Manzanillo, Acapulco, Puerto Angel, Salina Cruz, Tonala, San Benito and other places; the Lower California Development Co., which concern receives a moderate subsidy per round trip during the continuance of the contract, and is required to make 72 trips per year between San Diégo, Todos Santos, and San Quintin; Compañia Naviera del Pacifico, which consists of three different lines, one required to make 48 trips per annum between Guaymas, La Paz and Emeka and intermediate ports, receiving for this service an annual subsidy, another line receiving a separate yearly subsidy for 4 round monthly trips between Mazatlán, Altata, and Topolobampo, and the third line making 36 trips per year between Guaymas, Santa Rosalia, Mulege, Loreto, and La Paz, receiving for this service a special payment; Compañia de Navegacion en los Rios Grijalva, Chilapa y Tulija, a small line which is required to make 3 monthly trips between Frontéra, Tepetitan, and Pavo Réal; and Compañia Limitada de los Ferrocarriles de Veracruz. This also has a subsidy, the service required being 312 trips a year between Alvarado and Chocaltianguis, 104 between Alvarado and San Juan Evangelista, and 156 between Alvarado and Alonso Lazarro, touching at intermediate ports.

A great number of concessions have been granted by the Mexican Government to companies purposing to establish new steamship lines on both coasts, all of which promise to add greatly to the efficiency of the service between the ports on their respective itineraries.

CHAPTER XXXIV

Ports and harbours—Improvements on west coast—Tampico—Rivalry with Veracruz—Progréso—Acapulco—Railway communication difficulties—Mazatlán—Government projects—Tuxpan—Canal enterprise—Coatzacoalcos—Harbour and port works—Salina Cruz—Port works and new town—Topolobampo—Three transcontinental routes—Mexico's interest in Panama Canal.

