THE PANAMA CANAL AND INTERNATIONAL TRADE COMPETITION

HUTCHINSON

CANAL AND INTERNATIONAL
DE COMPETITION

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THE PANAMA CANAL AND INTERNATIONAL TRADE COMPETITION

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TO MY FATHER

PREFACE

In preparing the following chapters on the Panama Canal and international trade competition, the author has made no attempt to present a complete compendium of facts relating to the commercial intercourse between the two great regions which the canal will connect. The great movements in international trade result not so much from the successive seizing of new opportunities to supply the demand for this or that commodity in which the trader deals as from the operation of economic forces which make two or more economically different regions mutually dependent upon one another. The roots of large trade movement lie in diversity of resources and differences in stage of economic growth; the understanding of its possibilities and the recognition of its opportunities rest upon a group of factors which lie in the field of economic geography. Throughout the following pages the attempt has been made to place the emphasis upon those economic-geographic factors which render the Atlantic and the Pacific countries economically interdependent and hence tend to produce commercial interchange between them. The author has sought to avoid the mistake either of too precise prediction as to what trade development must take place or of presuming to instruct practical busi-

ness men as to the precise methods which they should employ in the conduct of their businesses. American business men have on the whole shown themselves well able to handle the problems which have confronted them. Yet there are certain fundamental movements and forces which are sometimes easily overlooked unless one's attention is particularly directed towards them, the losing sight of which may lead to the waste of a good deal of useless effort; and the attempt is here made to indicate clearly what these basic movements, forces and tendencies are. The traders or the trading nations which most readily and quickly put themselves in line with forces already operating are the ones which will be the most likely to accomplish permanent results.

The object of this book, therefore, is not to give mere information or to present a mass of facts but to use the material gathered for the purpose of illustrating tendencies. It is hoped that such a presentation may prove to be suggestive to business men who have or may have dealings with the countries in question or are interested in forming some opinion concerning the possible or probable commercial influence of the new canal. At the same time, the discussion of the problem may not be void of interest to the general reader or the student of commercial or economic history or geography. The business man who looks through the following pages with a view to getting specific information concerning some particular line of trade in which he may be interested will probably meet with disappointment, but he may nevertheless be able to find suggestions which,

in the light of his fuller practical experience in the business world he may expand and make use of.

The materials for the book have been gathered through a series of years during which the author has made a study of the commercial problems of Latin-America and the Pacific Ocean countries generally. The statistics used have been compiled from official sources for all of the countries which publish such data. Most of the facts and statements of a more general nature are based upon the writer's personal observations in the course of a series of visits to all of the countries mentioned and conversations with men actively engaged in commercial dealings in those countries. In the chapter on the effect of the canal on trade routes the report of the Isthmian Canal Commission on Panama Traffic and Tolls by Professor E. R. Johnson, has been extensively drawn upon; and here and there use has been made of articles and reports previously published by the present writer. Among these latter are: Trade Conditions in South and Central America, Washington, 1906–07; The Panama Canal and Foreign Trade Competition, *Daily Consular and Trade Reports*, January, 1913; The Panama Canal and Competition for Trade in Latin America, the Orient, and Australasia, *Journal of the Royal Statistical Society*, London, March, 1913; New Opportunities in the Pacific, *Yale Review*, July, 1914; Voyage Costs via Panama and other Routes, *American Economic Review*, September, 1914. The author also takes this occasion to express his appreciation of the courteous and efficient assistance rendered him by the American and other consular and diplo-

matic officers in the various countries visited by him in the prosecution of this work and to friends at home who have given aid in the form of suggestive criticism.

LINCOLN HUTCHINSON.

BERKELEY, CALIFORNIA, *June*, 1914.

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CHAPTER I

INTRODUCTION

EVER since Balboa's discovery that only a narrow strip of land blocked the passage from the Atlantic to the Pacific the traders of the world have looked forward to a time when this obstruction would be removed. The goal of the mediæval merchant's ambition was the fabulously wealthy East. The only routes thither in the sixteenth century were either overland through Asia, or by the long and hazardous sea voyage via Cape Horn or the Cape of Good Hope. The Asiatic route was infested by the Turks: the voyage around Africa was beset by serious perils of storm and Arab pirates: the route via Magellan or Cape Horn presented the handicap of enormously increased distance. The knowledge that a mere forty-mile land barrier at Panama was the only obstacle to a shorter and safer passage to the Eastern treasure house, inevitably prompted men to dream of its removal.

For three centuries and more this hope has lived, but the demand for its fulfillment has been subject to many varia-

tions in intensity. The need for such a route has on the whole grown less pressing as the world has passed from the mediæval to the modern stage of commercial activity. The economic growth of the countries of western Europe and the settlement and development of the resources of America gradually converted the Atlantic Ocean basin into the greatest commercial area in the world's history. The trade of the Orient, though its value, in absolute amount, was steadily increasing, was relatively of much less moment than during the days of da Gama and Albuquerque. European commerce with Asia and the Indies still longed for a better route than those which existed but the appeal was vastly less general.

Then came de Lesseps' triumph at Suez. European commerce found its easier outlet to the East, and to Europe, at least, the value of a western gateway to the Pacific became even less significant.

This was true, however, only for a short time. During the last quarter of the nineteenth century several new factors made their appearance in the world of international trade and turned men's thoughts again toward the desirability of a more direct communication between the Atlantic and the Pacific. The United States, which until that time had been chiefly an exporter of raw materials and foodstuffs and had not competed seriously with Europe in the sale of manufactured articles, rapidly rose to prominence as an exporter of the latter class of goods. Several of the larger countries of South America, through greater political stability and greater attention to the development of in-

dustries and resources, rose from their former insignificance as traders and lent new importance to the Pacific as well as to the Atlantic littoral of that continent. A great industrial revolution in Japan, predictions of similar developments in China, American enterprise in the Philippines, increasing population and the exploitation of new resources in Alaska, British Columbia, Australia, New Zealand, and even in Mexico and Central America, gave a new significance to the Pacific Ocean not as a mere route to the Indies, but as a trade area on its own account. The conception of the Isthmus of Panama as a barrier naturally came into prominence once more.

To the United States this aspect of the Isthmus as a barrier, appealed with greatest force. The geographic relations between her great trade centers and the Pacific markets were such as at first sight to make the cutting of the canal seem to offer her greater opportunities in the Pacific than to any European nation. The deeply-rooted conviction of American merchants carrying on trade between the Atlantic and Pacific coasts of the United States itself that they were helplessly the prey of the trans-continental railway freight rate makers added to the demand for a short sea route. And what was coming to be regarded as an economic necessity was suddenly raised to the position of a military necessity as well, by the Spanish war and the spectacular voyage of the "Oregon."

To Americans, then, for the reasons just mentioned, the opening of the Panama Canal appeals as an event of the utmost importance. To Europeans, on the other hand,

the significance is not thought to be so great; their largest trade interests in the Pacific are already cared for by the Suez or the Cape of Good Hope route. Yet even to them, with the increasing importance of the West Coast of South America, of Central America and Mexico, of the Pacific Coasts of the United States, British North America and Alaska, the facilities offered by the new route must appeal with considerable force. At any rate, whether directly interested or not, their fortunes are seen to be rather deeply concerned, indirectly, through the increased facilities which will be offered to their great new competitor, the United States. It is safe to say that the commercial world as a whole believes in the canal as a potent factor in international trade competition. In America there is a certain tendency to exaggerate its importance; in Europe a certain skepticism as to the extent of its influence; but in general a belief that its completion will have important results. Predictions as to what these results will be would be of great interest to statesmen and of immense value to merchants; and many attempts to forecast the future have been and are being made. These have resulted in so many widely differing and often diametrically opposed opinions that one is tempted to despair of any real solution; yet surely, so profound a geographical change as the cutting of a passage between the Atlantic and Pacific Ocean basins, through a barrier which in extreme north and south length stretches over 6,000 or 7,000 miles, must have some results which we ought to be able to foresee. The differences of opinion may merely be the outcome of too hasty generalization, on the

one hand, and an exaggerated attention to details, on the other. When the enthusiast makes sweeping statements as to results it is so easy for the specialist to discover glaring exceptions that the whole conclusion becomes discredited.

Much confusion seems to have resulted from our having fallen into the use of a figure of speech. We use the phrase—the canal will "create" a new line of traffic—the cutting of the Isthmus will "do" certain things; forgetting that the canal will be a purely passive factor in the problem and will really "do" nothing at all. Foreign trade, like all trade, is an affair of individuals or groups of individuals, actuated by self-interest, seeking profit by exchanging goods. The motive power lies with the traders of the various countries of the Atlantic and Pacific Ocean basins. The canal will merely open to some of these persons opportunities which did not formerly exist. Whether or not it will open an opportunity to any specified person will depend on many considerations. The canal will be used in any particular trade only if it offers a chance for additional profit to some particular trader or traders. The forces producing trade between Atlantic and Pacific countries already exist and operate: the canal may or may not, in any particular case, offer new facilities for the operation of these forces. The study of the probable results of the opening of the new route becomes an analysis of these causes and the relation between them and the new opportunity.

Foreign trade is essentially a barter, an exchange of surplus commodities. One country exports to another only because it has a surplus of some commodity which it can

exchange for something of which the second country likewise has a surplus. The transaction is reciprocal in character and the goods exchanged must, in the long run, be equal in value. The exchange may, of course, be, and indeed usually is, indirect or "triangular." Any specific country may export to a second country from which it gets nothing in return, in order to use the credit thus established for the import of goods from a third country, but this does not destroy the reciprocal character of the transaction nor alter the fact that foreign trade is an exchange of commodities. The fundamental prerequisite to the exchange is the production by each of the exchanging countries of a surplus of something which the other peoples want: and the fundamental determining factor is to be found in an analysis of what these peoples want. Imports, in other words, psychologically come first. Export exists only for the purpose of paying for import.

The character of this demand for foreign goods depends on many things. A country producing chiefly foodstuffs must if it would progress economically usually import its manufactured goods: one which is pre-eminent as a manufacturer will usually be in need of foreign food supplies. Another which possesses abundant supplies of iron and facilities for manufacturing it, may find it profitable to purchase abroad its supplies of manufactured textiles.

Given a demand for foreign goods of any class, the determination as to where these shall be purchased, i. e., the origin of the imports, will likewise rest on many considerations, sometimes lying within the decision of the individual trader

but probably more often settled for him by popular opinion: sometimes determined even by the foreign seller himself. If the goods demanded are bulk goods of uniform quality, or with differences in quality which it is difficult for the uninstructed public to understand, the individual trader may exercise a wide discretion. If the goods be highly specialized manufactures such as "fashion goods," i. e., goods which people learn to know by their size, shape, color, label, etc., the consumers' taste may be the sole determining factor. If the import be connected with some foreign investment of capital for the construction, say, of public works, the foreign lender may dictate in the matter. On the whole there seems to be a movement in international dealings toward an increasing number of transactions which approach the second class. This results from the spread of popular intelligence among the trading nations, a more widespread knowledge of the character of goods and their differences in quality: and it tends to reduce the position of the individual trader more and more to that of a mere agent giving expression to popular demand. Whether such a tendency can be proved to exist or not, it is certain that a very considerable proportion of the international trade dealings of to-day belong to the second class just mentioned. A consequence of this is that in regard to a very large number of the commodities that enter into international exchanges, mere price or cost is only one of many elements which determine the origin of imports. When the individual trader can himself determine where he is to purchase goods, there is a strong incentive for him to purchase in the cheap-

est market. But when he is merely acting as an agent of popular demand many other less strictly economic factors may decide the point. What we may call sentimental considerations may turn the scale. Racial prejudice against a foreign country may prevent the growth of any large popular demand for its goods; while racial affiliations or political or intellectual rapprochements may create a popular leaning towards goods which may be actually inferior and dearer. The people may insist on having French or German or American goods, merely because the facilities of travel between their homes and one of these countries have produced a greater degree of familiarity with its products. Or the mere fact that people see the flag of a particular nation on its merchant vessels more frequently than that of another may produce a popular impression that it, as a great trader, must have the best goods for sale. It is in such ways that sentiment plays an important part in determining the direction of trade.

