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Contents: REPORT OF NAVAL WAR COLLEGE COMMITTEE ON DEFENSE OF GUAM.

THE DEFENSE OF GUAM.

Introductory.

The question of the Defense of Guam divides itself quite naturally into two parts:

(1) The Relation of Guam to our Situation in the Pacific.

(2) The Nature and Extent of Defenses Required.

1913

21

DEFENSE OF GUAM.

PART I.

THE RELATION OF GUAM

TO

OUR POSITION IN THE PACIFIC.

The Relation of Guam to Our Situation in the Pacific.

An examination of The Relation of Guam to Our Situation in the Pacific requires first of all a study of the general situation in the Pacific.

In every region not subject to the exclusive domination of one power each power will find its interests most acutely threatened by some one other power. The measures taken to guard against the encroachments of that power, if adequate, will be efficient against any lesser threat. So first of all we are led to study the situation and ambitions of Japan.

A study of our own situation and ambitions is next in logical sequence. A comparison of conclusions derived from these two studies will clarify and accentuate the Relation of Guam to our Position in the Pacific.

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THE SITUATION AND AMBITIONS OF JAPAN.

With the full exploitation of natural resources, the development of manufactures, and the increase of populations of the nations occupying the Atlantic littoral, there has appeared the need of new lands and new markets.

The best of these lands and the greatest markets of the future are to be found in and around the Pacific, and this area has in recent years increased in importance accordingly. Here, all the world powers are struggling for commercial advantages, securing their colonies, laying plans for the acquisition of other lands, and, in general, preparing for the future of their peoples, which, to continue in greatness, must have room and material for their activities.

Among the world powers represented in this struggle only Japan is an Asiatic power---a power (by reason of geographical location) whose entire world activity is centered in the Western Pacific and whose very existence depends upon the place that she makes for herself there. In this regard the position of Japan differs from that of all the other powers, to whom influence in that region is only an important issue, not the one vital issue. Another point of difference, and an important one too, is that the Japanese are of the Yellow race. Since the beginning of time white races have wielded the major power of the world because they excelled in the art of war. They have looked upon the colored races as inferior, and still do so. Today they believe that they have the right to the freedom of the world, and, at the same time, the absolute right to forbid Asiatics to enter their territories when, for instance, competition with their own peoples might tend to lower the standard of living. This attitude on the part of the white powers hurts the pride of Japan, and the feeling of resentment engendered thereby forms a powerful unifying moral force in cases of national action.

The natural enemies of Japan in the Pacific, or those nations so situated that their natural development is most likely to encroach upon

and limit that of Japan, are Russia and the United States. (China is not included, as she is not yet a world power, and for another reason which will be noted hereafter.) Both Russia and the United States are young, rich and powerful. Russia has a population of about 150,000,000 people and the United States a population of about 100,000,000. Japan has a population of only 54,000,000. and is further handicapped by having a much lower birthrate. She is poor financially and her home territory has been exploited to the utmost.

For economic reasons Japan must expand. She has already built up a great sea carrying business and has developed manufactures to some extent. As to the latter, however, it is not believed that Japan will ever become a great manufacturing nation like Germany. The Japanese can imitate successfully but they seem to lack that creative force which is necessary to the highest progress. Foreigners and foreign capital might partially solve this problem but the Japanese seem chary about admitting either into the big projects. In general, conditions are such that a large mass of the people must take up other industries, and this, together with the fact that the Japanese have a racial tendency towards agricultural pursuits, necessitates the acquisition of land.

Japan is weak compared with her natural rivals. What general course then must she take in order to cope with them? The broad answer is: Concentration and conservation of her people. She must concentrate so that she may educate the people she has as to national aims and have them in a position to respond when needed. She must surround them with such conditions as will best favor their mental, moral, and physical welfare, and thus offset quantity with quality. By this course she will also be best able to remove the stigma of intellectual inferiority placed there by the white race. At the same time she must not neglect her position as the first Asiatic power, but endeavor to unite and strengthen the Eastern races and thus prepare in them future allies of the same racial characteristics and aims. This action will also tend to strengthen her commercial position, which must be carefully nurtured.

