CHAPTER XXI

THE CANAL ZONE GOVERNMENT

THE Canal Zone is a strip of territory ten miles wide, its irregular lines following the course of the canal, which is its axis. Over this zone the United States, under its treaty with Panama, exercises jurisdiction "as if it were sovereign." The American Government was unwilling to undertake the great and expensive work of constructing the canal without having this guaranty to protect it from possible harassment at the hands of the Panaman authorities.

One of the first tasks that confronted the United States authorities when they entered upon the work of building the canal was that of providing a civil government for this territory named by law the Canal Zone. Postal facilities had to be provided; a police system had to be established; customs offices were required; fire protection was necessary; a court system was needed; a school system was demanded; and, in short, a sort of territorial government had to be put in operation before the work of building the canal could go forward satisfactorily.

This government was established in 1904 under the direction of Major General George W. Davis, the first governor of the Canal Zone. From time to time it was extended and improved. More

than half of this was appropriated out of the Treasury of the United States, and the remainder collected in the operations of the government. In addition to directing the government of the Zone, the head of the department of civil administration was the titular representative of the Canal Commission in all matters in which the commission and the Republic of Panama had a mutual interest. However, in practice, the Panaman Government looked directly to the chairman and chief engineer on all important matters.

One of the earliest and most important subjects requiring their cooperation was that of sanitation in the cities of Panama and Colon. The United States agreed to advance money for building sewer and water systems, and for street improvements, in the two principal cities of the Republic, on condition that the Republic of Panama and the two cities would reimburse the United States Treasury through the water rents. The street improvements were to be paid for in 10 years, and the sewer and water systems in 50 years; in the meantime the United States was to be allowed 2 per cent interest on the money advanced. This amortization of the Republic's debt for these improvements has been going steadily forward.

In laying out the government of the Canal Zone it was thought wise to adhere as closely to Spanish laws and customs as was expedient under the new conditions. In view of this consideration the methods of taxation on the Canal Zone were allowed to remain largely the same as under the old Spanish laws of Colombia. Likewise the

Spanish system of judicial procedure was adhered to during the early years of the construction period. It was not, indeed, until 1908 that the right of trial by jury was established in the Canal Zone. At that time former Senator J. C. S. Blackburn, of Kentucky, was at the head of the department of civil administration, and he regarded it as repugnant to American ideas of justice to deny to Americans on the Isthmus the right to be tried for felonious offenses by juries of their peers. Upon his representations President Roosevelt issued an executive order extending the right of trial by jury to the Canal Zone, and that order was effective after 1908.

With the early opening of the canal it became advisable for Congress to determine the future policy of the United States toward the Canal Zone, and to lay out a system of government there which would meet the needs of the future. It was determined that the Canal Zone should be used for the operation of the canal, rather than for a habitation for such settlers as might choose to go there. Hence the provision was made that the President of the United States should have the right to determine how many settlements there should be on the Canal Zone and how many people should be permitted to live there.

It will be the policy of the United States to discourage general settlement and to maintain only such towns as are necessary for the operation of the big waterway, granting only revocable leases to any outsiders when it is deemed advisable to allow them to occupy land within the Zone. There will be only five settlements in the Zone, if

present plans are carried out: One at Cristobal, one at Gatun, one at Pedro Miguel, one at Corozal, and the settlement at Ancon and Balboa at the Pacific terminus of the canal. The total number of people who will reside in these settlements will probably not exeed 10,000, a material reduction from the 62,000 living on the Zone in 1912. Those who are still there, but who will not be needed in the permanent organization, will be repatriated at the expense of the United States Government. In 1912 there were approximately 31,000 British subjects on the Zone, practically all of them negroes from the British West Indian islands and British Guiana. The great majority of these will be carried back to their homes, as will all of the 4,300 Spaniards who desire to return. There were nearly 12,000 Americans on the Zone at that time, and perhaps two-thirds of them will leave before 1915. There were nearly 8,000 Panamans on the Zone and most of them will go to the cities of Panama and Colon, or upon the Government lands owned by the Panama Republic outside of the Zone.

The work of clearing the Zone of its population was begun early in 1913. A joint land commission was appointed to adjudicate the claims of those Panamans who were living within the Zone on lands that were needed for the operation of the canal. This commission consisted, under the treaty existing between the two countries, of two Americans and two Panamans. In their work they first took up the claims of the poorer classes who had nothing but a thatched hut and a small patch of ground. The commission visited the

various parts of the Zone and fixed the value of such holdings. The people were given free transportation over the Panama Railroad, and usually were allowed from $50 to $100 for their homes. They preferred to move in colonies, so the Republic of Panama laid out small towns away from the Canal Zone for them. These natives, usually almost full-blooded Indians, were treated as kindly and as considerately as conditions would allow. They were willing to "fold their tents" like the Arabs, and leave their homes behind as they went out to conquer new ones in the jungles where the needs of a gigantic waterway could not encroach upon them.

The claims for lands which have to be taken from individuals by the United States will aggregate a half million dollars. As the Panaman Government allows homesteading on Government lands at a cost of about a dollar an acre, and as there are tens of thousands of acres of better land outside of the Canal Zone than inside, the policy of the United States in freeing this strip from native population will not work any great injury to the people.

During the construction period the laws under which the people of the Zone lived were made in three different ways. Of course, Congress as the legislative assembly was always supreme. But under the laws passed by it, the President of the United States was empowered to issue executive orders covering points not touched by congressional legislation, and under his instructions the Secretary of War could promulgate certain orders. In addition to this, the Canal Commis-

sion had a right to serve as a sort of local legislature. During the year 1912 sixteen executive orders pertaining to the Canal Zone were signed by the President and the Secretary of War, while five ordinances were promulgated by the Isthmian Canal Commission during the same period.

The court system under the construction-period government consisted of district courts, circuit courts, and a supreme court. There were five district judges and three circuit judges; and the circuit judges sitting together constituted the supreme court, from whose decisions there was no appeal. Under the permanent law there will be a magistrate's court in each town, which will have exclusive, original jurisdiction in all civil cases involving not more than $300, and of all criminal cases where the punishment does not exceed a fine of a hundred dollars or 30 days in jail, or both. Its jurisdiction will include all violations of police regulations and ordinances, and all actions involving possession or title to personal property or the forcible entry and detainer of real estate. These magistrates and the constables under them will serve for terms of four years. There will be a district court which will sit at the two terminal towns with the usual court officers. The circuit court of appeals of the fifth circuit of the United States will be the court to which appeals from the district court will be carried.

The postal service of the Canal Zone is practically identical with that of the United States. The revenues collected from the sale of stamps and postal cards amounted to $87,550 in 1912. Nearly a quarter of a million money orders were

issued during that year, representing a total of approximately $5,000,000. A postal savings bank system is also maintained, a counterpart of the one in the United States.

All mail matter sent from the Canal Zone bears Panaman stamps countermarked by the Canal Zone government. When the United States established the postal system at Panama, American postage was used. The Panamans were very much dissatisfied with such a procedure, however, since it deprived them of a large share of their postal revenue. Their postal rates to the United States were those of the universal postal union — 5 cents per ounce or fraction thereof on all first-class mail matter. The rate from the Canal Zone was only 2 cents. The result was that the citizens of Panama and Colon would not patronize their own post offices, but carried their mail across the line to the post offices at Ancon and Cristobal where they could mail their letters at the 2-cent rate. The Panaman Government protested against this, and it was agreed by the Americans that in the future all mail matter should carry Panaman postage stamps. These are furnished to the Canal Zone government at 40 per cent of their face value. In this way the share of the Republic of Panama in the postal receipts of 1912 amounted to nearly $33,000.

President Roosevelt selected one of his "rough riders," George R. Shanton, to establish the police force on the Zone. This police force was selected generally from men who had seen service in the United States Army and had made good records there. In 1912 the force consisted of 117 first-

class white policemen, 116 colored policemen, 20 corporals, 8 sergeants, 7 lieutenants, and 2 inspectors, besides a chief of police and an assistant chief of police. During that year 7,055 arrests were made, 70 per cent of which resulted in convictions. Police stations were maintained at all settlements along the line. A penitentiary was located at Culebra where approximately 140 convicts were confined. The penitentiary had to be removed owing to slides at Culebra Cut, and the men were put to work on the roads of the Canal Zone. They were kept in well-guarded stockades at night.

When Judge Henry A. Gudger was made a member of the judicial system of the Canal Zone he believed that it would be the scene of unusual lawlessness; he thought it would be a dumping ground for lawless people from all parts of the world. He therefore believed in strong repressive measures, and his earlier sentences were made heavy with that end in view. He found later, however, that the opposite was true. Under the system of quartering the canal help there was comparatively little mixing of the races. The negroes lived to themselves, the Spaniards to themselves, and the Americans to themselves; therefore, racial friction was largely overcome. The lawless found the Canal Zone a desirable place to shun. Judge Gudger soon discovered that severe measures were unnecessary, and in recommending pardons frequently stated that he had imposed sentences heavier than necessary to carry out the repressive policies he had in mind.