The factors determining the direction of trade, resting thus on the elements which make up popular demand for goods, are extremely complex. Prices, transportation charges, postal and telegraphic facilities for placing orders, time required for delivery, conditions of payment and credit, capital investments, racial and social conditions, facilities for personal intercourse through travel, mere habit, and many other things all play a part in determining whence imports are to come.

Much more simple, though still complex, is the question as to the route by which they come. Here the factors are

almost wholly economic, though the elements which enter into the economic problem are many. The element of popular demand plays a much less important part here than in determining the *origin* of imports. It is generally a matter of complete indifference to a purchaser whether the goods he buys have reached him by this, that, or the other route: he is concerned merely in getting what he wants at a price which is satisfactory. There are, it is true, a few cases in which this is not altogether true, such as those which arise from the belief of purchasers that goods which travel over certain routes are improved or deteriorated as compared with similar goods coming through other channels. Such for example is the case of tea, which is still in many parts of the world believed to suffer in quality if carried by sea; or of lemons or whiskey, which are supposed to be improved by a sea voyage. Concerning the great mass of ordinary articles of commerce, however, such considerations play no part. The choice of route concerns either the selling merchant, if the price has been made on a c. i. f. basis, or the purchasing distributer, if the price is f. o. b.: and even with them the question is only of indirect importance. The choice of route touches them only through the medium of freight rates. They select the one which offers them the lowest freight—all elements of time, safety, reliability, etc., being considered.

The choice of route is, then, mainly an affair which concerns the transportation companies. Assuming that real competition exists between different companies, it will be their aim to offer to the shipper, transportation of his

goods by the cheapest, quickest, safest means which will yield current rates of profit on the company's investments. Their choice of route will tend to settle upon that one which offers the greatest facilities in these respects.

The problem of the Panama Canal is thus really a two-fold one. The origin of imports, the determination where they shall be purchased, depends upon one set of factors; the route by which they shall come depends upon quite a different set. The problem we are considering is primarily the former; we are only indirectly concerned with the latter. We are not considering the Panama Canal as a business enterprise; we are not directly concerned with determining whether as a business concern, it will "pay." Our object is to form some idea, if possible, how, if it *is* used, it will affect the trade of nations. The two questions are, of course, intimately connected with one another. If it is not used at all, it can produce no effect whatever; the extent to which it is used will be an important factor in determining what its results on the interchange of commodities will be. Still, it will conduce to clarity of thought in the matter, if it is remembered that the two problems are distinct from one another.

The origin of imports depends, as already stated, on such considerations as prices, freight rates, postal and telegraphic facilities for placing orders, time required for delivery, conditions of payment and credit, capital investments, racial and social conditions, sentiment, habit, facilities for personal intercourse through travel, etc. The only way the canal can effect changes in the determination of the origin

of foreign purchases will be through alteration of some or all of these factors. Only in this indirect way are we concerned with the question of route at all. Our concern is an intimate one and yet, after all, it is an indirect one. If we are to form any estimate of the influence of the canal, we must first determine how it is likely to affect routes, and then ask how the changes in routes will react on the factors which determine the place of purchase of goods.

The question is thus one of extreme complexity. It bristles with most formidable difficulties. How will it be possible to analyze the intricate actions and reactions of so heterogeneous a series of factors? Serious differences of opinion exist among men of long experience as to the relative importance of these various factors. If it were possible to assign to each its due weight as a determinant of the direction of demand the whole affair would be far simpler. But who can say in any particular case, what the exact relative influence is of price and sentiment, of capital investments and habit, of easy communication and conditions of credit, in determining whether goods shall be purchased in this, that, or the other country? The most that could be hoped for is a very rough approximation. There is a way, however, out of some, at least, of these difficulties. It lies in adopting a method of investigation which in a certain sense eliminates the necessity of a relative evaluation of the separate factors by seeking to ascertain what the net results of the interaction of all the factors as a whole, is. The countries with which we are concerned have been trading with each other for a long time. All the factors

which determine the origin of imports have been operating under the old conditions as to routes. If we can determine what the results of their operation in the past have been we may relieve ourselves of the necessity of placing an exact value on any one of them and be able merely to ask ourselves what changes will take place in them. If, for example, it can be shown that the operation of all these factors together under present and past conditions, is such as to cause an increasing demand for, say German goods in Peru—in other words, that the net effect of the interaction of all existing stimuli to German trade in Peru has been to increase Peruvian purchases in Germany; and if it can be shown that the opening of the canal will render one or more of these stimuli more active without decreasing the force of others, it will be safe to predict an increase in German exports to Peru when the new route is available. Only if some of the stimuli were affected positively and others negatively would it be necessary to place definite relative values on them. As between two competing countries, say the United Kingdom and the United States, if it could be shown that the demand for American goods has been on the increase in Japan, and that the opening of the canal would affect the stimuli to American trade without materially altering the forces which have promoted a demand for British goods, it would be reasonable to conclude that the new route would make for an expansion of the American market in Japan.

All difficulties will not, by any means, be removed. Not only in those cases in which the stimuli are altered, some

of them positively and some negatively, but in those cases in which, as regards two countries, the stimuli which are altered positively are different in the two cases, will it still be necessary to form some judgment as to the relative efficiencies of these stimuli before any prediction can be made as to the results of the change. Nevertheless the fact that the method of investigation proposed offers any simplification of the problem, does give promise of enabling us to make some forecast as to the commercial effects of opening the canal.

It is proposed, therefore, in the following chapters, to examine the trade of the countries which are at all likely to be affected by the changes in trade routes, using the statistics of the past ten or fifteen years, with a view to determining first of all, what the trend of development has been; to plot the curves, so to speak, of growth or decline, and to learn as much as may be of the causes which have led to their assuming the particular forms which we shall find them to possess. Then, having determined the direction and character of the curves, the new factor, the canal, will be introduced, and attention will be centered on the question how this new factor, operating through the various stimuli to trade, may alter the direction or character of movement.

There is nothing novel in this method of investigation. It is one which is already familiar in many sciences, or at least something very similar to it appears in many scientific investigations. It is analogous, for example, to the method which would probably be used by astronomers in

predicting changes in the orbits of the planets if a new world were suddenly to be introduced into the solar system. The application to a social problem like commerce is of course difficult in the extreme, but if its limitations are recognized, valuable results may nevertheless be attained.

CHAPTER II

ROUTES

It is evident from the analysis presented in the preceding chapter that whatever changes the opening of the Panama Canal will effect in the *direction* of international trade must be the result of alterations of trade routes. The changes in routes will be the medium through which the trade influence of the canal will be transmitted. Not every modification of routes will alter the geographical distribution of markets, but no alteration in the latter will take place without a change in the former. It becomes necessary, therefore, before taking up an examination of the markets to form some sort of opinion as to the manner and extent to which the opening of the canal will alter the highways of commerce.

The commerce with which we are concerned is that of the Pacific Ocean countries—Chile, Peru, Bolivia (so far as its trade finds an outlet via the Pacific), Ecuador; the Pacific Coasts of Colombia, Central America, Mexico, the United States, and Canada; Alaska; the Pacific Coast of Asiatic Russia; Japan, China, French Indo-China, Siam, the East Indies, New Guinea, Australia, New Zealand, and the Pacific Islands. The trade routes which can conceivably be affected by the opening of the canal are those which con-

nect these countries with the nations of the Atlantic Ocean basin. The Panama canal route must compete with commercial highways already in existence; and in order to form any judgment as to what success it is likely to have in this competition it will first be necessary to get clearly in mind what these present highways are and the causes which have fixed them where they are. For this purpose, the report of the Isthmian Canal Commission on the shipping and trade of the Pacific Ocean as it existed in 1909–10 is of invaluable assistance.[1] In the following pages this report has been very extensively drawn upon.

There are to-day three main lines of all-sea communication between the Atlantic and the Pacific regions; by way of the Suez Canal, the Cape of Good Hope, and Magellan Straits. All three of these are used by steamers. A fourth route is used by a decreasing number of sailing vessels, namely that via Cape Horn. The Suez Canal is not made use of by this latter class of vessels because of difficulties of approach and toll charges: nor is the Magellan route, because of dangers of navigation. Sailing vessels reach the Pacific either via Cape Horn or via the Cape of Good Hope.

By far the larger part of the commerce between the two oceans is carried over the all-sea routes, with the exception of the trade between the two coasts of the United States, between the two coasts of British North America, and between the United States and Mexico. Of the all-sea traffic, that of the Pacific Coasts of North and South America is carried on chiefly via the Straits of Magellan. The com-

[1] E. R. Johnson: Panama Canal Traffic and Tolls; Washington, 1912.

merce with the eastern coasts of Asia goes mostly via Suez, while that of Australia, New Zealand, Southern Asia and the East Indies uses either the Suez Canal or the Cape of Good Hope route; large, fast steamers carrying passengers and mail ordinarily choosing Suez, while slow freighters prefer the Cape. Many of these freighters make the return voyage via Magellan. Such sailing vessels as are still operating in this trade of course use the Cape route.[1]

It is the general opinion of shipping men, so widely held that it may be accepted without question, that the sailing vessel is rapidly disappearing from international trade. Hence in any discussion of the influence of the Panama Canal on trade routes we may leave them out of consideration, and may simplify our problem by comparing only the three great all-sea routes actually used by steamers.

The factors which determine the choice of ocean routes include such heterogeneous items as distance, ocean currents and winds, weather conditions, dangers of navigation, distances between fuel stations, costs of fuel, way-freight markets, passenger traffic, toll charges, etc. Any attempt to make a general statement in regard to the merits of a particular route, which shall include an estimate of all of these items, must result in confusion. If, however, we can select from among these numerous factors those which play the most important part we may perhaps get a rough, general guide which will help us in discovering what the

[1] These statements can, of course, be accepted as applying only to what may be called the normal movement of vessels. There are many individual exceptional cases especially those in which a vessel makes the outward voyage by one route and the return by another.

probabilities of choice would be between two alternative routes. Now it so happens that among these ten or a dozen factors which influence the choice of routes three or four stand out pre-eminently. The first, and the one exercising the most profound influence is obviously distance. If it be assumed that the cost of operating the average freight steamer of 3,000 net registered tons and ten knots speed is $300 a day, the saving of a few days' distance must be a much more important consideration, except under very exceptional circumstances, than many of the other items above mentioned. The truth of this statement is brought out if we compare the effects of increased distance with the results of certain other adverse conditions. Suppose, for example, that in order to save a day's distance by some newly opened route a steamer of the sort just mentioned should be obliged to encounter an adverse ocean current. A current of twenty-four knots a day for any considerable distance is an exception in the ocean. In order that the benefit of saving one day's sailing for a ten knot steamer should be counteracted by such a current, the conditions would have to be such that the steamer in choosing the new route must face the current for at least ten days. It is doubtful whether anywhere in the ocean on any possible trade route a current of this extent and average speed could be found. Most currents are far weaker and much more quickly traversed. The few currents that are faster owe their speed largely to the fact that they are much more limited in extent. They are consequently rather easily avoided by unimportant detours. It seems safe to say that

only in an exceptional case would a steamer be likely to avoid a route which offered even one day's saving of distance, merely to escape an adverse current, or to take advantage of a favorable one.

