



DETAIL CONSTRUCTION OF A LOCK

The great tube, later covered by concrete, carries the water for filling the chamber

dolph, on Margarita Island, there are eight mortars of the new type, two 14-inch guns and two 6-inch guns. That armament will protect the Margarita Island side of the entrance and it also controls the waters to the south. On the Toro Point side at Fort Sherman we have eight mortars, two 14-inch guns, and two 6-inch guns. There are in addition two 6-inch guns provided at Manzanillo Point, city of Colon. In my opinion this armament is entirely adequate for the defense of the Atlantic side'".

It is apparent, therefore, that the unfortified Island of Taboga is the one questionable point in our Pacific line of defense. It is wholly probable that steps will be taken to erect such defenses as will make the seizure of this island impracticable to any enemy.

Plans for the landward defenses of the coast forts had not been determined upon at the time of publication of this book. Necessary no doubt from a

strictly military point of view, they seem to the civilian mind rather superfluous in view of the character of the countryside along the borders of the Zone. The general who would undertake to lead an army through the jungle would encounter a natural foe such as armed forces have never had to overcome, and his invading column would hardly emerge upon the Zone in fit condition to give battle to any considerable army of occupation.

However, should an enemy once effect a landing at any point within striking distance of Panama or Colon, say on the Chorrera coast, or at Nombre de Dios or Porto Bello, some defensive works would be needed to prevent their taking the coast forts in the rear. Such works are being planned and an extensive permanent camp is to be built at Miraflores, at which point the Canal can be readily crossed—there are to be no permanent bridges—and smaller posts at Margarita Island, Toro Point

and Culebra Island. To man the actual seacoast forts there will be 12 companies of coast artillery of 109 men each; while distributed in the army camps will be, according to present estimates, three



Photo by H. Piller

Courtesy, National Geographic Magazine

A GROUP OF GUYAMI GIRLS

regiments of infantry, a squadron of cavalry and a battalion of field artillery, making in all rather more than 8000 men.

The probable influence of the Panama Canal on commerce, on trade routes, on the commercial supremacy of this or that country, on the development of hitherto dormant lands is a question that opens an endless variety of speculations. Discussion of it requires so broad a knowledge of international affairs as to be almost cosmic, a foresight so gifted as to be prophetic. A century from now the fullest results of the Canal's completion will not have been fully attained. This creation of a new waterway where a rocky barrier stood from the infinite past in the pathway of commerce will make great cities where hamlets now sit in somno-

lence, and perhaps reduce to insignificance some of the present considerable ports of the world.

Certain very common misbeliefs may be corrected with merely a word or two of explanation. Nothing is more common than to look upon all South America as a territory to be vastly benefited by the Canal, and brought by it nearer to our United States markets. A moment's thought will show the error of this belief. When we speak of South America we think first of all of the rich eastern coast, of the cities of Rio de Janeiro, Montevideo and Buenos Ayres. But it is not to this section that the greatest advantage will come from the Canal. Vessels from our Pacific coast can indeed carry the timber of Puget Sound, the fish of Alaska and the Columbia River, the fruits of California thither more cheaply than now, but that is but a slight fraction of their trade. Nor are Brazil and the Argentine participators in Oriental trade to any great extent, though the Canal may make them so. The western coast of South America is chiefly affected by the Canal, and that to a degree rigidly limited by the distance of the point considered from the Straits of Magellan, and the size of the Canal tolls imposed.

Nor will the Suez Canal be an abandoned waterway after our own cut at Panama is completed. It will, indeed, be not surprising to see the Suez Canal tonnage increase, for trade breeds trade, and the Panama Canal will be a stimulant as well as a competitor. To all of British India and Southern China the distance from Liverpool via Suez is less than via Panama, and to Melbourne, Sidney and other Australian ports the saving in distance via Panama is less than 2000 miles. The Suez Canal,



A ZONE SIGN OF CIVILIZATION

it is to be remembered, is owned by Great Britain and a very slight concession in rates will be all that is needed to keep British merchant vessels to their long accustomed routes. We have had a harder task in digging our Canal than the French had at Suez, but we need cherish no delusive idea that we are going to put the earlier waterway out of business.

The really great material advantage which the United States is to derive from this monumental national undertaking will come from the all-water connection between our own Atlantic and Pacific coasts. A ship going from New York to San Francisco via the Straits of Magellan traverses 14,000 miles of sea—some of it the very most turbulent of all King Neptune's tossing domain. By Panama the same ship will have but 5000 miles to cover. The amazing thing is that ships are going around the Horn, or at least through the Straits, but the high rates on transcontinental railroads make even that protracted voyage profitable. What the Canal will do to transcontinental rates is a matter that is giving some railroad managers deep concern. It was in fact a consideration which led to prolonged and obstinate opposition to the building of any canal at all. Water carriage between the two coasts has long been a bogey to the railroad managers. When coastwise steamships on the Atlantic and Pacific with the Panama Railroad for a connecting link offered some competition, the five transcontinental railways pooled together and, securing control of the Pacific Mail Steamship line operating between San Francisco and Panama, used it to cripple all competition. For a time there was danger that the methods then employed might be

adopted to destroy the usefulness of the Panama Canal, and it was to guard against this that Congress adopted the law denying the use of the Canal to vessels owned by railroad companies.



HIS MORNING TUB

At the time of its passage this law created much discussion. The reason for it was widely misunderstood. Its first effect was the canceling of several orders for ships placed by railroad companies with shipbuilders in anticipation of the Canal's opening, and the public naturally cried out against a measure which seemed to interpose an obstacle to the re-appearance of the American flag on the high seas. But the law was bred of bitter experience. In bygone days it was discovered that both time and money could be saved on shipments from California to New York or other Atlantic seaports by sending them to Panama by water, across the Isthmus by rail, and then by water from Colon to their destina-



PART OF THE COMPLETED CANAL



NATIVE GIRL, CHORRERA PROVINCE

tion. This route grew in favor until the transcontinental railroads intervened to check its further development. Getting control of the Pacific Mail line of steamers from San Francisco to Panama, they first put their rates so low as to drive all competing ships from the route. Of course they lost money, but the loss was apportioned among the companies forming the pool, and when the competing concerns had been ruined or driven out of business, the rates were put up again and the losses that had been incurred were speedily recouped. Once the complete monopoly on the Pacific had been secured, every effort was made to discourage shipments by that route. The ships passed Los Angeles, the greatest fruit port in the country, without a call, but touched at innumerable little mud villages in Central America so as to make the time of through shipments intolerable. They often sailed with half a cargo—refusing to take freight that lay at their

docks on the plea that all their cargo space was disposed of. It was—to the railroads who afterward gathered up the rejected freight and shipped it east over their own lines at prices to suit themselves.

Taught wisdom by these tactics—against which they had unavailingly employed all the expedients of law and of coöperative competition—the shippers of California appealed to Congress to act wisely lest the Panama Canal as a waterway for all and a regulator of transcontinental freight rates be throttled by the railroads. They pointed out that the roads might in combination maintain one line of ships between New York and San Francisco which would make rates so low that no other line could meet them and live. Doubtless such a line would lose money, but the loss, divided among the conspiring roads, would be but a flea bite to each, and would be more than recouped by the higher rail rates they might charge. In response to this



NATIVE BOY, CHORRERA PROVINCE

appeal Congress enacted the law denying railroads the right to maintain lines of water carriage on what would be normally competitive routes. The statute though planned primarily for the maintenance of the highest usefulness of the Panama Canal affects other routes, notably Long Island Sound. It is denounced by the railroads and has doubtless checked to some extent American shipbuilding, but it is nevertheless the only apparent weapon against a very real and harmful device in the railroads' efforts to maintain high rates.

The question of the tolls to be charged for passage through the Canal is one that has evoked a somewhat acrimonious discussion, the end of which is not yet. About the amount of the toll there was little dispute. It was determined by taking the cost of maintenance of the Canal, which is estimated at about \$4,000,000 annually, and the interest on its cost, about \$10,000,000 a year, and comparing the total with the

for the first year at 10,500,000 tons, with an increase at the end of the first decade of operation to 17,000,000, and at the end of the second decade to 27,000,000 tons. The annual expenses of the Canal, including interest, approximates \$14,000,-



MAIN STREET, CHORRERA

000, and Congress has accordingly fixed the tolls at \$1.20 a ton for freight and \$1.50 per passenger. It is anticipated that these figures will cause a deficit in the first two or three years of operation, but that the growth of commerce through the Canal will speedily make it up.