The foregoing considerations point to Korea and Manchuria as the logical direction of Japanese territorial expansion. This region is next door to Japan and is favorable to the development of a strong race of people. Its possession forms a barrier to the encroachment of Russia, the immediate menace. This direction of expansion has been in the Japanese mind for many years as may be seen by a brief review of historical events.

With the overthrow of the nobles, or Daimios, in 1868, Japan became a modern free nation. Recognizing at this time the value of western civilization and her own backward state she bent all her efforts towards the introduction and assimilation of western ideas. The nation progressed greatly under this policy and there was such an increase in population and prosperity that in 1890 the need for expansion was felt. At the same time they feared that Korea would fall into the hands of Russia, who had already occupied Saghalein and the Amur province. Therefore, in 1894, Japan made war against China for the occupation of Korea, and was successful. By the treaty of peace, in 1895, Korea was declared independent of China, Liactung peninsula was leased to Japan, and a large indemnity was promised, but the Western powers stepped in and forced her to forego her conquests. This was a severe blow to Japan and brought home to her in the most forceful manner what her international position was and what she would have to do to maintain it.

About 1891, Russia began the construction of the Trans-Siberian railway, for the purpose of linking her eastern possessions with the home country, and of acquiring more territory from China. There was also a movement on in Russia to secure an ice-free port in southern Manchuria. Japan considered this a direct menace to her independence and directly after the war with China, 1895, began to prepare herself for war with Russia. She educated her people to that idea, enlarged and improved her national forces, and paved the way for alliances.

In 1896, Russia obtained permission from the Chinese government to run the Chinese Eastern railway through Chinese territory, and in 1898,

leased Port Arthur with Liaotung peninsula. At the same time she started to construct a railway from Harbin to Port Arthur, which was finished in 1900. At the outbreak of the Boxer Rebellion, in 1900, Russia seized the opportunity to occupy Manchuria for the purpose of protecting her railways, but she was afterward forced by the powers to promise to evacuate it by the spring of 1903.

In the meantime, Japan protested against Russia's acts but did not act, even in a strong diplomatic way. She was busy organizing her forces. In 1902, she concluded an alliance with England and entered into friendly relations with the United States for the purpose of securing herself from outside interference in event of war.

In 1903, Russia failed to complete her promise as to the evacuation of Manchuria and made military-commercial advances into Korea. At this move Japan began to act for she was ready for war. She opened negotiations with Russia for the fulfillment of her promise. This time the negotiations were of the kind that are pushed by adequate military power, but Russia did not heed and they ended in war in February, 1904. As a result of the war Japan gained control of Korea and a foothold in Manchuria---also (of utmost importance to the Japanese) the position of a world power.

From the foregoing it may be seen that from the first the Japanese statesmen recognized the necessities of national life, although they really did not know how to obtain them until the lesson was brought home at the end of the Chino-Japanese war. They recognized that a nation can no more develop when confined and starved than an individual and that there must be an outlet for surplus population; that if this surplus was not to be lost to the state that the state must furnish it with activities by commercial and territorial expansion; that the natural and proper direction of this expansion was Korea and Manchuria; that if the Russian encroachment continued it would limit expansion in the desired direction; and, finally, that a nation, like an individual, must fight for life and freedom, but not until the most thorough preparations have been made and the most favorable time arrives.

One of the most striking things in regard to Japanese action during the latter part of this period was the completeness with which policy and strategy were co-ordinated. When the Japanese statesmen realized, in 1895, that the Russian advance must be checked, by war if need be, they carefully estimated the preparation necessary for the attainment of that end and worked for it with extraordinary efficiency and directness. Nothing was overlooked. Money was lacking but that fact only delayed the day of preparedness, it did not turn them aside from their purpose for one instant. During the seven years of preparation, from 1895 to 1903, four cabinets were dissolved because they were not in accord as to the effort to be put forth in attaining the immediate national aim.

Such is a brief outline of Japanese policy since 1868. During this time Japanese national life was menaced twice. Two wars were fought. The first with China, an ancient foe, was fought to forestall the Russian advance and gain room for the Japanese people. Most of the gain in this war was lost by reason of the Japanese statesmen not knowing that the world as well as national forces must be prepared before waging war. The second war was fought to check Russia's advance which threatened the existence of Japan. The net results did not come up to Japanese expectations yet Japan won enough territory to occupy her present surplus energy.