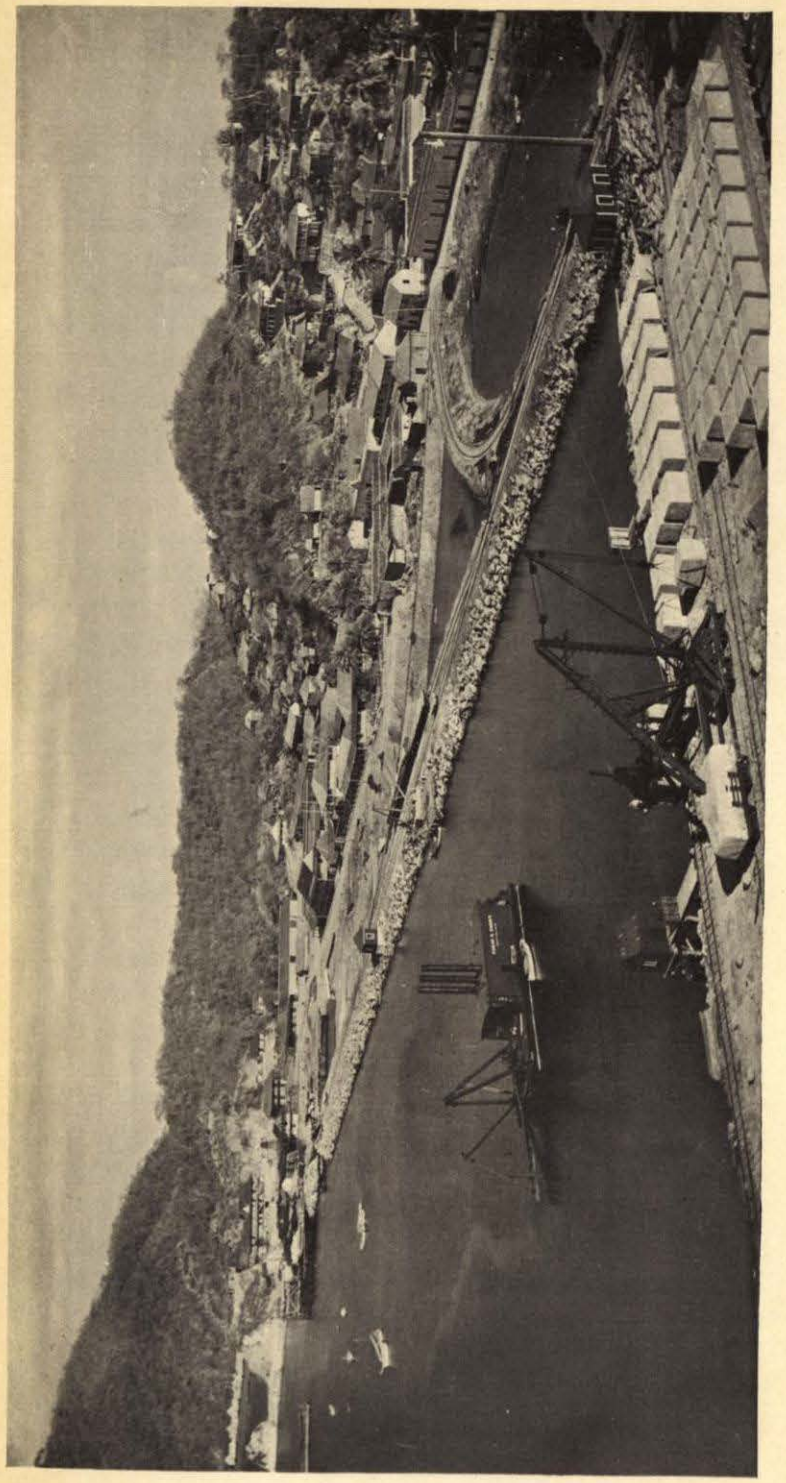
THE west coast of Mexico has for many years suffered from a lack of development, owing firstly to the poor accommodation at the ports and harbours which exist, and secondly to the absence of railway communication. All this is being rapidly changed, and even before these words are read at least one great system of railway and steamship transportation will have been inaugurated, and have commenced full operation, while two others will be approaching completion. The Gulf side of the Republic has been especially fortunate in regard to its geographical position, turning, as it does, not only towards North America, but towards European ports, the maritime traffic up till now having been the greatest at the Gulf ports of Tampico, Veracruz and Progréso. Owing to its proximity to the capital (but 12 hours travel), Veracruz, with its two lines of railway (the Mexican and the Interoceanic), has until late years enjoyed far and away the bulk of European freight to Mexico. Something over 1,000,000 tons now come annually to the Veracruz quays, and the present year is bound to see this amount considerably augmented.

Tampico, which, under the fostering care of the Central Railway, has developed from a small fishing-village into a moderately comfortable town, is connected by railway with the important City of San Luis Potosi and with Monterey, which is the centre of a great and growing iron and steel industry. This port is becoming a keen rival to Veracruz

itself, and when the new short line between Tampico and Mexico City, now commenced by the Central Railway, is completed (estimated at about three years from now), a certain amount of Veracruz business will leave it, probably for ever. But it must always remain an important port for European and coastal trade, whatever additional prosperity awaits Tampico.

Progréso is the great port for henequén imports and exports, which represent the immense trade interests of Yucatán. Nothing is likely to interfere with this trade, while the extension of the henequén industry is bound to make Progréso more and more progressive, as its name happily suggests. The other Gulf Ports are Campeche, Coatzacoalcos (the entry port for all the traffic over the Tehuantepec National Railway, which has its terminus on the Pacific Coast at Salina Cruz), Chetumal, Frontera, Alvarado, Nautla, Champotón, Isla Aguada, Puerto Morélos and Tuxpam. In course of time many of these ports will be connected with branch railway-lines, and thus further add to the importance of Mexican shipping interests.