A well-organized, paid fire department was maintained from the beginning and it was supplemented by volunteer companies in many places. In a number of towns fire engines of the latest automobile type were installed. Out of 300 fire alarms in 1912, nearly 200 were for fires in Government property valued at one and three-quarters million dollars, while the total loss was only $5,000.

The school system of the Canal Zone was laid out along the same lines that characterized all other activities for the welfare of the people who were engaged in building the canal. It was founded by Charles E. Magoon when he was governor of the Zone, and in 1912 had 75 teachers and officials, with an enrollment of 2,105, of whom nearly 1,200 were white. The standard required of the teachers was maintained at a high point. Of the 48 white teachers employed in 1912, 13 held degrees from colleges and universities, 19 held diplomas from standard normal schools, and 12 others had enjoyed at least two years of normal teaching. The white children on the Zone were given free transportation to and from the schools. Those who had to go on the railroad to reach their schools were given free passes. Those who attended the schools in their own neighborhood were gathered up in wagons and transported to school.

The system of roads for the parts of the Canal Zone adjacent to the canal itself was built mainly by convict labor at comparatively little cost. They have been useful to the natives in getting their few products to market, and during the

years to come will be available as military roads for use in the defense of the Zone. These roads are built according to the best American standards and are almost the only real roads in the entire Republic. The Panaman Government has extended one road from the Zone line to old Panama, and for a few miles into the interior, but aside from this national road activities have been few indeed.

The American road from Panama to the Zone boundary, leading toward old Panama, over the savannahs, is the pleasure highway of the Republic. It is practically the only road in the Republic where one drives for pleasure, and here every automobile in Panama City is pressed into service during the late afternoon and the evening. The elite of the capital city own summer homes along this road. These homes are by no means as elaborate as the summer homes along the Hudson, but the fact that they were seated amidst veritable gardens of flowers gives them an air of beauty and restfulness attractive even to the most blase traveler.

The water-supply system of the Canal Zone consists of a number of reservoirs on the watersheds of the Isthmus where no human habitations are allowed, and where trespassing is forbidden. The waters are examined for bacteria and other properties once each month, and a report thereon is made to the proper officials. Twice each month a physical examination of each reservoir, and the land from which it receives its water, is made by inspectors who report all conditions to the sanitary and other authorities.

If there is any sign of contamination, steps to overcome the trouble are taken immediately.

Where the reservoirs fill up to the spillway the waste water is not allowed to go over the top, but is drawn out from the bottom in order that the under layers of water may be the ones wasted. Water drawn out for domestic purposes is taken from the top wherever possible. The water has a somewhat unpleasant taste to people newly arrived upon the Isthmus, and in some cases serves to disturb the digestive tract, but to the people who become accustomed to it the unpleasant flavor, due to the presence of decayed vegetation, is forgotten, and the workers on the Canal Zone frequently declare they miss the Panama water when they go back to the States.

The permanent Government of the Canal Zone will be, in the main, merely a miniature of the government during the construction period. The law providing for the operation of the canal makes this Government entirely subsidiary to the main purpose for which the canal was built. It provides that when war is in prospect the President may appoint a military officer to take charge of the Canal Zone, and to conduct its affairs as they might be conducted were the Zone nothing more than a military reservation. The Government will have its headquarters at the Pacific end of the canal where Balboa, the principal permanent town on the Isthmus, will be located. This little American city will be Government-built and Government-owned, and it will be the smallest of all the world's capitals.

Under the new Government all old laws, not

TOM M. COOKE

THE POST OFFICE, ANCON

specifically repealed, or contrary to the new ones, will be continued in force. All executive orders issued by the President, and all orders and ordinances promulgated by the Canal Commission, during the construction period, not inconsistent with the act creating a permanent form of government, are made laws of the Canal Zone to continue as such until specifically repealed by act of Congress.

CHAPTER XXII

CONGRESS AND THE CANAL

WHILE the Congress of the United States ever has been charged with a lack of appreciation of the needs of the executive branch of the Government, spending money foolishly here and being niggardly with its appropriations there, the history of the legislation under which the Panama Canal was undertaken and completed shows that American lawmakers backed up the canal diggers in every necessary way.

One may read in all the hearings that were conducted, both on the Isthmus and in Washington, a desire on the part of the congressional committees having to do with the canal matters, to promote the work, and to enable those directly concerned in its execution to carry out their plans without hindrance.

It is probable that no project ever carried to completion under the aegis of the United States Government was studied more carefully by the legislators than the Panama Canal. There was a standing invitation from the Isthmian Canal Commission to members of the Senate and House of Representatives to visit the Isthmus, collectively or individually, for the purpose of acquainting themselves with the character of the work and its needs. This invitation was accepted by a large

percentage of the members of the House and Senate who served during the construction period. When a member of either branch of Congress visited the Isthmus and saw there the character of the work being done, and the spirit of the men behind it, he never failed to return an enthusiastic supporter of the work, ready by vote and voice to contribute his share to the legislation needed.

When the final Isthmian Canal Commission came into power a policy of absolute candor with Congress was adopted. When the annual estimates for appropriations were submitted, they came to Congress with the understanding that they represented exactly what was needed, no more and no less. Instead of recommending from 10 to 25 per cent more than they hoped to get, upon the assumption that Congress would scale down the appropriations — a policy long followed in many of the bureaus of the Government — the canal officials asked Congress to understand from the beginning that the figures they submitted had been pared down to the bone. The result was a happy one. Congress learned to depend upon the figures and to make its appropriations accordingly; consequently, the work was never handicapped by appropriations deficient in one branch and overabundant in another.

Congress for several years made its appropriations for building the canal under the assumption that it was to cost about $145,000,000, exclusive of government, sanitation, purchase price, and payments to the Republic of Panama. It was not until 1908 that a straightforward, definite effort was made to fix the ultimate cost. Ex-

perience showed clearly that all hands had hopelessly underestimated both the total amount of work to be done and the unit cost of doing it.

After a year's experience of carrying forward the work at full swing, the commission decided to face the situation frankly and attempt to ascertain exactly what might be expected. This investigation disclosed the fact that the estimates of the amount of work to be done were a little over 50 per cent short. Under the experience of one year's work it was calculated that the total cost of the canal would be $375,000,000, including sanitation, government, and payments to the New Panama Canal Company and the Republic of Panama, instead of $210,000,000, as these items would have aggregated under the estimates made in 1906. This was about one and a half times as much as the estimated cost of a sea-level canal. But, although Congress had fixed the limit upon the basis of an aggregate cost of $210,000,000, it cheerfully faced the restatement of the anticipated cost, and finally set the limit at $375,000,000.

From that day forward the great effort at Panama was to live within this limit, in spite of the extra work required. While Congress might have been willing to increase this limit, in view of the fact that an additional 97,000,000 cubic yards of material had to be removed, it was not asked to do so. The engineers desired above everything else to stay within their own estimates, and they did the extra work with money saved by increasing the efficiency of the force.

The first law providing for the government of the

Canal Zone was enacted in 1904. It gave to the President and those appointed by him the right to govern the Zone and imposed the duty "of maintaining and protecting its inhabitants in the free enjoyment of their liberty, property, and religion."

In 1907 an effort was made to reduce wages on the canal. The sundry civil bill of that year carried a provision that wages on the Isthmus for skilled and unskilled labor should not exceed more than 25 per cent the average wage paid in the United States for similar labor. This proposition was urged by Representative James A. Tawney, of Minnesota, then chairman of the Appropriations Committee of the House. When it came to a vote the wages fixed under Chief Engineers Wallace and Stevens were upheld by a vote of 101 to 10. Congress took the ground that the canal could be built only by the most liberal treatment of the people who were building it.

At another time a provision was inserted in the appropriation law establishing the 8-hour day law for American workers on the canal. A fight was made by the American Federation of Labor and other organizations to make it apply to the common laborer as well as to the Americans, but this was unsuccessful. The 8-hour provision did not work well, since the foremen and superintendents were permitted to stop work after 8 hours, while the laborers under them had to work an hour longer. This was later rectified by providing that the 8-hour law should not affect foremen and superintendents in charge of alien labor; and thus was overcome the difficulty of having an army of common laborers at work

an hour or so each day without superintendence or direction.

In 1906 it was provided by a joint resolution of the Senate and House that the purchase of material and equipment for use in the construction of the canal should be restricted to articles of American production and manufacture, except in cases where the President should deem prices extortionate or unreasonable. This provision undoubtedly increased by many millions of dollars the cost of the machinery with which the canal work was executed. While some dredges and other equipment were purchased in Europe, foreign purchases were the exception rather than the rule. When bids were submitted there were times when European prices of dredges were placed at less than $700,000, while American prices for the same dredges would amount to more than $1,000,000. When there were such marked difference in bids the awards were made to the European manufacturers.

Although the construction of the canal was authorized by the Spooner Act in 1902, it was not until 1906 that Congress expressed its views in legislation on the question of the type of canal that should be built. It was then that it declared the canal should be of the general lock type proposed by the minority of the board of consulting engineers, which was a complete approval of the plans urged by President Roosevelt. In order to make certain this decision as to the type of canal, a provision was incorporated in the appropriation bill of that year, setting forth that no part of the sums therein appropriated should be used for the construction of a sea-level canal.