In legislating upon the question of tolls Congress opened an international question which has been fiercely debated and which remains a subject of diplomatic negotiation between our State Department and the British Foreign Office. This was done by the section of the law which granted to American-built ships engaged in the coasting trade the right to

use the Canal without the payment of any tolls whatsoever. At the time of its appearance in Congress this proposition attracted little attention and evoked no discussion. It seemed to be a perfectly obvious and entirely justifiable employ-



PARK AT DAVID

amount of tonnage which might reasonably be expected to pass through annually. Prof. Emory R. Johnson, the government expert upon whose figures are based all estimates concerning canal revenues, fixed the probable tonnage of the Canal

ment of the Canal for the encouragement of American shipping. The United States had bought the territory through which the Canal extended and was paying every dollar of the cost of the great work. What could be more natural than that it should concede to American shipping owners, who had borne their share of the taxation which the cost of the Canal necessitated, the right of free passage through it?

The concession seemed the more obvious and proper because the privilege of free passage was limited to vessels in the coastwise trade. Under our navigation laws maritime trade between ports in the United States is confined to ships built in American shipyards. This regulation is clearly intended to confer upon the United States a monopoly of the building of coastwise ships, and the subsequent exemption of coastwise ships from Panama Canal tolls was a further benefaction to this monopoly. As a matter of fact, our coastwise trade was at the moment passing into monopolistic control, and the wisdom of making so prodigious a gift to a monopolistic combination might have justly been questioned. But the strictly business features of the Canal have always been decorated with more or less sentimental declamation about reestablishing the American flag on the high seas, and it was to contribute to the latter desirable end that the tolls were to be remitted. It seemed to occur to no one that the ships thus favored were either owned by railroad com-

panies and used largely to stifle competition or by a somewhat notorious organizer of trusts whose ambition was to control water transportation from Maine to the Mexico border, and who was checked in the attainment of his aim by a sentence to the Federal penitentiary. It is not only in war time that the flag is waved most enthusiastically by men

who only want the bounty that goes with it.

Nobody, however, at the time of the passage of the act regulating tolls thought it had any particular international significance. Its signature by the President was taken as a matter of course and it was not until some time afterward that the Ambassador of Great Britain presented his country's claim that the exemption clause was in violation of the Hay-Pauncefote treaty. The section of that treaty which it is claimed is violated reads thus:

"The Canal shall be free and open to the vessels of commerce and of war of 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 changes of traffic".

The outcry against the exemption clause soon became very vociferous. Perhaps the Canadian railroads or some of their officials may have been instrumental in this, seeing a possible profit in running ships from Montreal or Quebec to Vancouver or Victoria, touching at various United States ports en route. Such a voyage would not



A PLACID BACK WATER IN CHIRIQUI

constitute a "coastwise passage" under our laws, and foreign vessels might engage in such traffic. But they saw that the exemption in tolls by which a United States vessel of 12,000 tons would escape canal tolls amounting to \$15,000 would put them at a serious disadvantage. Hence they appealed to Great Britain and the protest followed. Whether affected by the vigorous colonial protest or not,

sacrificed her coastwise register if she continued her voyage to Yokohama or Hong Kong.

American public men and the American press are radically divided on the question. A majority, perhaps, are inclined to thrust it aside with a mere declaration of our power in the matter. "We built the Canal and paid for it", they say, "and our ships have the same rights in it that they have in the



GATUN LAKE. FLOATING ISLANDS MASSED AGAINST TRESTLE

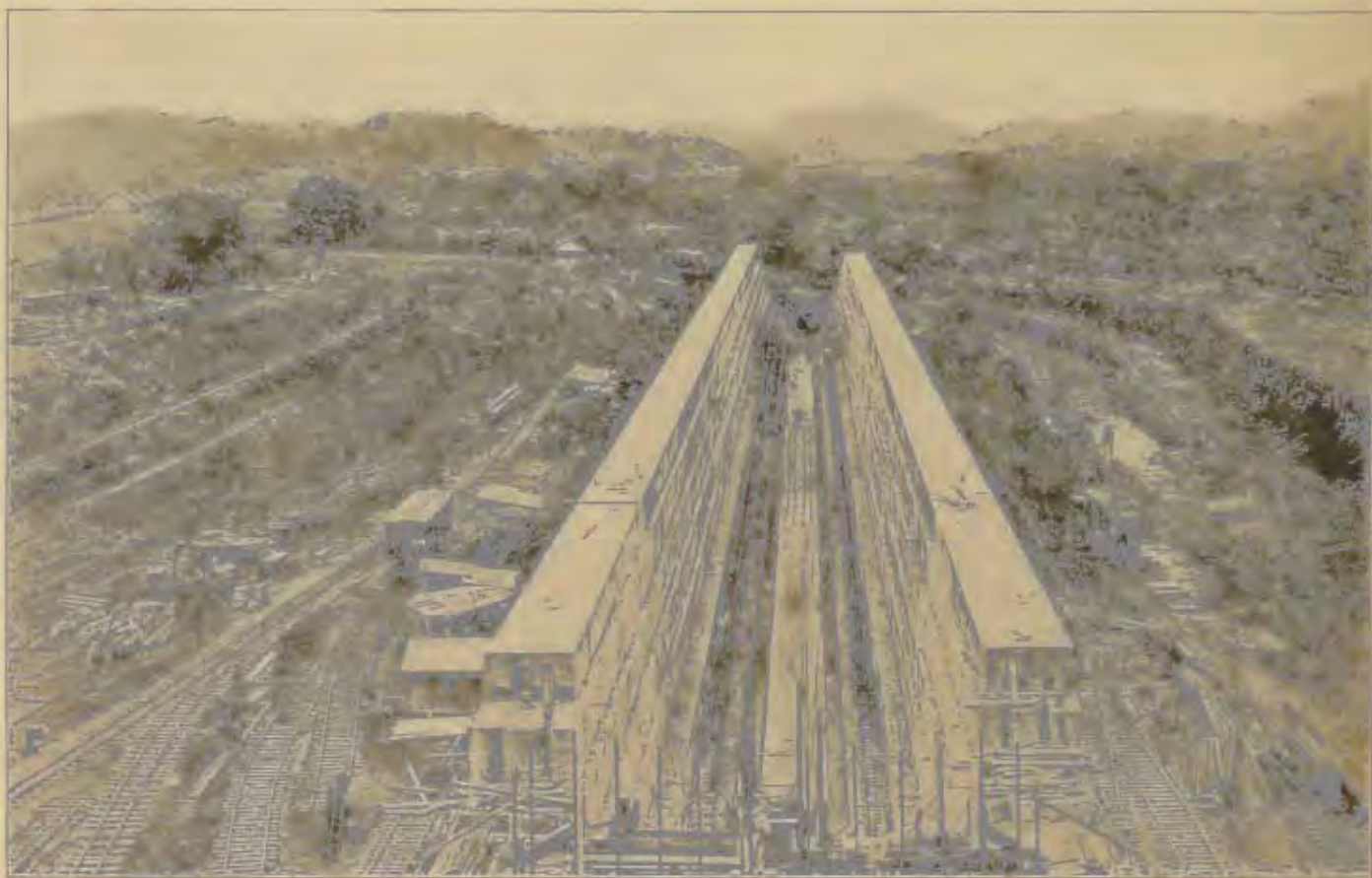
the British government urges that the United States will very properly adjust its tolls to meet the needs of the Canal for revenue, and that if the coastwise shipping be exempted there will be a loss of some millions of dollars in revenue which will compel the imposition of higher tolls on other shipping. It is urged also on behalf of the protestants that the word "coastwise" is capable of various constructions and that a vessel plying between New York and Los Angeles might be held not to have

Hudson River or the canal at the Soo. Besides the British cannot engage in our coasting trade anyway, and what we do to help our coastwise ships concerns no one but us". Which seems a pretty fair and reasonable statement of the case until the opponents of the exemption clause put in their rejoinder. "Read the treaty", they say. "It is perfectly clear in its agreement that the United States should not do this thing it now proposes to do. Treaties are, by the Constitution, the supreme law of the

land. To violate one is to violate our national honor. It would be disgraceful to let the word go out to all the world that the United States entered into sacred obligations by treaty and repudiated them the moment their fulfilment proved galling. The protected shipyards, the already subsidized coastwise steamship companies, are asking for more gratuities at the cost of our national honor. What is the use of reestablishing on the high seas a flag which all peoples may point out as the emblem of a dishonorable state"?

