of physique, skill, and morale, of those retained. The result is a higher general standard than that existing among any body of men in the service of our country. This is a valuable national asset which should be conserved as far as possible, but which will be dissipated, if immediate advantage is not taken of it, for, with the diminishing necessities of the work, the Commission will shortly commence to reduce its force.

Furthermore, it is of the greatest importance that the selection of the new operatives should begin at once and the task of drilling them in their future duties should be entered upon not later than the middle of the year 1912. In the opinion of the Chief Engineer the men who are to handle the machinery of the Canal should have at least eighteen months of preliminary experience and practice with it. If this is provided for the operation of the Canal will follow its completion with the least possible dislocation, the greatest economy, and no likelihood of accident.

Colonel Goethals, who is chiefly responsible for the provisions which will be contained in

the prospective bill, has given much careful thought to means of contriving the lowest costs, consistent with efficiency, in the matters of wages, operation, and sanitation. It is not proposed that the high wage scale at present in effect shall apply to the future employes. That scale was instituted when the force was first recruited, and when residence in the Zone entailed dangers and discomforts which have long since been eliminated from the situation. Under present conditions the suggested compromise appears to be eminently fair. In the case of machinists, who are now receiving sixty-five cents an hour, as against forty cents paid to their class in the States, the bill fixes a rate of fifty cents. In other grades the adjustment is made on a proportional scale. It has been ascertained that a number of men, probably sufficient for the requirements, are willing to remain on the proposed terms, but it is not believed that new men can be engaged without higher pay.

The bill contemplates an organization under the control of a single head, subject to appointment and removal by the President. The scheme of organization involves the subordination of all offices and functions within the Zone

to the operation of the Canal during times of peace, with provision for the immediate and automatic transfer of control to the military authority in the event of war, when the officer commanding the garrison in the Zone would assume entire charge of the waterway and the territory, whilst the superintendent of the Canal would take the position of a staff officer.

Various suggestions have been advanced for the disposition of the spare land in the Zone after the completion of the Canal. At present there are about two thousand negro squatters scattered over it. These are men who have deserted the labor force and taken up their abode with their families in the recesses of the bush. At a few points within the territory Americans and others hold small tracts of land under old titles. There was at Gatun a village that dated from the days of Columbian rule, but a few years ago the inhabitants were required to abandon the place, after being liberally indemnified for the loss of their holdings. The chief occupation of the Canal Zone is represented by the labor camps and stations along the line, and the settlement at Ancon.

After its completion the administration of the Canal will involve the police supervision and sanitary regulation of the Zone. Great saving in the expense of these services will be effected by the adoption of the Chief Engineer's recommendation that all persons not included in the military and operating forces shall be removed and excluded from the Zone on the completion of the Canal. If this should be done, the police and sanitary services would be confined to the immediate localities of the stations which will be situated at Gatun, Miraflores, Pedro Miguel, Ancon, and Balboa. The remainder of the territory will be uninhabited and may be allowed to lapse into jungle without becoming the source of disease or the scene of disorder, as it surely will if the present vagabond population of the outskirts is permitted to continue its occupancy, or if settlers are allowed to locate in it, as has been suggested in certain quarters.

