

CHAPTER XLII

THE NAVY AND THE PANAMA CANAL

NATIONAL POLICIES WHICH AFFECT EXTERNAL RELATIONS OF THE UNITED STATES—
POSSIBLE ANTAGONISTS IN THE ATLANTIC AND PACIFIC—OUTLYING POSSESSIONS AND THEIR BEARING UPON NAVAL REQUIREMENTS—CANAL SHORTENS THE ROUTE OF NAVAL REINFORCEMENTS BY 8,000 TO 10,000 MILES—EFFECTIVENESS OF NAVY NOT DOUBLED BY THE CANAL, BUT IT BECOMES A GREAT MILITARY ASSET—ADVANTAGES IN DISPOSITION OF THE FLEET—GREAT SAVING OVER MAGELLAN ROUTE—NEW DUTIES IMPOSED UPON THE NAVY BY THE CANAL.

BY CAPTAIN HARRY S. KNAPP, U. S. N.*

NOTE.—In the preparation of this History the Editor-in-Chief requested Admiral George Dewey to prepare a chapter dealing with the effect of the Panama Canal upon the United States Navy and naval strategy. Admiral Dewey was about to prepare such a chapter when his attention was directed to the appended article written by Capt. Harry Knapp, U. S. N., to which Admiral Dewey refers in the following letter: "My dear Mr. Bennett: Recalling our conversation relative to the bearing of the Panama Canal upon the naval development of the United States I have forwarded you a copy of an article on that subject written for the U. S. Naval Institute by Captain Harry S. Knapp, U. S. N., under the caption: 'The Navy and the Panama Canal.' Captain Knapp's views are in such complete accord with my own and are so clearly and convincingly presented, as to leave no occasion for separate comment on the subject on my part. Very sincerely yours, GEORGE DEWEY."

THE completion of the Panama Canal is so nearly at hand that the time has seemed appropriate to the board of control to publish in the "Proceedings" a discussion of the effect of the canal upon the navy. In responding to their invitation to submit a paper on this subject the writer wishes at the outset to make plain that what follows represents his personal conclusions, and that he neither desires nor is authorized to speak for anybody but himself.

Because it has the widest appeal the question of how the canal will affect the strength of the navy will be considered first and at most length. To those outside of professional circles it has a more direct and personal application than any other, because upon the answer will depend the appropriations that the taxpayer must provide. The canal has been an expensive undertaking for the United States, and the people of the country, in thinking of its bearing upon the navy, naturally anticipate that its completion may considerably

modify the appropriations for the upkeep of the naval establishment. Everybody is familiar in a general way with the shortening of sea routes via the Panama Canal from our Atlantic to our Pacific coast; for instance, that the direct distance from New York or Philadelphia to San Francisco is reduced from about 13,000 miles via Magellan to about 5,000 miles via Panama, or that the distance from New Orleans to San Francisco is about 9,000 miles less via the canal than via Magellan. From such general and obvious knowledge it is an easy step to the conclusion that the strength of the navy with the canal may be much less than it would necessarily be without the canal; or, what amounts to the same thing, that the appropriations for the navy may be greatly reduced as soon as the canal is opened. Twice recently within a week the writer has heard members of Congress refer to this very matter, one of them saying, in effect, that the canal would increase the effectiveness of the navy two- or three-fold, while the other thought its effectiveness would be doubled. The writer, while prepared to admit that these

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remarks were rather an after-dinner *façon de parler* than the expression of a deliberately formed opinion, yet believes they indicate a somewhat general impression that careful study of the situation will not justify.

A prerequisite to the formation of any intelligent conclusion on this question is an understanding of the conditions that govern the strength of the navy. The ultimate, dynamic, use of the navy is to beat the enemy in war; the every-day political use of the navy in peace is to avert war by reason of its existence ready for war. Neither purpose will be served unless the navy be adequately strong in material and personnel, and unless the personnel be trained and efficient; the navy itself is responsible for trained efficiency, but the country at large, through Congress, is responsible that adequate strength be provided.

Wars do not merely happen; they usually result from the clash of some definite policies. In an attempt to fix the strength of our navy the national policies of our government that affect other countries are a prime factor to be considered. The United States has the following definite policies in its external relations: 1st, the avoidance of entangling alliances; 2d, the Monroe Doctrine; 3d, the Open Door in the Far East; 4th, Asiatic exclusion; 5th, the control and protection of the Panama Canal itself. Where any of these policies affect adversely the interests of other nations there is the possibility of friction, and where friction arises there is always the possibility of war.

The first of the policies mentioned above may be dismissed with a word, for it is distinctly one of abstention, and so is not apt to be the cause of diverse interests. Its effect is, however, that we must play a lone hand, and that is not without a bearing on the strength of the navy. The second policy was recognized in a manner by England in the Clayton-Bulwer treaty of 1850, and to a greater degree in the Hay-Pauncefote treaty of 1901. But other nations do not accept it as international law, and it is not infrequently the subject

of unfriendly comment. The Monroe Doctrine may be the occasion of friction, and so of war, with European nations, and there is a possibility that it may be with Japan, or at a later day with China. The relation of the Monroe Doctrine to the navy was pointedly indicated by Mr. Secretary Meyer, when he said in effect, for his words are not before the writer, that the Monroe Doctrine is just as strong as the navy, and no stronger. The third policy is one that may cause friction with both European and Asiatic nations. The fourth concerns our relations with Asiatic nations only. The fifth policy is a result of a duty we have assumed single-handed for manifest reasons of advantage, and we consulted no nation about it except Great Britain. It has a very direct bearing upon the strength of the navy, upon which it throws an added responsibility.

The extension of our foreign trade that is now being so urgently advocated in connection with the change of our tariff laws cannot be placed, perhaps, under the same head as the policies just mentioned. But foreign trade certainly does involve relations with foreign nations; and, as a matter of fact, commercial and trade rivalries are most fruitful causes of misunderstanding between nations.

What has just been said does not exhaust all sources of possible wars by any means, as it does not exhaust all our external relations. Enough has been said, however, to show reasons why war is not an improbability—certainly it is a possibility—with nations in Europe and Asia. European nations will hardly attack us in force in the Pacific, nor will any nation fronting on the Pacific be apt to attack us in force in the Atlantic. We have, therefore, to anticipate the possibility of war in the Atlantic with a European nation, and in the Pacific with an Asiatic nation.

This leads us to the formulation of a policy for the strength of the navy. It should be strong enough to safeguard our interests and meet any probable attack

in either ocean and not leave our interests unguarded in the other. In explanation of the last clause it may be said that a full consideration of the subject should not stop short of the possibility of a simultaneous attack in both oceans, however improbable; a war with allied nations in the Atlantic and Pacific is not impossible. It is especially the duty of men in the military branches of the government to have their eyes open to every contingency.

In considering possible antagonists in the Atlantic Great Britain may be eliminated from consideration. In the first place it would take us many years to catch up with her in material strength if we tried, and would entail an enormous expense; in the second, war would be a blow to her commercial interests and interests of supply that she can ill afford to suffer; and, in the third, we have a hostage in Canada worth many battleships. There are, moreover, powerful interests of a more sentimental nature that are yet very real. No such strong reasons exist for eliminating any other European nation from the list of possible antagonists and the formula therefore becomes, in its final and definite statement, that our navy should be strong enough to meet in the Atlantic the maritime nation of Europe next strongest to Great Britain, and in the Pacific the strongest nation in that ocean.

As affecting the strength of the navy it is well to keep in mind also the position of the United States in the two oceans. In the Atlantic, aside from the maintenance of the Monroe Doctrine, we have a great material interest in Porto Rico, which is our own territory; and toward Cuba and Panama we have a duty in the protection of their independence. Then there is the canal itself. All of these interests are comparatively near to us, and very much nearer than is any European adversary. In the Pacific we are in a very different case. There we have Alaska, the Hawaiian Islands, Guam, the Philippines, and Tutuila, the nearest 2,000 miles and the most distant 7,000 miles from our coast, and

some much nearer possible adversaries in that ocean than ourselves. The distance of our outlying Atlantic interests has vastly less bearing on the strength of our fleet in that ocean than has the distance of our outlying Pacific interests on the strength of the fleet in the Pacific.

If the Atlantic and Pacific were closed oceans the formula reached above for the strength of the navy would mean that in each there should be maintained a force (that may be called the Standard Atlantic Fleet and the Standard Pacific Fleet, for brevity) sufficient for the duty in that ocean, which is the Two-Ocean Standard, pure and simple.

Neither here nor elsewhere in this paper will a concrete estimate be undertaken of the strength in numbers of ships of the "standard" fleets. Such an estimate is not reached by a simple matching of ship by ship, but is influenced also by such considerations as the probable situation of the theater of war, the possibility that the assumed antagonist may not be able to have his entire strength present in that theater for political or other reasons, and the morale of the antagonist. This may not impossibly result in the conclusion that our own necessary strength in ships is less than that of some possible antagonists and greater than that of others. For the present purpose no such concrete estimate is necessary and it is enough to say that the strength should be "sufficient for the duty."

Without the canal the requirements are practically the same as if the Atlantic and Pacific were closed oceans. For, though the possibility exists of reinforcement in one ocean from the other, yet the long distance to be traversed by the reinforcement by whatever route, the difficulties about fueling en route, and the danger, especially to a force coming from the Pacific, of finding the enemy between the reinforcement and the body it is attempting to join, all militate so greatly against a successful issue that it would be imprudent to count upon it.

With the canal in operation, however, a different situation arises. The route of the reinforcements will be shortened from 8,000 to 10,000 miles by the canal, and that route will lie on interior lines. Fuel can be taken at stations under our own flag, separated by distances less than those representing the sea endurance of the fleet; the embarrassment arising from the necessity of avoiding any semblance of violating neutrality in fueling will thus be avoided. Junction is possible from forty to sixty days sooner, and the enemy need not be passed to effect it. Put in another way: Guantanamo is at practically the same distance from the English Channel that it is from San Francisco via the canal; or again, the nearest Asiatic port to Honolulu is only about 1,250 miles nearer than Panama, but is about 8,700 miles nearer to Honolulu than our nearest Caribbean port by way of Magellan. In the face of such facts it would be difficult to maintain that the canal will have no effect on the strength of the navy, for that would be tantamount to the claim that the canal has no military value to the United States.

On the other hand, the claim that the canal will double the effectiveness of the navy or more is a great exaggeration. Though such statements probably result from loose use of language rather than a careful study of the situation, they are dangerous, for they are apt to be taken literally by the layman, and the navy cannot afford to have such an impression gain ground. To show their fallacy it is only necessary to consider the matter of distances. It is quite true that the canal will enable the fleet to be transferred from one ocean to the other in a few hours, but that is only the beginning of the problem. The added strength that the canal will give to the navy must be measured by the facility the canal affords in enabling reinforcements to arrive in time to be of use tactically; that is, as a part of the entire force in battle with the enemy. The canal will be of little use if the reinforcements arrive so late that the battle has already been

won by the enemy. The Atlantic terminal is about 700 miles from Guantanamo, 1,200 miles from the most distant part of the Caribbean, and 2,000 miles from New York, no inconsiderable distances in themselves. On the Pacific side the condition is very much less favorable, for the Pacific terminal is about 3,250 miles from San Francisco, 4,700 from Honolulu, 8,000 from Guam, and 9,350 from Manila. Merely to be able to get the fleet rapidly from one ocean to another is a great gain, a very great gain; but it is not by any means the whole problem. Allowing the fleet an average speed of 12 knots from departure to destination, which is high, considering the time necessary to coal and effect repairs and the necessity that all the fighting components arrive together and ready for action, this means that, from the time of leaving the canal until it arrived where it would probably be needed, the shortest interval is about fifty-eight hours to Guantanamo, and the longest is about thirty-three days to Manila, during which the enemy will not have been idle. The canal will be a great military asset in war, and an equally great one in anticipation of war; but it is quite beside the mark to say it will double the effectiveness of the navy, or do anything approaching that.

The truth, as usual, lies between these two extreme views just examined, and the writer believes that the former is much nearer the truth than the latter. By its very nature the problem of determining just what will be the effect of the canal upon the strength of the navy cannot be mathematically demonstrated. The solution is largely one of opinion, and will be modified as greater or less weight is given to the several considerations on which it is based. If the general formula advanced above for fixing the strength of the navy be accepted, then manifestly, canal or no canal, the minimum permissible strength of the navy is that which will enable us to meet, with our entire force, our strongest probable enemy, wherever situated. Under the same conditions the maximum strength

that can be claimed as necessary is the sum of that of the Standard Atlantic Fleet plus that of the Standard Pacific Fleet (Great Britain being excluded for reasons above given). This amounts to saying that the maximum strength that can be claimed as necessary is that which will enable us to conduct a war with prospect of success in both oceans at once, which is the Two-Ocean Standard again. If the possible antagonists in the two oceans, in relation to whom our formula for strength is founded were equally strong, our minimum permissible navy would be half as strong as the maximum navy that will ever be necessary. They are not equally strong, however, and our Standard Atlantic Fleet should now, and the condition is probably permanent, be stronger than the Standard Pacific Fleet need be. The Standard Atlantic Fleet, therefore, is the measure of our minimum permissible strength; and, to avoid any misunderstanding, the words "minimum permissible strength" are used in the narrow sense of indicating the very least strength that can logically be believed allowable by anybody who believes in a navy at all for well-founded reasons. The quoted words do not represent the writer's views of what our minimum naval strength should be.