The most important consideration to the shipowner, after saving of distance, is probably the saving of fuel costs. An ordinary ten knot freighter of the size mentioned burns something like thirty tons of coal per day. The average cost of coal in the chief coaling stations on the world's trade routes is about $4.70 a ton. Of the $300 average daily cost of operation of the average freight steamer, therefore, no less than $141, or 47 per cent. is the outlay for fuel. If saving of distance and costs of fuel were the only two considerations determining the choice of two alternative routes, it would, therefore, be an easy matter to reduce the problem to a mathematical statement. On a round trip voyage occupying say sixty days' sailing time each way a new route cutting down the distance by a single day's steaming each way would offer no saving of expense over the old route if the average cost of coal by it were enhanced by only ten cents a ton. On the other hand, a new route cutting down the sailing time of a sixty days' round trip by five days each way would offer a considerable saving even if the cost of coal by the shorter route were fifty cents a ton higher. On long ocean routes, such for instance as those leading to the Orient, the differences in average costs of coal by alternative routes probably do not exceed $1.20 a ton. If this be taken as a fair average of extreme differences it is possible to estimate approximately

the limits of influence of this factor in determining the choice of routes. On a one hundred and twenty day round trip a saving of a little over twelve days each way, by choice of a new route on which the fuel costs were $1.20 per ton higher, would leave the costs of the voyage equal by either route. It would probably require a saving of thirteen days to turn the scale in favor of the shorter route. Similarly, other things being equal, a saving of seven days on a sixty day round trip, or of three and one-quarter days on a thirty day trip would be necessary in order to cause a preference for the new route.

Toll charges are likewise one of the large items of expense and their influence in determining choice of route may also be stated in fairly definite form. The estimated cost of operation of ordinary freight steamers stated above at about $300 a day is based upon an average which has been calculated at approximately ten cents per day per net registered ton.[1] The charge for tolls in both the Suez and Panama canals is also based on net tonnage, the rate being practically the same in each case—six francs, twenty-five centimes at Suez and $1.20 at Panama—with some slight differences in the method of measuring net tonnage. Between these two routes, therefore, there may be said to be no choice in this respect. But when it comes to a decision whether a particular ship is to use either canal or some other alternative route, the question of preference, other things being equal, becomes one of simple arithmetic. The operating costs being ten cents per ton and the tolls $1.20 per ton,

[1] Johnson: Panama Traffic and Tolls, pp. 176–9.

any route which required more than twelve days longer than the canal route would be abandoned in favor of the canal. In other words, for the average freight steamer it would require a saving of time of at least twelve days, by the use of a canal route, to offset the deterrent effect of a toll of $1.20 per net registered ton. It is necessary to emphasize the fact that this statement applies only to the ordinary freighting vessel of say ten knots speed. For faster vessels, such as are now ordinarily used for combined passenger and freight service the per diem costs per net ton are of course larger. For a twelve knot vessel of this class the costs are probably fifteen cents per ton per day: for a fifteen knot boat, they may run up to twenty cents. Obviously, the repelling effect of tolls becomes less for such vessels. For the twelve knot boat, an eight days' saving of time would offset the tolls: for a fifteen knot one, six days would be sufficient.

Much more difficult to reduce to a calculable basis is the effect of opportunities for picking up local freights and passengers. Rates of transportation of both freights and passengers vary greatly, as do also the profits on the business, especially between way ports. It would probably be impossible to form any useful opinion as to the relative value of this sort of business compared with through business, but it may not be impossible to find a basis of comparison in this respect of two competing routes. The amount of local freight and passenger business must bear some more or less definite relation to the number of way ports and the population and commercial activity of the

countries in which these ports are situated. Of two alternative routes, that one which has the greatest number of stations, with the larger population, and the greatest general commercial activity, must offer the greatest opportunities for local business. So that while it may be impossible in advance to say whether the business of this kind picked up on any particular route will be sufficient to pay the cost of losing one or two or ten days' time in order to take that route rather than a shorter one, it may nevertheless be possible to arrive at some judgment, other things being approximately equal, as to whether one route would be preferable to another in this respect. For example, it may be impossible to say whether local traffic between San Francisco and Yokohoma would yield sufficient return to make it worth while for a vessel bound from Panama to Yokohama to call at San Francisco; yet it is practically certain that there is much greater likelihood of such a stop being profitable than a stop at Honolulu en route from Panama to Yokohama.

The other factors which enter into the determination of the choice of route by vessels are of very minor importance compared to those which have now been discussed. Insurance rates are not likely to be very different on the various alternative routes. The prevalence of storms, unless it be very marked in some particular locality, does not play a great part in altering the routes of steamships. It may cause them on a single voyage to alter their courses somewhat, causing some delay and thus lengthening that voyage, yet, on the whole, in the course of a year, the addi-

tion to the expense account is obviously very slight. It would determine choice of route only if all other things were quite equal and competition were very close. The same may be said in regard to differences in port charges. At terminal points, charges would of course be identical by either of two alternative routes. Only at way ports at which a vessel might stop to discharge or receive passengers or cargo would differences between the two routes make themselves felt and then they would only form one of the elements in the expenses of way freight and passenger business. Only in those cases where this local business furnished a large part of the income of a shipping company would the question be likely to become one of much concern.

This brief analysis of the relative importance of the elements which go into the determination of choice of trade routes makes it obvious that the most potent factors in determining whether vessels engaged in any particular traffic will abandon the routes which they now use in favor of the Panama route will be the question of distance, the outlay for canal tolls, the cost of fuel supplies, and the possibility of getting way freights and passengers. In the main, the other factors, though operating, will be of much less moment. Only where the relative merits of the canal route and some other are closely balanced would these other factors need serious consideration.

These elements which may be regarded as the chief determinants of the choice of routes naturally fall into two classes; one relating to the operating expenses of the steamship company; the other to its income. On the one side

must be placed the relative cost of operating a vessel over one route rather than another, including the general operating expenses, the amount of coal consumed, the cost of the coal, and the tolls payable, if any. On the other side of the account will be the income from freights, which will obviously depend upon the amount of cargo which can be carried per voyage, the rates which can be charged, and the number of voyages which can be made during a given period such as one year. To this must be added passenger and mail receipts, way freights, way passenger receipts, etc., for such vessels as carry mails and passengers or which do a way freight business. For many vessels, also, subsidy payments add a large item.

In spite of the elimination of minor items, these factors which remain are, therefore, sufficiently numerous and complex to leave the problem still a most confusing and difficult one. It will be desirable, if possible, to get still further simplification, and this we may do by confining our attention to one class of vessels only.

Speaking broadly, the international trade of the world is carried in two distinct sorts of vessels; liners plying on definite routes on a more or less fixed schedule with sailing dates announced often many months in advance; and tramps, sailing when, and to the port for which, they can get cargo. The liner, in general, is the vessel which, because of its fixed schedule and route, carries the bulk of the passenger traffic of the world and if it is of sufficient speed gets mail contracts and shipping subsidies where such exist. Sailing on definite schedule, whether it has a cargo

or not, this sort of vessel is the one most likely to have space for and be most interested in seeking way freights. The tramp is far more likely to have full cargo from its port of clearance to its final destination.

It is well known that the bulk of the world's ocean freights are carried by this tramp class of vessel. Just how large the proportion is it is impossible to say with any degree of certainty, but it is probably well over one-half of the total, especially in regions like the Pacific Ocean basin the countries of which export chiefly bulky raw and semi-raw materials. Of the steamers entering and leaving San Francisco, for instance, in the year 1911, over two-thirds belonged to the tramp class and less than one-third to the liner class.

If, therefore, in examining the relative merits of two routes, we confine our attention to tramps, and assume that they sail with full through-cargoes, we shall get comparisons which will cover a considerable share of ocean commerce, and may get results which, although they may not be conclusive, will at least be suggestive. And we shall eliminate from our problem the confusing and intricate factors of mail, passenger, subsidy, and way-freight receipts, leaving only to be considered the expenses of operation and the annual freight receipts.

The average size vessel of this sort is about 3,000 net registered tons, the cargo carrying capacity, about 6,000 tons, speed about ten knots, and the coal consumption about thirty tons per day.[1] The cost of such a vessel is somewhere in the neighborhood of $300,000 and its owners

[1] Johnson: pp. 176–9.

aim to make an annual profit of about 25 per cent. on their investment. The general operating expenses; salaries and wages (both in land offices and aboard ship), provisions, maintenance and repairs, insurance, taxes, etc., have been put at an average of $160 a day. The only other item of expense, that for fuel, varies with the price of coal at fuel stations. Such an average vessel is at sea under steam approximately two hundred and thirty days in a year and in port the remaining one hundred and thirty-five days. The operating costs while at sea may be taken, therefore, at $160 per day for general expenses, plus the cost of thirty tons of coal per day at the prices ruling at the ports where the vessel took on fuel. The operating costs while in port will be merely the $160 a day for general expenses.

Using these average figures as the basis for estimating costs via two competing routes it would seem that we might get results which although they would probably not be applicable to any particular vessel, would at least be comparable with one another and help us form some judgment as to the relative merits of the two routes.

This point can best be illustrated by giving a specific instance. A vessel going from Liverpool to Wellington may choose either the Suez or the Cape of Good Hope route. If it takes the former its expense account will be somewhat as follows:

For the round trip:

108.2 days under steam @ $160 a day for general expenses.....					$ 17,312
Tolls @ 6 frcs. 25 cents. per net registered ton, $3,600 each way..					7,200
Coal: Liverpool–Gibraltar.....	162	tons @	25/3 [1]	$1,023	
Gibraltar–Port Said.....	240	" "	23/0	1,380	
P. Said–Colombo.....	429	" "	25/6	2,734	
Colombo–King George Snd. ...423		" "	26/0	2,749	
King George Snd–Melbourne ..201		" "	25/6	1,281	
Melbourne–Sydney..... 72		" "	19/6	351	
Sydney–Wellington & ret.....320		" "	16/0	1,280	
Sydney–King George Snd.....273		" "	16/0	1,092	
King George Snd–Colombo....423		" "	25/6	2,696	
Colombo–P. Said.....429		" "	26/0	2,789	
P. Said–Gibraltar.....240		" "	25/6	1,530	
Gibraltar–Liverpool.....162		" "	23/0	932	
					$ 19,837
Cost per round trip.....					$ 44,349

[1] Contract prices, 1912. See Johnson, pp. 157–170.