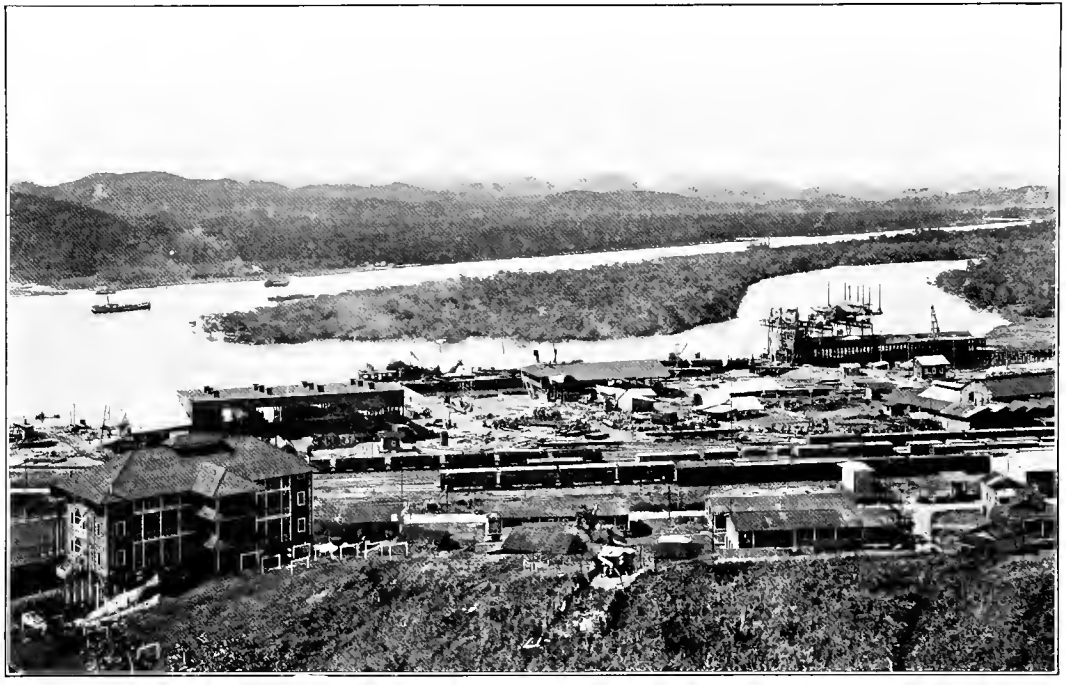
The relocation of the Panama Railroad is nearly completed. The new line is slightly more than forty-seven miles in length. The original terminuses of Colon and Panama are retained. It had been intended to take the line through the Culebra Cut on a berm, but

the numerous slides have led to the abandonment of that design and the road is carried round through the foot hills. The total cost of the new line will be about nine million dollars.

The Canal bill provides for the treatment of the Panama Railroad, at present a separate interest, as a complementary accessory to the Canal, and its adaptation to any military necessities that may arise.

Balboa will be the chief future point in the Canal. It is situated at the Pacific mouth of it and has already extensive docks, machine shops, and other buildings. Here will be the headquarters of the Canal and the principal *entrepot* of its traffic. There is no doubt but that Balboa will grow into a town of large proportions, and there are not a few, conversant with the situation and prospects, who entertain the opinion that Balboa will grow at the expense of Panama. It must become a great commercial centre and point of transhipment.

It may be well to remind the reader that the cities of Colon and Panama, although geographically within the Canal Zone, were excluded from the lease of that territory to the United States and remain in the possession



THE BALBOA MARINE SHOPS.

and under the jurisdiction of the Republic of Panama. The United States has by treaty agreement certain conditional control over the cities in question in the matters of order and sanitation.

CHAPTER XII

PROGRESS IN PANAMA

PROGRESS is hardly the proper word to apply to the movement in the Republic since the first edition of this work was published. Aside from the extent to which it has been carried along by the advance of the Canal operation, the country has made no progress, nor have its people availed themselves in anything like the degree possible of the opportunities that have been created by the development of the American enterprise.

That the country is susceptible of splendid development is beyond question, but whether it will take place or not must, of course, depend upon the people, and they are not at present headed in the right direction, nor possessed of the degree of interest and purpose that the situation demands. In the interior the people have no ambition beyond the needs and pleasures of the immediate morrow. The masses

live from hand to mouth — happily enough, maybe, but uselessly. They are either blind to their immediate opportunities, or careless of them. In the towns, corn costs ten cents a pound, rice fifteen cents, and eggs are as dear as in New York, whilst there is a scarcity of these commodities even at those prices, with rice and corn fields surrounding the spots. The trouble is that the cultivator is too indolent, or not sufficiently enterprising, to raise more than enough for his personal needs.

The few well-to-do display no interest in the poorer classes, nor any in the progress of the country, except in so far as it may affect themselves immediately. They seem to be quite content that the old order of things should continue, and display no realization of the fact that the world, even the Latin-American portion of it, is moving past them and going ahead. There is an utter lack of community interest or co-operation. In our Western settlements, poor men have accomplished wonders by working together with a singleness of purpose and an unselfish regard for the general prosperity of their community. Similar results are, of course, possible everywhere. The man of means who should start a movement of that sort in Panama

would set a valuable example to his countrymen.