Today Japan consists of the Japanese Islands, Korea, recently annexed, the Liaotung peninsula, and a Chinese sphere of influence that is destined to expand. Let us look forward to the day, that Japan herself foresees, and appreciate the then position of the empire. Let us assume that that empire includes a huge slice of northern and eastern China, the development of whose resources will assure to Japan a permanent position as the leading Asiatic power. Her position will then be subjected to three influences, Russia, China, and the sea. The relation of the Japan of the future to the sea bears on our problem. The empire she hopes to build cannot long survive without the freedom of the sea. Peace gives that freedom, but the freedom of the sea that is so urgently sought by statesmen and strategists is the freedom that continues during war. What will be the situation of

Japan in this respect? She will communicate by sea outside her empire on five great commercial routes:-

(1) By the North Pacific to North America.

(2) By the Central Pacific to Panama.

(3) By the Central and South Pacific to South America.

(4) South to Australia.

(5) By the China Sea towards Europe.

The freedom of every one of these routes is threatened by our positions in the Pacific. In case of war with us Japan would find routes (1) and (2) automatically closed, routes (3) and (4) threatened by the Hawaiian Islands and Guam, respectively, and route (5) dominated by the Phillipines. Every commercial exit of Japan by sea would be flanked by our positions; an intolerable condition in war. These flanking positions are of course unimportant if they do not represent local strength supporting sea power.

It has been possible on occasion for nations to give up commercial exchange for a time, but such suspension of trade is becoming increasingly difficult. The world tendency is towards organization. This tendency makes the survival of nations dependent upon the non-interruption of their relationship to the whole world. It is against this interruption that Japan must guard.

Today Japan is essentially an island empire. There is one other island empire. Japan is an ally of England, a student of her greatness. Greatness came to England by way of the sea. The secure distant positions that the wisdom of her statesmen gave to her guarded the sea routes. These positions are now essential to her greatness.

Japan must have learned from the history of England's sea power the importance of guarding commercial routes, the importance of placing it beyond the power of a possible enemy to sever her sea communications. The application of this lesson would find its first expression in an attempt to seize those positions most easily taken, and most apt to be supporting points of hostile naval operations. Our tenure of the Hawaiian Islands, of Guam, and of the Philippines, stands in the way of the extension of

Japanese naval influence and in the way of the security of her sea communications.

Our security in the Pacific positions will gradually create among the Japanese the same feeling for us that Germans have for England, the feeling that there is a sentinel, (whether tolerant or not makes no difference) at the door, and that nothing can be done if the sentinel chooses to say nay. This may be somewhat of an intangible feeling, but it is very human and common to nations and individuals alike.

So far we have considered more specifically the situation of Japan at war or in expectation of war. The peace aspect of her situation is not more favorable to our continuance in the Western Pacific. She recognizes in us her most formidable commercial rival. She looks with jealous eyes on every advance we make in the Chinese market. She knows that our position in the Philippines overlooking the Chinese coast is, if secure, a strong reenforcement to commercial effort, on the mainland. She knows that military power behind such permanency of position gives the confidence essential to sound commercial expansion. Japan knows that every advantage we gain in the Chinese market may ultimately become her loss. Japan is constrained by the necessity for growth to seek special commercial privileges wherever she finds it possible to make her influence predominant. She knows that the value to her of commercial interests will very greatly increase as opportunities for territorial expansion become more limited, and that competing commercial superiority may ultimately lead to a complete checking of her national development.

SUMMARY:

(1) Japan is the dominant Asiatic Power. The continuance of this position is essential to her development.

(2) Japan must expand. The logic of her situation, as well as her recent history indicates the necessity for expansion on the mainland of Asia.

(3) Japan's position as a world power, both in peace and in war, is opposed naturally to our positions in the Western Pacific. These may in time become of commanding importance to her.

THE SITUATION AND AMBITIONS OF THE UNITED STATES IN THE PACIFIC.