Congress was always willing to aid the engineers in meeting unforeseen contingencies by giving them unusual liberties in the application of moneys appropriated. It was provided that as much as 10 per cent of any appropriation might be used for any of the other purposes for which money was appropriated, thus allowing the necessary leeway to insure a systematic progress of the work throughout all its features. This provision many times came to the rescue of the chief engineer, when he found that more money was needed at one point and less at another than had been estimated 16 or 18 months before.

While President Roosevelt was in the White House Congress gave him abundant authority over all phases of the task at Panama. He was empowered to do almost anything he thought expedient for hastening the work. For instance, in 1907 when he considered building the canal by contract, Congress provided that nothing in the Spooner Act should prevent him from entering into such contract or contracts as he might deem expedient for the construction of the canal. This practically gave him full authority over the limit of cost and the methods of building. He was thus the sole judge of the character of the contracts that he might make. No President in the history of the country ever was vested with fuller jurisdiction and control over a great matter than was President Roosevelt in this case. That he did not enter into such contract was due mainly to the reports made to him by Col. George W. Goethals, who had just been appointed chief engineer.

In 1908 the Secretary of War was authorized

to purchase for the Panama Railroad Company two steamships of American registry of not less than 9,000 gross tons each, the cost of which should not exceed $1,550,000, for the transportation of supplies, equipment, and material, and of officers and employees of the Canal Commission. These ships, when no longer required for that service were to be transferred to the Secretary of the Navy for use as colliers or other auxiliary naval vessels. These ships carried the bulk of the cement used in building of the great locks, and more than paid for themselves in the saving of transportation charges which would have been levied by private carriers. In the appropriation act of 1909 Congress decided that the carrying of marine or fire insurance was bad policy for the Government, and provided that no such insurance should be carried by the Panama Railroad Company, but that it should be reimbursed for any loss it might sustain from the appropriations made by Congress for the building of the canal.

There were a number of committees in Congress which dealt with canal legislation. Principal among these were the Committees on Appropriations of the two Houses, the Committee on Interoceanic Canals of the Senate, and the Committee on Interstate and Foreign Commerce of the House. The Appropriations Committees dealt with the question of appropriations. The House Appropriations Committee usually made a trip to the Isthmus before each session of Congress. There it would hold hearings, questioning closely every person connected with the work who had made estimates for its benefit, its members seeing

A NEGRO GIRL

A MARTINIQUE WOMAN

SAN BLAS CHIEF

AN INDIAN GIRL

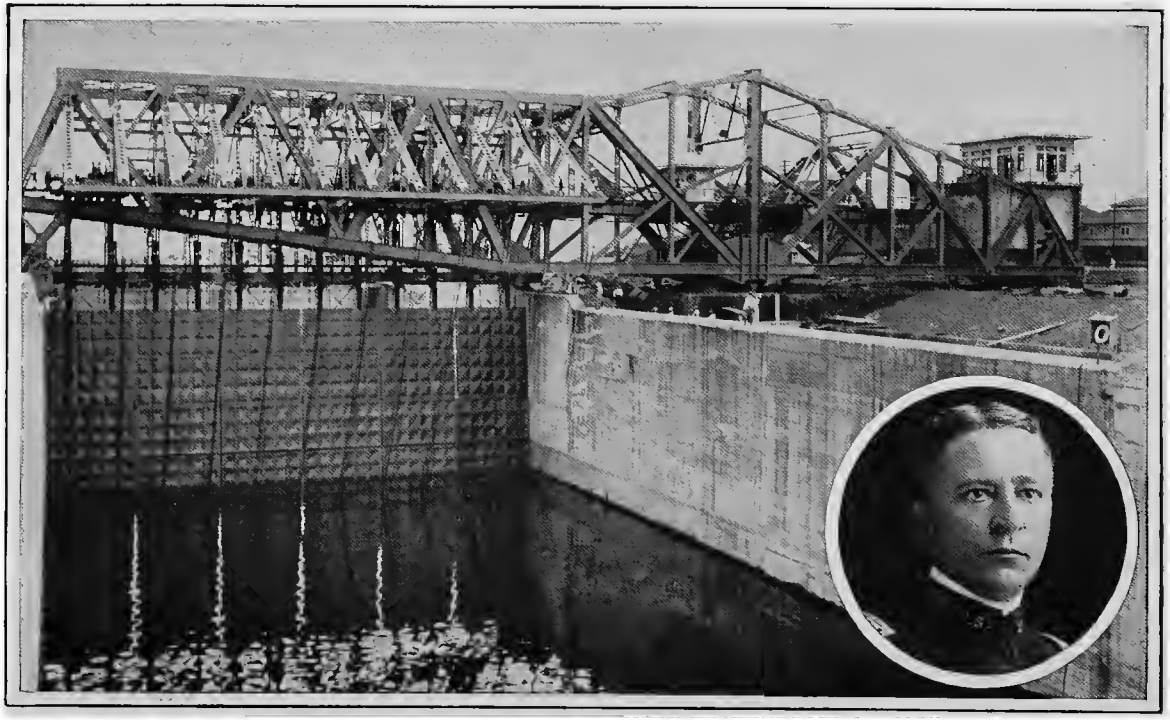
AN ITALIAN

A TIMEKEEPER

A SPANIARD

A NEGRO BOY

A FEW OF THE MANY TYPES ON THE ISTHMUS



TESTING THE EMERGENCY DAM, GATUN LOCKS

COL. HARRY F. HODGES

with their own eyes the projects for which each individual appropriation was asked. The practice was, during these visits, to go over a part of the work and then to hold sessions of the committee for the purpose of asking questions about that phase of the undertaking. The testimony was taken down by an official stenographer and printed for the use of every Member of Congress. A few months later the chairman and chief engineer would make a trip to Washington and furnish the committee with such supplementary information as the intervening time might have disclosed.

The Senate Committee did not visit the Isthmus as frequently, as it usually found that the hearings held by the House Committee afforded it sufficient information on which to predicate its action. All matters having to do with organization traffic, or general laws for the Canal Zone, were handled by the Committee on Interoceanic Canals of the Senate and the Committee on Interstate and Foreign Commerce of the House. It was the latter committee, under the chairmanship of Representative William C. Adamson, of Georgia, which framed the permanent Canal Law, under which the Isthmian waterway will be governed and operated. The big fight in Congress over the type of canal was waged before the Senate Committee on Interoceanic Canals. The records of this committee, together with the additional records in the hands of Congress, constitute one of the most extensive accounts of a great work anywhere to be found. The official literature of the Panama Canal is almost as voluminous as the canal is big.

Although Congress usually left the details of canal construction to be worked out by the Canal Commission and the President, from start to finish it showed a determination so to deal with the big project that it could look back over the work with the feeling that it had contributed its share to the triumph of the undertaking.

CHAPTER XXIII

SEA-LEVEL CANAL IMPOSSIBLE

NO ONE can dispute the wisdom of the United States in deciding to build a lock canal. To have undertaken a sea-level canal would have involved this Government in difficulties so great that even with all the wealth and determination of America, failure would have ensued. It is, perhaps, putting it too strongly to say that a sea-level canal is a physical impossibility, but it is not too much to say that such a canal would take so much money and so much time to build that the resources and patience of the American people would be exhausted long before it could be made navigable.

The advocates of a sea-level canal declared that a channel could be dug through Culebra Mountain with the excavation of 110,000,000 cubic yards. As a matter of fact, Culebra Cut, with its bottom 85 feet above sea level, required the excavation of almost that same amount.

Engineers who advocated a sea-level canal declared that the material in Culebra Mountain was stable, and that only moderate slopes would be necessary. As a matter of fact, the material in the mountain proved highly unstable, and, except for a few short sections, slides and breaks were encountered all during the construction period. The

result was that practically two Culebra Cuts were dug. The engineers, in beginning the present canal, calculated that 53,000,000 cubic yards would be excavated in Culebra; the amount actually removed was 105,000,000 cubic yards. Upon this basis a sea-level Culebra Cut might have required the excavation of 230,000,000 cubic yards.

Calculating an average monthly excavation of a million cubic yards, the task would have required 17 years to complete. In other words, if a sea-level canal had been undertaken and had been physically possible, the celebration of the opening of the waterway would have been set for 1925 instead of 1915.

Among all of the members of the majority of the board of consulting engineers who favored a sea-level canal, only one, E. Quellenec, Consulting Engineer of the Suez Canal, showed any appreciation of the difficulties which were to be expected in Culebra Cut. He announced, in voting in favor of a sea-level canal, that he could not do so without first reminding the United States Government of the great difficulties that would lie before it in Culebra Cut. Henry Hunter, Engineer of the Manchester Ship Canal, declared that Culebra Cut presented no serious problems at all; that a sea-level cut could be dug more quickly than the locks of the other type of canal could be built. He further declared that it was as clearly demonstrable as any engineering problem could be, that it would be possible to use 100 steam shovels in Culebra Cut. No one has accused the engineers on the canal of lack of ability in maneuvering shovels, yet at no time were they able to use more than 46.

If President Roosevelt had followed the recommendation of the majority of the board of consulting engineers in favor of a sea-level canal, it seems probable that the United States would have followed the French in retiring defeated from the Isthmus, or else would have reconsidered its purpose to build a sea-level canal and have undertaken a lock canal, as the French had done.