It is in connection with the West or Pacific coast of Mexico that the greatest enterprise is being displayed. Acapulco is a fine natural harbour in the State of Guerréro, and at one time was to have been connected with the capital through the Interoceanic Railway. Indeed, the British shareholders of that far-from-fortunate line, now under National management, were tempted to invest their money originally upon this understanding. But it is safe to say that the extension will never be built by the present owners of the Interoceanic, from lack of money. Railway communication with the interior, therefore, being absent, the trade of Acapulco remains somewhat unimportant, and of a gradually diminishing character. There is some idea of another line of railway coming in by a roundabout way; but the terrific mountains and *barrancas* which will have to be encountered and overcome by any line of rails, and which have sufficed to frighten off the Interoceanic all these years, offer an almost insurmountable obstacle to any company or individual unprovided with an immense amount of constructional capital. The Interoceanic Railway is far from being that Company.



PORT AND HARBOUR OF MANZANILLO DURING CONSTRUCTION OF BREAKWATER.—*see pp.* 317-323.

The Mexican Central Railway contemplates the extension of its Cuernavaca Division in the direction of Acapulco, and if undertaken that port would be brought into direct communication with Mexico City.

Acapulco harbour was discovered and much used by Herñan Cortés in 1531, he sailing thence in that year up the coast of Sinaloa. Again, in 1540, the port was used as the departure place by Hernando de Alarcon, who discovered California, and promptly annexed it in the name of the King of Spain.

Acapulco is said to be not only the finest natural harbour in Mexico, but about the second finest in the world. Like those of Topolobampo and Manzanillo, the harbour is surrounded by beautiful and lofty mountains, the passage from the sea being a narrow and tortuous but perfectly safe one. In this respect it reminds one of the entrance to the Harbour of Santos, in Brazil. In the early days of the Spanish conquest, Acapulco was a strongly fortified place, and so well was it provided against assault that long after the rest of Mexico became the possession of the Independence followers, Acapulco remained Spanish. The only break was when the then indomitable priest Morélos took and held for a few days the fort with his patriot army, and with the valuable assistance of a former Spanish prisoner, Colonel Ellis P. Bean.

Mazatlán, on the other hand, in the State of Sinaloa, is more fortunately placed, since there are two short lines of railway running from the port into the interior, but neither as yet communicating with the Capital. The Southern Pacific Railway, an exceedingly powerful but badly conducted American Corporation (which also owns the Arizona Eastern Railroad, the Arizona and Colorado Railroad, the Cananea, Yaqui River and Pacific Railroad, the Maricopa and Phœnix and Salt River Valley Railroad, and the Gila Valley, Globe and Northern Railway), are busily engaged upon constructing a long line of railway, stretching from Nogales, in the Northern State of Sonora, through the enormous State of Sinaloa, with its millions of acres of untouched agricultural territory, through the Territory of Tepic, as far as the City of Guadalajara, its terminus in the State of Jalisco.

Although not a coastal line, the new railway is, by several branch lines, to open up communication with the Mexican

Ports, including that of Mazatlán, and thus bring them indirectly into relation with the interior of the country and with the ports situated on the Gulf side of the Republic. By this means Mazatlán will have a bright future to which to look forward, and is taking time by the forelock by building suitable accommodation in the town itself. But as yet little has been done towards improving the harbour and providing the necessary docks and port accommodation. I understand, however, that the Mexican Government will pay attention to this great undertaking so soon as sufficient money can be spared or be raised to devote to it.

As a matter of fact, all the plans for constructing the port and harbour works at Mazatlán were completed, and the Government awarded the contract to Colonel Edgar K. Smoot, who built the fine port works at Galveston, Texas, U.S.A., and who has since constructed the port works at Manzanillo. The Government in the end asked to be released from the Mazatlán business, and transferred the contract to the port works of Manzanillo, of which full particulars will be found in the following Chapter.

In its time Mazatlán has suffered many misfortunes. Perhaps the worst was a visitation, in 1902 and 1903, of the dreaded bubonic plague. In some two months, from deaths and desertions, the population of Mazatlán was reduced from 20,000 to 4,000. About 390 deaths actually took place, and over 1,000 houses were burned by the authorities. The population were severely afflicted, being on the verge of starvation and the objects of charity for many weeks at a time.