Our total naval strength at this minute is not equal to that of what is called above the Standard Atlantic Fleet. Hence the completion of the canal should have no immediate effect upon our building. It remains to find an answer to the question: What effect will it have upon our building policy for the future?

The writer's personal opinion is that, when the canal is finished, our policy should be to have eventually, and as soon as possible, a total strength not less than that of the Standard Atlantic Fleet plus three-quarters that of the Standard Pacific Fleet. These so-called "standard" fleets are not fixed quantities, but will vary from year to year as foreign nations increase their own naval strength. The policy itself can, however, be fixed, and some policy should be established.

The reasons that have appealed to the writer in reaching this conclusion are as follows:

(a) With no canal our total strength should be the sum of both the Standard Atlantic Fleet and the Standard Pacific Fleet.

(b) The canal so greatly shortens distances between the two oceans that some reduction of strength below that of (a) is justifiable when it shall be finished, in view of the great financial burden imposed by a great navy, and the rather remote possibility of simultaneous war in both oceans.

(c) This reduction should not be sufficient to leave the nation in a hopeless case in either ocean if war broke out there while war was being waged in the other.

(d) As the strength of the Standard Atlantic Fleet must be maintained in any event, the Pacific Fleet is the one in which to make the reduction in strength.

(e) Our interests are so great, and are scattered over such immense distances in the Pacific, that anything less than three-quarters of the Standard Pacific Fleet would make even a defensive war in that ocean hopeless.

(f) With three-quarters of the Standard Pacific Fleet a defensive war, a containing war, so to speak, would not be hopeless while waging a war on equal terms in the Atlantic.

(g) If there were no prospect of war in the Pacific at a time when engaged in war in the Atlantic, then one-half of the Standard Pacific Fleet, and perhaps less, would suffice to guard our interests in the Pacific, leaving the rest of the fleet in that ocean free to reinforce the Atlantic Fleet and give in the Atlantic a marked superiority of force.

(h) If at war in the Pacific with no prospect of war in the Atlantic, a great superiority of force could be maintained in the Pacific that would be the more valuable, owing to the distances over which the navy would have to operate in that ocean.

The composition of the fleet will be little affected by the existence of the finished

canal. All classes of fighting ships will be as much needed after the canal as before, and their numbers and proportions deemed requisite for the duty in either ocean will be necessary, canal or no canal. It is not improbable that the defense of the canal itself may demand a limited number of certain classes of vessels that would not otherwise be necessary. But in its large aspect the composition of the fighting fleet can hardly be affected by the completion of the canal. Even in the matter of auxiliaries the same thing appears to be true. If the navy depended upon its own auxiliaries for the transfer of supplies and fuel from one ocean to the other, the canal would naturally serve to diminish the number of supply and fuel ships; but such cargoes are practically all sent by contract. Other auxiliaries are based in number on the fighting ships they have to serve, and distance has little to do with the question. Speaking in a broad way, then, the existence of the canal will have no effect on the composition of the fleet.

It is more than probable that the completion of the canal will effect some changes in the disposition of the fleet in time of peace. It has already been pointed out that the navy is not now as strong as is theoretically necessary in the Atlantic alone; so that for a considerable time to come, whatever building program may be adopted, it will be necessary to concentrate our entire fighting fleet in time of war, trusting to Providence that the part sent to the threatened ocean will not be needed during the war in the ocean from which it is withdrawn. In effecting this concentration the canal will be a very great military advantage to us. In time of peace, however, the completion of the canal will enable some changes to be made in the present disposition of the fleet. The disposition now, while dictated by reasons of convenience under present-day conditions, is yet not very logical considered in the light of all-round preparedness for war. A very possible outcome will be the maintenance of a force of fixed strength in each

ocean, with a shifting squadron that will go first into one and then into the other. This can be so managed as to keep in both oceans a force better balanced in all its components of fighting strength than is now the case with either. There will be other advantages also, one being the appearance on the Pacific coast of parts of the navy that cannot now be seen there. The people on the Pacific coast are as vitally interested in the navy as are those in the East; yet they habitually see the least powerful and least modern of our ships. It is natural and, indeed, commendable, that they should wish to have in their own waters at one time or another the flower of the navy. The completion of the canal will enable this to be done; and it will, further, be good policy for the navy to do it, and so stimulate the friendly interest in the navy that is always in evidence on the Pacific coast.

Another advantage that will accrue in connection with the transfer of ships from one ocean to another is the possibility of making between our own ports, and without taxing the hospitality of foreign nations, the long voyages in fleet that we believe in our service to be so advantageous as a means of fleet discipline and fleet preparedness. The entire battle fleet could easily go from New York to Seattle, stay ten days at San Francisco and ten in Puget Sound, and be back in New York in a little more than three months. As a long-distance cruise this would have many advantages over a cruise to Europe and back, not the least of which would be the experience gained in logistics over a route that the fleet may have to make some day in one direction or the other when the errand is not peaceful.

The completion of the canal will be advantageous to the navy in still another way connected with the disposition of the ships of the fleet. Corinto, Nicaragua, is less than 100 miles further distant from New York via Panama than it is from San Francisco. All the Pacific coast of Central America outside of Mexico is 1,000 miles or



1. U. S. Marines scaling a wall, Ancon Baseball Park, July 4, 1912.

2. Panama Railroad Dock Cristobal, showing Torpedoboat Destroyers.



more nearer Panama than it is to San Francisco. It will, therefore, be possible generally to send ships more quickly from the Atlantic to the Pacific coast of Central America in times of disturbance there than it will be to send them from San Francisco.

The preponderance of our naval strength will probably continue to be in the future, as it has been in the past, habitually kept in the Atlantic. That ocean is the better one for the upkeep, drill and administration of the battle fleet for many reasons. But the canal will permit of many changes of disposition, some of them permanent and some temporary, that will be advantageous and that are impracticable under present conditions.

The completion of the canal should serve to bring home to every one the importance of our naval bases in the West Indies and the Pacific. That their importance has not been adequately realized is evidenced by the lack of funds provided to put them in an efficient condition. The Monroe Doctrine was an old story before the war of 1898; but few people realized that it extended our military frontier beyond the Atlantic and Gulf coasts, for it is a mental conception and not a tangible thing appealing to the senses. After 1898 and the acquisition of Porto Rico there was a visible projection of our frontier into the Caribbean; and after the Hay-Pauncefote treaty in 1901, which gave the United States undivided responsibility for the canal, another visible and material interest appeared still further to the front. It has always been clear to the naval mind that our military frontier extends far beyond our continental borders, and now, irrespective of the Monroe Doctrine, it extends from the Atlantic coast around Porto Rico to the canal; and it has been equally clear that, for the security of that frontier, a naval base somewhere on the outer edge of the Caribbean is a necessity. After careful consideration Guantanamo was selected as the site for such a base as being the suitable harbor situated furthest to the front on the edge of the Caribbean. Con-

gress has not yet signaled its appreciation of the necessity for Guantanamo by the provision of an adequate program for its defense and equipment, though there are some signs of such an appreciation. Nor do the people of some of the gulf states realize that the frontier has advanced more than a thousand miles from their coast, and that the New Orleans and Pensacola naval stations no longer serve any useful military purpose, if one may judge by their arguments against the action of the Navy Department in closing them during the last administration. When the canal becomes a great utility in regular operation instead of an interesting engineering work, when trade has settled into the new routes the canal will make possible, and when business men have occasion to think of it daily as a vital link in their transportation problems, a juster appreciation will arise of the necessity of a naval base at Guantanamo for the protection of the canal and of the trade routes converging toward it, as well as for the maintenance of our general interests in the Caribbean, that will doubtless find expression in a complete scheme for its defense and equipment.

If, as it almost surely will, the canal serves to place in the Pacific Ocean, even for a part of the time only, a greater force and one of larger ships than is now there, the question of bases in that ocean must be considered. In the Pacific, excepting our limited plant in the Philippines, there are three bases—Mare Island, Bremerton, and Pearl Harbor. To care for any considerable force in peace, and, what is more important, to care for it in war, these are all too few. Pearl Harbor is in the making, and Bremerton is not yet a first-class base. San Francisco Bay is the place above all others on our Pacific continental coast that is suited for a naval base by reason of its strategic situation geographically and the advantages attending the proximity of a large city. But the Mare Island Navy Yard is impossibly situated for this purpose. It has neither the area nor the depth of water needed for modern

capital ships and its distance from San Francisco and lack of a railway connection are handicaps in the supply of labor and in the economical handling of freight and building supplies. At the present time the available depth is twenty-two feet at mean lower low water, and the channels constantly and rapidly silt up. It is even difficult to keep the entrance to the new dry-dock deep enough for safe docking of ships that can enter it. The adopted departmental policy is to have forty feet depth from the sea to our navy yards, and that depth of channel is being urged at our important commercial ports in the interests of commerce. To all except those who will not see it has been increasingly evident during the last ten years that the Mare Island Navy Yard is doomed for the service of modern capital ships, and it is equally evident that a new location, somewhere in San Francisco Bay, on deep water near the city, must eventually be provided for their docking and repair. If the people of California desire and expect to see any considerable part of our modern fleet habitually visiting in their waters after the canal is finished, they cannot too soon bestir themselves to provide in the deep water of San Francisco Bay the naval facilities that are required for the supply, upkeep, and repair of modern capital ships. Mare Island does not afford them, for the simple reason that recent capital ships cannot safely go there, if for no other. Men cannot drive rivets on a ship twenty to thirty miles away. The completion of the canal should help to force this conclusion home if the people of California are not prepared to accept it now.

Of Pearl Harbor and Bremerton there is less occasion to speak in this connection. Congress is treating Pearl Harbor in a liberal spirit, and the facilities at Bremerton are gradually increasing. The development of both should go on to provide for the increased naval shipping that may naturally be expected to follow the completion of the canal; but, above all, to provide for the greatly increased demand

upon them in the event of a war in the Pacific.

The consideration that perhaps comes most naturally to mind in connection with the canal is the immense shortening of distances effected by it in most cases between points in the Atlantic and Pacific. This consideration, was, of course, the reason for building it. What may be termed the commercial routes from New York to Hong-Kong, those that take in ports of call, are practically the same length via Panama and Suez, the difference between them being less than twenty miles in favor of Suez; but the Panama route is the shorter from New York to Shanghai and the ports of Japan. From New York to Manila the Panama route is shorter than that by Suez unless the former go by way of Honolulu and Yokohama. The further east the point in the Pacific, the greater the gain in distance to New York by the Panama route. Valparaiso is 3,750 miles nearer New York via Panama than via Magellan. Speaking generally, the distance is shortened via the canal from New York to any point in the Pacific inside of a line drawn from Magellan Strait, through Australia and the Philippines, to Hong-Kong. As affecting naval movements this means more than time and fuel saved, though both economies are of prime importance. It means the possibility of sending ships from the Atlantic to almost any place where they will be needed in the Pacific by a route that has fuel stations under our flag along the entire distance, no two of which are further apart than the fuel endurance of our capital ships. This is an enormous advantage, for the problem of fueling our naval ships in time of war on a passage from the Pacific to the Atlantic, or vice versa, would be a staggering one by either the Suez or Magellan route, and the attitude of neutrals might make it almost an unsolvable one. The canal will eliminate the question of neutrality altogether, and for that reason alone it is of incalculable benefit to the navy.

The question of economy is, however, one

not to be ignored. Between New York and San Francisco, in either direction, Panama and Guantanamo would probably be ports of call for a fleet. A study of the saving of time, fuel, and money effected by sending a fleet between Panama and Guantanamo through the canal instead of through Magellan gives some astonishing results. Such a study has been made, based on the movement of twenty-five capital ships with attendant cruisers, destroyers, and auxiliaries. It is too long to give more than the results, but they are sufficiently interesting.

The time saved under the assumption is about sixty days. This could be considerably shortened by increasing the assumed sea speed, or decreasing the days at anchor for coaling, repairs, and recuperation of the personnel, but at the expense of fuel burned, with the attendant cost and necessity of fueling oftener. The route via Magellan that the fleet would follow between Guantanamo and Panama requires nearly 900 actual steaming hours at twelve knots, or thirty-seven days. This makes no allowance for necessary time to refuel and repair, so that sixty days is not an unreasonable gain in time to allow in favor of the canal, in view of the fact that refueling on the Magellan route would have to be carried on at places outside the territorial limits of neutrals, and often under disadvantageous circumstances. This might be time enough to enable the enemy to finish the campaign in his favor, not to speak of the harassment of the personnel while making the long sea voyage via Magellan, during which every man would know that he and his ship were needed every moment of the time, with the prospect that the fleet would not arrive after all in time to effect its purpose.

The saving in coal is about 290,000 tons, and in fuel oil about 54,000 tons. At the present market values of these fuels taken for the conditions, this means a money saving of nearly \$3,000,000. Not to overestimate this saving, and assuming that an oversupply of twenty per cent. has been

allowed, the saving in coal would still be 240,000 tons, in oil 45,000 tons, and in money \$2,500,000.

The gain in time is the all-important economy, but the saving in money is itself important. In view of our lack of a merchant marine, however, the simplification in the supply of fuel via the canal is of vastly greater moment than the money saving. The United States can furnish whatever money the circumstances of war may demand, but it cannot build overnight a merchant marine for the service of the fleet. This subject could be greatly elaborated, but enough has been said to show what a valuable military asset the canal is in its bearing on fleet logistics.