The United States is practically an island power subject to no serious threat of invasion except by way of the sea. It is the greatest of world powers bordering the Pacific. By its secure positions on the Pacific Coast, at Panama and Pearl Harbor, and by the strength of its naval forces, it dominates the eastern Pacific. The security of all American interests in the western Pacific necessarily depends upon American Sea Power capable of being exercised in that area. No American land forces likely ever to be maintained in the Philippines in time of peace will be adequate to the security of those islands. Such forces will be most effectively employed if operating in support of the fleet. Our military situation in the western Pacific is therefore essentially a naval question.

The United States regards its tenure of the Philippines and Guam as benevolent and peaceful. It regards its policy of the open door in China as just and praiseworthy. It believes that it threatens no nation that conducts itself properly. It is not seeking territorial aggrandizement. And yet other nations do not believe all these things.

They see that the great tendency indicated by American history is territorial growth westward. True this has always been the general direction of racial expansion but they see that we form no exception to the rule. The acquisition of:-

Louisiana	1803
Florida	1819
Texas	1845
New Mexico and California	1848
Alaska	1867
Hawaiian Islands	1898
Porto Rico, Philippines and Guam	1898
Canal Zone	1904

tends to induce widespread incredulity of our proclaimed Pacific policy of non-expansion.

The permanency of our just policy of equal commercial privileges in the Far East is doubted by those who do not construe the Hay-Pauncefote treaty as we do. They believe we urge equal opportunity when that is the most we can hope for and practice special privilege when it is safe.

The opening of the Panama Canal should mean greatly increased American commercial activity in the Far East. Our proclaimed ambition in the Pacific is freedom in commercial competition. We foresee enormous increases in our sea-born trade, almost unbelievable expansion of industrial activity at home. The raw material together with the brains and resources to use it, are ours. It is therefore our legitimate ambition to preserve to ourselves our share of the as yet undeveloped markets of the world, the markets of Asia.

Such preservation of our commercial interests will flow from diplomatic and commercial pressure constantly applied. Diplomatic pressure derives its efficiency from continuity of intention and from the force behind it. Commercial pressure derives its efficiency in part from the same source, the security incident to force in readiness to be applied. It is the experience of the past that commercial conflict is in danger of leading to military conflict. As society becomes more highly organized and national prosperity more dependent on distant trade, the danger of military conflict over commercial interests increases. This feature must be distinctly recognized by any power seeking trade expansion.

All foreign trade is in the nature of a strategic offensive. The military bulwark of foreign trade must be force capable of the strategic offensive.

But let us dismiss for the moment our commercial position in the Pacific and regard our territorial position only. Either, we purpose to hold the Philippines, or we purpose to grant them independence. In the latter case it is not conceivable that such independence will extend to the right of hostile alliance or of union with another power. The duty of preserving that status of the Philippines which we determine as best will

continue. The problem will be vastly more difficult under their nominal independence than under present conditions. We are committed to a situation which cannot be allowed to change except in accord with our will. Our will can prevail against the will of another only through the application of diplomatic or military force.

The Philippines and Guam are now practically defenseless. Our commercial security in the western Pacific is no greater than our territorial security. We are offering both to an enterprising enemy. Once lost they would seem to be lost past any hope of efficient recovery. Why? Because we are not prepared to exercise Sea Power in their defense or in their recovery.

Such is our position in the Pacific.

SUMMARY:

The United States by virtue of geographic position and of Sea Power dominates the eastern Pacific. Its continental frontiers are not open to invasion except by way of the sea.

Its commercial and territorial interests in the western Pacific are important and insecure. Their growing importance makes them increasingly insecure.

The security of the colonial possessions and of the commercial interests of the United States in the western Pacific depends, and must always depend, primarily, upon sea power and its ability to operate in the threatened area.

THE RELATION OF GUAM TO OUR POSITION IN THE PACIFIC.

From the studies already made it is clear that Japanese interests are in conflict with our own interests in the Far East.

That the tendency of this conflict of interests is, to become more acute with industrial and consequent commercial development.

That our ultimate security as well as the proper growth of our interests in the Far East will depend upon the ability of sea power to act in the threatened area. Further it is essential that sea power should act in time.

The problem then is how to ensure that our sea power shall be able to act swiftly in defense of our interests in the Far East.