So rests the argument. The advocates of the remission of tolls to the coastwise ships of the United States have the best of the position, since their contention is already enacted into law, but the opposing forces are vigorously urging the repeal of the law. Congress will of course be the final arbiter, and as the Canal cannot be opened to commerce before 1915 there is ample time for deliberation and just judgment. A phase of the problem

which I do not recall having seen discussed arises out of the literal acceptance of the language of the treaty as bearing upon the use of the Canal in war time. It declares that the Canal "shall be free and open to the vessels of commerce and of war of all nations . . . on terms of entire equality", and while it goes on to prescribe the rules to be followed in war time it nowhere declares the right of the United States to debar to the warships of a hostile nation the privilege of passing through the Canal. Under the strictest construction of the language of the treaty the refusal of the United States to permit a German or a Japanese fleet to pass through, even though that nation was at war with us, would be a violation of the treaty which would justify English interference to enforce the opening of the Canal—which of course would be war. No such contingency could possibly arise, nor any such construction be put upon the language of the treaty by any reasonable and responsible party. Yet it



GUIDE WALL AT MIRAFLORES

This picture shows method of lock construction. The space within these two walls will be filled with dirt and cement. The ground on either side will be inundated, forming a small lake through which the Canal passes.

is scarcely a more forced construction than the one applied in order to make it appear that we may not free our own ships in purely domestic trade from canal tolls.

The fundamental principle controlling the amount of the tolls is to fix them at such a figure as to minimize the competition of Suez. Commerce proceeds by the cheapest route. Some slight advantage may accrue to the Panama route if the government can

make such contracts with American mines as to be able to furnish coal at the Isthmus at a price materially less than is charged at Suez. The estimates, supplied by Prof. Johnson, of probable commerce have been based on a price for coal at Cristobal or Colon of \$5 a ton and at Balboa of \$5.50 a ton. At the time the prices for coal at Port Said on the Suez

Canal were from \$6.20 to \$6.32 a ton. This, plus cheaper tolls, will give Panama a great advantage over Suez.

The first immediate and direct profit accruing to the people of the United States from the Canal will come from the quick, short and cheap communication

it will afford between the eastern and western coasts of the United States. People who think of passenger schedules when they speak of communication between

distant cities will doubtless be surprised to learn that on freight an average of two weeks will be saved by the Canal route between New York and San Francisco. The saving in money, even should the railroads materially reduce their present trans-continental rates, will be even more striking. Even now for many classes of freights there is a



POLING OVER THE SHALLOWS.

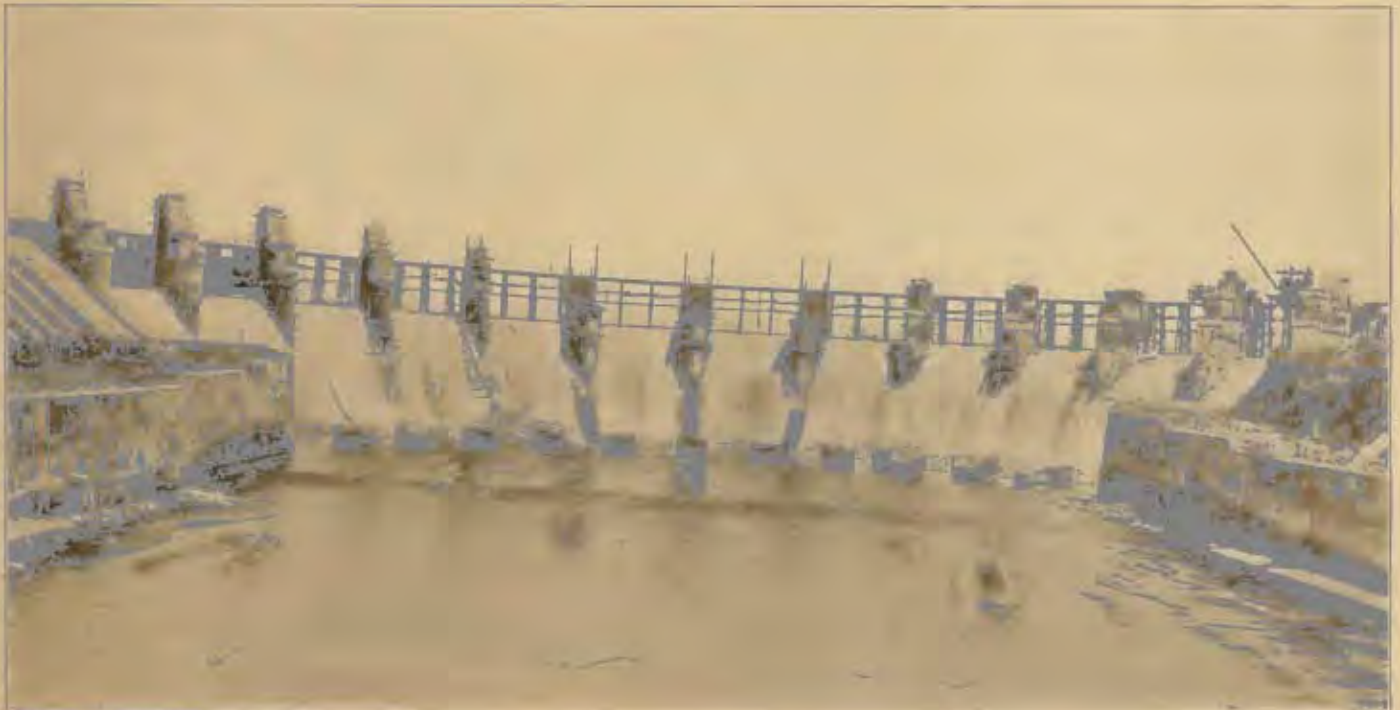


Photo by American Press Association

THE SPILLWAY ALMOST COMPLETE.

The scaffolding will be removed and all towers built to height of those on left



SAN BLAS LUGGER IN PORT

At least one month's steaming will be saved by 12-knot vessels going through the Panama Canal over those making the voyage by way of the Straits of Magellan. A general idea of the saving in distance between points likely to be affected by the Canal is given by the table prepared by Hon. John Barrett, Director General of the Pan-American Union and published on page 384.

profit in shipping by way of the Straits of Magellan—a distance of 13,135 miles. By Panama the distance between New York and San Francisco is but 5262 miles, a saving of 7873 miles or about the distance across the Atlantic and back. From New Orleans to San Francisco will be but 8868 miles. Today there is little or no water communication between the two cities and their tributary territory.

The Pacific coasts both of the United States and of South and Central America will be quickened into new life when the stream of commerce begins to flow through the new channel at Panama. It may be wise to lay emphasis at this point upon the fact that so far as industrial and commercial life on our own Pacific coast is concerned it needs little quickening, as the march to civic greatness of those communities has been unparalleled. But even that magnificent advance has been impeded and harassed by the difficulty of communication with the markets of the Atlantic coast. The struggles of the Pacific coast planters and lumbermen to break the bondage imposed upon them by the railroads have been fairly frantic, and their uniform failure pathetic. Perhaps the railroad managers have demanded no