In the City of Panama, business men lack the enterprise and self-confidence to avail themselves of the new openings for endeavor that have grown out of the Canal operation and will continue for some years to do so. They are allowing foreigners to come in and secure advantages, which they should, at least in some degree, retain for themselves. Some of the larger business houses of Panama would do well to take in experienced Americans as partners, or well paid managers.

During the past year there has been a marked increase in the interest evinced by Americans in the country as a field for investment and settlement. This should not be accepted by the people as evidence of a wild desire to secure property in Panama. There appears to be danger of the Government falling into this error and repulsing capital, which is coy enough under any circumstances and especially reluctant where every form of undertaking is experimental. No doubt a considerable proportion of the applications made to the Government for grants of land and other concessions are advanced by irresponsible speculators, without

means or substantial backing, and wisdom would dictate the exercise of strict discrimination against such propositions. But, on the other hand, the utmost encouragement should be given to genuine and advantageous offers on the part of foreign capitalists to establish industries in the country. Unless such encouragement is forthcoming the money will promptly pass elsewhere. Several other inviting fields will be brought into close touch with the United States by the opening of the Canal, and other governments are making attractive offers to American capital and showing a keen appreciation of the advantages to be gained by securing it. Quite recently a syndicate of American monied men, representing $2,000,000, or more, decided to transfer their plans for investment from Panama to Ecuador.

Many Americans are looking toward Panama as a possible place of settlement, but they find many discouraging difficulties in their way. Most of these it is within the power of the Government to mitigate or remove. American emigration to Panama will not reach considerable proportions until the persons in this country desiring information regarding the former shall have better facilities for securing it and

acting upon it. The prospective settler is usually a man of small means, who can not afford the expense and trouble of going down to the Isthmus on an uncertain quest for land. He must be put in the way of getting reliable and full information in the States, of selecting his tract and of receiving his provisional title before leaving home. The late President Obaldia was fully alive to this need and had planned to provide for it. The present Administration appears to be indifferent to the matter.

The future development of the country, if it is to be at all commensurate with its splendid resources, must depend in the main upon corporate investment and enterprise, and settlement on the colony plan. Americans can not be recommended to settle singly or in small numbers in the midst of native communities.

The natives have not at present the knowledge nor experience to make the most of their opportunities. Perhaps they have not the energy, nor the initiative. It is quite possible, however, that all these qualifications may be acquired in time, should the people have the benefit of the example of modern methods and habits of industry. I have no doubt but that

a small colony of Americans, farming in a country district of Panama would soon influence the surrounding community and cause a transformation in its manner of working and living. For instance, I can not believe that the natives would be indifferent to the effects of the use of the plough and the harrow when they had been clearly demonstrated, and I believe that they would be glad to make their immediate environment more comfortable if they should be shown how it might be done at little trouble and expense.

The Government is doing all that it can, with the extremely limited means at its command, to improve conditions in the interior. It is building roads and bridges throughout the settled districts, and extending the electrical means of communication. These are the first and most urgent needs of the people. But the Government has not, and never will have, sufficient funds to improve the rivers and harbors, to develop the water powers, to exploit the forests, and to effect the score of other extensive improvements that are desirable. If these things are done at all, it must be through the medium of foreign capital.

The much talked of railroad from Panama to

David has made no advance beyond the stage of preliminary survey. This is due to the opposition of President Arosemena, who rejected all the bids for the construction of the line and, for the second time, vetoed a railroad bill sent to him by the Assembly. The action of the President has given rise to much adverse criticism and not a little unsavory insinuation. There is no doubt that the next administration will put the project into effect.

During the year 1911, a few corporate enterprises of importance have been launched, with the backing of foreign capital. The chief of these is a railroad in Darien, for which a concession has been given to a German company. The line will penetrate an entirely unexploited region, rich in timber and fertile lands. Another development of consequence is the acquisition by Mr. Minor Keith of the charter and property of the long-latent street railway company. The construction and operation of the system may now be looked for at an early time.