Last year (1906) Mazatlán was again in a sad plight, being cut-off from any sort of communication for over a week by reason of floods, wash-outs on the railways, and the impossibility of any ships approaching the coast. Naturally the port has suffered severely in a business way, but things are gradually righting themselves, and prosperity must be restored to Mazatlán as soon as the new railway comes within reach of it. In the meantime the town has been blessed with an excellent drainage and sewerage installation, while the Federal Government, as I have said, recognising the necessity for improving the harbour, will allot the first spare money they can find to that purpose.

Tuxpan, as a port of entry, has but a very brief period further to exist, for, as soon as the Tampico-Tuxpan Canal is finished, which will be this year, importations there will cease, and go instead to Tampico. At no time have the entries at Tuxpan been very important. Those for 1904, for instance, amounted to only $106,000 (say £10,600), against $22,000,000 (say £2,200,000) for Tampico, and $40,000,000 (£4,000,000) for Veracruz. Tuxpan is a dull place, with about 14,000 inhabitants, and probably not a single Britisher among them. They are composed of Mexicans, Spaniards and a few Americans.

Tampico port shipments are already considerably larger than those at Veracruz, but in actual value they are lower, since, while for the greater part Tampico receives coal, coke, iron, tinplate and other goods of this character paying but little duty, Veracruz is the port of entry for the more costly articles, paying a heavier duty. In conversation with the Head of the Customs House at Tampico, I was informed that whereas the total customs receipts at the port amounted to little more than $4,000,000 for 1900-1901, in 1904-1905 they had increased to nearly $8,000,000, and for 1905-1906 to nearly $9,000,000. For the year 1906-1907 they are likely to stand at over $9,500,000, while in three years' time, when the National Railway and the Central Railway will have completed their new lines connecting Tampico with Mexico City and the whole of the Republic, the revenue is estimated to approach $18,000,000 to $20,000,000. These figures, I may repeat, are an official estimate, carefully considered and emanating from the highest possible authority upon the subject.

Tampico possesses many advantages over Veracruz as a port of entry. In the first place, loading and unloading can be carried on there almost all the year round, the exception being when the "Northers" blow in the winter, and when occasionally vessels are unable to cross the bar. The length of detention, however, scarcely ever exceeds two days, and the occasions upon which the delay happens are perhaps half-a-dozen during the season. At Veracruz, on the other hand, all work has to be arrested while the furious "Northers" blow on that coast, and these last from two to three days and occur sometimes twice in a week. The cost of handling cargo at Tampico

from the ship to the railway-truck is but $2.00 per ton, as against $3.00 and $3.50 at Veracruz. The appliances and machinery for handling the freight at the first-named port are likewise more up-to-date than at the southern port, and a better class of labour is obtainable. In 1905 the amount of cargo on British ships landed at Tampico amounted to 379,023 tons, which was 19,620 tons more than during the previous year. The consignments consisted mostly of coal, coke, tinplate, corrugated iron-sheeting, wire, pipes, iron rails, etc., etc.

Campeche lies on the west shore of the Peninsula of Yucatán, and is completely open to the "Northers" which blow furiously during the winter. The Bay of Campeche resembles the Bay of Biscay in many ways, and extends the whole distance from Cape Palma to Veracruz. There is no harbour worthy of the name in this wide district. There is a line of railroad extending from the City of Campeche to Mérida, the Capital of Yucatán, which is 173 kilometres in length (say 108 miles), and which has been in operation since 1898. Like many other Mexican ports, however, at the present time, Campeche has no railway connection with the Capital.

Up to some three or four years ago Coatzacoalcos was little more than a desolate Indian fishing-village; but to-day with its railway terminus, extensive Port works and a considerable foreign population, the town is completely transformed. Nothing, however, could ever render Coatzacoalcos an attractive place of residence, destitute as it is of almost all the necessary essentials to make it so. Nevertheless the harbour, which Herñan Cortéz considered the best on the Gulf Coast, as it undoubtedly is, is of far too much importance to have been so long neglected. The Federal Government selected it as the eastern terminal of the Tehuantepec National Railway, and it must continue to grow in wealth and size as the trans-Isthmian trade develops. This year, upon the occasion of the official inauguration of the Tehuantepec National Railway, Coatzacoalcos received the new name of "Port Mexico."