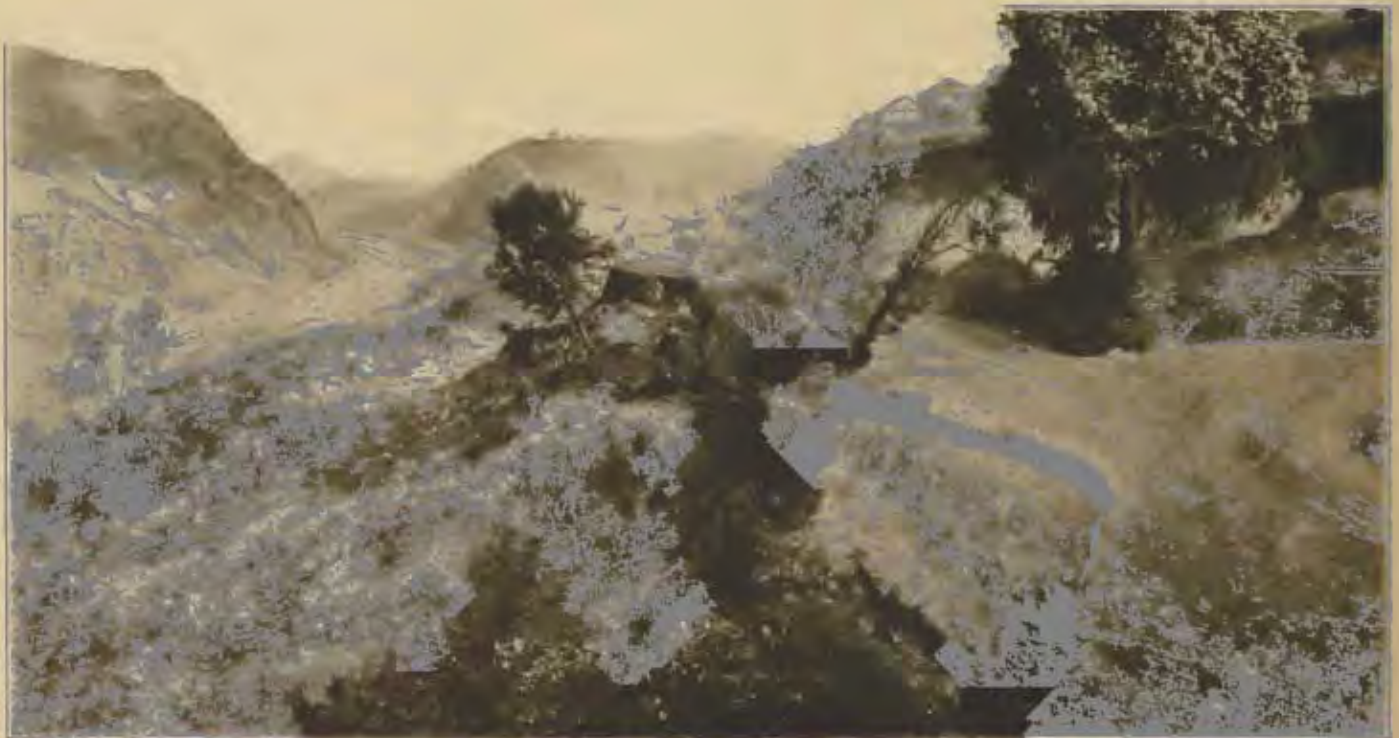


Photo by Brown Bros.

THE BEGINNING OF A SLIDE

The great crack has opened in the side of a road; note house in the distance about to go

more than a rightful care for the interests of their stockholders warranted. This is no place to argue the railroad rate question. But from the shipper's point of view the demands have been so intolerable that every expedient for resisting them has been tried and failed. Even now there is profit to a corporation—and to the shippers that patronize it—in carrying goods from San Francisco to Hawaii, thence to Tehuantepec and across that Isthmus to the Gulf and thence again to New York in competition with the direct railroad lines. If freight can be thus handled profitably, with two changes from ship to car and vice versa, it is easy to see how vastly beneath the charges of the railroads will be the all-water route between New York and San Francisco. It is little exaggeration to say that for commercial purposes all the Pacific seaboard will be brought as near New York and European markets as Chicago is today. The forward impetus given by this to the commercial interests of the Pacific baffles computation.

But it is Latin America that has reason to look forward with the utmost avidity to the results that will follow the opening of the Canal. For the people of that little developed and still mysterious coast line reaching from the United States-Mexico boundary, as far south at least as Valparaiso, the United States has prepared a gift of in-



THE HAPPY CHILDREN OF THE ZONE

calculable richness. Our share in the benefit will come in increased trade, if our merchants seize upon the opportunity offered.

From Liverpool to Valparaiso today is 8747 miles and from New York 8380. But when the ships go through the Canal the English vessels will save little. For them the run will be reduced to 7207 miles, while from New York the distance will be cut to 4633. With such a handicap in their favor New York shippers should control the commerce of Pacific South America north of Valparaiso. Guayaquil, in Ecuador, will be but 2232 miles from New Orleans; it has been 10,631. Callao, with all Peru at its back, will be 3363 miles from New York, 2784 from New Orleans. In every instance the saving of distance by the Panama route is more to the advantage of the United States than of Great Britain. Today the lion's share of the commerce of the South American countries goes to England or to Germany.

North of the Canal

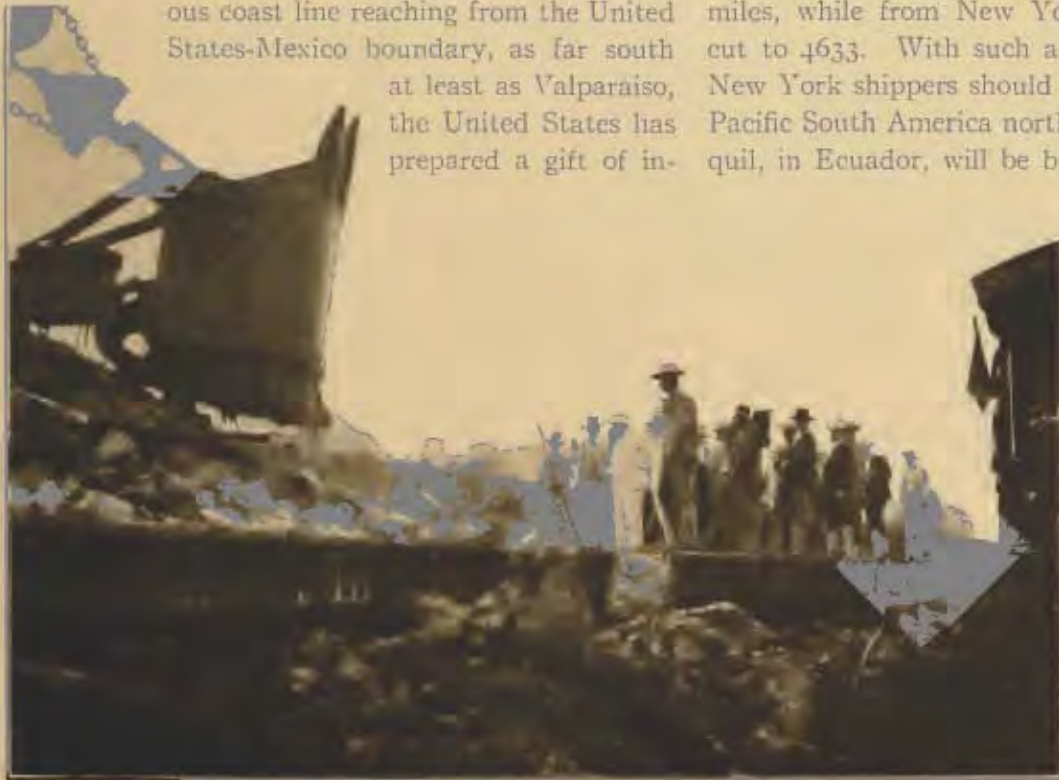
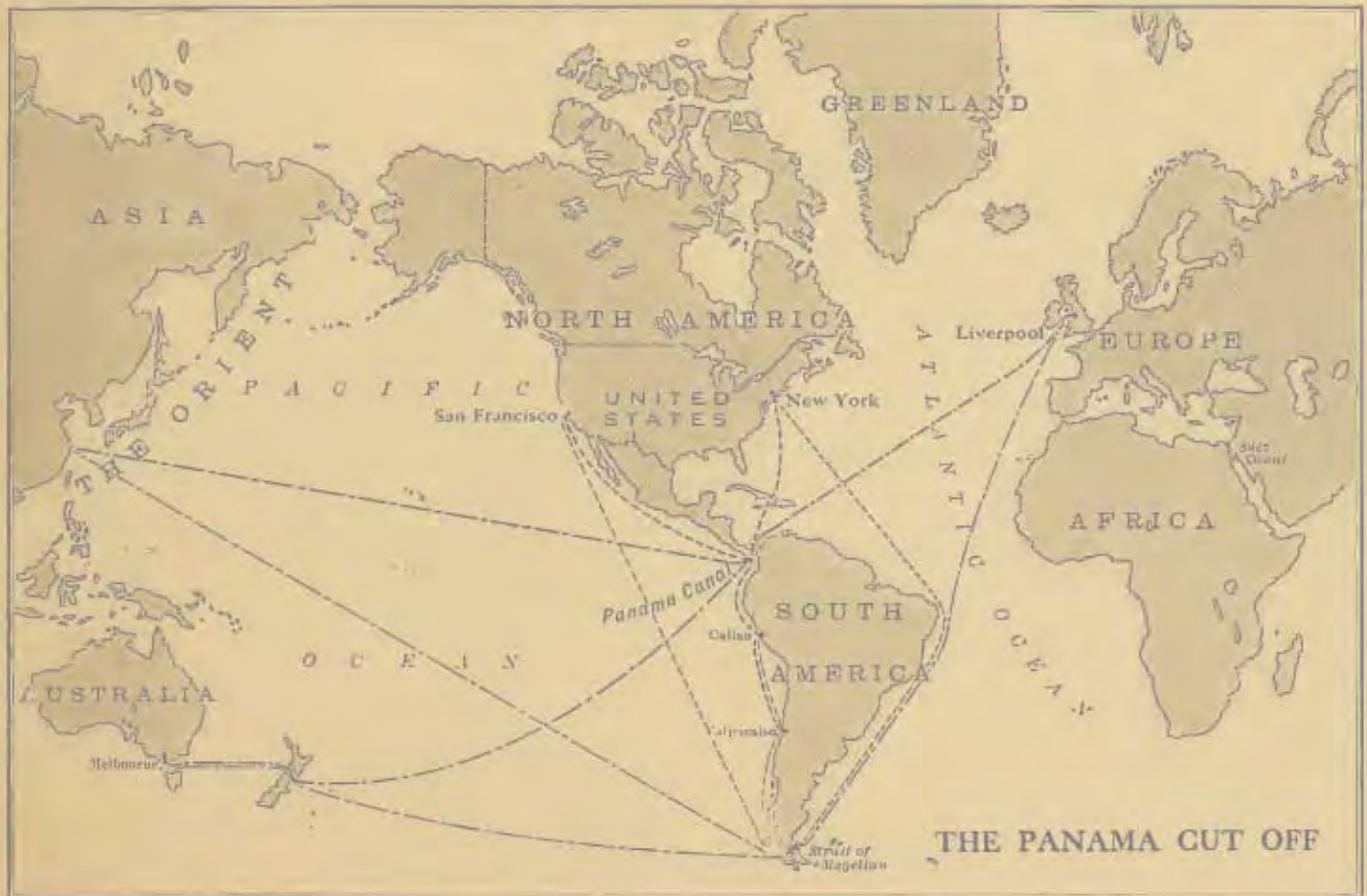