But, even if it had been possible to build a sea-level canal at Panama, it appears that such a canal would not have been as satisfactory as the present one. While the canal the United States possesses at Panama to-day is a great waterway 300 feet wide at its narrowest part, in which ships can pass at any point, the sea-level canal projected would have been a narrow channel winding in and out among the hills, too narrow for half its length for the largest ships to pass. Currents, caused by the Chagres River, and by the flow of other streams into the canal, would have made navigation somewhat dangerous.

The principal ground upon which the majority members of the board of consulting engineers voted in favor of a sea-level canal was that it was less vulnerable. This contention, in the light of what has happened at Panama, seems to carry no great weight. Such a canal would have required a masonry dam 180 feet high across the Chagres at Gamboa, to regulate the flow of that river into the canal. This dam, very narrow and very high, would have been a much fairer mark than the great Gatun Dam for the wielder of high explosives. Furthermore, while earth dams, like that at Gatun, have weathered earthquake shocks of great sever-

ity, masonry dams, like that proposed for Gamboa, have been tumbled to the earth by shocks of much less power. The regulating works at Gatun will take care of a volume of water approximately twice as great as the Chagres has ever brought down. On the other hand, the proposed dam at Gamboa would have cared for only one-third as great a discharge as the highest known flow of the Chagres.

It was calculated that the lake made by the dam at Gamboa would always be held at low stage between floods, but if two floods came in quick succession this might have been impossible. Such a situation would have made the Chagres River always a menace to the canal, instead of its most essential and beneficent feature.

Those who objected to the lock type, on the ground that the locks could be destroyed, seemed to forget that even the sea-level project demanded a set of locks to regulate the tides of the Pacific. While, contrary to the usual idea, there is no difference in the mean level of the Atlantic and the Pacific Oceans, the difference in the tides at Panama is about 18 feet. This is due to the shape of the Bay of Panama. As the tide sweeps over the Pacific and into that bay, it meets a funnel-shaped shore line, which gradually contracts as the tide travels landward. The result is that the tide rises higher and higher until it reaches a maximum of 10 feet above average sea level. When it flows out it reaches a point 10 feet below average sea level, thus giving a tidal fluctuation of 20 feet. On the Atlantic side the tidal fluctuation is only 2 feet.

Under these conditions the canal could not be operated during many hours of the 24 without the

tidal locks, if at all, and it would be almost as great a hindrance to have the tidal locks destroyed as to have the present locks injured. Another perpetual menace in a canal with a bottom width of only 150 feet for half of its distance, would be the danger of a ship sinking and blocking the channel. When the *Cheatham* sank in the Suez Canal it wholly blocked the waterway for nine days, and partially blocked it for a month.

According to the Isthmian Canal Commission, the present canal affords greater safety for ships and less danger of interruption to traffic by reason of its wider and deeper channels; it provides for quicker passage across the Isthmus for large ships and for heavy traffic; it is in much less danger of being damaged, and of delays to ships because of the flood waters of the Chagres; it can be enlarged more easily and much more cheaply than could a sea-level canal. The lock canal has a minimum depth of 41 feet, and less than 5 miles of it has a width as narrow as 300 feet. It can take care of 80,000,000 tons of shipping a year, and, by the expenditure of less than $25,000,000 additional, can increase this capacity by at least a third. It can pass at least 48 ships a day, doing all that a sea-level canal could do, and many things that a sea-level canal could not do.

No one denies that if it were possible to have a great Isthmian waterway at sea level as wide as the present lock canal, it would be the ideal inter-oceanic waterway. But, as such a proposition is out of the question, the American people have at least one thing for which to thank Theodore Roosevelt — that at a critical time in the history

of the canal project he allowed himself to be converted from the advocacy of a sea-level canal to the championship of a lock-level canal, in the face of a majority report of one of the strongest boards of engineers ever assembled, and prevented a situation at Panama that would have been humiliating to America, and which probably would have ended for all time the efforts of centuries to let ships through the American Isthmus.

CHAPTER XXIV

FORTIFICATIONS

WHEN Congress decided that the Panama Canal should be regarded as a part of the military defenses of the Nation, it became necessary to fortify it in such a way as to make it practically impregnable to naval attack. It was, therefore, decided that there should be ample coast defenses at the two ends of the canal and that these defenses should be protected from land attack by the quartering of a sufficient number of mobile troops to hold in check any landing parties that might attack the works by an overland route.

In carrying out this plan Congress met every demand of the military experts. When the plans for the fortifications were pending before the Appropriations Committee of the House every military authority, from Gen. Leonard Wood and Col. George W. Goethals down, who appeared before the committee was asked if he considered the defenses recommended as sufficient for the purposes intended, and each replied in the affirmative.

These defenses consist of large forts at each end of the canal, with field works for some 6,000 mobile troops. The defenses on the Pacific side will be somewhat stronger than those on the Atlantic side,

probably for the reason that better naval protection ordinarily could be afforded to the Atlantic than to the Pacific entrance, on account of the proximity of the Atlantic waters of the canal to American shores.

At the forts on the Atlantic side four 12-inch guns, sixteen 12-inch mortars, six 6-inch guns and four 4⅞-inch howitzers will be mounted. The guns at this end of the canal will be distributed between Toro Point on the west side of the entrance channel and Margarita Island on the east side. There will be two big 14-inch disappearing guns at each of these points. They will be so placed as to sweep the horizon in the seaward direction, and at the same time will be able to concentrate their fire on the enemy as he steams in toward the channel entrance between the great breakwaters which cut off Limon Bay from the ocean.

At the Pacific end all of the defenses will be on the east side of the channel. They will consist of one 16-inch gun, six 14-inch guns, six 6-inch guns and eight 4⅞-inch howitzers. There are three small islands on the east side of the Pacific entrance channel known as Naos, Perico, and Flamenco. They rise precipitously out of the water and offer ideal sites for heavy defense. A huge dump or breakwater has been built from the mainland at Balboa out to Naos Island and this, in turn, has been connected with Perico and Flamenco by large stone causeways. The great dump has made several hundred acres of available land for quartering the eight companies of coast-defense troops which will be stationed at the Pacific end of the

canal. These islands are 3 miles from the mainland and their guns will completely bar the way to any hostile ships which might seek to enter the canal.

On the other side of the channel, at a distance of about 12 miles, lies the island of Taboga where the Canal Commission maintains the sanitarium for its employees. It had been suggested by some that fortifications should be planted there, but it was declared by the military authorities that the guns of Naos, Perico, and Flamenco would completely command this island and prevent a hostile nation from using it as a base of operations.

The range of the guns extends more than a mile beyond Taboga Island. The big 16-inch gun which will be mounted on Perico Island is the largest ever built. It was made at the Watervliet Arsenal. It carries a projectile weighing more than a ton for a distance of 21 miles. At 17 miles it can toss its death-dealing 2,400-pound shell at an enemy as accurately as a base-ball player throws a ball to a team-mate 17 yards away. Its projectiles are filled with powerful explosives, a single one of which in the vitals of any battleship would be enough to place it out of commission. The big guns and the mortars are intended primarily for defending the canal from attack by water. The smaller guns and howitzers would come into play when an enemy approached within a mile and would be used to repel his efforts to effect a landing. Nearly all of these howitzers may be moved from place to place to meet the needs of the field troops in case of land attack. Eight of them will be permanently stationed at Gatun Locks. There

will be other field works at Gatun, Miraflores, and Pedro Miguel ready for occupancy at a moment's notice by the field troops stationed on the Isthmus. These howitzers are so located that 12 of them may be concentrated at any given point in case of danger.

The big guns of the permanent forts are all mounted on disappearing carriages so that they are exposed to fire only at the moment of discharge. The 12-inch mortars will not only play their part in defending the canal from water attack, but will be able to sweep the country on the Atlantic side as far inland as the Gatun Locks and on the Pacific side as far inland as the locks at Miraflores. They have a range of nearly 4 miles, and when loaded with shrapnel will prove a most effective weapon against field troops operating anywhere within the vicinity of the locks.

The land lying contiguous to the sea-level ends of the canal will be platted off into squares exactly as a city is laid out. Should hostile troops come upon this territory the men in the fire-control station would simply ascertain the number of the block or blocks on which they were operating, and the mortars would be so oriented as to throw their big projectiles thousands of yards into the air to fall directly on those blocks. They would, therefore, be practically as useful in land operations as in the water defense.

Every feature of the armament defending the entrance of the canal will embody the latest improvements known to military science. The carriages for the big guns have been specially designed, and were put through the most thorough

and exacting tests before their adoption. The fire-control stations are said to be the last word in insuring the effective use of the guns. Determining how a big gun shall be aimed so that its projectile will hit a target 10 miles away is not an easy task. Of course, the gun can not be pointed directly at the target, since this would cause the projectile to fall far short of the enemy, and also the effect of the wind and the motion of the enemy would carry it wide of its mark. To guess the range and to secure it by experimentation would be to prevent any effective fire whatever. Therefore, it is necessary first to determine the approximate range, the motion of the enemy and the velocity of the wind.