Coatzacoalcos River forms the natural harbour, and one of almost unlimited capacity. Unfortunately, however, there existed a strong bar which had to be removed, necessitating almost herculean labours, so as to prevent it ever forming

again. The method of treatment adopted by the contractors, after moot consideration, was that selected at the mouth of the Mississippi River, as well as that at the mouth of the Pánuco River at Tampico. This consisted of constructing two converging jetties, or training walls extending from the mouth of the river out into the sea, thus confining the currents within the limits necessary to secure the scouring-out of the channel across the bar by the action of the river itself. The length of these jetties is 1,300 metres, and they are constructed of rubble and rock dumped down, apparently "anyhow," but really with great forethought and accuracy, into the sea. A neat concrete wall has been built on the top, giving a completely finished appearance to the work. The west jetty was first completed, but the east jetty was found more troublesome owing to all the heavy material in the form of rocks and rubble having to be carried across the river in flat barges, worked by an endless chain. Each barge bore a burden of 250 tons of rock, and made four trips daily. About 9,000 tons were delivered and sunk weekly, the dumping being done by a crane with a 20-ton lifting capacity.

In order to secure the required depth of 10 metres of water on the bar, a good deal of dredging was found necessary. Substantial steel wharves and strong steel warehouses have been erected, the latter being 126 metres long by 33 metres wide. Vessels coming alongside have a minimum depth of water of 10 metres. The total frontage of the wharves at Coatzacoalcos is 1,030 metres, and their average depth is 26 metres. Every necessary appliance and machine, mostly operated by electricity, is to be found here, and seldom have I seen a more complete or efficient plant for rapidly handling the ships' cargoes, either loading or unloading. Ample accommodation has been provided in the railway yard, the length of this being 2 kilometres, while it is 200 metres in width. Altogether the terminal tracks, other than that laid out on the wharves, amount to nearly 20 kilometres. I may add that the whole of this terminal yard has had to be filled in, taking no less than 700,000 cubic metres of stuff to do it.

The port works at Salina Cruz necessitated even more care, forethought and expenditure than the massive structure at Coatzacoalcos. The greatest amount of engineering skill,

patience and resource were demanded, and were at the proper season duly forthcoming. Nature, so far from assisting in the carrying out of the enterprise, seemed to have imposed every possible obstacle. Salina Cruz is an open roadstead, bereft of every kind of natural aid, such as, for instance, had been found at Veracruz, where a similar work was undertaken by the same firm of contractors. Here, as also at Veracruz, the most terrific "Northers" blow during the winter months, with this difference, however, that they blow from off the land instead of from the sea. While these north winds serve to beat down the surf, the summer winds from the south cause it to rise to great heights; and thus a double difficulty had to be encountered and overcome. In a word, a double harbour had to be constructed—an outer and an inner. The first provides a harbour of refuge, and is formed by two massive breakwaters thrown out in the shape of two embracing arms of unequal length far into the sea.

The east breakwater, which is the longer of the two, is 1 kilometre in length. It extends in a perfectly straight line for 370 metres from the shore, then for 250 metres on a curve of a radius of 573 metres, then follows another straight line of 380 metres. The west breakwater is 581 metres long, having 260 metres straight from the shore line; 112 metres on a curve of 100 metres radius, and 209 metres straight. In both breakwaters the convex sides of the curves turn seawards, thus offering a snug and complete protection from the roughness of the sea without.

The depth of water at the extremities of the breakwater is about 20 metres, this being the total depth at the entrance to the outer harbour. The width of the entrance, that is to say, the width between the two converging arms of the breakwaters, is 200 metres. The total area of water enclosed is 20 acres.

The inner harbour provides absolutely still water. All this vast area is entirely artificial, and, as a matter of fact, the water in this huge basin actually covers the former town of Salina Cruz, or, I should say, the site where the old town formerly stood. The stupendous work entailed in carrying out this scheme may be imagined when I add that the basin, or inner harbour, measures 1,000 metres long by 222 metres

wide, with a minimum depth of water of 10 metres at low tide.