Simply for the ordinary service of the fleet in time of peace the canal will effect very large savings to the naval appropriations. A fair average price for eastern coal of a kind fit for naval use is \$8.45 per ton at San Francisco, Puget Sound, and Honolulu. While no exact prediction can be made, competent authorities believe that when the canal is in operation the price at which eastern coals can be laid down at these places will not be more than \$6.20 per ton. Taking as a basis the amount of coal on naval account sent to the Pacific in the last fiscal year, 160,000 tons, the saving amounts to \$360,000. Nor does the advantage end there; a collier can take a cargo via the canal to the Pacific coast, discharge and be back at Norfolk in the time she would take to make the voyage out via Magellan. This roughly divides by two the tonnage necessary for any given supply of coal at those ports. In time of war in the Pacific, this will be of inestimable advantage, considering our woful lack of a merchant marine. With respect to other bulky naval supplies, like provisions, the same thing does not hold true, for they can be delivered equally well and at little difference in cost on either coast from their points of origin. Even ammunition and guns, which are practically all manufactured in the east, would very probably be sent by rail to the Pacific in order

to save time, though the expense would be greater. But with oil fuel, again, the advantage to the navy is apparent, and this time the gain is in movement toward the Atlantic. In the last few months the price of oil has markedly increased. California produces more oil than any other state and its price is lower than eastern oils. This fact, in addition to the important fact that a large oil-producing area has been set aside for naval purposes in California, points to the possibility that the navy may soon be using California oil in the Atlantic, which would hardly be possible without the canal. The demand for oil increases every day and many of the older wells are falling off in production; the navy may not improbably have great occasion in the years to come to congratulate itself that the canal will make the Pacific coast fields available.

Modifications of trade routes that will follow the completion of the canal are sure eventually to cause a reduction in freight rates, and so act as a stimulus to trade. The increased trade will, in turn, demand a greater tonnage, though this demand will be partially met at first by the ability of the same amount of shipping to provide for a greater trade because of the shortened distances via the canal. Still it can hardly be doubted that the opening of the canal will create a demand in time for an amount of shipping considerably greater than exists now in order to provide for the increased trade. The opinion has been advanced that the United States merchant marine will be greatly stimulated by the operation of these causes. The navy earnestly hopes that this may be true, for a large merchant marine is a necessity for a strong navy only in a less degree than the auxiliary ships especially designed for its service; and anything whatever that can properly be done to increase the merchant marine should have the active support of the navy. In so far as the coasting trade is concerned there seems to be good reason to expect an increase of United States shipping, for that trade is certain to grow rapidly upon the

opening of the canal, and foreigners cannot take any part in it. Moreover, the exemption of this class of shipping from the payment of canal tolls will virtually be a subsidy. Already some ships have been built for this trade in anticipation of the completion of the canal, and others are being built. But the writer has been unable to convince himself that the opening of the canal will alone serve to draw American capital into a form of investment from which it has persistently kept aloof, and under present conditions and laws he anticipates little or no resultant increase in that part of the merchant marine of the United States engaged in foreign trade. Without any close examination of the reason why, it seems to be a fact that Americans either cannot or else do not care to compete with other maritime nations in the sea carriage of foreign trade, and it is not apparent that the opening of the canal will by itself change that condition. That we should have a flourishing merchant marine is a matter of such vital interest to the navy that it will anticipate with satisfaction the increase of shipping engaged in coastwise trade due to the opening of the canal; and, as remarked above, the navy should exert its influence in favor of every proper measure tending to put American ships on the ocean in the foreign trade.

However interesting and profitable it may be to dwell upon the military advantages to the United States attending the opening of the canal, that feature is not the most vital one to the navy. The canal puts an added and very great responsibility upon the navy, and this fact is one that the navy and its friends must always keep in mind.

The canal is being built, and it will be operated and controlled, solely by the United States Government. The protection of the canal, therefore, falls solely upon the United States. Moreover, in the Hay-Pauncefote treaty of 1901, the neutralization rules are embodied in Article 3, in which the language is: "The United

States adopts, as the basis of the neutralization of such ship canal, the following rules. . . ." We are, therefore, the sole guarantors of the neutralization of the canal. Again Article I of the treaty of November 18, 1903, with Panama, reads: "The United States guarantees and will maintain the independence of the Republic of Panama." Finally, the United States trade passing through the canal will be very great. Here are new and great responsibilities, all flowing from the canal, and all dependent upon the navy for their realization. The navy is the outer line of defense of the canal as it is of the country. The inner line of defense of the canal resides in the fortifications and garrison at the canal itself. If our navy is driven from the sea and made negligible an enemy with a great army can undertake with impunity the transportation of the troops necessary to overcome the inner line of defense and complete the victory begun on the ocean. The task may not be easy for him, but its possibility must be conceded if the sea is closed to us and open to the enemy. The only possible and final assurance of safety for the canal is in a navy strong enough to meet the enemy, beat him, and prevent him from ever getting near it. The following words, quoted from Admiral Mahan, indicate the alternative: "Permanent [naval] inferiority means inevitably ultimate defeat, which fortifications can only delay." And a few lines later he uses these words: "If the United States desires peace with security, it must have a navy second to none but that of Great Britain; to rival which is inexpedient, because for many reasons unnecessary."

The United States is not a military nation. There is little consideration and less understanding among the people at large of military matters. The Government has no defined military policy, using

"military" in its wide sense, and it has no defined naval policy. By this is meant that there is no soberly thought-out relation between our military strength and our situation in the world—between our declared external political policies and the only means yet found efficacious to uphold them—that manifests itself as a guiding principle in Congress, or even in the recommendations to Congress. There should be such a military policy, and it should carry on from administration to administration, from Congress to Congress, and be considered a part of our foreign affairs policy, as little open to attack from within our own household as the external policies on which it is founded. Our form of government, the immensity of our country, and our isolated position, almost insular as far as other first-class nations having great military strength are concerned, all doubtless conspire to cause the general lack of interest of our people in foreign affairs, which is the ultimate cause why there is so little appreciation of the underlying need for a strong navy. The navy is popular just now, and to that degree it is fortunate; but the roots of its existence should lie in deeper ground than popularity. It is to be hoped that the completion of the canal may serve to broaden the national outlook, and that we may be able to look back to it in coming years as the period in which a reasoned national policy, founded on national aims, shall have had its birth in the country at large.

There would be no excuse for a failure of the navy itself to have a "reason for the faith that is in us"; nor can that reproach be laid at the door of the navy, which has for years had a definite, consistent policy as expressed by the responsible advisers of the Navy Department. Moreover, the effect of the canal upon that policy has been carefully kept in mind since the day the canal was started.

CHAPTER XLIII

THE DEFENSE OF THE CANAL ZONE

BY MAJOR-GENERAL LEONARD WOOD, U. S. A.

THE people of the United States in constructing the Panama Canal undoubtedly had in mind its great commercial advantage to the world at large; they realized that it would facilitate commerce, that it would bring certain sections of the west coast of North and South America into closer relations with Europe; it was looked upon as a great world benefit, one of those great works the beneficial results of which go to the betterment of mankind.

The American soldier and sailor at once saw in the completed canal an implement of tremendous military utility, and realized that it would enable the prompt transfer of our fleet from one ocean to the other, or the quick union of the fleet on either ocean. In a certain way it doubled our naval efficiency. It is now practically completed; and, like all great undertakings, it carries with it great responsibilities; it must be safeguarded. Its secure holding is of more importance to us than to any other nation; and consequently, we are confronted, from the military standpoint, with the problem of holding the Canal Zone securely, so that the canal may be always available to us, and not available to our enemies. With this end in view, careful and detailed studies have been made of the Canal Zone area; powerful fortifications are being constructed at each extremity of the canal, and the preliminary steps taken to provide a garrison adequate to hold it against any force, excepting such force as might be landed as a result of our losing sea power—that is to say, the garrison ultimately to be provided will be sufficient merely to hold the canal against raiding forces from fleets. If we should lose sea control so as to permit the free

transport of troops by an enemy, then the force required to hold the canal securely would be a very large one. These are some of the aspects of the problem which confronts us.

The expansion of the United States into a world power has brought in its train many new responsibilities—responsibilities which thus far have been discharged with great good to humanity and with much benefit to ourselves, in that our occupation of tropical countries has resulted in discovering the method of transmission of yellow fever, and the means of its control. Through the application of this knowledge, yellow fever has been done away with, and the tropics made a white man's country for all time, so far as this disease is concerned. Yellow fever need no longer harass the Southern states; the great losses from widespread quarantine are no longer necessary. Great results have also been accomplished in the control of malaria and other widespread tropical diseases—results tending to increase the energy, and consequently the productive power of tropical and semi-tropical people, as well as that of the population of some of our Southern states.

The Canal Zone is a typical tropical area, with heavy forests and luxuriant vegetation. The problem of its defense involves many interesting features. Great care must be exercised in the sheltering and sanitation of troops. Officers and men cannot be kept advantageously in the tropics for more than a few years at a time. All this involves not only the maintenance of a highly efficient garrison, always equipped and ready to meet any emergency, but also a careful application of the latest sanitary principles.

CHAPTER XLIV

THE PANAMA CANAL FROM A NAVY STANDPOINT

INCREASED BURDEN OF PROTECTING CENTRAL AND SOUTH AMERICAN COUNTRIES UNDER MONROE DOCTRINE—THE FLEET PROTECTED BY CANAL FORTIFICATIONS—NECESSITY OF STRONGER NAVAL FORCES IN THE PACIFIC—ENGLAND'S ALLIANCE WITH JAPAN—NAVAL BASES IN THE PACIFIC—ENFORCING NEUTRALITY OF THE CANAL—THE RESERVE FLEET.

BY CAPTAIN PHILIP ANDREWS, U. S. N.

NOTE.—In accordance with Navy Regulations, permission to publish this article was requested by Capt. Andrews, and was granted by the Secretary of the Navy, in a letter dated Aug. 14, 1914, as follows: "Permission is granted you to publish without change your article entitled 'The Panama Canal from a Navy Standpoint,' submitted for scrutiny under Article 1534 (3), U. S. Navy Regulations, 1913. (Signed) JOSEPHUS DANIELS."

THE Panama Canal has been successfully built. It has been fortified. It is being operated commercially.

The doubts and controversies which preceded it, the difficulties of building, may now be forgotten and attention riveted on what it will do for the navy, the nation, and mankind generally. That the recipients of the canal's bounty are mentioned inversely in the order of their importance is because this article deals mainly with its effect on the navy, and only incidentally with the others.

In arguing for the building of the canal, the benefit to be gained by the freer use of our naval force in war or threatened war, was used to arouse patriotic and widespread interest in the canal, yet the material benefits to the United States in the easier exchange of commercial commodities, and to mankind generally, were of much greater importance.

The shortening of trade routes, the development of Central and South American states, through fuller emigration and commercial opportunity, the direct benefits to our sparsely populated Pacific coast in supplying labor, and the opening of new markets in the vast Pacific Ocean—one thinks of these at once as among the direct results of joining the two oceans.

Let us look ahead some years to the prob-

able effect of the stimulus given Central and South America after the opening of the canal. It needs only a fair imagination to see what will happen. The trade to and from these countries will vastly increase, and they will become well populated by people from Europe and the United States, and probably even by Asiatics. Investments of foreign capital will be heavy. Until the native population is overcome by children of foreign blood, or intermarriage, the governments of some Central and South American states will not be strong enough to stand alone or to resist aggression, nor will they be stable. We must continue for years to exercise a suzerainty over them; and while protecting them against outside interference, require of them honest government and fair dealing among themselves and toward outside nations. Stable governments must henceforth be the rule, not the exception.

This, then, is the newer Monroe Doctrine. The United States protects, when necessary, Central and South America from interference from other nations, but it now demands and will enforce as necessary not only fair dealing with foreigners and stable government within, but a government which shall be founded on justice and the consent of a majority of the governed. This course will make for the ben-

efit of Central and South America, and equally for the United States and those other nations which have citizens and money invested in these countries.

The navy shares in the benefits conferred by the canal to a marked degree. The greatest benefit is the shortening of the distance between our Atlantic and Pacific seaboard. The seaboard frontiers of the United States are not only the Atlantic and Pacific coasts, but also the necessary water communication between them, for at times it will be necessary to send our naval force from one coast to the other. When there was no canal, our sixteen battleships of the Atlantic fleet went from one coast to the other by the Straits of Magellan; a long route but fairly sure. In war time even this would be feasible provided no greater force than ours was met, for the route is far from a base. With the Panama Canal in operation the distance is much decreased, the time even more; but safety is infinitely greater because the communications to the canal (or away from it) on either ocean are shorter and more easily defended. The safety of the fleet is also increased by the strength of the canal itself; the powerful guns at its entrances, the defense of the line of the canal by an adequate army force, and by the dry docks and repair shops at the disposal of our ships. Thus our ships may seek shelter behind the guns at the entrance as against a superior force, and safely await the arrival of more of our ships from the other side, or may all seek shelter in the interior lake of the canal while a part may be repaired or docked. The entrances are well fortified with heavy guns to keep off hostile vessels, so that our fleet, wishing to emerge to give battle to the enemy's fleet, can safely leave the entrance and form in line of battle before it can be reached by an enemy's guns.

If we have an enemy in each ocean, desirous of joining, we can at least go through the canal, reach one part and give battle before a junction can be made.

Until recently it was only necessary to

have our main fleet in the Atlantic, where it seemed most likely international complications might arise. But the Pacific Ocean for some years has been steadily increasing in importance to us, and the two wars in which Japan has recently engaged have placed her and her policies in a position where careful statesmanship will be necessary to avoid controversy between us. This condition has been coming and would have arrived whether the Panama Canal had been dug or not, but the recognition of it was partly responsible for the building of the canal.