If it chooses, instead, the Cape route, the costs will be:

111.2 days under steam @ $160.....					$ 17,792
Coal: Liverpool–Durban.....759		tons @	25/3	$4,791	
Durban–Sydney.....831		" "	13/0	2,701	
Sydney–Wellington & ret.....320		" "	16/0	1,280	
Sydney–Durban.....831		" "	16/0	3,324	
Durban–Liverpool.....759		" "	13/0	2,467	
					$ 14,563
Cost per round trip.....					$ 32,355

The annual costs for two exactly similar vessels running, one via Suez, and one via the Cape would be:

Via Suez:—2.12 round trips (230 days) @ $44,349.....	$ 93,133
General expenses in port (135 days @ $160).....	21,600
Total annual expenses.....	$114,733
Via the Cape:—2.07 round trips @ $32,355.....	$ 67,946
General expenses in port.....	21,600
Total annual expenses.....	$ 89,546

This gives us a basis for a rough comparison of the annual expenses of the two vessels; but the annual income must also be considered. On the assumption that the vessels will carry full cargoes, each will take on every voyage all the freight it can put into the space not occupied by the necessary coal. The carrying capacity of each is assumed to be 6,000 tons. Each must surrender enough of this space for use as coal bunkers, to give it a sufficient supply of fuel to carry it over the *longest* distance between stations. On the Suez route the largest amount of space thus sacrificed will be four hundred and twenty-nine tons (coal from Port Said to Colombo): on the Cape route, eight hundred and thirty-one tons (Durban to Sydney). The former, therefore, on a round trip can carry 11,142 tons of freight, and in a year 23,398 tons; the latter, 10,338 tons on a round trip, and 21,710 per annum. Assuming, again, that each would aim at making an annual profit of 25 per cent., and that the capital investment is $300,000 per vessel, the Suez vessel would find it necessary to get an annual gross income of $114,733 plus $75,000 or $189,733, and in order to do so would be obliged to charge an average freight rate of $8.19 per ton: the Cape vessel's annual gross income would have to be $89,546 plus $75,000 or $164,546, and its freight rate $7.58 per ton. Clearly, the Cape route would be given preference.

This method of comparison is, obviously, based on a series of rather violent assumptions; that the bulk of ocean freight is carried by tramps, that the average size of such vessels is 3,000 net tons and the carrying capacity 6,000

tons; that the average speed is ten knots per hour and the coal consumption thirty tons per day; that the average investment is $300,000 and the annual profit aimed at, 25 per cent.; that the average number of days at sea is two hundred and thirty per annum and in port one hundred and thirty-five; that the expenses other than for fuel average $160 per day and that fuel prices are those of 1912; that full cargoes will always be carried; and that, on the whole, there will be as many vessels moving in one direction as the other on any particular route. It would be absurd, therefore, to imagine that the figures arrived at have any value as absolute quantitative measurements. But, if exactly the same assumptions are made in every case, if the average figures used may be accepted as at least being somewhere near the truth, and if they include allowances for the chief factors which are likely to affect the choice of routes by the particular class of vessel considered, it may not be unreasonable to believe that the calculations furnish a fairly correct basis of comparison between such routes.

In the illustration given above concerning the routes from Liverpool to Wellington, the figures arrived at for freight rates between the two ports, of $8.19 per ton via Suez and $7.58 via the Cape have of course no validity in themselves, but as units upon which to base a comparative estimate of the relative merits of the two routes, they are at least significant. They focus within themselves, so to speak, the more important elements of the problem, time (distance), fuel costs, general operating expenses, toll charges, income, and normal profits. If we, therefore,

make a comparison of the various all-sea routes from the Atlantic to the Pacific based upon figures reached by this method, we shall be likely to get results which will at least be suggestive.

The all-sea routes from the Atlantic to the Pacific, to-day, are, as has already been stated, three in number: via Suez, via the Cape of Good Hope, and via Magellan Straits. The new Panama route will enter into competition with all of these. In order to get a complete estimate of the facilities offered by the new canal it would be necessary to examine the costs and receipts on every specific route from every Atlantic port to every Pacific port between which trade is being or may be carried on. Obviously such an estimate would necessitate a large amount of labor and would be likely to result in confusion through the multiplicity of details. Again, a simplification by elimination has been attempted. The bulk of the trade from the Atlantic to the Pacific originates in the Atlantic States of the United States or in Northwestern Europe. New York handles most of the American trade and half a dozen ports like Liverpool, Southampton, London, Havre, Rotterdam, and Hamburg, handle the European. If we analyze conditions for New York we shall get a fair idea of the relation of the canal to routes from America. Similarly, if we analyze conditions for any one of the European ports just mentioned we shall get a fair idea of its relations to Europe; for the effects of the canal on the routes from these various European ports will not greatly differ. They are so situated that distances, costs, etc., from any one of them will be about the same

as from any other. We shall not go far wrong, then, if we choose Liverpool as the typical European port, and make our comparisons for New York on one side of the Atlantic and Liverpool on the other.

On the Pacific end of the routes such a complete simplification is impossible. The best we can do is to select from the hundreds of ports a few which may be regarded as representing the more important regions. The following may be regarded as the typical Pacific Ocean ports:—for Southern Chile, Coronel; Central Chile, Valparaiso; Northern Chile, Iquique; Peru, Callao; Ecuador, Guayaquil; Central America, San José de Guatemala; Western Mexico, Acapulco; Pacific Coast of the United States and British Columbia, San Diego, San Francisco, and Seattle; Japan, Yokohama; Northern China, Shanghai; Southern China, Hongkong; Philippine Islands, Manila; Straits Settlements, Singapore; East Indies, Batavia; Southern Australia, Melbourne; Eastern Australia, Sydney; and New Zealand, Wellington.

Calculations, made as already indicated, for the various routes from New York and Liverpool to these nineteen Pacific ports give the results shown in Tables I, II, III and IV in the Appendix.

If we assume that in general (for vessels of the type we have been considering) that route will be chosen which gives the lowest rate per ton, calculated in the manner indicated, then the Panama route will be used (if toll rates remain as at present fixed, at $1.20 per net registered ton) as follows:

From Liverpool To	*From New York* To
Coronel	Coronel
Valparaiso	Valparaiso
Iquique	Iquique
Callao	Callao
Guayaquil	Guayaquil
San José de Guatemala	San José de Guatemala
Acapulco	Acapulco
San Francisco	San Francisco
Seattle	Seattle
	Yokohama
	Shanghai
	Melbourne
	Sydney
Wellington	Wellington
	[1] Manila

The Suez route will be used

From Liverpool To	*From New York* To
Yokohama	Hongkong
Shanghai	[1] Manila
Hongkong	Singapore
Manila	Batavia
Singapore	
Batavia	

[1] No difference between the Suez and Panama routes.

The Cape route will continue to be used from Liverpool to Melbourne and Sydney.

For vessels of a larger, faster type, the passenger and mail steamers of to-day, a different set of calculations is required. Such vessels in use on routes to the Pacific Ocean basin average approximately 5,000 net registered tons in size, have a speed of about fifteen knots, and burn about seventy tons of coal a day. The average running expenses

reach about $700 a day exclusive of fuel. The average capital cost of such vessels is taken at $800,000.

Calculations, exactly similar to those above, for vessels of this class give the results shown in Tables V, VI, VII and and VIII in the Appendix.

These tables show that if no other elements than those included in the calculations entered into the problem, we might be justified in concluding that the Panama Canal would be chosen by vessels of the fifteen knot class on practically the same routes as those preferred by the ten knot vessels. But the receipts from passenger traffic, mail contracts, way freights, and subsidies will here play an important part and will in many cases be a determining factor. For example, according to our calculations for a fifteen knot vessel, the Cape of Good Hope route is ninety-four cents a ton or 10 per cent. cheaper than the Suez route on the voyage from Liverpool to Melbourne, and twenty-four cents, or 3 per cent. cheaper, from Liverpool to Sydney; yet it is a well-known fact that such vessels prefer the Suez route. In other words, the Suez route to-day offers inducements of a sort not included in our calculations sufficient to counterbalance a 10 per cent. advantage in the Cape route. On the only routes from Liverpool in which the Panama Canal may compete with Suez (to Wellington), the advantage of Panama is only sixty cents a ton or less than 7 per cent. and it is probable, therefore, that the Suez route will continue to be used.

For fifteen knot vessels from New York, the advantages of the Panama route, where any advantage exists, are in

every case well over 10 per cent.; to Shanghai, 12 per cent.; to Yokohama, 25 per cent.; to Melbourne, 21 per cent.; to Sydney, 27 per cent.; and to Wellington, 36 per cent. It is not unlikely, therefore, that the Panama route will be chosen by vessels bound for these ports in spite of mail, passenger, and way-freight attractions of the Suez route. To Hongkong, on the other hand, the calculations putting the two routes on an exact equality, it is probable that the Suez route will be chosen in many cases at least.

On the American shores of the Pacific, the advantages of the Panama over the Magellan route are, on the whole, too great to be overcome by other considerations. From New York, even to the southernmost port on the list, Coronel, the Panama route shows a rate of 39 per cent. cheaper than the Magellan: to Guayaquil, the advantage of the Panama route becomes 70 per cent. Only in regard to vessels from Liverpool to the southern South American ports would there seem to be any doubt. The advantage of the Panama over the Magellan route to Coronel is only 11 per cent. and to Valparaiso, 16 per cent. It may well be that the way-freight and passenger business on the east coast of South America, at Buenos Aires, Montevideo, Rio de Janeiro, etc., will furnish sufficient attractions to keep these vessels in their present channels.

On the whole, then, it may not be far from the truth to conclude that for vessels of the fifteen knot class the situation after the competition of the Panama Canal shall have made itself felt will be about as follows:

The Panama route will be used

From Liverpool	*From New York*
To	To
Iquique	Coronel
Callao	Valparaiso
Guayaquil	Iquique
San José	Callao
Acapulco	Guayaquil
San Diego	San José
San Francisco	Acapulco
Seattle	San Diego
	San Francisco
	Seattle
	Yokohama
	Shanghai
	Melbourne
	Sydney
	Wellington

The Suez route will be used

From Liverpool	*From New York*
To	To
Yokohama	Singapore
Shanghai	Batavia
Hongkong	
Manila	
Singapore	
Batavia	
Melbourne	
Sydney	
Wellington	

Doubtful will be: the routes from Liverpool to Coronel and Valparaiso, and from New York to Hongkong and Manila.

From the facts thus brought out concerning the probable routes of the two classes of vessels, if it be assumed that they are even approximately correct, several important conclusions may be drawn. They may most clearly be indicated by reference to the following table.