There is an ingenious instrument known as the range finder, by which the approximate distance of the target is determined. This instrument looks something like a cross between an opera glass and a small telescope. The operator puts his eyes to the opera glass part of the range finder and locates the enemy just as one would with an ordinary pair of glasses. When he locates the hostile ship he sees two images of it. There is an adjusting screw which he turns until the two images blend together and become one. The turning of this screw automatically adjusts a scale on the instrument, and when the two images exactly coalesce the distance of the ship is registered on the scale. The operators in the fire-control station make the necessary calculations as to the effect of the wind, the motion of the enemy and other elements entering into marksmanship, and telephone the results below to the men who aim the gun.

It takes two men to aim each gun; one takes care of its up-and-down movement, and the other of its right-and-left movement. When the man in the fire-control station telephones that the enemy is so many miles away, the man who has charge of the up-and-down movement of the gun so adjusts his telescopic sight on a registering scale that when it is pointed directly on the enemy the muzzle of the gun will be elevated high enough to carry the projectile that distance. The man who has charge of the right-to-left movement adjusts his sight so that when it is pointed directly at the enemy the muzzle of the gun will be pointed far enough to the right or to the left to land its projectile amidship on the enemy. Each man stands on a platform and operates a little wheel on an endless screw. He turns this wheel backward or forward just enough to keep his sight exactly on the enemy.

After the gunners have received their instructions the first shot is fired. This is called a "ranging" shot, and as the best range finder can not register the distance to the exact yard it is necessary for the fire-control station to gauge exactly how far short of, or how far over, the target the projectile has carried. The up-and-down sight is adjusted in accordance therewith and usually the second, or at most the third, shot gets the exact range. This method of locating the enemy will be used on all the fortifications of the canal.

It is unanimously agreed by military authorities that no naval force will risk an open attack upon such fortifications, since almost inevitably it would result in the disabling, if not the sinking, of a number of battleships and a great crippling of the

enemy's force that he could not afford to risk unless he had first swept the seas of our own naval strength.

In order to make certain that no surprise attack could be successful, one of the most complete searchlight equipments to be found in any fortress in the world has been authorized for the canal fortifications. There will be 14 searchlights, with 60-inch reflectors, made so that they will send the brightest of white lights out to sea and over the land as far as the range of the guns may reach. These searchlights cost more than $20,000 each, and it requires a year to construct the big mirror which is placed in each of them. Electric plants at each fortress will generate electricity for the operation of the guns and of the searchlights.

In anticipation of sudden need nearly $2,000,000 worth of reserve ammunition will be kept on the Isthmus. There will be 70 rounds for the big 16-inch gun — enough to operate it constantly for two hours, providing for a shot about every two minutes. The big 14-inch guns will carry a shell weighing 1,400 pounds, propelled by a 365-pound charge of smokeless powder which will drive it through the air at an initial speed of nearly half a mile a second — enough momentum to carry it through at least 5 feet of wrought iron. The charge of powder by which these guns will hurl their projectiles on their death-dealing mission, generates a force which would lift the great Masonic Temple of Chicago 2 feet in a single second.

Three regiments of infantry, 1 squadron of cavalry, 1 battalion of field artillery, and 12 com-

panies of coast-defense troops will be permanently stationed on the Isthmus. The field troops, consisting of the infantry, cavalry, and field artillery, will be stationed at Miraflores, where permanent quarters will be provided together with the necessary drill grounds. These quarters will cost in the neighborhood of $3,000,000. At this point they can be maneuvered to advantage and moved to any part of the Canal Zone needing defense. It was originally intended to place these troops at Culebra on the east side of the channel, but this would necessitate their going a distance of about 5 miles to get to a point where they could conveniently cross with the artillery to the other side of the canal.

Quarters for eight companies of coast-defense troops are being established on the Naos Island dumps. Quarters for two companies of these troops are being provided at Toro Point, and for two other companies at Margarita Island. These will afford sufficient strength at the Atlantic side to man the guns temporarily, in case of hostilities, until any additional troops needed can be brought up. All of the troops, both field and coast defense, will be adequately housed and the permanent structures erected for them will be as substantially built as those of any modern army post in continental United States. There will be drill grounds large enough to maneuver the troops stationed on the Isthmus. Roads affording access to all parts of the Canal Zone have been built.

In addition to the provisions for the permanent forces on the Isthmus, additional field works will be provided to accommodate the 20,000 troops

which might be brought to the Isthmus in case of war. These field works will take the form of barricaded positions, entrenchments, and other protective breastworks which will enable the troops to undergo a state of siege. It has been estimated by the engineers that behind such works as have been planned one defender can stand off six assailants, so that a body of 20,000 mobile troops under these conditions could hold the Isthmus against a siege of 100,000 for a reasonable time. These field works will be constructed principally around Gatun and Pedro Miguel. The buildings for the permanent force stationed on the Isthmus will be constructed on the unit system so that any necessary expansion can be made.

The question of fortifying the canal was one which engaged the serious attention of Congress for a long time. There were two main viewpoints as to what policy should be pursued. One contention was that the canal should be made neutral, open to the ships of all nations, including the United States, on equal terms even in case of war between the United States and any other country. It was contended by those who took this view that to declare it neutral would render it immune from any attack and guarantee its perpetuity as a great commercial undertaking under the control of the United States.

They contended, furthermore, that the United States was bound, under the terms of its treaty with Great Britain, to make the canal neutral and that to fortify it would be to violate the Hay-Pauncefote treaty. They asserted that the United States was under solemn obligations to

recognize the principle of neutrality as applied at Suez and offered the express terms of the Hay-Pauncefote treaty in proof of their contention. This treaty provided that "the United States adopts, as the basis of the neutralization of such a ship canal, the following rules substantially embodied in the Convention of Constantinople, signed the twenty-eighth of October, 1888, for the free navigation of the Suez Canal; that is to say:

"First, the canal shall be free and open to the vessels of commerce and of war, all nations observing these rules on terms of entire equality so that there shall be no discrimination against any such nation, or its citizens or subjects, in respect of the conditions or charges of traffic, or otherwise. Such conditions and charges of traffic shall be just and equitable.

"Second, the canal shall never be blockaded, nor shall any right of war be exercised, nor any act of hostility be committed within it. The United States, however, shall be at liberty to maintain such military police along the canal as may be necessary to protect it against lawlessness and disorder.

"Third, vessels of war of a belligerent shall not revictual nor take any stores in the canal except so far as may be strictly necessary; and the transit of such vessels through the canal shall be effected with the least possible delay in accordance with the regulations in force, and with only such intermissions as may result from the necessities of the service."

It will be seen from this that the language of the treaty seems plainly to imply that the United

States had no right to fortify the canal. It is interesting to note, however, that when the controversy over the tolls between the United States and England arose, the English Government expressly conceded the right of the United States to fortify the canal and to exercise absolute rights of sovereignty so far as military considerations were concerned. It would constitute an interesting chapter in diplomatic history if someone would tell the real reason why the English Government waived its rights of demanding a neutral canal under the Hay-Pauncefote treaty.

Those who advocated the fortification of the canal contended that the United States had acquired practical sovereignty over the Canal Zone, and that thereunder it had a perfect right to provide for the defense of the territory. They asserted that the canal was undertaken because of the military necessities of the United States, as demonstrated by the trip of the *Oregon* from the Pacific to the Atlantic, during the Spanish-American War and that to fail to fortify the canal would be to lose the military advantages which its construction had given to the United States.

It was further contended that to allow the canal to be neutral would, in the case of war between the United States and some foreign power, compel the United States to keep its own warships out of the canal its own blood and money had built, or else compel its permanent operating force at Panama to commit a sort of legal treason by putting the enemy's ships through the big waterway on the same terms with American ships.

This contention was answered by those who took

the opposite view with the statement that all treaties would be suspended in case of war and that neutralization would cease between the United States and its enemies at such a time.

The other side replied that if this were true, it would then be too late properly to fortify the Isthmus, and that if the United States expected ever to deny to any country the neutrality provisions of the Hay-Pauncefote treaty, the fortifications should by all means be built in advance.

The long and earnest debate brought forth from some the prediction that England would not acquiesce in such a construction of the treaty, and from others the statement that under the terms of that instrument other nations had a right to protest against the fortification of the canal. In the face of these arguments, however, Congress determined by a substantial majority to fortify the canal, and the whole world has acquiesced. England not only did not protest, but in its toll controversy notes expressly declared that the United States had the right to fortify the canal.

CHAPTER XXV

FIXING THE TOLLS

LONG before the Panama Canal was finished shipping interests in every part of the world began inquiring minutely as to probable rates of toll, stating that it would be necessary for them to have this information before making plans to meet the changed conditions. Some wanted to plan construction of new ships, while others desired principally to readjust their transportation lines in accordance with the new conditions.