The canal has cut the distance from New York to San Francisco from 13,000 to 5,000 miles, and has reduced the time in even greater proportion than the distance on account of cutting out delays necessary for replenishing fuel. Our battle fleet, therefore, of whatever strength it may be, is rendered vastly more mobile by means of the canal, and can readily and quickly pass from one ocean to the other in case of need.

Before the opening of the canal, our fleet in the Atlantic should have been measured by our need for enforcing the Monroe Doctrine; in the Pacific by the strength necessary to share in the trade of the East and in enforcing Asiatic exclusion, for the time at least one of our definite policies. Thus both oceans would have ultimately demanded strong fleets suited to their necessities, and as commerce grew and competition became keener stronger fleets would have been necessary. The canal has made it possible for us to maintain a smaller battle fleet because it can pass quickly from one ocean to the other as necessary and be available for either.

It has been said that the building of the canal would double our navy, but this probably only meant that one fleet would suffice, instead of two which could rarely be joined, and then only after great delay. And the fact that naval forces, with no canal, would necessarily be divided and make it necessary to have each separate fleet of full strength, was a prime factor

in deciding that we should build the canal. It was, in fact, a military measure to reduce our ultimate expenditure for war vessels; an economy. It is immaterial here to conjecture what strength each fleet would have had without the canal; or what our one battle fleet will be with the canal. Both would depend upon the policies of other nations, and on their varying naval strength.

By what proportion the canal has increased our naval or military effectiveness can not be stated; it is more correct merely to say that it saves us from larger expenditures for war vessels, by requiring less naval strength to prevent wars, and to meet war, should it come.

In all probability a battle fleet suited in size for any contingency in either ocean will suffice for our needs. This means in effect that we should be approximately as strong as or stronger than Germany or France in the Atlantic, and stronger than Japan or China in the Pacific. Just as soon as our naval strength falls below that of any European nation that needs land for her surplus population, we invite, and may get, a defiance of the Monroe Doctrine. Indeed, the opening of the canal itself, by gradually increasing commerce and opportunity in Central and South America, will invite such aggression. Trade and colonization, in fact though not in name, will increase the interest of all nations in Central and South America. Even now, both European and Asiatic nations have large colonies in South America.

We have guaranteed the neutrality of the Panama Canal; we must maintain it by force if need be against any and all. We have bound ourselves to do this. What this may mean no one yet knows; the need for force on this score would probably arise at the same time as other difficulties.

We must prevent two nations at war from fighting in the canal, or near it at such distance as we may prescribe. We cannot allow the passage through the canal of belligerent vessels of one nation in pursuit of its enemy until a suitable time has

elapsed, just as belligerent vessels of one nation are not allowed to depart from the same port until twenty-four hours after its enemy's vessels have left.

One circumstance remains which is at once an embarrassment and a source of security to us, and might affect materially our need for naval strength—England's offensive and defensive alliance with Japan. It means baldly that England will join Japan in case she cannot persuade her to go it alone, or refrain from war. It is certain that England's close commercial dependence on us in the way of investment, and her reluctance to part with Canada, would lead her to advise against war with us, but the possibility is there. It is equally certain that wise Japan does not wish war with us or with any nation. Her greatest need for successful development lies in many years of peace, and wisdom to cope with her serious internal problems and her financial condition.

With our battle fleet in the Pacific a large part of the time, as it will be, the extension of our naval bases becomes necessary. We now have Mare Island in California, and Bremerton in the State of Washington, and a small coal pile at San Diego. Our facilities for repair and outfit of our ships on the Pacific will be entirely inadequate when the battle fleet gets in the Pacific for any length of time. The navy yard at Bremerton must be increased and a first class naval base established on San Francisco Bay, the natural strategic center of the Pacific Coast. It is probable even that a naval station must ultimately be established in southern California, for the length of our Pacific seacoast is about 1,200 miles. With this purely navy yard development will probably also go the establishment of a torpedo station for manufacture, repair and test of torpedoes, and possibly even a powder factory and facilities at one of the navy yards for manufacture and repair of guns.

With the increase of naval facilities on the Pacific Coast will come a diminution in the number of navy yards on the Atlantic

Coast. We have now two on the Pacific Coast and eleven on the Atlantic Coast.

We will have in the canal itself ample docks and shops for the repair of our ships, but necessity will force the development of Guantanamo, on the southeast side of Cuba, and probably will urge the establishment of a coaling and naval station on the Pacific between Panama and San Diego, a long distance of 2,840 miles.

These are all on our coasts or on the line from coast to coast, but our responsibilities point still westward. Pearl Harbor in Hawaii is approaching completion. It is the great outpost of our Pacific Coast whose possession is vital to us, and it must be denied an enemy. It is also a vital link in our line of communications to the Philippines, which if we retain, will also require the fortification of Guam as the next step. Then a minor naval base will be necessary in the Philippines.

Smaller questions which will undoubtedly arise after the opening of the canal will be the necessity on the Pacific Coast for increased barracks for the larger number of men needed, increased facilities for oil fuel and coal, and provisions and supplies. This will mean more storehouses, barracks, fuel depots, and additional expenditure for equipment and supplies for the fleet when in the Pacific.

It will be necessary to make some rearrangement of the reserve fleets, probably balancing each with the different elements usually in a standard fleet. It is likely too that additional torpedo vessels and sub-

marines of a more modern type will be transferred to the Pacific Coast. We already have torpedo vessels and submarines in the Philippines, and submarines in Hawaii. Guam, too, will get its quota of both for local defense.

The Atlantic reserve fleet is based at Philadelphia and the Pacific reserve fleet at Bremerton Navy Yard. Both are composed of the older vessels which would form the second line, and perhaps be the final reliance in war should it happen that our main battle fleet had met the enemy and been disabled, or in need of repairs even if victorious. It has been well said that the nation which can quickest get its reserve fleet of older and less formidable ships to the front will decide the war finally in its favor. Any modern action is bound to disable the greater number of vessels on both sides; it is necessary, therefore, to keep our older vessels in good repair in reserve, with reduced crews ready when needed.

The political situation may easily render it necessary to transfer either reserve fleet to the other coast, a contingency which would require more men than we now have, for we have not yet enough officers and men to man all our effective vessels.

Take it all in all, the opening of the Panama Canal will be the beginning of great development and progress in which the navy will follow and share; as always a necessary adjunct for peace, which must be as strong relatively as the interests it guards and preserves.

CHAPTER XLV

OUR FOREIGN COMMERCE

COMPARISONS OF FOREIGN TRADE OF LEADING COUNTRIES—COMMANDING POSITION ENJOYED BY UNITED STATES—IMMENSE SIZE OF HOME MARKET—LESSONS OF THE EUROPEAN WAR—CHANGED CHARACTER OF AMERICAN EXPORTS—TRADE BALANCES—CONSTRUCTIVE LEGISLATION NEEDED—COMBINATIONS AND FIXING PRICES IN FOREIGN TRADE SHOULD BE LEGALIZED—MERCHANT MARINE—AMERICAN INVESTMENTS ABROAD—EFFECT OF PANAMA CANAL UPON AMERICAN COMMERCE—BAD FINANCIAL CONDITIONS IN SOUTH AND CENTRAL AMERICA AND CHINA—AMERICAN ASSISTANCE NECESSARY—PAN-AMERICAN SUPREME COURT SUGGESTED—PAN-AMERICAN DEFENSIVE ALLIANCE AS A SUBSTITUTE FOR MONROE DOCTRINE.

BY JOHN HAYS HAMMOND

IN the year 1913 the total commerce of the world was \$40,468,000,000. These figures in the main relate to net imports and domestic exports. They do not relate to any single uniform year, but are for the latest year available. The following figures show the foreign trade for the year 1913, of three leading countries:

	<i>Exports</i>	<i>Imports</i>
United Kingdom....	\$2,557,000,000	\$3,742,500,000
United States.....	2,428,500,000	1,813,000,000
Germany.....	2,403,311,000	2,563,354,000

The foreign commerce of the United Kingdom, the United States, and Germany combined equals about thirty-seven per cent. of the total commerce of the world. In respect of an export trade, the United Kingdom leads, very closely followed by the United States, which in turn is approximated by Germany.

It is because of the magnitude and diversity of our home market that we have heretofore made, comparatively speaking, but desultory and inadequate efforts to extend our foreign markets. The position we hold to-day in the world's foreign commerce is most reassuring as to the opportunities presented to us in the future development of foreign trade. We have achieved this commanding position in the world's export trade, for such it virtually is, despite lack of systematic effort,

handicapped by inadequate banking and transportation facilities, and without the valuable assistance rendered to their nationals by the governments of our competitors. Having regard to these facts, there can be no doubt of the remarkable potentiality of the United States in this field of commercial activity and of its inherent capacity to become eventually the dominating factor in the world's commerce.

It has not been through lack of ability on our part that we have not already achieved this position, but because our incomparable home market has been able to absorb the products of our national industries, for which reason we have not been compelled, as have Great Britain and Germany, to assiduously develop an export trade. *The value of the products absorbed by our home market is about twice as much as that of the total exports of the world.* Within the small area of Greater New York alone, for example, the value of manufactures annually exceeds the exports of either Great Britain or Germany. These figures show in a striking way the magnitude of our national industries. Not only in the value, but in the diversification of our industrial products, we hold a position incomparably more important than any other nation in the world.

One of the economic lessons of the present war is the complete vindication of the fiscal policy which has resulted in the building up and expansion of our great national industries. We learn more clearly the interdependence of our industries, the vital dependence, for example, of the great industry of agriculture on the prosperity of the manufacturing industry; for in the manufacturing centers it finds its best market. We learn the importance of all of our industries to the extensive classes employed in our great transportation systems, in our agencies of distribution, etc., and we must conclude, therefore, that *the keynote of our economic and fiscal legislation must ever be to preserve unimpaired the integrity of our home industries and the purchasing power of our domestic markets.*

With a rapidly increasing population, and especially a rapidly increasing number of wage-earners, we must extend our industrial activities; but we must, nevertheless, not lose sight of the fact that over-extension in industry inevitably causes depression in times of business recession. Indeed, authorities agree that we are now rapidly approaching the limit, that is to say, the point of saturation in our domestic markets, at least in so far as present demands under normal conditions are concerned. It is obvious, therefore, that we must either curtail the capacity of our factories, which would result in throwing out of employment millions of wage-earners and the disorganization of complementary industries as well, or we must depend upon the exploitation of foreign countries for the relief of our congested home markets.

In the character of our export trade there has been a significant change in recent years. As late as the year 1901 foodstuffs constituted nearly seventeen per cent. of our total exports, whereas, a decade later, in 1911, foodstuffs formed only about five per cent. of the total exports. On the other hand, a very encouraging phase of our export trade is the rapid increase in manufactures exported. In 1901 manu-

factures (and manufactures for further use in manufacturing) represented but 31.8 per cent. of our entire exports, whereas, in 1911, 44.5 per cent. of our total exports were manufactures. Conformably with this change in character of exports we find a gradually diminishing percentage of manufactures imported, but, on the contrary, the importation of a rapidly increasing percentage of crude materials for use in manufacturing. The recently enacted (Underwood) tariff has unfortunately resulted in an increased importation of manufactures, and the present war has stimulated the increase of food exports, but both these factors are to be regarded as aberrations only in our commercial history.

The bulk of the exports of Great Britain and Germany has been wholly or partially manufactured articles, eighty per cent. of the exports of Great Britain and sixty-five per cent. of the exports of Germany coming under this category. Therefore, our future competition with those countries will be almost entirely confined to exports of that kind. In her foreign trade Great Britain follows the line of least resistance. She sends to British colonies and possessions, where she enjoys preferential tariff rates, nearly forty per cent. of her entire exports, while only thirty per cent. is sent to other manufacturing countries having a protective tariff; and of the remainder of her exports a large part is sent to neutral markets, where there is no competition from home industries. Germany and America, on the other hand, have succeeded in developing the bulk of their trade with countries which have highly organized competitive industries in the same lines of merchandise; *i.e.*, America and Germany have "bucked the center" while Great Britain has "played the ends."

In the year 1913 the United States had a "favorable" trade balance of about \$615,000,000; but, as a matter of fact, there are "invisible exports" that tend to wipe out this apparent credit balance. These are, ac-

ording to Prof. Jeremiah W. Jenks, First: \$225,000,000 on account of payments of loans made to this country or of interests and dividends due on investments made here, the United States being a debtor nation to Europe, it is estimated, to the sum of about \$5,000,000,000. Second: Money drawn on letters of credit and other forms of foreign drafts by Americans traveling or residing abroad, amounting, according to Sir George Paish, to a net sum of about \$170,000,000. Third: Funds remitted abroad for investment by immigrants residing in this country. These remittances, it is estimated, amount to from \$150,000,000 to \$250,000,000 annually. Fourth: Remittances by American manufacturers and merchants for payment of freight shipped in foreign bottoms, estimated at a net sum, after deductions, of about \$25,000,000. These are the "invisible" exports, the amount of which is a factor in determining the net balance of our national commerce.

England, Germany, and France (*i. e.*, the peoples of these nations) have a large debit, so-called "unfavorable" trade balance, owing to the fact that they are creditor nations and receive from the debtor nations increased imports which represent the interest due them for foreign loans and investments.

In competing with foreign markets we are to meet our great trade rivals, who, by years of experience and by the expenditure of colossal sums, have obtained a foothold more or less firm in the markets we seek. Therefore, to successfully compete with these nations we must secure for ourselves every advantage we can derive from the most efficient exploitation of our national industries, fostered by constructive legislation at home and promoted by able commercial diplomacy abroad. This has been notably the policy of Germany, and its success is evidenced by the unparalleled strides she has made in the development of her great foreign commerce.