"COST OF SERVICE" RATES FOR 10 KNOT, 3,000 TON VESSELS AND FOR 15 KNOT, 5,000 TON VESSELS FROM NEW YORK AND FROM LIVERPOOL VIA PRESENT ROUTES AND VIA NEW ROUTES

	10 knot, 3,000 ton vessels						*15 knot, 5,000 ton vessels*					
	Old Routes			New Routes			Old Routes			New Routes		
	From New York	From Liverpool	Percentage of difference	From New York	From Liverpool	Percentage of difference	From New York	From Liverpool	Percentage of difference	From New York	From Liverpool	Percentage of difference
Coronel	4.90	5.54	+11.5	3.23	4.93	+34.5	6.18	6.81	+ 9.3	3.94	6.81	+42.1
Valparaiso	5.05	5.61	+ 9.8	3.10	4.82	+35.7	6.44	7.05	+ 8.7	3.80	7.05	+46.1
Iquique	5.56	6.03	+ 7.8	2.80	4.41	+36.5	7.04	7.57	+ 7.0	3.38	5.36	+36.9
Callao	5.82	6.42	+ 9.3	2.40	4.03	+40.4	7.40	7.95	+ 6.9	2.88	4.90	+41.2
Guayaquil	6.24	6.86	+ 9.0	2.07	3.75	+44.8	7.81	8.53	+ 8.4	2.48	4.53	+45.3
San José	6.82	7.47	+ 8.7	2.12	3.81	+44 4	8.62	9.25	+ 6.8	2.54	4.60	+44.8
Acapulco	7.07	7.73	+ 8.5	2.45	4.09	+39.1	8.86	9.50	+ 6.7	2.94	4.96	+40.7
S. Diego	7.80	8.49	+ 8.1	3.27	4.96	+34.1	9.95	10.44	+ 4.7	3.97	6.04	+34.3
S. Francisco	8.16	8.89	+ 8.2	3.51	5.20	+32.5	10.35	10.80	+ 4.1	4.30	6.35	+32.3
Seattle	8.45	9.21	+ 8.2	3.90	5.55	+29.7	10.63	11.35	+ 6.3	4.78	6.83	+30.0
Yokohama	8.20	6.94	—15.4	6.21	6.94	+10.5	10.20	8.72	—14.5	7.68	8.72	+11.9
Shanghai	7.61	6.48	—14.8	6.77	6.48	— 4.3	9.41	7.96	—15.4	8.31	7.96	— 4.2
Hongkong	7.09	6.06	—14.5	7.09	6.06	—14.5	8.85	7.44	—15.9	8.85	7.44	—15.9
Manila	7.09	6.06	—14.5	7.09	6.06	—14.5	8.75	7.35	—16.0	8.75	7.35	—16.0
Singapore	6.34	5.26	—17.0	6.34	5.26	—17.0	7.75	6.40	—17.4	7.75	6.40	—17.4
Batavia	6.54	5.42	—17.1	6.54	5.42	—17.1	7.97	6.57	—17.6	7.97	6.57	—17.6
Melbourne	7.27	6.83	— 6.1	6.45	6.83	+ 5.6	10.31	9.06	—12.1	8.12	9.06	+10.4
Sydney	7.32	7.14	— 2.5	6.33	7.14	+11.3	10.61	9.27	—12.6	7.75	9.27	+16.4
Wellington	7.73	7.53	— 2.6	5.78	7.35	+21.4	10.94	9.80	—10.4	7.05	9.80	+28.1

+ indicates percentage by which New York rates are lower than Liverpool rates.
— indicates percentage by which Liverpool rates are lower than New York rates.

It will be seen at once that the development of the new routes makes a great difference in the relative positions of New York and Liverpool in relation to many of the Pacific markets. The rates which have been obtained by the calculations presented represent comparative costs of service. By the old routes, for both classes of vessels New York has a slight advantage over Liverpool to ports on the west coast of North and South America, ranging from 7.8 per cent. in the case of Iquique to 11.5 per cent. in the case of Coronel, for vessels of the ten knot class; and from 4.1 per cent. to San Francisco to 9.3 per cent. to Coronel, for fifteen knot vessels. The use of the Panama Canal will increase New York's advantage from five to tenfold, the cost of service becoming from 30 to 46 per cent. cheaper from New York than from Liverpool.

For the Australasian ports New York now stands at a disadvantage compared with Liverpool, ranging from 2½ to 6 per cent. for ten knot vessels and from 10½ to 12½ per cent. for fifteen knot vessels. The Panama Canal will convert this handicap into an advantage of from 5½ to 21½ per cent. for the slower, and from 10½ to 28 per cent. for the faster vessels.

For ports in the Orient and the East Indies there will be far less change. For Hongkong, Manila, Singapore, and Batavia, there will be no alteration. For Shanghai, New York will still remain at a disadvantage, but it will be reduced from about 15 per cent. to a little over 4 per cent. Only in the case of Japan (Yokohama) will the present disadvantage be converted into a distinct advantage. At

present the costs of service from Liverpool are 15.4 per cent. cheaper than from New York for ten knot, and 14.5 per cent. cheaper for fifteen knot vessels. The new route will make the costs from New York 10½ per cent. cheaper from New York than from Liverpool for the slower, and 12 per cent. cheaper for the faster ships.

It must again be emphasized here that the figures given have no significance as absolute measurements of the freight rates that are likely to be put in force. Their value is relative merely. It would be absurd, for instance, to imagine, on the basis of the calculations presented, that the freight rate to Wellington on a ten knot vessel will be just the $5.78 per ton from New York given in the table, or the $7.35 per ton from Liverpool. Actual freight rates depend upon a vast complexity of factors many of which have not been, and could not be included in any calculations such as those that have been presented. For line vessels, in general, it is a well-known fact that cost of service does not determine rates. The numerous shipping "conferences" to which the owners of such vessels are parties, in large measure eliminate competition and the rates are fixed on the monopolistic principle of "what the traffic will bear." Costs of service which are represented roughly by the figures given in the tables, in such cases give only a lower limit beyond which the rates cannot permanently sink: the actual rates may be far higher. It may nevertheless not be unreasonable to expect that whatever rates are actually made by vessels of this class, the cost of service from New York being higher or lower than from Liverpool, there will

be a tendency at least for these actual rates also to be higher or lower and in somewhat the same proportions as the costs of service.

For tramp vessels, the ten knot class of the tables, the connection between cost of service and actual rates is far closer. The rates here are in most cases highly competitive and therefore tend to sink to the level of cost of service, and the probability becomes far stronger that the actual rates charged will bear a relation to one another fairly close to the ratios arrived at by our calculations.

On the whole, then, it seems justifiable to conclude from the tables given that New York as a result of the opening of the new canal will be likely to get, in the long run, lower freight rates than Liverpool, to the entire west coast of North and South America, to Japan and northern China, and to Australasia.

Another element of possibly even greater importance to the trade is the frequency and rapidity of service in the transmission of goods. The higher and more costly the class of goods the more important, of course, does this factor become.

By present all-sea routes New York is, in general, at a disadvantage compared with Liverpool. A reference to the tables presented in the Appendix shows that the time of delivery from New York to points on the west coast of North and South America is only a day and a half less than from Liverpool for ten knot vessels and one day for fifteen knot vessels. With the new route open goods from New York can be delivered by the slower vessels in about eleven

days' less time than from Liverpool, and by the faster, in seven days' less time.

In Australasia, New York now labors under a disadvantage compared with Liverpool of something over three days' time for ten knot vessels, and about five and one-half days' time for fifteen knot vessels (via Suez). The new route will put New York from nine to twelve days nearer to Australia and New Zealand than Liverpool, for the slower class of ships, and from four and one-half to seven days nearer for the faster.

For Batavia, Singapore, Manila, and Hongkong there will be no essential change in this respect, but for northern China and Japan New York's position will be greatly strengthened. Ten knot vessels now require eight days' more time, and fifteen knot vessels, five and one-half days' more time to go from New York than from Liverpool to Shanghai. With the canal open the difference against New York will become less than one day.

By present routes, ten knot ships from New York to Yokohama require about eight days longer than from Liverpool: via the new route New York will be eight days nearer than Liverpool. For the faster vessels New York's present disadvantage of five days will be converted into an advantage of five days.

The analysis of the all-sea routes between the Atlantic and the Pacific Ocean basins presented in the preceding pages makes it evident that so far as the traffic is waterborne, the new canal will offer certain very definite advantages to the shippers of the Atlantic and Gulf coasts of the

United States that do not now exist. Their position as competitors with Europe for the trade of the west coast of North and South America, of Australasia, of Japan, and of northern China will be materially strengthened. Our examination thus far has, however, been confined merely to the all-sea routes, and will be incomplete unless the relation of the canal to existing land-and-sea routes is also analyzed. Many classes of goods get from the Atlantic States of the United States or from Europe to the Pacific countries either wholly overland or by a combination of overland and sea routes. Many of these commodities, especially those of high value relatively to bulk or weight, will continue to use the channels already established and the effect of the opening of the canal on trade in such commodities will be comparatively slight.

The present land-and-sea or wholly overland routes are those via the Trans-Andine Railway from Buenos Aires to Valparaiso, the Panama Railroad, the Tehuantepec Railway, and the various American and Canadian transcontinental railroads. Of the first three of these little need be said. The Trans-Andine Railway is too far removed from the main channels of Atlantic-Pacific trade, and its cost of operation over the high Andean passes is so great, that it is not likely ever to play an important rôle in the trade under consideration. The Panama Railroad will obviously cease to be a factor as soon as the canal is in full operation and hence need not be considered, and almost the same may be said of the Tehuantepec Railway. The costs of two transshipments on this latter route (from ship to railway at one

end and from railway to ship at the other) plus the railway freight between Salina Cruz and Puerto Mexico is so great —over $2.50 per ton—that in spite of the rather longer distance via Panama to certain Pacific ports and the toll at Panama (about sixty cents per cargo ton) there is little likelihood that it will continue to be used extensively except for local traffic.

The only really important overland competitors of the Panama route will be the great trans-continental railways farther north. The bulk of the traffic between the eastern and western sections of the United States and Canada, a large amount of the trade between Europe and western North America, and a considerable share of the commodity and passenger movement between both Europe and eastern North America and the Orient is carried on these railways. These railways will continue to hold a certain portion of this business and in regard to such traffic as does thus continue to use the old routes, the opening of the canal will, of course, have no effect on the positions of the various competitors for the markets, except so far as it may necessitate a lowering of railway freights. And even if the competition of the canal should force the railroads to lower their rates the effects on the *relative* positions of the competitors would be unimportant, for so long as rates were uniformly applicable to both domestic and foreign goods, whatever advantages American shippers might get from a reduction their European competitors would also get. In attempting, therefore, to form an opinion as to the influence of the Panama route it will be necessary to arrive at some judg-

ment as to the extent and character of this traffic on which the canal will have no effect because its routes will not be changed from their present channels.

On this point there is a wide divergence of opinion, and indeed the problem is so intricate that any conclusion that may be arrived at can be accepted only with many reservations.[1] Such high-priced goods as the tea and silk of China and Japan may continue to be carried as at present, across the Pacific to San Francisco or Vancouver and thence by special freight train to their eastern destination on this continent, or by further transshipment across the Atlantic to European ports. Yet even in regard to these there may be serious doubt. Silk, for example, now reaches New York from Yokohama by the San Francisco route in about twenty-one days, paying a through freight of $120 per ton of 2,000 pounds. If, on the completion of the new canal, this commodity were to be carried direct from Yokohama to New York in the fastest steamers now plying between Yokohama and San Francisco (about fifteen knots), the delivery time would be extended to 27.2 days. The share of this through rate of $120 a ton which goes to the ocean carrier is $40 a ton. If the rate from San Francisco to New York via Panama were to be made proportional to this, the through all-sea rate from Yokohama to New York would be in the neighborhood of $80 a ton and the shipper would therefore save as an offset to a loss of about six days' time, a sum of $40 a ton. This saving would far more than cover the loss of interest for six days on the value of a ton

[1] See Johnson: pp. 47–89.

of silk which is about $5,000. It may well be, therefore, that even so costly an article as silk will seek the new route, and if this be so then there is a strong likelihood that most commodities will do the same except small packages of high value, in the shipment of which haste is the prime consideration.