In the summer of 1911 I made a tour in the Pacific section of the interior, omitting the Province of Chiriqui. I was surprised to find in the region between the Canal Zone and

CHIRIQUI CATTLE AND MULES IN A CORRAL.

Chiriqui, agricultural land quite as rich as any in that Province. In fact, the *llanos* in Cocle are the most extensive that I have seen in the country. It may be said that, whilst the *llanos* in Chiriqui are as lakes in the midst of forest, in Cocle, the *monte* is as an island in a sea of *savannah.* In Panama Province, particularly about La Chorrera and Chame, there are fine pasture lands, partially occupied by natives of means. From the former district cattle are sent to the City of Panama on the hoof and, after a leisurely drive, arrive in good condition for killing. The lower half of Cocle is composed of splendid agricultural land. With the exception of occasional light *monte,* it is open, gently rolling, well-watered and well-drained. The grass upon the *llanos* is thick and succulent. The cattle are healthy and of good weight. The usual crops thrive with little care, but the amount of cultivation is far below what it should be. The people of the countryside appear to be happy and healthful. Cleanliness is a pronounced characteristic of themselves and their dwellings. Back of Penonome, in the mountain district, there are forests of valuable hardwoods, but at present no facilities exist for getting out the timber. If, however, the

United States authorities establish a sanitarium in the Valley of the Anton, as they have some thought of doing, this section will be connected with the sea coast by a good road. Rubber and cacao are successfully grown in this hinterland, and gold mining is carried on to a small extent. In the neighboring Province of Veraguas there are also a number of workings from which gold in more or less paying quantities is produced, but so far, the mining industries of Panama have not shown any striking results. Some of the best assays have been of ore from deposits so difficult of access as to make their operation a matter of doubtful profit. It is quite possible that, with ample capital, some of these mines might be made to pay handsomely.

The northern portion of Los Santos and the eastern section of Veraguas are much like lower Cocle in the character of their lands. The remaining parts of the two former provinces are forested. Certain limited sections contain very valuable tracts of mahogany and other commercial hardwoods. These are much more accessible than the timber lands of the back-country of Cocle. In order, however, to locate tracts desirable for operation it is necessary

to do extensive prospecting under the guidance of men familiar with these forests.

The Darien country is in general heavily forested and contains the largest quantity of hardwood timber in the Republic. There are, however, in the stretch between the Canal Zone and the Rio Chepo, many extensive areas of fine *savannah,* some of which is taken up and in use. Several important developments are to be looked for in the Darien country in the near future.

I receive frequent enquiries as to the difficulties and dangers of travel in the interior. Neither exist in a degree that need concern a healthy man, with an ordinary stock of common sense. My last trip up-country was made in the middle of the rainy season when travel is more than ordinarily hazardous. I spent little time in the towns and the best accommodation available, as a rule, was a native hut. This involved some degree of discomfort, but hardly any danger which was not avoidable. Drinking water should always be boiled as a precaution, although it is quite safe to drink it in the great majority of cases. Mosquito netting should always be used when sleeping in a settlement or within a quarter of a mile of one. Under

those circumstances the insect which transmits malaria has ample chance to infect itself, but in the open country its sting is not apt to be followed by ill consequences. It is well to carry one's own provisions to a great extent, and to depend upon the casual supply for little more than fruit, vegetables, milk and eggs. Fruit is often eaten to excess with bad results. There need be no anxiety about drinking the milk, but the country meat is a source of grave danger. It is offered as food too soon after being slaughtered to be digestible, and it is always hung where flies and other insects can freely feed upon it. Cuts, sores, even the slightest abrasions, should be promptly disinfected and kept clean in the tropics. For any kind of itching or eruption the best remedy is dhobie's ointment. A few simple medicines, such as a laxative, an astringent, a digestive, quinine, and salol, will meet all other requirements.