I have referred to the stimulus of constructive legislation at home. It is not my wish to inject politics into a discus-

sion of this kind, and I therefore disavow criticism inspired by partisan motives. As a matter of fact, both of our great political parties are transgressors. It is indeed unfortunate that the solution of great problems purely economic in character should not always be entirely dissociated from politics; that legislation dealing with the tariff, currency, trusts, and other economic subjects vital to the welfare of the whole nation is, on the contrary, determined on strictly political lines—settled, indeed, by politicians on the stump rather than by business men in boards of trade. Economics is too often subordinated to politics. The vehement attacks on corporations by high officials of our government, indiscriminately impeaching the integrity of our corporate practice and of our business men, has not only prejudiced our position as exporters in foreign markets, but has increased also the difficulty of obtaining foreign capital indispensable to our industrial activities. This has a far-reaching consequence, having regard to the fact that we have borrowed from abroad upward of five billion dollars for the development of our home industries. It is by excess of exports that we are able to pay the interest on this large sum and to gradually wipe out our indebtedness. There has been much unintelligent prejudice, partly inspired for political purposes, against what we call "big business," but the people of the country should be convinced that unless our industries can be developed on large scale production, as is the practice of our great European trade rivals, we shall be seriously handicapped in our quest for foreign markets. England permits, France encourages, and Germany sometimes even compels, combinations in the interest of the industry and the general public. Governmental intervention was of great advantage to the potash industry in Germany, and the more recent intervention of the Government to prevent cutthroat competition between the Hamburg-American and the North German Lloyd lines was

undoubtedly most beneficial to German stockholders.

In the enforcement of the Sherman law, our government should remove, as far as possible, obstacles to the cheap production of commodities for our export trade, so as to place our country at least at no disadvantage compared with our competitors. Coöperative combinations, and the fixing of prices for products exported, should be allowed to enable the smaller industries to more advantageously exploit foreign fields. Then, too, it should be legal for transportation companies to give special rates to the seaboard for products destined for shipment abroad.

In making future tariff revisions, we should endeavor to obtain reciprocal advantages from nations profiting by such revisions.

One of the practices that has been much criticised is the sale of our products abroad at lower prices than at home, but this practice is justified because of the fact that we are dealing chiefly with our surplus products, especially in times of depression. The alternative policy would be to close down the mills. By so doing the effective organization which has been built up would be impaired and likewise many wage earners would be thrown out of employment.

So great is the interdependence of the commercial nations of the world that we find in times of depression in this country similar conditions prevailing in Europe, and consequently congested home markets for their products.

To compete successfully, therefore, with the minimum prices of our European competitors in foreign markets, it is often necessary, especially under conditions referred to, for us to make lower quotations abroad than those at which the same commodities are sold at home. This is the practice of European nations. A further vindication of such policy is that by securing the foreign trade which would otherwise go to our competitors we are enabled to retard the expansion of their industries,

and in that way to prevent them attaining the low costs of production that we ourselves enjoy; and after all, in the long run, the maintenance of the maximum production of our mills results in an average price in our home market lower than could be attained by operating on a smaller scale, and for that reason the consumer gains rather than loses.

An American merchant marine would be most valuable in the development of our foreign trade. To-day only ten per cent. of our foreign commerce is carried in American-owned vessels, ninety per cent. being carried in vessels for the most part owned and controlled by our trade rivals. The advantage of direct and frequent sailings is important in the development of trade relations; but, while this is true, many of us do not approve of steamship lines being owned or controlled by the government, as it would obviously deter private investment in lines which would be subject to competition by government-owned vessels. The rehabilitation of our merchant marine can best be accomplished by private enterprise after the necessary amendment of our navigation laws and the provision of subventions, etc., to compensate for the subsidies to their nationals by other governments. According to the Hon. Oscar W. Underwood, "All of the great shipping nations of the world are to-day granting subsidies in one form or another to their ships passing through the Suez Canal, except our own government. Already two of the shipping nations are providing subsidies for the ships passing through the Panama Canal, and undoubtedly the other shipping nations will shortly adopt the same policy."

Far more important than an American merchant marine is the extension of American banking facilities in foreign countries. This is now made possible by the recently enacted Federal Reserve Act, and the National City Bank of New York is to be commended for the enterprise it is showing in establishing branch banks in South America. The investment of a nation's

capital abroad is of great advantage in the expansion of its commerce. It is indeed the "open sesame" to the nation's export trade. The investment of British capital in the nature of loans to foreign governments (with the collateral advantages usually obtained for its nationals in the way of commercial concessions), and for the development of the resources of those countries, amounts to about \$750,000,000 annually. It is estimated that more than \$20,000,000,000 of English capital has been invested abroad, (about \$5,000,000,000 of which represents investments in Latin America) bringing in an income of \$1,000,000,000 annually. This refers to the remunerative investments only.

One of the fundamental requisites for successful competition for the world's markets is low cost of production; and in this connection it is well to disabuse the mind of the public of the long-cherished delusion as to the tremendous superiority of American labor, Yankee ingenuity, and American machinery over those of all foreign countries. The fact is, that this superiority no longer obtains in the same degree as formerly, for the reason that technical training abroad and the introduction of American machinery have already minimized the advantage that American industry formerly enjoyed in this respect. When this situation is realized there can be but little doubt that for their own protection American wage-earners will be compelled to increase their efficiency, so as to make possible the maintenance of the American standard of living, and at the same time lower the cost of production so as to enable our country to compete successfully with our trade rivals for foreign markets.

One of the essentials of efficiency in production is industrial peace. This is too large a subject to discuss at present, but, while realizing the complexity of the problem, I do not believe that I am too optimistic in expressing the opinion that the relations between employer and employee are better to-day, fundamentally, than for

many years past. The employer appreciates the justice and also the advantage, when properly conducted, of the principle of collective bargaining, and both the employer and the employee recognize more than ever before their interdependence and their reciprocal obligations as well; and with the spirit of fairness that generally prevails we have every reason to believe that the labor agitators, on the one hand, and unreasonable employers, on the other, are destined to become less serious obstacles to industrial peace. The people of the country of all classes, irrespective of political affiliations, are beginning to recognize the fact that politicians have, in a large measure, by their indiscriminate and demagogic attacks on the corporations controlling national industries, created a lack of confidence which has contributed to periods of depression. For that reason there is to-day a strong revulsion of feeling throughout the country against the attitude of such legislators, and I believe we have every reason to hope that the compelling force of enlightened public opinion will, in the future, result in legislation facilitating, rather than, as has hitherto been the case, obstructing the processes of industrial development, while, at the same time, adequately safeguarding the interests of state, community, and individual.

Another important problem indirectly affecting our trade is that of the curriculum of our public schools. The policy of our public school system is in a large measure directed to the preparation of boys for college and the university, subordinating the importance of preparing them for some efficient service in industrial and commercial pursuits. This is obviously wrong, and inexcusably so when we consider the small percentage of pupils that enter the colleges and universities after graduation from the high schools. At least the curriculum of the public schools should be arranged so as to better equip the graduates to earn their livelihood in commercial and industrial vocations. I believe that boys should have less erudition and more

knowledge. We should remember that "he is idle who is not best employed," and that there are far too many young men educated for professional life who add to the already congested ranks of the professions, and whose energies could be far more profitably expended in other vocations. They should be included in the producing, rather than in the non-producing class of the community.

During recent years our consular service has been greatly improved, and it reflects credit upon our country; but there is still room for improvement, and I would advocate that in the selection of men for that service some consideration be given to their qualifications for future service in diplomacy, so that in the selection of ambassadors, men who have attained distinction in the consular service should be available.

Coincident with the declaration of war in Europe considerable enthusiasm was evoked, verging indeed on hysteria, in the agitation to build up our export trade in South America. The opening of the Panama Canal has also given a stimulus to this movement; but, lest we repent at leisure, it behooves us to "make haste slowly" in our efforts to expand our trade with Latin America. While the Panama Canal will be of great advantage to this country in the development of foreign commerce, it will not facilitate our trade with Mexico, Central America, or with the northern and eastern sections of South America, with the exception of that commerce to be developed between our Pacific Coast states and those points. The Panama Canal will eventually add immensely to our foreign commerce in the Orient, and will be of incalculable advantage to our Pacific Coast trade, but in the future, as in the past, the bulk of our South American trade will, I believe, be with the South American states on the Atlantic and not with those on the Pacific Ocean.

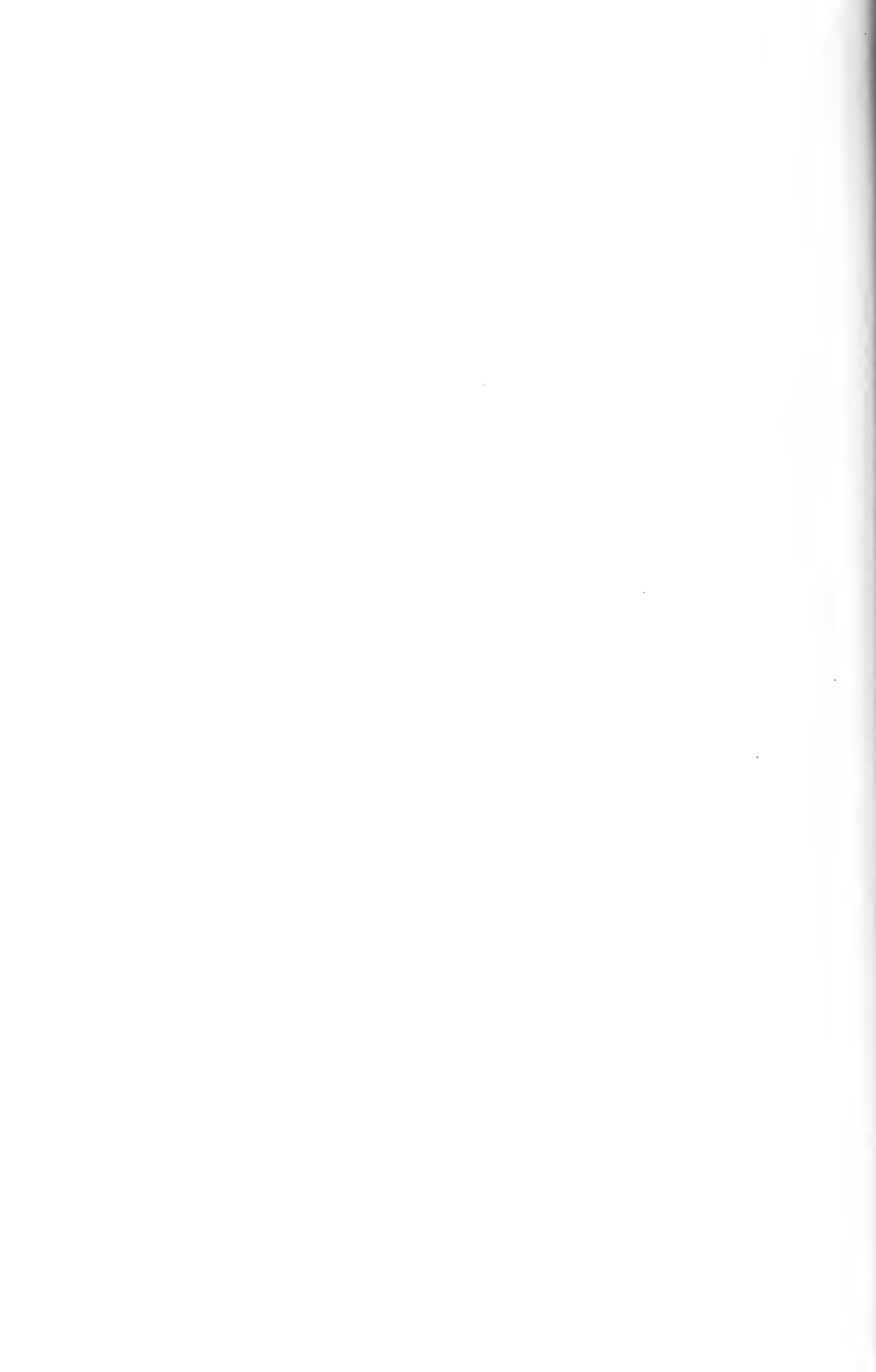
The immensity of the area of the South American states, aggregating 6,850,000 square miles (or nearly twice that

of continental United States), with a population of almost 35,000,000, appeals to the imagination of our manufacturers, merchants, and exporters; but there are important problems, financial, engineering, social and economic, to be solved before the potentialities can be realized. In 1912 South American exports amounted to \$1,176,971,000. The imports amounted to \$960,504,000, of which \$153,000,000, or about sixteen per cent., was from the United States. The total South American imports slightly exceed in value the sum of the exports of the United States to the United Kingdom and Canada alone; less than half the value of the manufactured products of Greater New York, and not more than one-fortieth of our domestic trade. These figures further emphasize the magnitude of our home market.