Similar analysis leads to the conclusion that the bulk of the traffic between the two seaboards of the United States and Canada will also seek the canal route. The through rail rate to-day from New York or Pittsburg to San Francisco on harvesters, reapers, etc., is $25 a ton of 2,000 pounds. The cost of service rate for steamers, calculated as in the tables already presented (assuming that toll will be charged at Panama) is $3.51 a ton on ten knot vessels and $4.30 on fifteen knot vessels. The time of delivery by fast freight is about twenty-one days: by ten knot steamers the sailing time would be twenty-two days, and by fifteen knot vessels, fourteen and one-half days. Even making enormous allowances, therefore, for possible errors in the calculations presented, it would appear quite certain that the Panama route would be given preference. Even on goods of the lowest rate class, such for instance, as nails, spikes, etc., it would seem equally certain that Panama would get most of the traffic, the rail rate from New York to San Francisco being $14.00 a ton or several times as high as the cost of service rate of the tables.

Concerning routes from interior points in the eastern and central states to interior points in the Pacific States there is much more uncertainty, for to the all-sea rate from

the Atlantic to the Pacific port must be added the local freights at either end from the interior point to the seaboard. The general conclusion of the Isthmian Canal Commission's report already referred to [1] is that freights originating within a few hundred miles of the Atlantic and Gulf coasts and destined for points within a similar distance of Pacific coast ports will in all probability choose the canal route, and vice versa. We shall see, in a later chapter, that the chief demand on the Pacific slope of the United States and Canada is for highly manufactured commodities and that their principal export goods are such as seek a market in densely populated manufacturing regions. Since, therefore, the chief manufacturing sections of the United States are relatively near the Atlantic seaboard and the chief producing regions of the Pacific shore, near the Pacific, it seems probable that the bulk of the interchange between the two sections will take place via the Panama Canal.

In short, therefore, it seems highly probable that so far as the great trade movement from coast to coast of the United States and Canada, or from the Eastern United States to the Orient is concerned, the present all-rail or sea-and-rail routes are likely to be abandoned in favor of the canal route. If this be true, then the conclusions already reached in regard to the all-sea traffic hold good for this traffic as well, and the opening of the canal will tend to strengthen the position of our eastern manufacturing centers as competitors with Europe.

[1] Johnson.

CHAPTER III

THE PACIFIC COUNTRIES

THE Panama Canal will open a channel between two great commercial basins. Whatever influence it may have in promoting or stimulating commercial intercourse must be exerted through the alteration of trade routes. The probable changes in routes we have now examined in detail and have arrived at certain conclusions. Our next task must be to try to form some opinion as to the nature and volume of goods which will be carried by the new route. The countries of the Atlantic Ocean basin are sending a stream of goods into the Pacific for distribution to the peoples who live on its borders. The canal will so change routes as to alter the relative advantages and disadvantages of the various competing purchasers and sellers. Whether these alterations will produce changes in the markets for particular classes of goods will depend upon the ability of the purchaser or seller or both to respond to the new opportunities. For example, it has been seen that the canal will give a shipper from New York to Callao certain advantages in competition with an European shipper which he does not now possess. This points to an increased trade between New York and Callao. If, however, the character of goods which the merchants of Callao are demanding are of a sort

which the merchants of New York cannot supply, or the products of Peru are not in demand in the United States, the opportunity offered by the opening of the canal may remain unutilized. In order to estimate the influence of the canal we must know something of the character of the markets at both ends of the routes which it will serve. This involves a study of the economic and commercial conditions in the countries which the canal will connect.

The countries of the Pacific which may be affected by the opening of the canal include practically all the lands which are touched by Pacific waters except southeastern Asia and the East Indies. Specifically the countries are: Chile, Bolivia, Peru, Ecuador, Colombia, Panama, Costa Rica, Nicaragua, Salvador, Guatemala, Mexico, the Pacific Coast of the United States and Canada, Alaska, Asiatic Russia, Japan, China, the Philippine Islands, Australia, New Zealand, and the Pacific Islands generally. Strictly speaking, several of these countries touch both the Atlantic and the Pacific Ocean basins. Colombia, the Central American States, Mexico, the United States and Canada all touch both oceans, and Bolivia's approaches are also both from the east (through Argentina) and the west (through Chile and Peru), yet they all, or certain parts of them must be regarded as belonging commercially to the Pacific rather than to the Atlantic. Bolivia is approached more easily from Antofagasta or Mollendo than from Argentina and most of her foreign trade already passes through these ports; the Central American States are approachable from both sides, but their Pacific ports will be within much

easier reach of the great currents of trade than the Atlantic when the new routes through the canal to the west coast of the United States and Canada and to the Orient shall have been established, and the same may be said of Mexico so far as her foreign commerce is sea borne; and the Pacific slope of the United States and Canada within four or five hundred miles of the coast will be more accessible from the Pacific than overland by rail. Colombia, at present, belongs more definitely to the Atlantic basin, most of her foreign trade passing through Caribbean ports, yet there are possibilities of development at Buenaventura and Temuco on the Pacific which may in time alter that condition.

These two score or more of countries of the Pacific Basin offer striking contrasts in economic development. Not only do they differ fundamentally from the great commercial countries of the Atlantic Basin but the contrasts among themselves are enormous. A comparison of their areas, population, foreign commerce, etc., will emphasize this point.

The total area of these Pacific Basin countries, including the five South American countries named, the Central American States, the Pacific States only of Mexico and the United States, British Columbia, Alaska, Japan (and Korea), all of China except Tibet and Chinese Turkestan, the Philippine Islands, New Zealand, and the Australian States of Queensland, New South Wales, Victoria, and South Australia, reaches the enormous total of 9,539,000 square miles or about one-fifth of the land surface of the earth.

The aggregate population is 536,000,000 or one-third of the world's total. The average density of population (56) is therefore greater than the rest of the world as a whole, though it is much less than in the great commercial nations of Europe. Their aggregate foreign trade, however, is relatively insignificant: the grand total of exports and imports ($2,658,000,000) is, for example, only about 40 per cent. of that of the United Kingdom alone. Their per capita trade ($5) is only one twenty-seventh that of the United Kingdom, and only about one-eighth that of the United States. The Pacific Basin therefore as a whole may be regarded as an unexploited area in the matter of international trade dealings.

There are, however, great contrasts among the Pacific countries themselves. The entire Pacific Coast of North and South America is a region of sparse population. The total area of the western countries of South America, Central America, the Pacific States of Mexico and the United States, British Columbia, and Alaska, 4,359,000 square miles, is greater than that of Europe, but the population, 31,600,000, is less than that of Italy which is just the size of the single state of Nevada. The average density of population is only seven to the square mile. Only one country in the list, little Salvador, reaches what may be considered a dense population, one hundred and forty-eight to the square mile. No other Pacific American country reaches even twenty to the square mile though the State of Washington has seventeen and California fifteen.

As regards density of population Australia and New

Zealand belong in the same class as these Pacific American countries just mentioned. The Australian Commonwealth as a whole with its 2,975,000 square miles (equal in size to the United States exclusive of Alaska) has but 4,600,000 inhabitants, or only one and one-half to the square mile. Even its most densely populated states, those on the eastern and southeastern coasts, might almost be classed as uninhabited, with the single exception of the small State of Victoria, and even it has only fifteen persons to the square mile. New South Wales supports a population of only 5.2; South Australia, only 1.1; and Queensland, only 0.9, per square mile. Tasmania, the smallest of the states, supports about seven to the square mile. A peculiar feature of the distribution of population is the high percentage of urban population. The Commonwealth may almost be said to be a country of cities. Six capitals, Melbourne, Sydney, Brisbane, Adelaide, Perth, and Hobart, contain over 35 per cent. of the total number of inhabitants of the entire country. The other sixteen towns of over 10,000 each, raise the urban population to about 45 per cent. of the total. The single city of Sydney contains 38 per cent. of the entire population of New South Wales; Melbourne, 45 per cent. of that of Victoria; and Adelaide, 47 per cent. of that of South Australia. Probably no other important country in the world presents such a concentration of population. New Zealand is somewhat more densely peopled but even here the country is relatively uninhabited, 10.5 to the square mile. The concentration is not quite so great as in Australia, the nine cities and

towns of over 10,000 population aggregating only 38 per cent. of the total.

The contrast between these Australian countries and the Pacific American countries above mentioned, on the one hand, and the Oriental Pacific countries, on the other, is profound. The Chinese Empire, as a whole, supports 101 people to the square mile; the Empire, exclusive of those parts which cannot be said to belong to the Pacific Basin (Tibet and Chinese Turkestan), 130 to the square mile; China Proper (the eighteen provinces), 266; Korea, 152; and Japan, the enormous number of 349. Even Manchuria has 44 persons on every square mile. In no other part of the globe of any considerable area (with the possible exception of India) is so dense a population supported chiefly on the products of its own soil. Several countries have a higher density, England for instance (669); the whole United Kingdom (375); Germany (310); Belgium (659); Holland (472), etc.; but these populations depend upon outside peoples for a large part of their supplies. The import trade of the United Kingdom reaches $73 per capita per annum; of Germany, $36; of Belgium, $114; of Holland, $223. The imports of Japan, on the other hand, are only $4.70 per capita; of China, 70 cents.

The Oriental countries must, therefore, be regarded as inactive in international trade. A comparison, in this respect, with other Pacific countries, is instructive and interesting. The total foreign trade of China (imports and exports together) amounts to $1.27 per capita; of Japan, to $8.95. None of the Pacific countries on the American

coast falls as low as this with the single exception of Colombia. Central America, as a whole, and Peru, average $12 per capita; Mexico, $16; Ecuador, $17; Bolivia, $21. Chile reaches a rather higher total of $76 on account, largely, of the great value of her nitrate export. These figures seem large in comparison with those of the Oriental countries, but they are far surpassed in the case of Australia whose foreign trade reaches a surprising total of $142 per capita, and of New Zealand, with a trade of $174. The external trade of the Pacific States of the United States and of British Columbia can only be estimated, as so much of it uses land routes, but it probably ranges from $50 to $100 per capita.