Photo by Brown Bros.

"MAKING THE DIRT FLY"

are the Central American countries of Costa Rica, Nicaragua, Honduras, Salvador, Guatemala and Mexico. On their Gulf coasts harbors are infrequent and poor, but on the Pacific plentiful. Their territory is as yet little developed, but with few manufacturers of their own they offer a still undeveloped market for ours. In all, the twelve Latin-American countries bordering on the Pacific have an area of

to which the Canal will give the readiest access. Here other nations will profit equally with ours unless our merchants show a greater energy in the pursuit of foreign trade than they have of late years. Time was that the old shipping merchants of Boston, Philadelphia and New York asked odds of no man nor of any nation, but had their own ships plying in the waters of all the world, with



THIS MAP SHOULD BE STUDIED IN CONNECTION WITH THE TABLE OF COMPARATIVE DISTANCES ON PAGE 384

over 2,500,000 square miles, or about that of the United States exclusive of Alaska and its insular possessions. They have a population of 37,000,000 and their foreign trade is estimated at \$740,000,000. In this trade the United States is at the present time a sharer to the extent of \$277,000,000 or about 37 per cent. With the Canal in operation it is believed that the total commerce will be doubled and the share of the United States raised to 50 per cent.

However, it is the great Australasian and Asiatic markets, now scarcely touched about the outskirts,

captains who were at once navigators and traders—equally alert to avoid a typhoon and to secure a profitable cargo or charter. But that sort of foreign trade is now vanished with the adventurous spirits who pursued it. Unless conditions governing the American merchant marine materially change within the next two years—of which there seems today no likelihood—it will be England and Germany with their existing lines of ships that will chiefly benefit by the United States \$400,000,000 gift to the commerce of the world.

Curiously enough New York, or for that matter

TABLE I.—DISTANCES AND TIME SAVED VIA THE PANAMA CANAL AS CONTRASTED WITH ROUTES VIA THE SUEZ CANAL, THE CAPE OF GOOD HOPE, AND THE STRAITS OF MAGELLAN BETWEEN THE ATLANTIC GULF SEABOARD OF THE UNITED STATES AND AUSTRALASIA

To	FROM NEW YORK						FROM NEW ORLEANS						REMARKS
	Dis- tance saved	Days saved for vessels of					Dis- tance saved	Days saved for vessels of					
		9 knots	10 knots	12 knots	14 knots	16 knots		9 knots	10 knots	12 knots	14 knots	16 knots	
Adelaide...	Miles 1,746	7.5	6.7	5.6	4.6	4.0	Miles 3,258	14.0	13.1	10.8	9.2	8.0	Difference between routes via Panama, Tahiti, Sydney, and Melbourne, and via St. Vincent and Cape of Good Hope. Difference between routes via Panama, Tahiti, and Sydney and via St. Vincent, Cape of Good Hope, and Adelaide. Difference between routes via Panama and Tahiti, and via St. Vincent, Cape of Good Hope, Adelaide, and Melbourne. Difference between routes via Panama and Tahiti and via Straits of Magellan.
Melbourne	2,770	12.3	11.0	9.1	7.7	6.7	4,282	19.3	17.3	14.3	12.2	10.7	
Sydney....	3,032	17.7	15.8	13.1	11.2	9.7	5,444	24.0	22.2	18.4	15.7	13.7	
Wellington	2,493	11.0	9.9	8.1	6.9	6.0	3,488	15.6	14.0	11.6	9.9	8.6	

TABLE II.—DISTANCES AND DAYS SAVED BY THE PANAMA OR THE SUEZ CANAL BETWEEN THE ATLANTIC GULF SEABOARD OF THE UNITED STATES AND JAPAN, CHINA, THE PHILIPPINES, AND SINGAPORE

To	Via	FROM NEW YORK						FROM NEW ORLEANS						REMARKS
		Dis- tance saved	Days saved for vessels of					Dis- tance saved	Days saved for vessels of					
			9 knots	10 knots	12 knots	14 knots	16 knots		9 knots	10 knots	12 knots	14 knots	16 knots	
Yoko- hama...	Panama	Miles 3,768	10.0	15.2	12.0	10.7	9.3	Miles 5,705	25.9	23.3	19.3	16.5	14.4	Via San Francisco, Singapore, Hongkong and Shanghai.
	Suez													
Shanghai	Panama	1,876	8.1	7.3	6.0	5.1	4.4	3,813	17.1	15.4	12.7	10.8	9.4	Via San Francisco and Yokohama. Via Colombo, Singapore and Hongkong.
	Suez													
Hong- kong...	Panama							1,919	8.4	7.5	6.2	5.2	4.5	Via San Francisco, Yokohama and Shanghai. Via Colombo and Singapore.
	Suez	18												
Manila..	Panama	41						1,078	8.0	7.7	6.4	5.4	4.7	Via San Francisco and Yokohama. Via Colombo and Singapore.
	Suez													
Singa- pore...	Panama													Via San Francisco and Yokohama. Via Colombo.
	Suez	2,184	11.0	9.8	8.1	6.9	5.9	547	2.0	1.7	1.4	1.1	0.9	

So far as Asiatic traffic is concerned, there is almost sure to be some overlapping of routes. Conditions other than those of time and space will occasionally control shipmasters in the choice of a route. But so far as the trade of our Atlantic ports with Hongkong, the Philippines and points north and east thereof is concerned it will all go through Panama. So, too, with the vessels from English, French or German ports. If the contemplated economies offered by the price of coal and fuel oil at Balboa are effected, the inducements of this route will divert from Suez all European shipping bound for Asiatic ports north of India. A careful study of the Suez Canal shows that the trade of the United States with all foreign countries made up 33 per cent of the total traffic, and the commerce of Europe with the west coast of South America comprised 38 per cent. Col. Johnson compiled for the benefit of the Commission a table which showed the vessels which might advantageously have used the Canal in 1909 and

1910, and accompanied it with another giving his estimate of the amount of shipping that actually will use the Canal in 1915 and thereafter. As the expression of official opinion based upon the most careful research, these tables are here republished.