In order to develop our Latin American trade, with characteristic impetuosity and strenuosity we agitated the instantaneous creation of a merchant marine as a first step. We did not realize that the lack of a national merchant marine was by no means the greatest obstacle to the immediate development of our South American commerce. We ignored the "absorptive power" as well as the far more important factor, the "purchasing power" of these states. Hardly more than a cursory investigation of this subject suffices to show that we cannot expect substantial returns from this field in the near future. The financial conditions in South America at present are unfortunately decidedly adverse. This state of affairs exists likewise in China, Central America, and many other countries, not entirely due to but greatly aggravated by the European war. The fact is, many of these countries have borrowed from Europe sums far in excess of their ability to repay for some time to come. Some of this money has undoubtedly been wasted, but the greater part has been expended in industrial and commercial undertakings which have not as yet reached the period of fruition. Even before the war many of these countries were in financial



These three views show typical sections of the canal completed and under water. All of them lie between Gatun Lake and the deep section of Culebra Cut.



distress, but the war has greatly aggravated this condition by causing depreciation in the value of their products owing to lack of European markets.

If we are eager to promote the extension of our Latin-American trade, we must be prepared to assist in financing the governmental necessities and also the requirements for the completion and expansion of the industries and commerce of those countries. It will be a long time, undoubtedly, before European capital will be available in requisite amounts for that purpose. Under conditions existing before the war our country was able to secure comparatively cheap money from abroad for its industrial needs, and thus would have been able at that time to finance in a measure the development of the natural resources of Latin America with the profits derived from the exploitation of our home industries financed by European capital. Undoubtedly the time will come when American capital will seek extensive investment in the development of the industries of the newer countries, and from that investment will result a proportionate increase in our foreign trade. If, however, American capitalists are to assume the rôle of banker and broker for Latin-America, we must reverse our governmental policy in many respects. We must, for example, encourage and assist our manufacturers, merchants, banks, and transportation agencies in "drumming up" and building up foreign trade. To do this we must have the cordial and competent coöperation of the Department of State. The government must cease to stigmatize Americans who invest their money abroad in foreign industries as unprincipled exploiters. We must rather emulate the example of Germany in its systematic and stimulating coöperation with the citizens of that country in their activities in foreign lands. Above all, we must guarantee to our citizens at least the same degree of protection as to

life and property accorded the citizens of other nations by their governments. To obtain cheap money, which is required for commensurate industrial development, the Latin-American nations must guarantee the security of investment of foreign capital against discriminatory laws and confiscation, especially in times of revolutionary movements.

To attain the confidence of American investors and to obviate the serious objection that exists to investments in some of the Latin-American countries, I would advocate the creation of a Pan-American Supreme Court, to deal specifically with and to decide disputes as to foreign investments in Latin-American states. Such a court should be composed of leading jurists of our own and of the Latin-American nations, and should sit in neutral territory. If inspired only by self-interests the aim of such a court would obviously be to establish confidence as to the security of Latin-American investments, and for that reason foreign investors would be assured of fair treatment. Such a court might be one of final resort. In any event, it should try cases and endeavor to adjudicate claims before resorting to diplomatic agencies, a practice which almost invariably results in friction and often in extreme tension.

Cordiality of feeling between nations is essential to advantageous commercial relations, and it is for this reason that many of us advocate the substitution of a Pan-American Defensive Alliance for the Monroe Doctrine in South America. There no longer exists the necessity of maintaining this doctrine as applied to the whole of South America. The people of that country resent the "big brother" position as supererogation on our part. We should, I believe, restrict the application of the Monroe Doctrine to the states of Central America, to Mexico, and to the countries in the Caribbean Sea area.

CHAPTER XLVI

THE EFFECT OF THE PANAMA CANAL ON HAWAII

COMPARISON OF TRANSPACIFIC ROUTES FROM PANAMA TO YOKOHAMA, VIA SAN FRANCISCO AND VIA HONOLULU—SUNSHINE BELT VS. FOG BELT—SOUTHERN ROUTE SHORTER IN TIME, WITH CHEAPER COAL AND QUICKER DESPATCH—ATTRACTIVE TO TOURISTS—CLIMATIC ADVANTAGES—IMMIGRATION QUESTIONS—THE SUGAR INDUSTRY—EFFECT OF THE TARIFF—COMPARISONS WITH OTHER SUGAR-PRODUCING COUNTRIES.

BY LORRIN A. THURSTON.

THE question is asked, "What effect will the opening of the Panama Canal have on Hawaii?"

The answer to this question lies in the future; but there are known facts which warrant drawing certain conclusions in advance.

The traffic through the canal which will directly affect Hawaii is of two kinds, viz.:

1. That which is bound to or from the Asiatic Coast and adjacent islands, which needs a way station for supplies or instructions, and

2. That which makes Hawaii its direct objective point, in connection with local freight or passengers, or through tourist excursions.

The all important question to Hawaii is: "Will steamers operating between Panama and the Asiatic Coast make Hawaii a port of call, or will they prefer ports on the Pacific Coast or in Alaska?"

A number of articles on this question have been published in which it has been argued that no steamer operating over the routes indicated will call at Hawaii—San Francisco or Dutch Harbor in the Island of Unalaska being given the preference.

The chief reason upon which this argument is based is that the distance between Panama and Yokohama, for example, via Honolulu, is greater than via San Francisco.

This claim, as to distance, is correct. In order that there may be no question as to the exact facts, I compile the following

figures from the U. S. Weather Bureau Map of the North Pacific for December, 1914:

SOUTHERN ROUTE (via Honolulu)	
Panama to Honolulu (Great Circle Route).....	4,685 miles
Honolulu to Yokohama (Great Circle Route).....	3,394 "
Total distance Panama to Yokohama via Honolulu.....	8,079 miles
NORTHERN ROUTE (via San Francisco)	
Panama to San Francisco.....	3,277 miles
San Francisco to Yokohama (Great Circle Route).....	4,536 "
Total distance Panama to Yokohama via San Francisco.....	7,813 miles
Distance in miles in favor of San Francisco.....	266 miles

Admitting a handicap of 266 miles against Hawaii, why should ships go by the long route?

The reply is that in shipping routes as well as lovers' walks by moonlight, "the longest way round is frequently the shortest way home."

The "short line" argument ignores the fact that many things affect and decide routes of travel besides distance.

There are good reasons why the bulk of transpacific Asiatic commerce will go via Honolulu instead of via San Francisco, in spite of the 266 miles handicap against the former.

Some of these reasons are given hereunder. There should be kept in mind, in

this connection, the location of the several steamer routes across the North Pacific.

There are three distinct lines of steamer travel across the Pacific, north of the equator, between the American and the Asiatic continents, viz.:

(1) The southern route, via Hawaii, is in the northeast trade-wind belt, advertised by the Pacific Mail Steamship Company as the "Sunshine Belt," from the fact that the sun shines along this route during the great majority of the days of the year, and that the normal wind is a gentle breeze varying from ten to twenty knots an hour.

Since white men have visited them there has been nothing in the nature of a typhoon or hurricane in the Hawaiian Islands. Even heavy gales are few and far between, and fog is not known there.

The Hawaiian Islands and the surrounding ocean are the most favored spot, climatically, on earth.

(2) The northern route, from San Francisco, is along the Great Circle line. This is known as the "fog belt," for the reason that fog is prevalent there during the greater part of the year. The prevailing wind along this line is from the west, and, as a rule, considerably stronger than the trade winds of the southern route. Violent storms are also prevalent along this line.

(3) The central route begins at San Francisco, but abandons the Great Circle route and its short distance of 4,536 miles, for a course considerably to the south thereof and making a distance to Yokohama of 4,791 miles, an increase in distance of 255 miles over the northern short line route. This line is recommended by the hydrographic bureau at Washington to steamers crossing the Pacific from San Francisco. The object in taking this longer route is to escape the fog, violent winds and currents and storms of the northern route. It is another demonstration that "The longest way round is the shortest way home."

A fourth route from Portland and Puget Sound parallels the second route,

further north, but this route need not be considered in connection with the question at issue.

The foregoing demonstrates that although, theoretically, the northern route is 266 miles shorter than the southern, the route actually to be sailed is within eleven miles as long as the southern route. Without looking for any further reasons, the supposed advantages of the northern "short line" route disappear right here. All that remains to be done is to catalogue the many advantages which the southern route, via Hawaii, has over the northern route, via San Francisco.

The following are submitted as reasons why most of the steamers crossing the Pacific from Panama to the Asiatic Coast, which do not have specific business at San Francisco, will travel via Hawaii:

The sea is normally smooth and the winds gentle on that portion of the Pacific extending from Panama to Hawaii, and from Hawaii to the Asiatic Coast.

On the other hand, the normal weather on the northern route across the North Pacific involves high seas and stormy winds.

The bulk of transpacific traffic will be carried on in comparatively low-powered freight steamers, making ten to twelve knots an hour, to whom boisterous weather conditions are a serious hindrance.

A few days of heavy weather, bucking head seas and winds, and the racing of the propeller as it is pitched up out of water, will use up far more fuel and time on the shorter rough route than will be expended on the longer but smoother route.

Stormy, rough weather is in every way detrimental to economical steaming; tends to rack, strain and otherwise injure the ship, with the possibility of wetting and otherwise injuring the cargo, regardless of what direction the wind is from. Under these conditions, other things being equal, or even against a considerable handicap, the smooth water and gentle wind route will be chosen.

It is a fact known to all navigators of the Pacific, and demonstrated by the

records and charts compiled and published by the U. S. Weather Bureau, that the normal wind along the "southern route" across the Pacific, north of the equator, *i.e.*, the route via Hawaii, is the northeast trade wind, *i.e.*, it is normally a fair wind for ships going from Panama to the Asiatic Coast.

On the other hand, the normal wind along the "northern route," *i.e.*, the Great Circle route from San Francisco, is a strong westerly and northwesterly wind, with frequent gales, which winds extend well down toward the Mexican coast, *i.e.*, the wind is normally adverse to ships bound to the coast of Asia. The same general conditions, differing only in degree, prevail upon the central route.

The difference in a ship's progress made by an adverse or a fair wind is but little on a short voyage; but the difference in favor of 8,079 miles of fair wind by the southern route as against 7,813 miles of head wind by the northern route, or 8,068 miles by the central route, will not only nullify the theoretical 266 miles handicap, but leave a credit besides, in favor of the southern route.

The prevailing ocean current along the southern route is from east to west, while on the northern route it is from west to east, bending to the south when it reaches American shores and extending well down the Mexican coast.

The weather bureau observations show that along the southern route the current runs westward at a rate of one-half to three knots an hour; and that on the northern route it runs to the eastward at a rate of from one-half to two knots an hour.

To be conservative, estimate the average rate of current on both routes at one knot an hour.

A steamer making ten knots an hour will steam 240 miles a day; at which rate, if there were no current, favorable or unfavorable, it would take her thirty-three days steaming from Panama to Yokohama. With a current of one knot an hour, equal

to twenty-four knots a day, she would gain, on a voyage of thirty-three days, thirty-three times twenty-four knots or a total of 792 knots.

On the northern route, if there were no current either way, other things being equal, it would take a ten-knot boat thirty-two days to cross from Panama to Yokohama. With an adverse current holding her back at the rate of one knot an hour, or twenty-four knots a day, the voyage would be prolonged thirty-two times twenty-four knots or the equivalent of 762 miles; equal to three days' extra steaming.

In other words, a steamer will, by reason of a favoring current, gain 792 miles on the southern route, and by reason of adverse current, lose 768 miles by the northern route, or a total handicap, by reason of currents, of 1,560 miles in favor of the southern route as against the northern.

The type of steamer under consideration burns about thirty-five tons of coal a day. Six days extra steaming would, therefore, involve burning 210 more tons of coal, amounting at \$8.00 a ton, the average San Francisco price, to \$1,680 for extra coal alone, besides other expenses and losses easily amounting to as much more.

In the face of these figures the 266 miles of theoretical handicap against Hawaii again disappears and the apparent handicap again changes sides. It is as though what appeared to be a mountain in the air had become a hole in the ground.

It may be thought that the points above made concerning storms and adverse winds and currents are purely theoretical. This is not so. There is scarcely a year goes by that some steamer bound across the North Pacific for Asia does not limp into Honolulu more or less crippled and short of fuel, after days and weeks of bucking the tempests of the northern route, here to replenish and pursue her way rejoicing along the "sunshine belt."

A concrete instance occurred only recently. The steamer *Strathdon* left Puget Sound on November 2, 1914, bound for

Japan. She should have reached her destination not later than the 19th. On the 21st she arrived in Honolulu out of fuel, her captain reporting such a succession of heavy seas, storms and head winds that he could not reach Japan. He recoiled and proceeded via the southern route.

The writer well remembers an arrival of the Pacific Mail Steamer *Rio de Janeiro* at Honolulu (the same steamer which later struck a rock and foundered while trying to enter San Francisco Harbor in a fog). Portions of her deck houses had been demolished and part of her masts cut away for fuel. She had arrived within 800 miles of Yokohama via the northern route, when, owing to the heavy adverse winds and seas, the fuel supply was so depleted that the captain decided he could not reach port, and ran for Honolulu, which he reached only by means of using his deck houses and masts as fuel.

Practically all of the Pacific Mail and Japanese Mail line steamers plying between San Francisco and Yokohama now travel the "sunshine belt," via Honolulu, although it is 5,474 miles that way, instead of the direct, "fog belt" route, although it is only 4,536 miles by that course. In other words they prefer a course which is 938 miles the longer.

The entire North Pacific is beset with fogs during the greater part of the year. The U. S. Weather Bureau charts show fog prevailing during forty per cent. of the time in this vicinity during some months of the year. Fog is especially prevalent at the port of San Francisco.

One of the favorite arguments of the northern route theorists is that Dutch Harbor, on the Island of Unalaska in the Aleutian Islands, will make an ideal midway coaling station for the Panama-Japan route. Examination of the facts shows this claim to be an absurdity.