These contrasts it is important to bear in mind in attempting to form any judgment as to the commercial possibilities of the Pacific Ocean countries, for they unquestionably rest on causes which go to the very roots of trading activity and it is only through a modification of these fundamental forces that great changes of condition can come. Exactly what these fundamental causes are it is extremely difficult completely to analyze; yet some of them at least seem to be demonstrable. Density of population obviously has no very direct connection with commercial activity for there are as many instances of low density with high activity as there are with high density and high activity. Climatic conditions do seem, however, to be a potent factor. Only one of the tropical American countries which we have been considering has a per capita trade as large as $17; and even this figure which belongs to

Ecuador is due to the fact that the country has a semi-monopoly of one important commodity, cacao. Even Mexico, which is partly without the tropics, and Bolivia, which while within the mathematical tropics, is, on account of its altitude, partly temperate, hardly pass this figure, having per capita trade of $16 and $21 respectively. Temperate South America (Chile) and temperate North America (Pacific Coast States of the United States) show a much higher activity. Chile's trade reaches $76 per capita and the North American countries at least as much and probably more. On the western shores of the Pacific a similar tendency is noticeable. Tropical Australia (Queensland for instance) has a trade of $109 per capita; the temperate regions much more. New South Wales' figure goes to $175, and Victoria's, to $141. New Zealand, wholly temperate, has a trade of $174 per capita. The same condition seems to exist in China. Reliable figures of per capita trade of the various regions are not obtainable, but the total trade of North China (from Shanghai northwards) is more than double that of South China. Japan, wholly temperate except Formosa, is, as we have seen, much more active commercially than any part of China.

Another factor which unquestionably plays a part in stimulating commercial activity is the presence of European populations, especially those belonging to the north European or Teutonic races. The countries with low per capita trade as a rule have a low percentage of such population. None of the tropical countries of the Pacific Coast of North America has a European population of over 20 per cent. of

the total and many of them have much less. Mexico has 19 per cent. In Chile the percentage goes much higher. In temperate North America as well as in Australia and New Zealand, the people are almost wholly European, while in China and Japan the percentage falls practically to zero. In a very roughly approximate way these differences, it will be observed, correspond with the difference in per capita trading activity.

This European population or population of European origin apparently makes itself felt in the foreign trade of the countries in two or three ways. Native-born Europeans, descendants of early immigrants or colonists, naturally retain something of their taste for European goods and devote their energies to the production of commodities with which they are able to continue their purchases of such goods. With European-born recent immigrants the connection is of the same sort but more direct. They are apt to demand not merely the goods which their European standards of living require, but also the goods of the specific country from which they came. The descendant of the colonists demands European goods; the German or Italian immigrant himself demands German, or Italian goods. Thus the German "colonists" of southern Chile swell the import trade from Germany and the English settler in the Australian bush looks to the United Kingdom for many of his supplies.

Another class, also, of European residents in these foreign countries and colonies exerts a direct influence on trade movements. They are the corporation officials, managers

of enterprises, agents for this, that or the other activity financed from home. All such enterprises tend to swell the imports from the investing country during the period in which the investment is being made. When German capital, for example, gets a concession for a railway in China, the materials for the building are apt to come in larger measure from Germany than from other countries. After the investment is complete and the enterprise is a "going" concern, the dividends to the investors tend to swell the exports to Europe. The high per capita trade of Australia, New Zealand, Chile, British Columbia, and the Pacific States of America with regions outside their own borders is unquestionably due in part to these investments of the capital which has come to them from the outside.

Yet another factor may be regarded as of undoubted importance. The younger, more sparsely populated countries have a more important trade than the older, more densely populated ones. It seems to be a general law of economic development in the centuries since the middle ages, that new countries, if they have natural resources and an energetic population, rapidly develop a high degree of per capita trading activity. This unquestionably comes about through the fact that, with oversea transportation facilities, such countries at once find it profitable to devote their energy to the production of a surplus of raw materials rather than of the numerous other commodities of which they are in need, and to export the former in exchange for the latter. As, however, population increases, industries requiring a larger employment of labor become profitable

compared with the extractive industries. A smaller relative production of raw materials follows and a larger relative production of the things which the people had been purchasing abroad; with the result that the per capita interchange of goods with foreign countries declines. Later still a further stage of growth is reached in which with increasing density of population a country is no longer able to supply itself with the needed foodstuffs and raw materials and in procuring these things for itself is forced to purchase them by expanding its foreign markets for manufactured articles, thus again tending to increase its per capita dealings with other nations. The great trading nations of Europe seem to have reached this stage. Their exports are, in the main, manufactured articles, while their imports are predominantly foodstuffs and raw materials. Such countries as Australia, New Zealand, Chile, and the Pacific Coasts of temperate North America are still in the earlier stage where trade is active because their sparse populations are able to produce a large surplus of the raw materials and foodstuffs which their territories supply and to sell them elsewhere in exchange for the finished products which their people demand. The Eastern United States is passing rapidly through a transition from the former to the latter stage.

China and Japan present an interesting exception to this general rule. With them the natural course of development was arrested by the adoption, partly at least through fear of political domination by foreigners, of a policy of isolation. Their abundant natural resources, sufficient for the needs of their earlier more sparse populations, and the exemplary

industry of their peoples, enabled them for a long period to dispense with the necessity of commercial dealings with outsiders. The growth of population, however, began in time to press upon resources and as the fixed policy and the established habits of the people prevented their meeting their requirements by purchases abroad, physical need forced them into closer attention to procuring at home the necessaries of life—the things with which to feed and clothe their bodies. The result was stagnation. A people who are engaged in a life and death struggle to wring from their soil enough food to keep them from starvation, ceases to be able to produce much to exchange with foreigners, and the consequence is seen in China's foreign trade to-day of $1.27 per capita, and Japan's of twenty years ago, of $1.70 per capita. Japan is now, however, struggling out of that condition. Labor, before applied to the struggle to get enough food from the soil to feed the people, is being applied increasingly to the task of producing things which can be exchanged abroad for food. Net per capita imports of food which in 1890 were less than seven cents have risen now to fifty-seven cents, an increase of eightfold, and Japan's total foreign trade has grown from $1.70 per capita, to $8.95. China is in the position which Japan occupied before the recent industrial revolution in the latter country began. The long isolation has resulted in so dire a struggle for existence that no great development can be expected until means are provided whereby the vacuum created by the transfer of labor from the production of food to the production of things which foreign nations require, has been

filled by providing other sources of foodstuffs, either in foreign countries such as Siberia or in the less populated regions of China itself such as parts of Mongolia, or in Manchuria.

The ability of any country to engage in active commerce with other parts of the world depends fundamentally of course on the character and extent of its natural resources. It must be able to produce in quantity larger than is required by its own people, commodities which other peoples desire. In this respect there are enormous differences between the various regions which surround the Pacific. What these differences are can probably be best indicated by an examination of the export trade of the countries under review. Having made clear what it is that they are able to-day to produce in sufficient surplus to be able to sell abroad we shall be better able to form some judgment as to what part they may be able to play in the future trade of the Pacific.

The trade statistics of many of the Latin-American countries are too incomplete to give reliable figures of their trade, but for Mexico, Costa Rica, Chile, and Peru, at least, we may reach definite conclusions. For China, Japan, Australia, New Zealand, sufficiently reliable figures are available. For the Pacific States of the United States and for British Columbia, because of the fact already alluded to, that much of their extraterritorial trade is carried overland to regions under the same fiscal control as themselves, conclusions must be based on other evidence than that of official trade statistics which do not exist.

For the countries for which relatively complete statistics are available the figures show the following:—

ANNUAL AVERAGE EXPORTS BY CLASSES OF COMMODITIES

Values in millions of dollars

	Forest products	Animal products	Agricultural products	Mining products	Manufactures	Miscellaneous	Total
Mexico [1]	1.3	6.0	30.6	69.7	0.2	16.4	124.4
Costa Rica [2]	0.1	0.1	7.3	0.7	....	0.1	8.3
Chile [3]	0.0	2.1	3.0	90.3	1.2	8.7	105.3
Peru [4]	4.4	2.4	9.8 [8]	5.0	0.9	6.0	28.5
China [1]	...	70.2 [7]	61.8	....	34.6 [9]	41.9	208.5
Japan [3]	7.6	60.4 [6]	10.8	19.9	58.9 [10]	39.3	196.9
Australia [1]	5.8	172.4	39.0	93.5	31.1	0.5	324.3
New Zealand [1]	4.2	70.7	4.8	12.0	1.0	0.2	92.9
Philippines [5]	...	.....	30.3	1.3	1.0	1.4	34.0

[1] 1906–1910.
[2] 1907–1910.
[3] 1905–1909.
[4] 1906–1909.
[5] 1905–1908.
[6] Includes: silk, 56.4; and fishery products, 4.0.
[7] Includes: silk, 49.7; and fishery products, 1.0.
[8] Includes sugar, 5.4.
[9] Includes "medicines," 19.5.
[10] Includes: cotton yarn, 15.1; cotton tissues, 8.8; and silk tissue, 18.1.

Important differences between these countries will at once be noticed. In Mexico and Chile mineral products greatly exceed any other class, in the former constituting 56 per cent. of the total and in the latter, 86 per cent. In China, Japan, Australia, and New Zealand, animal products predominate, making 34 per cent., 31 per cent., 53 per cent., and 76 per cent., respectively, of the total export. Only in the Philippine Islands and Costa Rica do agricultural products exceed all other classes, the percentages in these

cases being 90 and 80 respectively; but in China, Mexico, Peru, and Australia they are nevertheless important, making 30 per cent., 25 per cent., 34 per cent. and 12 per cent. respectively of the total. Nowhere do forest products rise into prominence except in Peru and even there they make up only 15 per cent. of the total. Manufactures play a very unimportant part except in the two most densely populated Oriental countries; China's exports being 16 per cent. of this sort, and Japan's, 30 per cent. There is this great difference, however, between the manufactures of these two countries that China's are almost wholly the products of small domestic industries while 70 per cent. of Japan's are the output of cotton and silk factories organized on modern lines.

Although, as already stated, statistics of the extraterritorial trade of the Pacific States of the United States and of British Columbia are not available in form to make them valuable for our purpose, yet the character of their products is such as to make it clear that in the export business they occupy a position very similar to that of the other sparsely populated regions of the Pacific. The exports of Canada as a whole are divided among the various classes as follows: forest products, 3 per cent.; animal products (including fishery products), 22 per cent.; agricultural products, 37 per cent.; mineral products, 14 per cent.; manufactures, 24 per cent.; and miscellaneous products, a small fraction of one per cent. As less than five per cent. of the total capital invested in Canadian manufactures is employed in establishments in British Columbia, it may be assumed

that the exports of manufactures from this region are negligible. British Columbia produces but 0.2 per cent. of the wheat, 0.1 per cent. of the barley, 0.5 per cent. of the oats, 4 per cent. of the potatoes, and 7½ per cent. of the flax of the whole Dominion. The agricultural exports of British Columbia cannot, therefore, be large. On the other hand, this province possesses 40 per cent. of the forest area of the Dominion, produces 27 per cent. of the huge fish output, and probably even a higher percentage of the mineral output. The chief exports, therefore, it is safe to say are lumber, fish, and minerals.

In the Pacific Coast States of the United States conditions are very similar except that there is a larger variety of products. These six States, Arizona, California, Nevada, Oregon, Washington, and Idaho have manufacturing establishments whose aggregate capital represents only 5 per cent. of the total capital so employed in the United States as a whole. Their products are mainly the output of the pastoral, agricultural, and mineral industries, and the forests. Together they support 24 per cent. of the sheep of the United States and supply 20 per cent. of the wool clip. They grow 13 per cent. of the country's wheat, 18 per cent. of its beet sugar, and 26 per cent. of its barley. California is the greatest producer of fruit and wine in the country. Together they supply 37 per cent. of the country's gold, 43 per cent. of the silver, 38 per cent. of the copper, 36 per cent. of the lead, 47 per cent. of the petroleum, 87 per cent. of the quicksilver, and 100 per cent. of the borax. Oregon possesses one-sixth of the standing timber of the nation, but

the lumber resources of Washington and California are also enormous. The coast and river fisheries produce nearly 50 per cent. of the nation's fish supply.