With this in mind, President Taft in 1912 recommended to Congress the passage of a law fixing the tolls and providing for the permanent operation of the canal. Congress, acting upon this recommendation, passed what is known as the Permanent Canal Law. In this law are stated the terms under which the canal may be used by the shipping world. It authorizes the President to prescribe, and from time to time to change, the tolls that shall be levied by the Government of the United States for the use of the canal. No tolls may be levied on vessels passing through the canal from one United States port to another. Provision was also made that tolls might be based upon gross or net registered tonnage, displacement tonnage, or otherwise, and that they might be

lower on vessels in ballast than upon vessels carrying cargo. When based upon net registered tonnage, for ships of commerce, the tolls can not exceed $1.25 per ton, nor be less, other than for vessels of the United States and its citizens, than the estimated proportional cost of the actual maintenance and operation of the canal. The toll for each passenger was fixed at not more than $1.50.

Acting under the law authorizing him to fix the rates within the limitations stated by the law itself, President Taft issued a proclamation fixing the toll at $1.20 per net registered ton on all ships of commerce, other than those carrying cargo from one United States port to another. The net registered ton is the unit of measuring a ship's cargo-carrying capacity, used throughout the world in general, and by British shipping in particular. It consists of 100 cubic feet of space, so that when a ship is measured its net registered tonnage is determined by the number of these units of space it contains. A ton of cargo seldom fills a hundred cubic feet of space; frequently it will not fill more than 40 cubic feet. The charge per ton of actual freight under this toll of $1.20 per net registered ton ranges from 44 to 80 cents a long ton upon the freight carried, depending upon the class of cargo. Such a toll adds from 2 to 4 cents per hundredweight to the freight rate between two points through the canal. It might cost 5 cents to take a barrel of flour from Colon to Panama, or vice versa.

While ships will be charged tolls on the basis of net registered tonnage, not all ships carry freight

upon that basis. In the majority of cases cargo is taken on at "ship's option" — either by weight or space. Forty cubic feet is estimated as the space occupied by an ordinary ton of freight, and ships usually carry cargo at rates based on that amount of space for each ton. The 40 cubic feet method of determining the amount of cargo carried is adopted by maritime interests because a long ton of wheat occupies about that amount of space. From this it will be seen that for the purpose of collecting tolls the United States allows 100 cubic feet of space for a ton, while the ordinary shipping firm allows only 40 feet per ton. Thus it happens that a shipowner charges the shipper for carrying $2\frac{1}{2}$ tons where the United States charges the shipowner for carrying 1 ton.

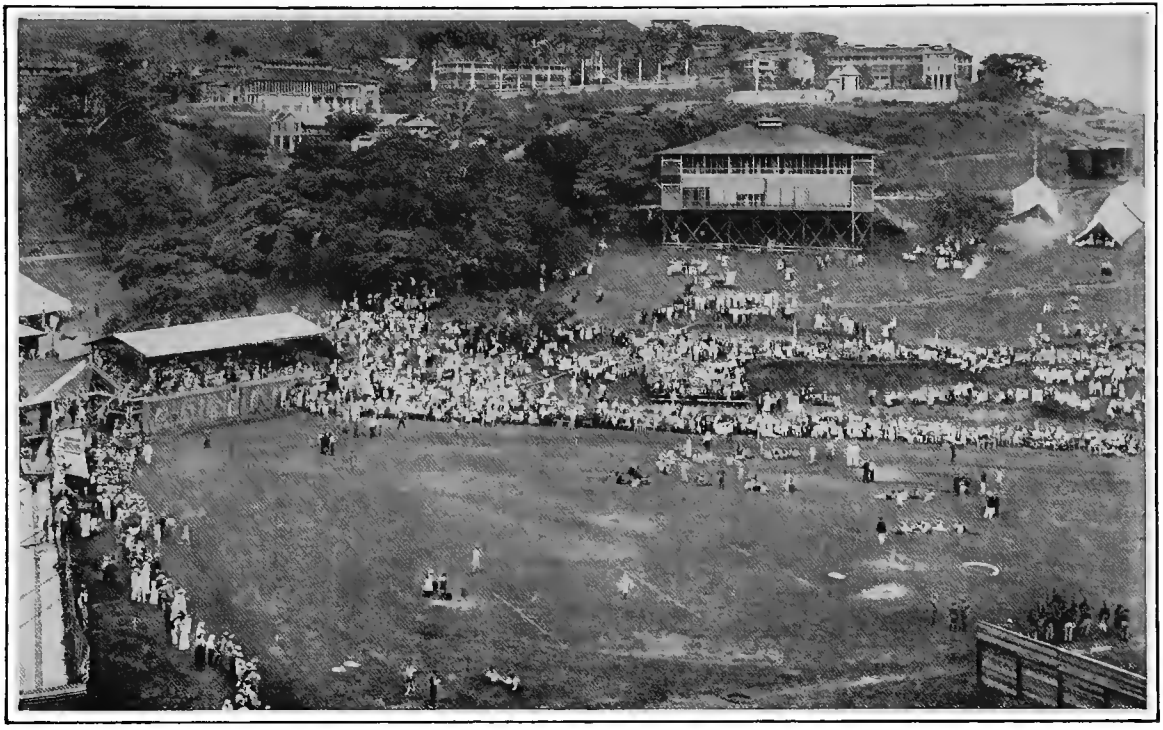
Notwithstanding the fact that the shipowner collects for the carrying of $2\frac{1}{2}$ tons where he pays toll on 1 ton, he still has to pay what seems, in the aggregate, a large sum of money each time his ship passes through the canal. An ordinary 5,000-ton ship will be charged $6,000 for passing from one ocean to the other. A ship like the *Cleveland*, the first around the world tourist steamer advertised to pass through the canal, will have to pay $14,000 for the 12-hour trip from Colon to Panama. A steamship like the *Lusitania* will have to put up some $30,000 for a single passage. The average ship will pay from $5,000- to $10,000 for its passage. This seems like a high rate, even though it does amount to only 2 or 4 cents per hundredweight of cargo, but when one takes into consideration the time saved in passing through the canal, and the cost of main-

taining a ship on the high seas, the rate becomes a reasonable one.

The average ship costs about 10 cents per net registered ton per day for keeping it in operation. Thus a 10,000-ton ship will save about a thousand dollars for each day its voyage is shortened. If this voyage be shortened by 20 days, the shipowner makes a net saving of $8,000 when he selects the Panama route over some other route. In fact, he may save even more than this, for the other route might involve the giving of additional space for bunker coal, which otherwise would be used for cargo. Convenient coaling stations mean a minimum of space required for the operation of the ship and a maximum of cargo-carrying capacity. In this way a merchant ship might save several thousand dollars additional by choosing the Panama route over the Strait of Magellan.

It is estimated that the tolls it will be necessary to collect to make the canal self-supporting will be $15,500,000 a year, since that amount will be required to meet the expense of operation and return 3 per cent interest on the investment. The $15,500,000 is made up of $3,500,000 for operations, $250,000 for sanitation and government and $11,250,000 for interest on the $375,000,000 the canal cost. This takes no account of approximately $10,000,000 which will be required for the support of the troops on the Isthmus. Should this be considered, the total annual charges to be made would approximate $25,000,000, but this, in the view of those who have considered the matter, is not a proper charge against the cost of operation.

It has been stated that a proper system of



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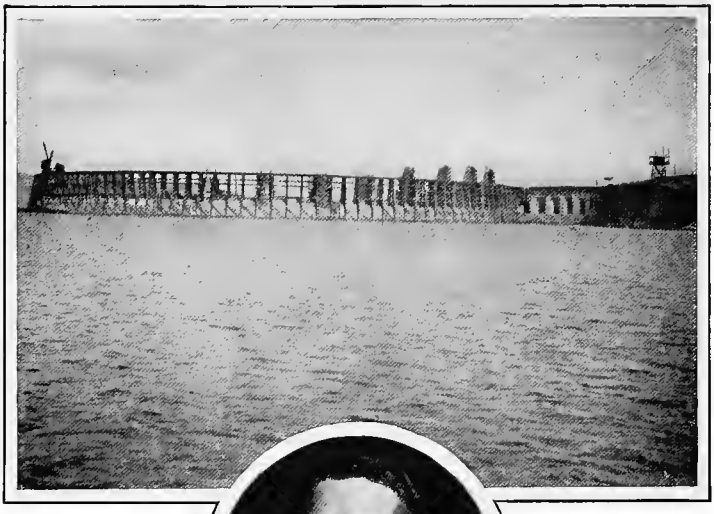

CALEB M. SAVILLE

GATUN SPILLWAY FROM ABOVE AND BELOW

finances would provide for the repayment of the cost of constructing the canal in a hundred years. This would mean an annual charge of $3,750,000, and would bring the total annual outlay, exclusive of the cost of protection, up to $19,250,000. From this viewpoint the canal will not be self-sustaining until the total traffic approximates 17,000,000 tons a year, which it will reach about 1925.

It has been estimated by Prof. Emory R. Johnson, the Government expert on canal traffic, that the total tonnage which will pass through the canal during the first year of its operation will approximate 10,500,000 net registered tons. Since the shipping of the United States is permitted to pass through without paying tolls, the tonnage upon which toll will be collected will yield a gross revenue of approximately $10,000,000. This will afford the United States an income of a little less than 2 per cent on the money invested, after paying the actual cost of operation. On this basis it probably will be four or five years from the opening of the canal before the returns will yield 3 per cent on the investment.