Along the front of this basin is constructed a wall of concrete monoliths, each measuring 6 metres wide, 13 metres long and 17 metres high. These huge masses of solid concrete, each made for the particular purpose to which it was destined, are sunk by inside dredging to 13 metres below low-water, so that the tops alone are visible for 4 metres above the surface at low-tide. The monolith-wall is again protected by an inner rubble wall, faced with cement, and fronting the outer harbour. This wall stands 4 metres wide at the top, and the intervening space between it and the monolith-wall has been filled in with sand and other waste material, bringing it to an exact level with the first-named wall. Together, these walls provide a surface in width of some 70 metres.

Ships coming to Salina Cruz enter from the outer to the inner harbour through an opening left between the two breakwaters, measuring 30 metres wide, and which are spanned by two light-swinging bridges. Wharves of steel run down either side of the entrance, and tracks for wharfing purposes run the entire length. Here, as at Coatzacoalcos, every recent improvement in electrical and steam-driven machinery and appliances for handling the ships' cargoes has been provided, the vessels being expeditiously brought in alongside the wharf, loaded or unloaded, as the case may be, and as expeditiously sent away into the outer harbour.

Later on it is purposed to dredge back the inner basin to a width of 370 metres, when 10 piers also will be built, extending into the basin from the land-side. At the north-west corner of the inner-basin, a dry dock is nearly completed, and this will have a length of 180 metres and a width of 30 metres. The bottom measures 9½ metres below low water.

The new town of Salina Cruz, built by the Government contractors to replace the one they had destroyed, is a neat and well-designed one, but, unfortunately, as again in the case of Coatzacoalcos, Nature has been extremely unkind to the country by bestowing a generally unpleasant climate, and a soil composed entirely of a fine, gritty loose sand, most disagreeable at all times, either to walk upon, or when it is

blown, with the prick of needle-points, into one's face by the violent winds that prevail for the greater part of the year at this spot. I take it that the inhabitants of Salina Cruz are too busy with the immense amount of trade being done there, and are too much satisfied with their new and comfortable houses, to care very much about Boreas and his rough pranks.

The Pacific Coast terminus of the Kansas City, Mexico and Orient Railway will be at Topolobampo, in the State of Sinaloa, one of the finest ports on the coast, and requiring little or no heavy expenditure to make it an absolutely safe and snug one at all times of the year. From Topolobampo east the railway has already made considerable progress, there being something like 250 kilometres in operation, while it is expected that the line will be entirely finished from that port to Kansas City in 2½ years from this date. The distance between Topolobampo and Miñaca, where the Kansas City, Mexico and Orient Railway joins on to that of the Mexican Central, is a distance of 560 kilometres, a great portion of which has already been built, and some in operation. It is impossible to exaggerate the importance of this new transcontinental line, which will bring to Topolobampo a vast amount of traffic from the interior of the Republic and the East coast generally. A further description of the Port of Topolobampo will be found under Chapter XXX., which deals with the Kansas City, Mexico and Orient Railway.

The Ports of San Blas, in Sinaloa, and Guaymas, in Sonora, have very fine harbours, and they will no doubt, some years hence, be found enjoying a great amount of transcontinental trade. The first-named port is destined to be the chief port of entry and exit in connection with the new line of railway now being constructed by the Southern Pacific Co., while Guaymas has already a considerable trade connection which will be still further increased by the railway in question. Guaymas ranks also among the important commercial ports on the Pacific, being located at a distance of 154 kilometres from Hermosillo, the capital of the State of Sonora, as well as being connected by railway with Nogales, which is a border-town between Mexico and the U.S.A.

The bay of Guaymas is typical of all the Pacific Coast bays, and offers a fair example of the coast scenery. Bare mountains some 1,500 ft. high surround it, and in the still morning, when the light is upon them, they are most minutely reflected in the motionless water of the bay. The local colour of the water is green, but the intense blue of the sky changes it by reflection to a deep cobalt, while the mountains of rock are brown and terra-cotta. All these colours are changed again into towers and minarets of crimson and gold, purple and lilac, by the sunset light. An artist's soul would revel in the ever-changing lights and shadows, while his despair at catching them would be almost as great.