CLASSIFICATION OF ESTIMATED NET TONNAGE OF SHIPPING USING THE PANAMA CANAL
IN 1915, 1920 AND 1925

	Average per annum during 1915 and 1916	1920	1925
Coast-to-coast American shipping.....	1,000,000	1,411,000	2,000,000
American shipping carrying foreign commerce of the United States.....	720,000	910,000	1,500,000
Foreign shipping carrying commerce of the United States and foreign countries.....	8,780,000	11,020,000	13,850,000
Total.....	10,500,000	13,344,000	17,000,000



CULEBRA CUT ON A HAZY DAY

NET TONNAGE OF VESSELS THAT MIGHT HAVE ADVANTAGEOUSLY USED A PANAMA CANAL
IN 1909-10.

	Total Entrances	Total Clearances	Total Entrances and Clearances
Europe with:			
Western South America.....	1,553,887	1,504,513	3,148,400
Western Central America and Pacific Mexico.....	80,788	118,714	199,502
Pacific United States, British Columbia, and Hawaii.....	419,865	209,853	689,718
Pacific United States via Suez Canal.....	(1)	(1)	(1) 158,000
Oriental countries east of Singapore and Oceania.....	618,704	555,881	1,174,585
Eastern United States coast with:			
Western South America, Pacific Mexico, and Hawaii.....	300,000	166,080	467,595
Pacific Coast of United States (via Cape Horn).....	117,147	55,508	172,655
Pacific Coast of United States and Hawaii (via American-Hawaiian S.S. Co.).....	181,713	181,713	363,426
Oriental countries east of Singapore and Oceania.....	600,000	900,000	1,500,000
Pacific traffic:			
Pacific Coast.....	158,558	250,932	418,490
Atlantic Coast.....			
Eastern Canada with Alaska, Chile and Australia.....	13,410	22,248	35,658
Total.....	4,044,981	4,125,048	8,328,029

NOTE.—(1) Reported by Suez Canal Company; hence the total is not separable into entrances and clearances at American ports.

After all, however, the most patient investigation of the past and the most careful and scientific calculations of the probabilities of the future may produce a wholly inaccurate result. The real effect of the Canal on the world's commerce may be something wholly different from what the experts expect. But we may proceed upon the well-established fact that no new route of swifter and cheaper transportation ever failed to create a great business, and to develop thriving communities along its route. This fact finds illustration in the building up of the suburbs and back country by the development of trolley lines, and, on a larger scale, the prodigious growth of our Pacific coast after the transcontinental railroads had fought their way to every corner of that empire still in the making. Much is uncertain about what the Panama Canal will do for the expansion of our trade and influence, but the one thing that is certain is that no sane man is likely to put the figures of increase and extension too high.

More and more the exports of the United States are taking the form of manufactured goods. The old times when we were the granary of the world are passing away and the moment is not far distant when we shall produce barely enough for our rapidly increasing population. British Columbia is taking



made by Bruce Gray.

BIRD'S-EYE VIEW OF MIRAFLORES LOCK

At the upper end of the lock the guide wall extends into Miraflores lake; the lower end opens into the tide-water Canal.

up the task of feeding the world where we are dropping it. On the other hand, our manufacturing industry is progressing with giant strides and, while a few years ago our manufacturers were content with their rigidly protected home market, they are now reaching out for the markets of foreign lands. Figures just issued show that in 10 years our exports of manufactured goods have increased 70 per cent. The possibilities of the Asiatic market, which the Canal brings so much more closely to our doors, are almost incalculable. For cotton goods alone China and India will afford a market vastly exceeding any which is now open to our cotton mills, and if, as many hold, the Chinese shall themselves take up the manufacture of the fleecy staple they will have to turn to New England and Pennsylvania for their



HANDLING BROKEN ROCK

machinery and to our cotton belt of states for the material. The ships from Charleston, Savannah, New Orleans and Galveston, which so long steamed eastward with their cargoes of cotton, will in a few years turn their prows toward the setting sun. Indeed these southern ports should be among the first to feel the stimulating effect of the new markets. Southern tobacco, lumber, iron and coal will find a new outlet, and freight which has been going to Atlantic ports will go to the Gulf—the front door to the Canal.

How swiftly and efficiently American manufacturers and jobbers will seize upon the new conditions and avail themselves of this opening of new fields is yet to be determined. The enemies of a protective tariff are not the only ones who hold that it has had the

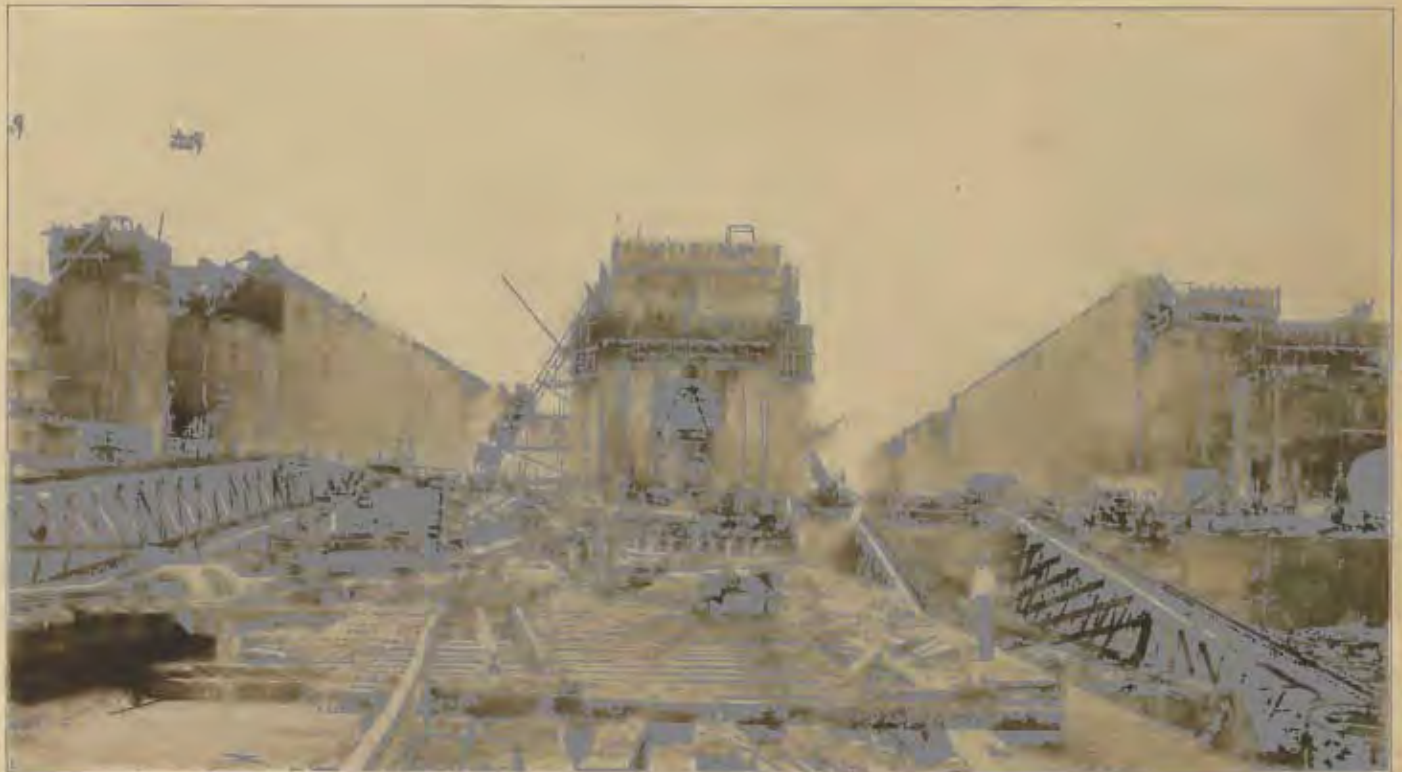


Photo by American Press Association

LOCK CONSTRUCTION SHOWING CONDUITS

result of dulling the keen spirit of adventurous enterprise for which our people were once noted. The absolute possession of a home market ever growing in size and into which no foreigner could enter with any hope of successful competition has naturally engaged at home the attention of our captains of industry. Bold and dashing spirits of the sort that one hundred years ago were covering

president or the head of a great manufacturing industry.