The ships of the world use approximately 75,000,000 tons of coal annually. The opening of the Panama Canal will save several million tons a year and the money thus saved will, in part, fall into the coffers of Uncle Sam. A vessel en route from Chile to Europe can save nearly enough in the cost of coal alone to pay the tolls that will be exacted at Panama.

When the United States came to frame its system of toll charges and collections, it was found

that there was a wide difference of opinion as to the right of the United States Government to exempt coastwise shipping from the payment of tolls. Under the Hay-Pauncefote treaty with Great Britain there was also a wide variance of opinion as to the question of whether the United States, as a matter of national policy, ought to exempt from the payment of tolls, ships trading between its own ports on the two coasts. These questions were argued pro and con, and Congress finally decided by a very close vote that the United States ought to allow ships trading between its own ports to use the canal free of charge. No foreign ships are permitted under any circumstances to engage in such traffic.

Those who advocated the exemption of ships trading exclusively between United States ports from the payment of tolls, did so on the ground that it would build up a wealthy American merchant marine which would be invaluable to the United States in time of war, and also that it would tend to reduce freight rates between Atlantic and Pacific points. They argued that every cent added to the cost of transportation through the canal would be reflected in freight rates between the East and the West.

Those who opposed the exemption of American coastwise shipping from the payment of tolls, asserted that the coastwise shipowners already had a monopoly on the handling of cargo between American ports, and that no further encouragement was needed. They argued that it would make little or no difference in rates whether tolls were charged or not, and that the only people who would

benefit would be the shipowners. They contended that the United States ought to charge everybody alike and use the tolls collected for the purpose of repaying the money it spent in building the canal. Some of them also contended that the Hay-Pauncefote treaty bound the United States to treat all shippers alike, and that the United States could not discriminate in favor of the American coastwise traffic without contravening the treaty with Great Britain. This view, however, did not prevail, and the law, as enacted, exempted coastwise shipping.

England immediately protested against this exemption on the ground that it was in contravention of the treaty between the two countries. The story of how the United States came to be bound by a treaty with Great Britain in the building of an Isthmian canal goes back for more than half a century. The year 1850 found the North American continent, north of the Rio Grande, in the possession of the United States, England, and Russia. The United States had only recently finished its continental expansion, and each of the two countries needed a canal to connect their east and west coasts. England had long possessed a west coast in Canada, but the United States had only recently come into possession of a Pacific seaboard. When it came to consider the question of connecting its two coasts the United States found that Great Britain was holding the position of advantage in the Isthmian region. It held the Bahamas, Bermuda, Jamaica, the Barbados, Trinidad, the Windward and Leeward Islands, British Guiana and British

Honduras; and held a protectorate over the "Mosquito Coast," now the east coast of Nicaragua. That protectorate covered the eastern terminus of the only ship canal then deemed possible.

Under these conditions the United States concluded that it was necessary for the support of the Monroe doctrine that some sort of an understanding should be reached between the two countries. England assented to such an understanding only after Nicaragua and Costa Rica had given to the United States its consent to the building of a canal across its territory. These treaties with Nicaragua and Costa Rica were negotiated but never ratified, and were used as a club to force Great Britain to make a treaty. The result was the Clayton-Bulwer treaty, which provided that neither Government should ever obtain or maintain for itself any exclusive control over an Isthmian canal, and that neither Government should ever secure for itself any rights or advantages not enjoyed by the other in such a canal. The proposed canal was to be entirely neutral, and the treaty set forth that the two countries agreed jointly to protect the entire Isthmian region from Tehauntepec to South America, and that the canal always should be open to both countries on equal terms. The canal under this treaty was intended to be entirely neutral with reference to defense, with reference to tolls, and with reference to such other nations as might join in maintaining neutrality.

When the United States decided to build the Panama Canal, it found the Clayton-Bulwer

treaty wholly unsuited to its aims and desires. It therefore asked England to enter into a new convention; the Hay-Pauncefote treaty was the result. This document declared that its purpose was to remove any objections that might arise under the Clayton-Bulwer treaty to the construction of an Isthmian canal under the auspices of the Government of the United States without impairing the general principle of neutralization.

Under this treaty the Government of Great Britain made a protest against the decision of the United States to exempt its coastwise traffic from the payment of tolls, claiming such exemption to be a violation of the neutrality agreement. This protest came in the form of two notes to the American Government. The first was written as a warning to Congress that the British Government would regard the exemption of American coastwise traffic from the payment of tolls as a discrimination against British shipping, and a violation of the neutrality agreement between the two countries. It admitted that if the United States were to refund or to remit the tolls charged, it would not be a violation of the letter of the treaty, and acknowledged that if the exemption of coastwise American shipping from toll charges were so regulated as to make it certain that only bona fide coastwise traffic, which is reserved for American vessels, would be benefited by this agreement, then Great Britain could have no objection. But it declared that England did not believe that such regulation was possible.

After Congress, with this note in mind, had

passed the canal toll law with an exemption to ships carrying goods between the two coasts of the United States, President Taft, in approving the measure, declared that the canal was built wholly at the cost of the United States on territory ceded to it by a nation that had the indisputable right to make the cession, and that, therefore, it was nobody else's business how we managed it. He contended that for many years American law had given to American ships the exclusive right to handle cargo between American ports, and that, therefore, England was not hurt at all when that shipping was exempted from toll charges.

England responded, in a second note, that the clear obligation of the United States under the treaty was to keep the canal open to the citizens and subjects of the United States and Great Britain on equal terms, and to allow the ships of all nations to use it on terms of entire equality. It also contended that the United States is embraced in this term of "all nations"; that the British Government would scarcely have entered into the Hay-Pauncefote treaty if it had understood that England was to be denied the equal use of the Panama Canal with America. The three direct objections urged by the British against the American canal law were: That it gives the President the right to discriminate against foreign shipping; that it exempts coastwise traffic from paying tolls; and that it gives the Government-owned vessels of the Republic of Panama the right to use the canal free. The answer of the United States to the first of these

objections was that the right of the President to fix tolls in a way that would be discriminatory against British shipping was a question that could be considered only when the President should exercise such action.

The British Government expressed the fear that the United States, in remitting tolls on coastwise business, would assess the entire charges of maintenance of the canal upon the vessels of foreign trade and thus cause them to bear an unequal burden. This, the second objection was answered with the statement that, whereas the treaty gives the United States the right to levy charges sufficient to meet the interest of the capital expended and the cost of maintaining and operating the canal, the early years of its operation will be at a loss and, therefore, at a lower rate than Great Britain could ask under the treaty. The third objection was considered insignificant.

The British Government, after laying down its objections to the American canal toll law, requested that the matter be submitted to The Hague tribunal for adjudication. The American Government declared that this course would not be just to the United States, since the majority of the court would be composed of men, the interests of whose countries would be identical with those of England in such a controversy. Before leaving office President Taft proposed that the matter should be submitted to the Supreme Court of the United States. The whole question was left in that situation when the change from the Taft to the Wilson administration took place.

As to the merits of the controversy, there is no

unanimity of opinion on either side of the Atlantic. Some British authorities entirely justify the American position, while some American authorities take the British position. It is probable that the controversy will require years for settlement.

Before the canal was open for traffic there was much speculation as to what rate policies the railroads would adopt to meet the situation caused by the competition of the Panama Canal. If the same classes of goods are handled through the canal as across the United States, there will be more than 3,000 different articles on the tariff books of steamship lines using the canal. In his report on the effects of canal tolls on railroad rates, Prof. Emory R. Johnson expressed the opinion that the payment of tolls by ships engaged in coast trade would affect neither the rates of the regular steamship lines nor the charges of the transcontinental railroads.

A provision of the canal toll law forbids any railroad to be directly or indirectly interested in any ship passing through the canal, carrying freight in competition with that railroad. This provision was inserted to prevent the railroads from controlling the steamship lines using the canal, and through that control fixing rates between the two coasts on such a basis as to prevent effective competition with the railroads themselves. The result was that a number of railroads had to dispose of their steamships engaged in coastwise trade. This provision affects several Canadian railroads, and after it was made the British Government served notice on the United States that it intended to take up this

AN ELECTRIC TOWING LOCOMOTIVE IN ACTION

BLOWING UP THE SECOND DIKE SOUTH OF MIRAFLORES LOCKS

question and consider whether or not the law in this particular does not infringe upon British rights.

Nothing seems more certain than that, in the course of years, canal tolls will be materially lowered from the $1.20 fixed by the President. It seems inevitable that the Panama Canal and the Suez Canal will enter into a lively battle for the great volume of trade between eastern Asiatic and Australasian points and western European ports. On this dividing line between the two great interoceanic highways there originates many millions of tons of traffic, and this will be largely clear gain to the canal which gets it. The considerations which will draw this trade one way or the other are the rates of toll, the convenience of coaling stations, the price of coal, and the certainty of the ability to secure proper ship stores. This spirit of competition will probably serve to lower rates more rapidly than they otherwise might be reduced. With some 10,000,000 tons of traffic on the great divide between the two canals, ready to be sent forward by the route which offers the best inducements, it is certain that good business policy will call for some hustling on the part of both canals. As the business of the Panama Canal expands, it can afford to reduce rates. With an ultimate capacity of 80,000,000 tons a year, as the canal stands to-day, the rate of toll could be cut down to 25 cents a ton when that capacity is reached, and still afford the United States an income large enough to take care of the operation and maintenance of the canal, and sanitation and government of the Canal Zone, to meet the interest

on the cost of building it, and to amortize the entire debt in a hundred years.