It is not to be inferred from the foregoing that any but men in robust health may safely subject themselves to the fatigues and discomforts of roughing it in Panama, or elsewhere in the tropics. Under such circumstances there must be more or less of a tax on the strength and stamina of the traveller. I am constrained

to refer to a remedy which I have found to be the most valuable adjunct to the medicine case. Sanatogen is so widely recognized by the medical profession as to need no advertisement, and I should be able to acknowledge my debt to it without incurring suspicion as to my motives. I have frequently used Sanatogen to fortify the system previous to an unusual strain and to accelerate recuperation after one. I find that a few weeks' course of the food — it is not a medicine — will put me in the best state of preparation for the most trying tropical trip, and a similar course afterwards will speedily restore any loss of vitality that may have resulted from my exertions.

In a former chapter I have touched upon the opportunities for Americans in Panama. It may be of interest to add the following from a recent article by myself in *Lippincott's Magazine:*

"With a few thousand dollars the man of ordinary intelligence and energy may settle in Panama with the assurance of gaining a competency for life in a comparatively few years. The time will come, within twenty-five years, probably, when a man may take up land anywhere in Chiriqui and be practically certain of

success from its cultivation. At present, however, the country is sparsely settled, and the newcomer must make his location with due regard to lines of communication and existing centres of habitation. His wisest course is to settle on a tract immediately adjoining some established development, such as a large cattle-ranch, or on the property of one or another of the corporations which are carrying out extensive improvements in different parts of the country. The advantages of such a course are too obvious to require detailed statement.

"The ideal plan for men of small means is to form colonies. This may be done in conjunction with some existing corporate operation, or independently. There are companies in a position to sell land ready for cultivation at lower figures than it would cost the individual to clear it. The arrangement would have the additional advantage of involving a number of facilities which the lone settler, or the small group, could create only at considerable expense and after years of labor. Ten or a dozen families taking up land in combination would share the burden of road-making and establishing other general utilities; they would market their produce with the utmost economy, and

purchase their supplies to the greatest advantage. In a colony composed of carefully selected members, the mutual aid, encouragement, and companionship will go a long way towards insuring happiness and success. Such a settlement may safely count on the cooperation of the Government to any reasonable extent. It will construct what bridges may be necessary along their roads, extend the telephone and telegraph to their village, and otherwise put them in possession of all the public conveniences enjoyed by the older centres of the interior.

" The best opportunities for corporate enterprise in Panama are in connection with lumbering, cattle-raising, and the production of sugar. The Darien country to the east of the Canal Zone is a vast forest of hardwoods, including mahogany and other kinds for which the demand is constant. A railroad is projected in this region, and doubtless it will soon be the scene of extensive operations. Several lumber companies have secured tracts in this section, and large shipments will be made from it as soon as the all-water route is made available by the opening of the Canal. Mahogany will then be laid down in New York more cheaply

than it can be marketed from any other part of the world.

" Cattle-raising in Panama is a field of endeavor which a man may confidently enter into with five thousand dollars, or even less. He can hardly fail of success. He may count on tripling his investment in five years, with a greater ratio of enhancement thereafter. This statement is not based on mere conjecture, but on actual experience of Americans and others.

" The unsettled political conditions previous to the independence of Panama prevented the investment of large capital in any industries. The biggest ranch in the country contains fewer than five thousand head of stock, and probably there has never been a much greater number in single ownership. It is quite certain, however, that cattle-raising on a comparatively extensive scale would be much more profitable than the smaller operations. There are two or three of the latter earning twenty-five per cent. net profit annually, although worked by the crude and wasteful methods of the natives. It is practically certain that a company which should handle twenty-five thousand head of cattle, combining ranging on the *llanos* with fattening in *potreros,* and employing machin-

ery, would clear from forty to fifty per cent. annually on the money invested by it.

" The yield of sugar-cane per acre in Chiriqui is equalled only by that in Hawaii. In the former country, however, there is no more than the most meagre cultivation, and replanting is necessary no oftener than once in twelve years. In the latter, the cane must be renewed every seven years and stimulated by fertilizers and irrigation. A ton of Hawaiian cane will represent at least twice as great a cost of production as a ton grown in Chiriqui.