The "money crop" of the region, therefore,—the things which it has to sell—consists of raw and semi-raw materials and foodstuffs, and economically it belongs in the same class with all the other sparsely populated regions of the Pacific Basin. They are all "young" countries in the economic sense and their industries are complementary to those of the "older" countries of western Europe. Even China and Japan, though their dense population puts them in a somewhat different class by giving them the latent possibilities of a more rapid advance into the "older" class of manufacturing nations, are still chiefly producers for foreign trade of raw and semi-raw materials and foodstuffs.

The specific commodities which this whole vast Pacific Basin is able to furnish for the markets of the world are very varied and naturally differ greatly in different portions of the region. Mexico's exports are 56 per cent. metals, in which the largest items are silver (31 per cent.), gold (13 per cent.), and copper (10 per cent.). The next largest is textile fibers, making 12 per cent. of the total, five-sixths of this class being hennequin. Live animals and hides (5 per cent.) and rubber (3½ per cent.) are the only other large items.

Central America's exports consist chiefly of coffee (about 56 per cent.), bananas (about 20 per cent.), gold and silver (about 4½ per cent.) and hides and skins (about 2 per cent.), with smaller quantities of hardwoods, rubber, etc.

While Colombia has a variety of resources and sends abroad a considerable number of different commodities, the chief exports are made up of a very few items; coffee (36 per cent.), skins (9 per cent.), bananas (6 per cent.), and rubber (2 per cent.). Ecuador's foreign sales are even more concentrated into a few classes of goods. Sixty-two per cent. of her total exports are cacao; 14 per cent. ivory nuts; and 6 per cent. rubber.

Farther south on the American coast, mineral exports come into prominence again. Seventeen per cent. of Peru's exports are mineral, mostly copper (11 per cent.). Bolivia's are 43 per cent. mineral, mostly tin (35 per cent.), and Chile's, 86 per cent., mostly nitrate (72 per cent.). Peru, however, furnishes also considerable supplies of other important articles. The largest single item is sugar, about $5,400,000 worth per annum; while rubber, ($4,400,000), cotton ($3,600,000), and wool ($2,000,000) are also important.

On the opposite shore of the Pacific, as has already been stated, we find a different set of conditions. Australia and New Zealand belong in the same general class of countries as those already considered, sparsely populated, devoting their energies to a few predominant industries and purchasing their imports by the sale of the products of these few industries; while China and Japan with dense population and great variety of industries have a much larger list of export commodities. In Australia, 40 per cent. of the export is of the single commodity, wool. Wheat [1] (14 per

[1] Figures for 1910.

cent.) is the only other item which rises above 7 per cent. of the total. Wool, hides, fresh meat, butter, tallow, live animals, and leather, make up 60 per cent. of the total, and minerals (mostly gold) furnish 17 per cent. Wheat and flour together add another 15 per cent. These three groups together, therefore, make up no less than 92 per cent. of the total exports. In New Zealand conditions are not very different. Wool alone constitutes [1] 36 per cent. of the total export, while wool, meat, butter, tallow, hides and skins, live animals, etc., furnish 76 per cent. of the total. The remaining 24 per cent. is composed mainly of minerals (mostly gold) with 12.5 per cent.; phormium, 3 per cent.; kauri gum, 2.6 per cent.; and lumber, 2 per cent.

The trade of China and Japan with countries of the Atlantic Ocean Basin is largely of the same general character, though the item differs. Seventy per cent. of China's exports are made up of silk, beans and bean cake, tea, cotton, vegetable oils, sesame seeds, straw braid, and hides, skins, and furs. Most of the cotton and a large part of the beans go to Japan and cannot therefore be included among the goods with which purchases are made from Atlantic countries. Japan's export to Europe and the eastern United States is mainly silk and silk manufactures, though copper, tea, earthenware, straw plait, camphor, rice, matting, etc., are also considerable items. The growing export of textile manufactures (chiefly cotton), the output of modern mills, goes chiefly to China and other near by Oriental countries. In the Philippines there is an even greater con-

[1] Figures 1906–10.

centration in the list of export commodities. Ninety-five per cent. of the purchases from Europe and the United States are paid for by exports of five commodities—"hemp," copra, sugar, cigars, and tobacco leaf.

On the whole it is evident that the export commodities of the Pacific countries, in spite of the great contrasts between different sections, have this much in common—that they are goods which in the main are complementary to the products of the industrial regions of the Atlantic such as the eastern United States, England, Germany, France, etc. The Pacific Basin produces a surplus of raw and semi-raw materials and foodstuffs which its peoples are able to use in purchasing the surplus products of the Atlantic countries.

The character of the goods which the Pacific countries receive in exchange for their exports may also be indicated by a brief analysis of their import trade. For purpose of comparison, the imports may be divided into four classes; foodstuffs (including beverages, tobacco and similar luxuries), clothing and clothing materials (textiles, ready-made clothing, boots and shoes, etc.), structural and industrial materials (such as are used in construction work and development of industries), and miscellaneous manufactures, etc. Taking the Pacific Basin countries as a whole, their imports at present consist of about 14 per cent. foodstuffs, 24 per cent. clothing, etc., 40 per cent. structural and industrial materials, and 22 per cent. miscellaneous manufactures, etc. Structural and industrial materials and general manufactures therefore predominate, together making up 60 per cent. of the total foreign purchases. And

they are increasing in relative importance. If we compare the two five-year periods 1902–1906 and 1907–1911 we find, for the countries whose foreign trade figures are sufficiently complete [1] to make the comparison possible, that the following changes have taken place: foodstuffs have dropped from 16.3 per cent. of the total imports to 13.9 per cent.; and clothing and clothing materials, from 28.4 per cent. to 23.8 per cent. Meanwhile industrial and structural materials have risen from 37.7 per cent. to 40.4, and general manufactures, from 17.6 to 21.9. There is abundant evidence, although complete statistics are not available, that a similar tendency exists in the other Pacific countries.

IMPORTS INTO PACIFIC OCEAN COUNTRIES. BY CLASSES

Annual averages in millions of dollars

	Foodstuffs		Clothing and clothing materials		Industrial and structural materials		Miscellaneous	
	1st period	2nd period	1st period	2nd period	1st period	2nd period	1st period	2nd period
Mexico	5.8	11.2	12.1	13.6	29.6	40.8	24.3	36.0
Costa Rica	1.0	1.0	1.0	1.5	1.0	1.5	2.4	2.9
Peru	1.9	2.4	4.9	5.8	6.8	8.8	6.3	7.3
Chile	3.4	3.9	9.2	12.1	16.5	38.0	21.9	36.0
China	30.2	48.7	96.8	96.3	41.4	49.6	28.7	75.0
Japan	33.6	31.6	11.7	17.0	77.7	129.0	22.2	39.0
Australia	33.1	31.6	59.4	79.3	84.1	118.1	13.6	21.9
New Zealand	6.8	10.2	14.1	18.5	26.8	36.4	10.7	12.2
Philippines	8.8	6.8	8.8	8.3	4.4	5.4	4.4	1.5
Total	124.6	147.4	218.0	252.4	288.3	427.6	134.5	231.8
Percentage of total imports	16.3	13.9	28.4	23.8	37.7	40.4	17.6	21.9

[1] Mexico, Costa Rica, Peru, Chile, China, Japan, Australia, New Zealand, and the Philippines.

These figures mean that on the whole the Pacific countries are passing through an economic transition. With certain exceptions which will be noted in the proper place, they are developing more fully their domestic production of foodstuffs and depending less on foreign supplies. This does not necessarily indicate, in most cases, that the actual quantity of foodstuffs produced is being increased, but it points rather to a diversification of the industries, a growth in production of certain classes of food, particularly those which result from the more or less elaborate working up of the crude materials (such for instance as wheat) into partly manufactured goods (such as flour). Similarly with clothing and clothing materials the relative decline in the importation of such goods does not indicate that the people are using less or poorer clothing, but that a part of their industrial energy is being turned toward the home production of such goods. In nearly if not all the Pacific countries the chief clothing material is cotton and in a great many of them the first steps toward the introduction of manufacturing have taken the form of an endeavor to develop cotton factories by means of high protective tariffs. The result has been that except on the Pacific Coast of the United States and Canada and a few of the smaller unimportant tropical sections of the Pacific, the manufacture of cotton goods of the cheaper grades which make up the bulk of the clothing materials which the people use, has made sufficient advance to curtail the purchase of foreign supplies.

In short, wherever one turns in the entire list of Pacific Ocean countries there is found a striking tendency of devel-

opment along roughly similar lines. They are all young countries in respect to modern industrial development. They are all engaged, more or less energetically, in developing their abundant natural resources whether they be the mineral and pastoral resources of Australia; the mineral deposits of South America; the minerals and fruits of Central America; the mineral or pastoral activities, or the textile manufactures of Mexico; the mineral, forest, agricultural and horticultural resources of our Pacific Coast States and Canada; the industrial resources of Japan; or the immense and various latent resources of the huge Chinese Republic. In the process of growth, as a necessary accompaniment and result of it, they are looking to the older industrial regions of the Atlantic Basin—to the eastern United States, to England, Germany, France, Belgium and other European States—for the needed capital and the immense quantities of highly specialized manufactures which the development of new industries demand—structural iron and steel, steel rails, locomotives, railway cars, bridge materials, galvanized iron, wire, agricultural machinery and implements, mining machinery, pumps, windmills, dynamos, general electric machinery and equipment, spinning and weaving machinery, hardware, tools, boilers, pipe, etc., a list which might be extended almost indefinitely. Alongside of this demand—which may be called the direct demand made by growing industries—is an accompanying indirect demand stimulated by more intimate knowledge of the products of the western world—for articles which in a certain sense partake of the nature of

luxuries: sewing machines, typewriters and calculating machines, bicycles, automobiles, writing paper, newspaper, printing presses, soap and other toilet requisites, patent medicines, perfumery, glass and glassware, rubber goods, furniture, household utensils, finer grades of textiles, millinery, etc., an almost infinite list of things few of which alone are important in international trade, but which in the aggregate play a considerable part in the sales of our industrial nations.

The general character of the interchange of goods between the Atlantic and the Pacific Coast areas is clearly indicated by the foregoing analysis of Pacific Ocean resources and the tendencies which Pacific Ocean trade has revealed in recent years. Whatever the ultimate commercial results of the opening of the Panama Canal may be, it is obvious that its first effects will be felt in connection with trade as it at present exists. The Pacific Ocean countries are sending to-day to the industrial countries of the Atlantic Basin, increasing quantities of foodstuffs, and raw materials, products of their mines, fields, flocks, and forests. With these exports they are purchasing in return, and also in increasing proportions, the multifarious products of American and European factories. The question to-day of prime interest to the industrial regions of the Atlantic is which of these Atlantic nations is going to be best able under the new conditions to supply the Pacific with these things which its peoples need.