Whether the earlier spirit of world conquest will again spring up in the American mind so long content with the profits of its own national preserves is yet to be demonstrated. To what extent it has vanished any thoughtful traveler in foreign lands observes with a sigh. One sees evidences of its



TRAVELING CRANE HANDLING CONCRETE IN LOCK-BUILDING

These cranes are the striking feature of the Canal landscape, handling thousands of tons of concrete daily

the seas with Baltimore clippers and the output of the New England shipyards turned their attention half a century ago to the building of railroads and the development of our western frontier. When the middle-aged men of today were boys, the heroes of their story books ran away to sea and after incredible adventures came home in command of clipper ships trading to China. Today the same class of fiction starts the aspiring boy in as a brakeman or a mill hand and he emerges as a railroad

weakness at every foreign international exhibition, for the American section is generally the least impressive there. The opinion of our manufacturers is often that to show their products abroad is folly because foreign manufacturers will imitate them with cheaper materials and labor. In most foreign markets, in the cities of Europe, South America and the Orient the chief American products you see displayed are those manufactured by one of those combinations of capital we call a trust, and

they are usually sold abroad at lower prices than at home. Typewriters, adding machines, sewing machines, shoes and the divers products of the protean Standard Oil Company seem to be the most vigorous representatives of American industrial activity abroad. Nevertheless the recent statistics show that our exports are on the up-grade, and evidences of growing interest in our export trade multiply daily.

That the Canal of itself will not make amends for indifference or lethargy on the part of our manufacturers goes without saying. The nation may supply them with the waterway, but it cannot compel them to use it, or even teach them how. Every American traveler in South America has groaned over the reports that come from every side concerning the fatuity with which our manufacturers permit themselves to be distanced in the race for the trade of those republics. Our consular reports are filled with suggestions from consuls, but the various associations of exporters are so busy passing

platitudinous resolutions about the need of taking the consular service out of politics that they have no time to heed the really valuable suggestions offered. Our methods of packing goods, and our systems of credits, are repugnant to the South American needs and customs and the fact has been set forth in detail in innumerable consular reports without any response on the part of our exporters. The American attitude is "what is good enough at home is good enough abroad"—which is patriotic but not a good rule



MESTIZO GIRL OF CHORRERA



TIVOLI HOTEL FROM HOSPITAL GROUNDS

on which to attempt building up foreign trade. Incidentally sometimes what is good enough for a home market is often too good for a Latin-American one. The English and the Germans recognize this and govern themselves accordingly.

It is a far cry from digging a canal to the system of educating young men to represent a firm in foreign lands. Yet one finds in visiting South America, or for that matter Oriental cities, that a great deal of the rapid expansion of German trade is due to the systematic education of boys for business in foreign lands. The weakest part of the educational system of the United States is its indifference to foreign tongues, an indifference possibly quite natural because but few Americans have really any need for any language except their own. But the German representatives sent to South America are at home in the Spanish tongue, and care-



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SANTA ANA PLAZA, PANAMA

This plaza was built up largely during the French régime and the open air cafés are relics of that period of pleasure. It is the gayest of the town's rallying places.

fully schooled in the commercial needs and customs of the Latin-American countries before they reach them. They are backed, too, by a strong semi-official organization in their own country. They have in most of the principal South American towns German banks quite as interested as the salesmen themselves in the extension of German trade. It is reported that whenever paper involved in an American transaction with a South American buyer passes through a German bank in South America a report of the transaction is sent to some central German agency which tries to divert the next business of the same sort into German hands. I have no personal knowledge of such transactions, but the story is current in South America and it is quite in accord with the German's infinite capacity for taking pains with little things.

Foreign ships, no less than foreign banks and the excellence of foreign commercial schools, are and will continue to be a factor in the building up of foreign trade via the Canal. Just as the German banks report to their home commercial organizations the transactions of other countries in lands whose trade is sought, so foreign ships naturally work for the advantage of the country whose flag they fly. Surprising as it may seem to many, and dis-



HOW CORN IS GROUND

appointing as it must be to all, it is the unfortunate fact that within a year of the time set for opening the Panama Canal to commerce there is not the slightest evidence that that great work is going to have any influence whatsoever toward the creation of a United States fleet in foreign trade. England, Germany, Italy and Japan are all establishing new lines, the last three with the aid of heavy subsidies. But in April, 1913, a recognized authority on the American merchant marine published this statement: "So far as international commerce via Panama is concerned not one new keel is being laid in the United States and not one new ship has even been projected. The Panama Canal act of last August reversed our former policy and granted free American registry to foreign-built ships for international commerce through the Panama Canal or elsewhere. But this 'free-ship' policy has utterly failed. Not one foreign ship has

hoisted the American flag, not one request for the flag has reached the Bureau of Navigation".

The reason for this is the archaic condition of our navigation laws. The first cost of a ship, even though somewhat greater when built in American yards, becomes a negligible factor in comparison with a law which makes every expense incurred in



THEY USED TO DO THIS IN NEW ENGLAND

operating it 10 to 20 per cent higher than like charges on foreign vessels. James J. Hill, the great railroad builder, who planned a line of steamships to the Orient and built the two greatest ships that ever came from an American yard, said once to the writer, "I can build ships in the United States as advantageously as on the Clyde and operate

has been to deprive the sailor of the ships necessary to earn his livelihood.

However, coastwise shipping will be greatly stimulated by the Canal. In the midst of the lamentation about the disappearance of the American flag from the high seas it is gratifying to reflect that the merchant marine of the United States is really



Photo by Brown Bros.