In the first place, Unalaska lies over 300 miles north of the Great Circle route and is thereby out of consideration. Again, the port named is not only located at the storm center of the North Pacific, but is one of

the foggiest in the world. It is not infrequently so beset with fog that for days and even weeks at a time, navigation is almost suspended in its vicinity. It is useless to belittle fog as an obstacle to navigation.

Few vessels attempt to enter or leave San Francisco in a fog, and those that do so, incur heavy risks. Fog conditions are responsible for a never ending series of wrecks and disasters. The *Rio de Janeiro*, which struck a rock and sank just outside the Golden Gate some years ago, is only one of a long series of victims to the fog terror of the North Pacific.

As against this deterrent to safe and economical commerce on the northern route, fog is unknown in the latitude of Hawaii, from Panama to Japan and China. The weather bureau charts demonstrate the correctness of this statement.

The mariner upon the southern route is certain that, day or night, whatever obstacles there may be to navigation will be visible; and seeing an enemy is half the task of conquering him.

The variation of the tides at Hawaii is only about fifteen inches. It is only two feet in extreme spring tides. As a result there are no violent currents to be reckoned with in entering the harbor, going to or from the wharf; there is no waiting for high tide on the bar; there are no delays of any kind due to tides or currents.

At San Francisco, on the other hand, the tidal variation is from five to eight feet, resulting in constantly changing and strong currents, constituting a hindrance to rapid manœuvering and a menace to safety.

Only last year a Pacific Mail liner was held up in San Francisco nearly all night while a diver cut away a cable from around her propeller which had become entangled while trying to straighten her course against a swift tidal current.

But recently the Oceanic steamer *Alameda* ran hard aground at Fort Point, in the Golden Gate, having been thrown off her course by a violent eddy during a few moments while the fog suddenly formed and obscured the view.

It is conservative to estimate that fog conditions alone will, on the average, prolong a voyage by the northern route, over one by the southern route, by at least a day.

There are two ports of call and supply for transpacific steamers in Hawaii, viz.: Hilo and Honolulu.

At Hilo the entrance to the harbor is a mile wide and forty feet deep. There is no entering channel and no obstacle to navigation. Ships can enter and leave by day or night.

At Honolulu the entrance channel is only half a mile long and 400 feet wide, with a minimum depth of thirty-five feet at low water. The channel is buoyed and lighted on both sides throughout its entire length. There are no obstacles to navigation. The harbor is entirely land locked and smooth, and the wharves are directly opposite the main entrance. There are no navigating or climatic obstacles to prevent a vessel entering or leaving the harbor at any time of day or night.

On the other hand, at San Francisco there is a bar across the entrance to the harbor about seven miles outside of Golden Gate, which prevents steamers of large draft entering or leaving at low tide in heavy weather. The Golden Gate is also seven miles from the foot of Market Street, the center of the shipping district. It is seldom that large ships enter or leave San Francisco after dark, and if they do so, it is at considerable risk.

The best quality of coal, available for commercial use in either San Francisco or Honolulu, comes from Australia. It is not of as good quality as the coal from the eastern states, but the latter can only be brought to Honolulu for commercial use in American ships, freight rates on which are so much higher than the rate on foreign ships that it cannot compete with Australian coal.

By reason of the 2,000 miles further haul to San Francisco from Australia, Honolulu is able to sell coal to steamers at about a dollar a ton less than the San Francisco

price. That Honolulu has the advantage over San Francisco in this respect is evidenced by the fact that the Pacific Mail Steamship Company buys as much of its coal in Honolulu as can be taken aboard during the time that its ships are in port.

As to coal loading facilities, Honolulu possesses the best in the Pacific. The Inter-Island Steam Navigation Company owns a dock at which automatic machinery can load over 100 tons of coal an hour, into an adjacent ship, and has also two floating automatic coal conveyor barges with a capacity of 500 and 1,250 tons respectively, one of which can discharge 100 tons and the other 200 tons an hour. They can be concentrated on one vessel if needed.

Two British steamers came into Honolulu December 8, 1914, one of them en route from Panama to Yokohama, and the other to Vladivostock. They each called for 500 tons of coal. One began loading at nine o'clock and the other at ten o'clock A.M. Both finished coaling at four o'clock P.M. One left the same afternoon at five o'clock and the other stayed over night to clean her boiler tubes, but for which she also would have left the same day.

I interviewed the captains of both steamers and asked them why they came via Honolulu instead of via San Francisco, the latter being the shorter route.

The captain of the steamer bound for Vladivostock replied, "Because the northern route is stormy, and both wind and current would be against me the whole distance, while the southern route has pleasant weather and a favorable wind and current. By taking the southern route I can get to my destination not less than two weeks sooner than I could by the northern route."

The captain of the steamer bound for Yokohama gave the same reasons and said also, "I can get coal cheaper and get much quicker despatch in Honolulu than I can in San Francisco."

To Hawaii oversea commerce, the arrival and departure of deep sea ships, is the alpha and omega of its commercial exist-

ence. Everything that it imports and everything that it exports passes by sea. Every one who goes anywhere and every one who comes from anywhere travels by sea.

These conditions have created a habit of mind, a spirit and method of treatment of shipping that markedly characterizes Hawaiian ports.

At Honolulu, especially, where all commercial as well as social life hinges upon, circulates around, and is vitally affected by oversea connections, arrivals and departures, promptness of inspection, despatch and service, are the rule and take place as a matter of course.

An instance is given above of two British steamers arriving off Honolulu at seven in the morning; securing pilot and harbor master service; passing health and customs inspection; entering and clearing; each buying and loading 500 tons of coal; securing necessary commissary supplies and leaving again at five o'clock in the afternoon of the same day. It is inconceivable that such despatch could be secured at any principal mainland port. In fact the captain of one of the steamers named stated that at the canal all he could get was 180 tons of coal a day.

Incidental to this question of preparedness for despatch, Honolulu is equipped with an up-to-date steel floating dry dock, owned and maintained by the Inter-Island Steam Navigation Company. The dimensions are: Length, 352 feet; inside width, seventy-six feet at bottom, eighty-four feet at top; draft over keel blocks, twenty-three feet six inches; dead weight capacity, 4,500 tons. The dock is built on the unit plan, and will be enlarged as required.

There is also immediately adjoining the dry dock the Honolulu Iron Works Company's plant, a fully equipped foundry, boiler and iron works. The equipment includes planers which can handle objects twenty-two feet long; foundry to make fifteen ton castings and lathes to accommodate objects fifteen feet long and five

feet in diameter, while any kind of boiler work can be manufactured or repaired. A full stock of plates, fittings and engineering and ships' supplies is maintained. The works are capable and make a specialty of repairs to ships and their machinery.

It is submitted that, whether Hawaii is the half-way house for all of the through transpacific business or not, enough has been shown above to demonstrate that it will not become the sequestered Sleepy Hollow of the world, as some predict; but that it will get a fair share of the benefits to be derived from the tide of commerce which will, within the next few years, sweep past our shores.

It will be noted that two of the reasons above noted apply directly to westbound ships only, viz.: reasons numbered two and three, relating to direction of winds and currents. The other six reasons stand, however, as to ships going both ways.

EFFECT OF THE CANAL UPON LOCAL TRAFFIC AND CONDITIONS IN HAWAII

Intelligent understanding of this subject requires a brief résumé of the location of and conditions in the Territory.

Hawaii is not a "possession," a "colony" or a "dependency." It is a full fledged Territory of the United States, subject to the obligations and entitled to the privileges of that status.

It is located 2,080 miles southwest of San Francisco, its nearest neighbor, and has an area of 6,649 square miles, equal to 4,127,000 acres. This area is a little larger than the States of Connecticut and Rhode Island combined, and a little smaller than the State of Massachusetts.

There are eight principal islands, extending over a distance of three hundred miles, running southeast and northwest. There are a number of small islands and reefs extending westerly for a thousand miles.

Honolulu, the capital and principal port, is located on the Island of Oahu, about the middle of the group. Two active volcanoes are on the island of Hawaii, 200 miles from Honolulu.

The islands are almost entirely volcanic in formation, being tops of mountains rising 15,000 to 20,000 feet from the bottom of the Pacific Ocean, to heights varying from 4,000 to 13,825 feet above sea level. The two highest mountains are nearly always capped with snow.

The moisture laden winds blowing in from the warm ocean meet the high, cool mountains, and cause excessive condensation on the windward side of the islands, resulting in heavy rainfalls and erosion of the mountains, thus creating a great number and variety of valleys, precipices, waterfalls, and jagged mountain peaks; covered in places with forest and jungle, luxuriant as in any tropical country; and elsewhere contrasting with barren peaks thousands of feet high, of an alpine character. The arable land is chiefly in the valleys and along the sea coast.

Hawaii appeals to the stranger from many standpoints. Its grand mountain scenery; its magnificent precipices; its waterfalls, falling sheer a thousand feet into blue ocean; its awe-inspiring active volcanoes; its sea bathing; its surf-riding; its social life and up-to-date conveniences. But after all, the one point upon which it can preëminently base its claim of superiority over every other country, is its climate.

Hawaii is located in the same latitude as Cuba; but is, on an average, ten degrees

cooler, for the reason that while Cuba is surrounded by the warm Gulf stream flowing northward from the equator, Hawaii is surrounded by the ocean current which sweeps up from Japan past the Alaskan coast, where it becomes thoroughly cooled, flows on down the coast of California and Mexico, and thence returns back across the Pacific, still retaining a portion of its coolness, thereby giving Hawaii a subtropical climate in a tropical latitude.

The stock statistics of countries which advertise climate as an asset, is that "the average temperature" is so-and-so; thus, while the maximum temperature may be 100 degrees and the minimum freezing, it is entirely correct to say that the average temperature is sixty-six degrees, which sounds very comfortable. The real test of climate is the actual—not the average—variation between the maximum and the minimum on any given day or month.

There are countries which vary in temperature each day as little, or even less, than in Hawaii; but such countries are in the low tropics, with a uniformly high temperature. Hawaii's claim is, not only that the variation is slight, but that the temperature is uniformly comfortable.

For thirty years weather records have been kept in Honolulu, showing the daily variation in temperature. It is unnecessary to publish the full record, but the following table, showing the highest and lowest tem-

TEMPERATURE RECORD FOR 1913, DEGREES F., HONOLULU.

	Highest Temperature on First Day of the Month.	Lowest Temperature on First Day of the Month.	Variation for the Day.	Highest Temperature for Whole Month.	Lowest Temperature for Whole Month.	Variation for Whole Month.
January.....	77	63	14	78	60	18
February.....	72	64	8	77	60	17
March.....	76	59	17	80	59	21
April.....	78	68	10	81	64	17
May.....	79	68	11	84	64	20
June.....	82	67	15	84	67	17
July.....	83	73	10	86	71	15
August.....	85	74	11	86	70	16
September.....	83	70	13	85	68	17
October.....	84	72	12	84	61	23
November.....	83	68	15	81	65	16
December.....	77	70	7	79	59	20

perature on the first day of each month, and for each whole month, during 1913, is a good index of Hawaiian climate.

The direct result of this slight variation of temperature between midnight and noon is a mildness and balminess in the atmosphere which gives it a soft, velvety touch and texture, and permits outdoor life all the year round without danger to health. It is this outdoor life and the ability to engage in outdoor sports without intermission, that puts the young men of Hawaii at the forefront of athletic sports both at home and abroad.

The champion swimmer of the world is Duke Kahanamoku, a Hawaiian boy who never received any instruction before breaking the world's record for both fifty and a hundred yards.

Although Hawaii has only a few boys at a time at colleges on the mainland, for years past Hawaii has had from one to three or four representatives on the football and baseball teams and rowing crews in the big varsities on the mainland. Their selection is purely on merit, and shows an astonishingly high percentage of efficiency when it is considered that they are chosen in competition with thousands of young athletes from the mainland. Their proficiency is largely due to the favorable climatic conditions under which they have developed.

Another fact, not altogether peculiar to Hawaii, but still a marked feature incidental to its climate, is that each island is so mountainous, rising from 4,000 to nearly 14,000 feet above sea level, that a few minutes to a few hours will take a person from the climatic conditions above noted to that of many degrees lower, even down to freezing.

The writer has cut ice ten inches thick on the first of August on the top of Mauna Loa, packed it down, and had ice cream made therewith in the low country before dark of the same day.

It may be well asked, "What has the foregoing description of Hawaiian scenery and climate to do with the Panama Canal?"

The question is well put. This is the answer:

The remarkable climatic conditions; the beautiful scenery; the possession of the necessities and luxuries of civilized life, together with its easy accessibility, have already made Hawaii one of the Pacific's great tourist resorts. The opening of the Panama Canal will make it a great world resort.

For several years past, round the world tourist steamers have made Hawaii an objective point. Two were due here last winter, but were prevented from coming by the war. These steamers have heretofore been compelled to come two-thirds of the way round the world, by the south of Asia, or by rounding South America.

With the opening of the canal, all of the great touring steamship lines which run excursions to the Arctic, the Mediterranean and the East and West Indies will be provided with a short cut to "the Paradise of the Pacific." Hawaii will be within two weeks direct steaming of New York and three of London and Paris.

A direct result of the opening of the canal should, therefore, be a radical increase in tourist travel to Hawaii. In fact, I look for care of the tourist to soon become, next to sugar production, the chief industry of the islands.

The opening of the canal will revolutionize immigration to Hawaii. To understand the significance of this point, a brief reference to the island population and labor conditions is necessary.

When Captain Cook discovered the Hawaiian Islands, he estimated the population at 400,000. This was probably an exaggeration, for upon the first official census taken in 1831, the record showed but 130,313 persons.