" Sugar manufacture at present is confined to the primitive bullock-power, wooden press, and the product is the coarse brown, molasses-laden article, known throughout Latin-America as *dulce*. Its superior advantage in the matter of cane production, and its prospective facilities for shipping the finished article, should enable Panama to market a high-grade sugar in competition with any of the present cane-growing countries. Two companies with ample financial resources are preparing to erect modern mills of large capacity that will turn out a high test sugar. These concerns must depend in the main upon small cultivators for their cane supply, after the manner of the Cuban centrals. The

company will sell or lease a certain acreage to the settler, under a contract which will bind the latter to plant the land, or a minimum portion of it, in cane, and require the former to take the product at a price to be regulated by the season's market conditions. The company may take the cane off the ground, after it has been cut, or require the cultivator to deliver it on the cars of the field railway. Under such an arrangement, the company's interests and those of the settler overlap. The latter can depend upon an equitable contract which will enable him to make a fair profit. If, in addition to his sugar tract, he has a few acres in coffee, cacao, or bananas, he may realize a good income from a comparatively small investment. With a few thousand dollars an American might handle one hundred and twenty acres for a sugar company. His only considerable expenses would be cost of labor, draft animals, and purchase price or rent of land.

"The best returns are to be had from the cultivation of long-time crops, such as rubber, cacao, coffee, and cocoanuts. None of these will begin to yield short of six years, but soon afterwards they will afford a life-income, representing an enormous percentage of profit, with little

TWO-YEAR-OLD RUBBER TREES, MARIATO.

further expense or trouble. The man of moderate means can best achieve the desired result by combining a short-time and a long-time crop, such as bananas and cacao, or sugar and cocoanuts.

"Cacao and cocoanuts are the most profitable tropical crops. A few thousand dollars judiciously spent in a plantation of either will, ten years later, yield an annual income largely in excess of the original investment. No extraordinary degree of experience or skill is required for success, and a man may easily make a living out of sugar or bananas while awaiting the maturity of his more valuable product.

"As the City of Panama responds to the new and increased demands for trade and commerce which will inevitably arise from the opening of the Canal, there will be a number and a variety of business opportunities available to Americans of the right sort."

Public lands may be secured in the Republic of Panama at a price of one dollar per acre. Such land is not, however, *llano,* or open grazing ground, but *monte,* which is land covered with trees and brush. If it is to be ploughed, at least twelve dollars per acre will need to be expended upon it before that con-

dition is attained. The purchase price of the land is paid, one half at the time the application is granted, when a provisional title is given, and the other half four years later, when the definitive or absolute title is issued. The latter will be granted only in case "the land is fenced with fences of a permanent character and is cultivated in at least four-fifths of its extent. If the cultivation be of an extent less than that part, only the part cultivated will be definitively adjudicated, and the remainder will be declared vacant; but the grantee will in all cases pay, as a penalty for the violation of the contract, the price to be paid as if the total adjudication had taken place." In other words, if a definitive title is applied for, the entire second half of the purchase price must be paid, regardless of the amount of land actually transferred. Title must be perfected not later than the close of the four-year period, but it may be done sooner, if the required improvements have been effected at the time that application is made.

The law specifies the following definitions of "cultivation:" "First. Lands cleared, ploughed, hoed, and prepared for the cultivation of plants in conformity with the usage of

modern agricultural art. Second. Lands sown in permanent useful plants at a distance of no more than ten metres one from the other, for which purpose it has previously been cleared. Third. Lands dedicated to the cultivation of permanent plants under shade, at a distance of no more than four metres one from the other. Fourth. That occupied by the houses or habitations and their annexes." The first of these paragraphs refers to fruit trees, tobacco, etc.; the second, to cacao, bananas, etc.; and the third to rubber. Lands converted into *potrero* for the fattening of cattle would come under the second paragraph.

Application for public land must be made to the Administrator of Lands of the province in which the tract desired is situated. The petition will be posted for thirty days in his office and will be read in public on a holiday, " such reading being previously announced by a roll of the drum; " it will also be published in the Official Gazette. If no opposition is presented in the meanwhile, certain further formalities will be performed, payment required of the first half of the purchase price, and a provisional title, granting possession and conditional use, will be issued.

The *llanos* are "commons," and there is no legal limit to the number of cattle that an individual may graze upon them, but no more than thirty acres of these lands may be fenced, or excluded for private use.

THE END.