It is certain that the United States made a good investment at Panama. Assuming that the coastwise traffic is worth to the Government the amount of the tolls it is exempted from paying, the canal becomes a self-supporting institution from the day of its opening, leaving all the military and trade advantages it affords the United States as clear profit.

CHAPTER XXVI

THE OPERATING FORCE

IT WILL require a force of about 2,700 persons to operate the Panama Canal. The major portion of this force will be engaged on the port works at the two ends of the waterway. With a large mechanical plant at Balboa, with large docks for the transhipment of cargo, and with other facilities required for making the canal the best equipped waterway in the world for handling marine business, more men will be needed for the conduct of the auxiliary works than for actually putting ships through the locks.

The force required at the locks will be comparatively small. It will consist of men in general charge of the lock operations, men in charge of the towing operations, men who handle the various mechanism and operate the several types of valves for the regulation of the water in the locks; and the general labor force consisting of a few hundred operatives at each end of the canal. A force will be required to operate the big hydroelectric station at Gatun Spillway, where the electricity for the operation of the locks and for the lighting of the canal will be generated. Another force will be required at the auxiliary power plant at Miraflores which will be operated by

steam. Fewer than a thousand men will be required in putting ships through the canal.

When the question of placing the canal on a permanent operating basis arose one of the first considerations was the scale of salaries to be fixed. Having in mind the fact that salaries paid during the construction period (which were 50 per cent above the standard in the United States) were based upon conditions existing in the early days of the American occupation, it was decided that this was an unfair basis for the permanent organization. The salaries for the construction period were made high because they had to be. It was more a question of reducing men to risk their lives than of fixing fair rates of compensation. The conclusion reached was that there was no longer any reason why the Government should pay salaries so much higher than obtained in the States, especially in view of the fact that all positions under the permanent organization would carry with them free quarters, free medical attendance, free fuel, free light, free hospital service and the like. It was finally determined that it would be fair to both the employee and the employer to establish as a basis of compensation for services in the permanent organization a scale of salaries not to exceed 25 per cent higher than obtained for similar positions in the United States. This decision was made on the basis that it would be fair to the employee and at the same time would allow the canal to be operated at a cost which would impose no undue burden on shipping.

When Congress took up the matter in the enactment of the permanent canal law, it reflected

the recommendations of the chairman and chief engineer of the Canal Commission in almost every particular. With reference to the canal employees, that body provided that they should be appointed by the President or by his authorities, and that they should be removable at his pleasure; also, that their compensation should be fixed by him until such time as Congress should regulate it by law.

The head of the permanent force on the Canal Zone will be known as the Governor of the Panama Canal. He is to be appointed by the President with the advice and consent of the Senate, for a four-year term, or until his successor shall be appointed and qualified. He will receive a salary of $10,000 a year, and will be the personal representative of the President on the Isthmus. Indeed, the permanent organic act provides that the President himself is authorized, after the disbanding of the Isthmian Canal Commission — which is to take place whenever the President thinks the work has approached a sufficient degree of completion to warrant it — to complete, govern, and operate the Panama Canal, and to govern the Canal Zone, if he desires to do it himself; or "cause it to be completed, governed, and operated through a governor of the canal." Of course, the President will prefer to "cause it to be completed, governed, and operated" through such a governor. As a matter of fact, when the question of selecting a governor comes before the President it may be expected that he will choose a man in whom he has every confidence to carry out the organic law on the Canal Zone, and to

place the canal in operation. This man will be as much of an autocrat on the Zone under the permanent organization as the chairman and chief engineer was during the construction.

When President Roosevelt undertook to carry out the provisions of the Spooner Act, and to have the canal dug by a board of seven commissioners, each independent of the other, he soon found that it would not work. After repeated trials he came to the conclusion that the control of affairs on the Isthmus should be concentrated largely under the chairman and chief engineer. He therefore issued an executive order requiring that all officials on the Isthmus should report to the chairman and chief engineer, giving him practically all control over the entire project. This brought both the Canal Zone Government and the sanitary department under the supervision of the chairman and chief engineer. The result was a coordination of the work and a satisfactory organization for its prosecution.

When Congress came to make the permanent canal law it profited by the unsatisfactory results that would have grown out of a rigid adherence to the principles of the Spooner Act, and concentrated all authority under the governor of the Canal Zone. There were those who thought the sanitary department should not be under the control of the governor, and still others who felt that the operation of the canal probably should be under one man and the civil government under another. But these suggestions were not followed, and the act as finally adopted makes the President practically a czar of the Isthmus, and

under him the governor need give account to no one but the President.

It has been the ambition of the present chief engineer of the canal to see the operating force fully installed and things moving along on a satisfactory working basis before leaving the Isthmus. He thinks arrangements should be made whereby acute changes of policy should be prevented. This he would do by having a principal assistant who would succeed the governor at the end of his four-year term. This would permit a continuous policy and an unbroken line of action which, according to his view, would make for the efficiency of the operating force. In speaking of this phase of the matter, he stated that were a new man chosen at the end of the four-year term of his predecessor — a man who had had no previous experience on the Isthmus — there would always be a tendency to make radical changes.

He would have on the governor's staff a doctor from the Army to have charge of the work of sanitation on the Canal Zone, who would report directly to the governor. The quarantine officer, in his opinion, should be under the Public Health Service of the United States. Under the plan as adopted in the permanent canal law, any officer of the Army or of the Navy chosen to fill a position in the canal operating force will be paid the same salary as a civilian, with the exception that he would get only the difference between his regular Army or Navy pay and the salary his position carried.

It is estimated that the expense of operating the canal will amount to about $3,500,000 a year.

This includes the cost of operating a number of dredges which will have to be maintained in connection with the canal work. The estimate was made upon the amount of business handled at the Sault Ste. Marie Canal which has the largest traffic of any canal in the world.

There will be five departments for the operation of the canal outside of the work of maintaining the civil government and sanitation. The operating department will have charge of the operation of docks and wharves at the terminals, pilotage, lockage, and the lighting of the canal. It is estimated that it will cost $400,000 a year to maintain the terminals, $150,000 a year to light the canal, and that it will require 60 pilots, at $1,800 each a year, to take ships through. During the first years of operation it is believed that a single shift can handle all the business that comes, but, as the years go by, it may require two shifts and eventually three to keep the work going.

The engineering department will require about 500 men and will have charge of all the construction and repair work pertaining to the canal property, and of all excavation and dredging in the canal. It will cost approximately a million dollars a year to maintain this department, of which three-fourths will be required for the operation of the dredges and other equipment for keeping the canal open.

The quartermaster's department will have charge of the construction, repair, and maintenance of all buildings, roads, and municipal improvements in the Zone settlements and of the receipt, care, and issue of all property and material. This department

will require nearly a thousand men and the total expense will be in the neighborhood of $600,000.

The electrical and mechanical department will have charge of the mechanical and electrical apparatus belonging to the canal, and of the permanent works at its two ends.

The accounting department will require some 60 men with annual salaries amounting to approximately a hundred thousand dollars. It is estimated that the cost of materials for the operation of the canal will range around three-fourths of a million dollars a year.

The force which will be maintained on the Isthmus, with their families, will make a Canal Zone population of approximately 5,000. These, in addition to the eight or nine thousand troops and marines which will be quartered there, will bring the total population up to about thirteen or fourteen thousand. Of these perhaps three-fourths will be along the southern 10-mile section of the canal. But, in spite of the greater population at the Pacific side, the Atlantic end will probably not lack for attraction. It is likely that Gatun Lake will be stocked with a supply of fresh-water fish, and that shooting preserves will be established adjacent to Gatun, to be conducted in connection with the Washington Hotel at Colon. There is also some talk of constructing golf links adjacent to Gatun, which will be open alike to the employees of the canal and to the guests of the two big Government hotels — the Washington and the Tivoli.

While a freight-carrying steamer will make its stay as short as possible, the probabilities are

that the passenger-carrying steamer will require at least 48 hours to make its calls at the two terminal cities and pass through the canal. They will probably handle the major portion of the package cargo, leaving the bulk cargo business entirely for freighters. When going through the canal from the Atlantic to the Pacific they probably will have cargo bound for a large number of Pacific ports on diverse routes. This would be discharged at Balboa and there be put into other ships to be carried to its destination. During the time the shipping and unshipping of cargo, replenishing stores, taking on coal and like operations are being performed, the traveler will be afforded opportunity to get acquainted with dry land again, and to enjoy for a day or two a respite from his long sea journey.

The plan advocated on the Isthmus for perfecting the permanent organization was as follows: The chairman and chief engineer would call upon each of the departments to furnish a list with the ratings of the best men. The man having the best record would be offered a position under the permanent organization similar to the one held by him under the construction organization. If he chose to accept this position under the wage standard laid out he could do so; if he did not, the next man would be given the opportunity, and so on down. In this way it was expected that the entire force would be chosen because of records made in the service.