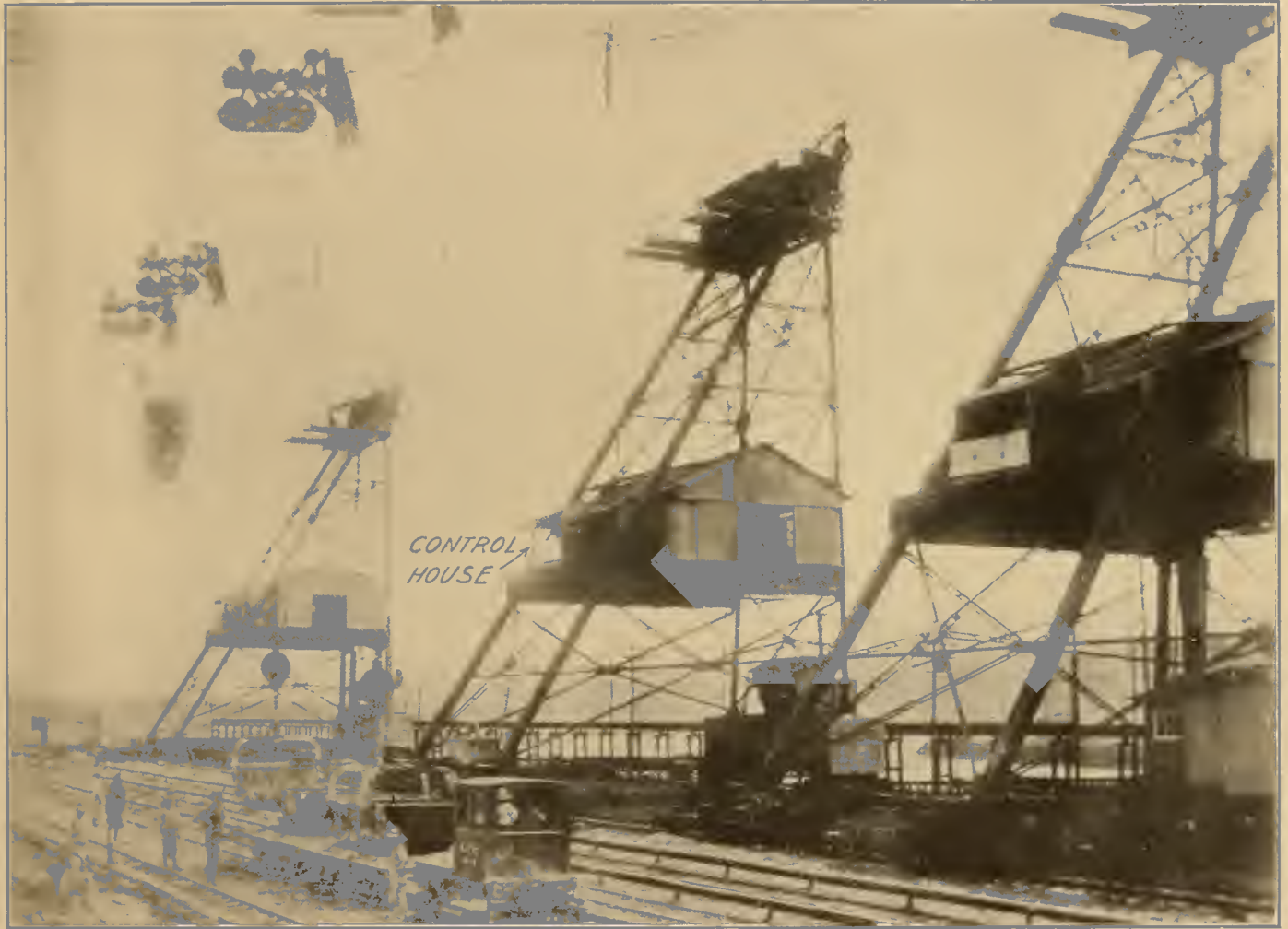
PILE-DRIVER AND DREDGE AT BALBOA DOCK

them without a subsidy. But neither I nor any other man can maintain a line of American ships at a profit while the navigation laws put us at a disadvantage in competition with those of every other nation". Those mainly responsible for the enactment and maintenance of the navigation laws declare them to be essential to secure proper wages and treatment of the American sailor, but the effect

the second in the world, though our share in international shipping is almost negligible. That we rank second as a whole is due to the phenomenal development of our shipping on the great lakes where with a season barely eight months long a shipping business is done that dwarfs the Mediterranean or the German Ocean into insignificance. This has built up a great shipbuilding business on

the lakes, and steel ships are even now being built on the Detroit River to engage in Panama trade. There are not wanting those who hold that if the money which has been spent at Panama for the good of the whole world, had been expended in making a thirty-foot ship canal from Lake Erie to tide-water on the Hudson, the benefit to the people of the

Gulf and from the Lakes to the Atlantic. After Panama the nation is unlikely to be daunted by any canal-digging project. Having improved the ocean highway, the people will demand easier access to it. Already there is discussion of whether the railroads will help or hamstring the Canal. Cargoes for the ships have to be gathered in the interior. When delivered



CONTROL
HOUSE

Photo by Brown Bros.

GIANT CEMENT CARRIERS AT WORK

Placed in pairs on either side of a piece of work requiring concrete, these frames support cables in which swing cars carrying concrete and controlled by a workman in the elevated house shown

United States, and to American shipping would have been vastly greater.

Indeed one of the pathetic things in the history of commerce is the persistence with which enterprising Chicagoans, and other mid-westerners, have tried to establish all-water routes to the European markets. All such endeavors have failed, costing their projectors heavily. It will aid, however, if the success of the Panama Canal shall not reanimate the effort to secure deep-water channels from the Lakes to the

at the seaport of their destination they have to be distributed to interior markets. It is in the power of the railroads to make such charges for this service as would seriously impede the economic use of the Canal.

Among the great canals of the world that at Panama ranks easily first in point of cost, though in length it is outdone by many, and its place as a carrier of traffic is yet to be determined. There are now in operation nine artificial waterways which may properly be called ship canals, namely:

1.—The Suez Canal, begun in 1859 and completed in 1869.

2.—The Cronstadt and St. Petersburg Canal, begun in 1877 and completed in 1890.

3.—The Corinth Canal, begun in 1884 and completed in 1893.

4.—The Manchester Ship Canal, completed in 1893.

5.—The Kaiser Wilhelm Canal, connecting the Baltic and North Seas, completed in 1895.

6.—The Elbe and Trave Canal, connecting the North Sea and Baltic, opened in 1900.

7.—The Welland Canal, connecting Lake Erie with Lake Ontario.

8 and 9.—The two canals, United States and Canadian, respectively, connecting Lake Superior with Lake Huron

The Suez Canal naturally suggests itself for comparison, though it falls far short in volume of traffic of either of the two canals at Sault Ste. Marie, between Lake Superior and Lake Huron. It is ninety miles long, or just about twice the length of the Panama, and about two-thirds of its length is dredged through shallow lakes. It is 31 feet deep as against Panama's 45, with a surface width of 420 feet, while the Panama Canal is from 300 to 1000 feet. The Suez Canal cost slightly under \$100,000,000 and pays dividends at the rate of 12 per cent. Lord Beaconsfield, who bought control of it for England in face of fierce opposition and was savagely denounced for wild-cat financiering, secured for the Empire not merely its strongest bond, but a highly profitable investment as well. The tolls now charged are about \$2 a ton according to the United States net measurement.



Of the other canals enumerated some, like the Manchester and the Elbe and Trave Canals, are of purely local importance, while others, like the Kaiser Wilhelm (better known as the Kiel) Canal, are mainly for naval and military purposes. In volume of traffic the first of all canals in the world is the American canal at the "Soo", with the Canadian canal paralleling it a fair second. The volume of traffic passing through these waterways during the

eight or nine months they are free from ice is incredible. In 1911 it approximated 40,000,000 tons and exceeded in volume Suez and all the other ship canals heretofore enumerated together. To the facilities for water carriage afforded by this and the neighboring Canadian canal is due much of the rapid growth and develop-

ment of the country about the western end of Lake Superior. What countries will profit in the same way by the work at Panama? The Pacific coast, both of North and South America. Perhaps South America even more than our own land, for its present state admits of such development.

One problem opened by the Panama Canal which seldom suggests itself to the merely casual mind is the one involved in keeping it clear of the infectious and epidemic diseases for which Asiatic and tropical ports have a sinister reputation. The opening of the Suez Canal was followed by new danger from plague, cholera and yellow fever in Mediterranean countries. A like situation may arise at Panama.

It is proposed, though I think not yet officially, to have passing vessels from infected ports inspected at the entrance to the Canal. If infection exists the ship can be fumigated during the passage through the Canal, which will take from ten to twelve hours, while the subsequent voyage to her home port, whether on our Atlantic coast or in Europe, will make any subsequent delay in quarantine needless. The plague is the disease most dreaded in civilized

communities, which it only enters by being brought by ship from some Asiatic port in which it is prevalent. Its germs can be carried by rats as well as by human beings, and for this reason in some ports vessels from suspected ports are not allowed to come up to a dock lest the rodents slip ashore carrying the pestilence. Some-



Photo by Brown Bros.

COL. GOETHALS' HOUSE AT CULEBRA

As is fitting, "The Colonel's" house tops the highest hill in Culebra, looking down the cut

times in such ports you will see a vessel's hawsers obstructed by large metal disks, past which no rat may slip if he tries the tight-rope route to the shore. The new contracts for wharves, docks and piers at all our Zone ports, prescribe that they shall be rat-proof. Indeed the rodents are very much under the ban in Panama, and the annual slaughter by the Sanitary Department exceeds 12,000.

Preparations are being made to make Balboa a quarantine station of world-wide importance. The mere proximity of the date for opening the Canal has caused discussion of its effect upon the health of civilized nations. At Suez an International Board exists for the purpose of so guarding that gateway

from the East that none of the pestilences for which the Orient has an ill-fame can slip through. No suggestion has been made of international control at

nation alone. Despite this cheerful optimism of Europe, there has not yet been a very prompt acquiescence by Congress in the estimates presented by



ELECTRIC TOWING LOCOMOTIVES ON A LOCK

Panama. In fact such of the foreign articles as have come under my eye have been flattering to us as a nation, asserting, as they all do, that in sanitary science the United States is so far ahead that the quarantine service may be safely entrusted to this

Col. Gorgas for the permanent housing and maintenance of the quarantine service. Since the United States is to give the Canal to the world; it should so equip the gift that it will not be a menace to the world's health.