The population continued to rapidly decrease, until in 1872 it was found to be only 56,897. Meanwhile the sugar industry was rapidly growing, and required a large number of field laborers. The resident population was entirely insufficient to meet the

situation, and induced immigration from foreign countries to meet the deficiency began as early as 1852. The first immigration was from China. Later it extended to the South Sea islands, Japan, Korea, Manchuria, Norway, Germany, Austria, Italy, Spain, Porto Rico, Portugal and the Portuguese islands off the Atlantic coast of Africa, and the mainland of the United States. Conditions on the mainland are more favorable for field laborers than in Hawaii, and consequently the many efforts to secure laborers from that point have failed. For the same reason there is no likelihood that they will ever succeed.

Asiatic sources of labor supply were near by, and the passage cost low; but at an early date, it was felt that it was good policy to encourage immigration from countries other than Asiatic.

The trip from Europe to the mainland of the United States is short and the fare low, and the expense is borne by the immigrants. The trip to Hawaii is so long and expensive that the immigrants are unable to pay their fares, and the same has been paid partly by the Hawaiian Government, and prior to annexation, partly by the employers needing labor.

The fact that there are no regular steamer lines between Europe and Hawaii has greatly added to the expense of this immigration. All immigration has been by specially chartered steamers, carrying from seven to twelve hundred people, around South America, involving a two months' voyage.

Under these unfavorable conditions, between 1852 and 1913, Hawaii introduced from all sources, approximately 193,000 assisted immigrants, costing over \$10,000,000. The last immigrants were 1283 Spaniards, who arrived in Honolulu, June 4, 1913. Including men, women and children, they cost the Territory \$117.54 each. The cost of adding each male adult laborer to Hawaii's population was \$341.68.

The funds with which to carry on this immigration are obtained by a special income tax on corporations, nearly all of

which is paid by the sugar plantations. It is needless to say that this is a heavy tax on the government and sugar industry of Hawaii.

The opening of the Panama Canal will make possible direct steamer service from Europe to Hawaii, at reduced charter rates; resulting eventually, in regular steamer service between the two countries, by which immigrants can come in small parties at lower rates. This will be doubly valuable by increasing the European population and decreasing the cost of getting them.

Whether immigration from Europe continues or not depends almost entirely upon whether a duty is maintained on sugar. If sugar is admitted duty free, there will neither be demand for additional laborers, nor money to pay for them.

The business life of Hawaii can be divided into three periods, viz.:

1. Prior to the execution of the reciprocity treaty between Hawaii and the United States, in 1875;

2. The interval between the passage of the reciprocity treaty and annexation to the United States, in 1898;

3. Since annexation.

The reciprocity treaty admitted sugar, rice and a few other Hawaiian products into the United States, free of duty. Prior thereto, Hawaii had been one of many groups of Pacific Islands doing a trading, barter and supply business with passing ships; chiefly whaling ships, with a small foreign trade. Hawaii was the largest and most prosperous of these groups, differing chiefly in degree, however, from its neighbors.

With the stimulus of a guaranteed free market for its products a remarkable awakening and development took place.

The production of sugar for 1875 was only 12,540 tons.

The total Hawaiian imports were valued at \$1,682,000 and the exports at \$2,089,000, a total commerce of only \$3,772,000 for the year.

In 1898 Hawaii was annexed to the United States. The production of sugar

for that year had increased to 229,414 tons.

Chiefly through the growth of the sugar industry, commerce had so increased that in 1898 the imports amounted to \$10,268,000, and the exports to \$17,346,000, a total commerce of nearly \$28,000,000 for the year.

Although the reciprocity treaty had thus greatly stimulated commerce, the local government was unstable, capital was timid and development retarded.

Immediately after annexation, in 1898, a marvelous expansion and increase of business took place, until in 1912, the foreign commerce of Hawaii amounted to \$84,143,000.

The sugar crop for the fiscal year ending September 30, 1914, was 617,038 tons, the record crop.

The exports for the fiscal year ending June 30, 1914, amounted to \$41,594,000, and the imports to \$36,550,000; making a total exterior commerce of \$77,144,000.

The population has increased to 227,391, including 8,373 in the army and navy, and excluding transients.

Hawaii has grown from a population of 56,000; a production of 12,000 tons of sugar and a commerce of \$3,771,000, in 1875, to a population of 227,000, a production of 617,000 tons of sugar and a commerce of \$77,144,000 in 1914.

Hawaii, by the way, is the only territory acquired at the time of the Spanish War which not only pays all of its own expenses, but is a direct source of profit to the United States government.

Since the organization of Hawaii into a Territory, in 1900, up to June 30, 1914, the United States government has collected in Hawaii, as customs and internal revenue, the sum of \$21,320,325. During the same period the expenditures of the federal government for local purposes in Hawaii have amounted to but a small fraction of this amount; leaving a handsome net profit to the United States government.

Practically all of this extraordinary development has been the direct result of the American protective tariff on sugar.

EFFECT ON HAWAII AND THE CANAL OF THE UNITED STATES SUGAR TARIFF.

Under normal conditions the great majority of the sugar plantations in Hawaii cannot make sugar at a profit, without tariff protection.

The demonstration of this statement is too long for this article; but it is available in every detail to any one who wants it.

In a nutshell, the reason for this status is that, excepting on the mainland of the United States, it costs more per ton to produce and market sugar in Hawaii than in any other sugar producing country.

As compared to the great cane sugar producing countries, Cuba and Java, for example, Hawaii is not a natural sugar producing country. It is only by the use of great capital and the development of scientific, intensive agriculture, unequaled on the same scale elsewhere, that with the fostering help of the American tariff, Hawaii has been developed into a sugar producer and now supplies nearly one-sixth of all the sugar consumed by the United States.

This statement will be discredited at first blush, by those unacquainted with the facts, but it will bear thorough analysis.

The main reasons for the high cost of sugar production in Hawaii are as follows:

1. SUGAR IS NOT AN ANNUAL CROP IN HAWAII.—It takes, with a few exceptions, from eighteen to twenty-four months, and on the higher lands, as many as thirty months to make a crop, instead of a year, as is the case in almost every other sugar country, with the consequent increase of cost; for all expense of upkeep and overhead charges for the longer time must come out of one crop. There are always two crops in the ground, and during several months of the year, three, all under care. The reason for this is climatic—too long to explain in detail.

2. HAWAII IS NOT NATURALLY FERTILE.—It costs an average of \$39 for fertilizer for every acre of sugar cane produced in Hawaii. Other cane producing countries scarcely use fertilizers at all.

3. IRRIGATION.—With the exception of certain districts, Hawaii is too dry to produce sugar cane without artificial irrigation. The cane from which one half of the sugar output is produced has to be irrigated every week or ten days.

One-third of the employees of irrigated plantations are continuously engaged in watering the cane.

The natural flow of water is insufficient for the purpose, and has to be supplemented by water pumped from wells at sea level to as high as 550 feet.

The irrigation pumps are the largest in the world, and single plantations pump as much as 60,000,000 gallons of water a day.

The fuel used is California oil and Australian coal.

There is more water used per day for irrigating cane in Hawaii, than the daily capacity of the New York aqueduct—700,000,000 gallons.

All this costs immense sums of money which other cane growing countries are not subject to. Cuba does not irrigate at all, and the few others which irrigate use surface, flowing water at nominal expense.

4. LABOR.—The labor supply in Hawaii is chronically short, and has to be continuously replenished at enormous cost, as above set forth.

Sixty per cent. of the cost of sugar in Hawaii is for labor; and on sugar plantations in Hawaii, laborers are better and more expensively cared for, and are paid more than in any other cane producing country.

5. FREIGHT.—Under the United States coastwise shipping law, Hawaii is compelled to use high priced American ships only, to carry freight to and from the mainland; while other sugar producing countries can use the cheap freight rates of foreign shipping.

The opening of the Panama Canal has reduced the freight rate on sugar, from Hawaii to New York, from \$9.50 to \$8.50 per ton, and it may go somewhat lower; but the freight on Cuban sugar to New York, Hawaii's chief competitor, is only \$2.50 per ton.

The average cost of marketing a ton of Hawaiian sugar, covering freight, insurance, charges and commissions, is from \$10 to \$15 per ton. The freight on merchandise from New York to Hawaii ranges from \$8 to \$20 per ton. The canal has reduced the rate by an average of about ten per cent. Later the reduction may be somewhat increased.

6. SHORT TERM CROPS.—Hawaii has to plant cane anew about every third crop. In Cuba they are said to be still harvesting cane growing from cuttings planted by the grandfathers of the present sugar planters. It is common to continue harvesting annually in Cuba from cane planted ten to twenty years before.

There are other minor handicaps to Hawaii's disadvantage, among them that Hawaii is so bedeviled with insect pests, and cane diseases; and the problems of meeting the naturally adverse conditions are so ever pressing and imperative, that the Hawaiian sugar planters are compelled to maintain, at their own expense, an experiment station, demonstration farm and corps of scientists that cost from \$80,000 to \$160,000 per annum.

The foregoing partially explains why it costs more to produce sugar in Hawaii than in any other sugar producing country in the world, except on the mainland of the United States.

The great world sugar producers, Cuba, Java and the European beet sugar countries, have cheap material, cheap labor and cheap freights.

Hawaii is inside the sacred circle of the American tariff, with its resulting higher basis of cost as to everything which enters into the production of sugar. If it, too, can receive reasonable protection, it can continue, and better its past magnificent record of development; but it cannot buy and produce in a protected market and sell in the open market.

In this respect, Hawaii is in the same boat with the cane sugar industry of Louisiana and the beet sugar producers of the North and West. Although Hawaii has

some advantages over them, they also have advantages over the sugar producer in Hawaii, such as cheaper material, cheaper freights and near-by market.

With reasonable protection, say of one cent per pound of sugar, the United States can, in time, produce all the sugar it consumes, thereby making itself a self-contained country, to that extent.

Without tariff protection, with some exceptions, the sugar producers will be absolutely obliterated both in Hawaii and on the mainland.

It may be replied to the foregoing that they are but generalities, and some "doubting Thomas" may "want to see the figures."

The point is well made, and the figures are herewith furnished:

There are forty-five complete sugar plantations in Hawaii. They are nearly all incorporated and owned by thousands of stockholders. Twenty-four of these are listed on the stock exchange, and their financial affairs are open to all. They are a fair representation of the whole.

The nominal United States tariff on sugar during 1913 was \$33.70 per ton; the actual protection was \$26.96 per ton, being the duty on Cuban sugar, or twenty per cent. below the full duty. For convenience of calculation call it \$27.00 per ton.

Even with this protection, six of these twenty-four plantations failed to make expenses in 1913; two made a profit of less than \$2.00 per ton; seven made an average profit of \$7.76 per ton; four made an average profit of \$12.36 per ton; and three made respectively \$15.01, \$15.29 and \$17.56 per ton.

Under normal conditions the price of sugar in the United States is the world's price, plus the duty.

In other words, the price of Hawaiian sugar in 1913 was approximately \$27.00 a ton higher than it would have been if sugar had been duty free.

The present tariff law puts sugar on the free list in 1916. If sugar had been on the free list in 1913, every sugar plantation

in Hawaii would have lost money. The proof of this statement is that the above figures show that not a single plantation made as much as \$27.00 per ton. The plantation making the best showing would have lost \$9.44 per ton, and, as its crop was 50,310 tons, its loss for the year would have been \$474,926.00. The one making the poorest showing would have lost \$41.44 per ton.

It may be claimed that in 1913 the price of sugar was low. It was. It averaged 3.506 cents per pound. The three previous years averaged higher than for any one of the past twelve years, viz.: the average price of ninety-six degrees raw sugar was 4.188 cents per pound for 1909, 4.453 cents for 1911, and 4.162 cents for 1912. Manifestly the result of a series of years is the only fair criterion of whether the Hawaiian sugar industry can survive free sugar.

The crops and profits of each of twenty-two listed sugar plantations for the eight years 1906-13 are published in the 1914 annual report of the Honolulu stock exchange.

These figures demonstrate that even though three high-priced years are included, there is only one of these plantations which would have paid expenses during the past eight years if sugar had been on the free list, while most of them would have been put entirely out of business.

The details of the results of free trade to these twenty-two plantations are available to any one who wants them.

Some of the plantations named would not fare so badly under free sugar now as they would have during the period named. Economies and improvements in apparatus and methods are being continuously made; but, on the Hawaiian plantations as a whole, the gains are comparatively small; not enough in the aggregate to offset the total loss of tariff protection.

From the foregoing it will be seen that the effect of the Panama Canal upon the commercial life of Hawaii will depend largely upon the tariff policy of the United States concerning sugar; and that, *vice*

versa, the canal will likewise be considerably affected thereby.

If a reasonable protection, say of one cent a pound, is maintained on sugar, Hawaii will send annually between 250,000 and 300,000 tons of sugar east, through the canal, and take in return a proportionate amount of supplies by the same route. If sugar goes, and remains, on the free list, this business will be almost blotted out.

What this would mean to Hawaii cannot be realized by one unacquainted with the conditions. Sugar is the commercial life

blood of Hawaii. There are 46,000 persons actually on the pay roll of the Hawaiian sugar plantations, with twice as many more directly dependent on the industry, and almost the entire population indirectly dependent thereon. All the other exports combined in the fiscal year ending June 30, 1914, amounted to only about \$6,000,000, with little opportunity for expansion. The civilization and physical existence of the people of Hawaii revolves around and depends upon the prosperity of the sugar business, with no other industry in sight to take its place.