Mellay once said, "For my easel give me an hour of Scotland's summer, rather than a month of Egypt's." Which would he have chosen had he seen Mexico in either summer or winter? A cloud landscape in Sonora, a sunset effect upon Chapala, or sunrise on Popocatapetl would have sent him into raptures of enthusiasm. Nowhere in this world would more wonderful, weird and awe-inspiring cloud effects be found than at Hermosillo, Sonora, during the rainy season. The glorious procession of heavy vapours across the sunlit skies, the fairy towers and battlements, the kaleidoscopic colourings, the transmutations of lights and shadows, the perfect stillness of all Nature combine to give an effect as unique as it is awesome, overpowering, prayer-compelling! What would not a Watts, a Carot or a Keith give for such a subject for his brush? Where were the masters of classic Spain and Italy that they have never committed to canvas these marvellous landscape pictures?

The interest which Mexico is taking in the Panama Canal is purely academic, and whereas many might suppose that with the millions invested in the various routes through their own country destined to secure eastern trade, the Republic would view with apprehension and jealousy the opening of a rival route, as a matter of fact, whether the Panama Canal ever becomes *un fait accompli* or stands as a monumental failure for evermore, Mexico has little to fear. With her three routes across the Continent, from Kansas City (U.S.A.) to Topolobampo, from Mexico City to Manzanillo and from Coatzacoalcos to Salina Cruz, across the Isthmus of Tehuantepec, Mexico will, in any case, secure the great bulk of the

traffics between the West and the East. There will in all probability be enough of it for all the four highways—if ever Panama is added to the existing triumvirate. Competition to some extent, however, must arise, although, if intelligently managed, as they are practically certain to be, the various routes may even be found to aid one another. Anyhow, some years must elapse before Panama has to be seriously reckoned with, and in that time all the three Mexican routes will have become thoroughly established and be handling as much business as they can conveniently carry.

What this triple provision of transcontinental and inter-oceanic traffic means to the Mexican Republic can only be surmised. The actual results may, and I believe will, astonish even the most optimistic. To say nothing of the increase in the Government's revenues, the opening up of the West Coast States of Sinaloa, Colima, and the East Coast route through Veracruz and Oaxaca, means the addition of hundreds of millions of dollars to the value of the lands on the Pacific and Gulf slopes. With or without Panama, these must become the recognised commercial highways of the world.

CHAPTER XXXV

PORT OF MANZANILLO: Government improvements and expenditure upon harbours—Colonel E. K. Smoot's contract—Heavy engineering work—Simple plan cleverly carried out—Massive masonry—Smoot's work at Galveston—Constructional excellence—Breakwater and sea-walls—Prevention against heavy sea damage—Coaling station—Permanent and useful undertaking—Scenic beauty of Manzanillo Bay—Perfect safety for vessels.

IN actual point of population, if not in geographical dimensions, the Republic of Mexico has probably spent more money in opening new, or perfecting existing, ports, than any country in the world. It has always been part of the policy of President Diaz to provide the necessary funds for this important form of enterprise, and, as evidence of the energy with which it is pursued, I may say that quite recently the Mexican Government undertook to expend no less than $65,000,000 (Mex.) on new port works, this being in addition to what had already been expended, and which may be put at another $50,000,000 or $60,000,000. Among the more important undertakings of this character are the port works of Manzanillo.

Manzanillo is a great natural harbour, but, in order to render it suitable for the accommodation of ships, and afford them shelter and protection during storms, it was necessary to enclose the harbour more securely, constructing a breakwater as an extension of a natural promontory, sheltering the harbour on the west side; while, to provide safety during loading and unloading cargoes, extensive sea-walls had to be built within the tranquil area of the harbour. The Government and the contractor, Colonel Edgar K. Smoot, were at first faced with great difficulties, owing to the unhealthy condition and atmosphere of Manzanillo, which is mid-tropically