The normal position of our fleet is on our home coast, and on that particular coast nearest to the area that Policy may indicate as critical. Since we are now examining the Pacific situation it is fair to assume that our fleet will be projected from the Pacific coast. Extended study has demonstrated that there is only one logical route for the fleet to take in a hostile approach to the Far East. That route is via Pearl Harbor and Guam---the central route. On this route we come in contact with no neutral interests. We use those resources and facilities that are exclusively our own. In this we recognize, and prepare for, the present tendency of international law that demands of a belligerent an even increasing degree of self reliance.

The fleet in its progress requires at intervals, secure harbors where it may refuel, re-victual, and refresh itself. We may assume for the present that Pearl Harbor is such a harbor. <u>There is no secure harbor west of the Hawaiian Islands on which our fleet can depend in time of War.</u> Picture for a moment what this fact would mean to a great fleet and train in readiness at Pearl Harbor, and obliged to undertake operations for the Naval Control of the western Pacific. Its first and logical stopping point en route is Guam. Guam is defenseless. No enemy having the power to prevent it will permit that fleet to use Guam. If the fleet arrives and finds

Guam fallen it must undertake to regain it, or must detour into some neutral harbor to the south, thereby losing time and upsetting its logistic arrangements. Many of the important units of the fleet carry barely enough coal to reach Guam from Pearl Harbor. Any attempt to go beyond or to turn aside must be made at the expense of the hazards and loss of time incident to towing.

As soon as the fleet is turned aside from its own route of approach, to a route that uses neutral or semi-neutral waters, the difficulties introduced by hostile neutrals may jeopardize the whole campaign. We must never lose sight of the fact that all those islands and harbors nearest to Guam are German.

It may be suggested that Corregidor defending the entrance to Manila Bay affords a secure harbor to which the fleet should look as the next stopping point after leaving Pearl Harbor. Any type of security that depends upon unsound strategy on the part of the enemy is itself a misnomer. Any enemy having the power to invest Manila Bay from the land side will use it and thereby make it untenable for our fleet. The fleet arriving at Manila with empty bunkers and no secure harbor available would be in an even more critical condition than when forced to turn aside from a hostile Guam. It must be accepted as a principle that in entering any hostile area combatant forces should be in the maximum readiness for continued activity. This is especially true as regards naval forces.

The modern tendency of naval development is towards the increased self-contained strategic mobility of the fleet. The question naturally arises does this not make the importance of Guam evanescent and fugitive? The answer is no. It tends rather to increase such importance. The development of the strategic capabilities of the fleet increases the area which may be dominated from a single position, but the position is still necessary.

So far we have considered Guam as a harbor, a stopping point for the fleet. The fleet must not only be able to go where needed, it must be able to go quickly. If there is one thing more certain than any other regarding a war in the Far East it is that blows then will be swiftly struck. The reply must be swift and powerful. If at the outset we are compelled to

delay all naval operations until we can assemble and equip an enormous fuel carrying train we will thereby permit to Japan ample time for making her grip so secure as to entail on our part the most exhausting operations to reestablish things as they were. That fleet is not strategically mobile whose movements require such complicated support as that involved in the mobilization of a vast merchant marine for war. - - - - If the coal to support the fleet in the Far East is brought from the United States it is estimated that even could the Government readily take over for the use of the Navy every American merchant vessel suitable for use as a collier, it would still be necessary to charter or purchase colliers having a total cargo capacity of 100,000 tons. Add to this the enormous demands of land operations to recover lost territory and we get some conception of the magnitude of our tasks. - - The only reasonable solution is preparation in time of peace to meet the logistic requirements of naval war.

The Commander-in-Chief of a mobilized fleet at San Francisco will proceed towards the Far East swiftly and with great confidence if he knows that there is at Pearl Harbor, and at Guam a total of a million tons of fuel for his use, and that it is secure from hostile attack. The same Commander-in-Chief commanding the same fleet would be hampered at every turn if obliged to manage the transportation of his own supplies. There would be delays innumerable, and difficulties sufficient to break down the resolution of many men. It should be the aim of our government to secure to its naval forces by suitable peace time preparation the greatest possible strategic freedom.

Every consideration points to the desirability of equipping, stocking and defending three great coaling stations on the central route across the Pacific. Pearl Harbor is already well under way. Guam is essential, first as a harbor of refuge and refreshment, and second, as the storehouse of fleet mobility. Its security and development will lend a degree of security to our defensive works at Manila not now fully realized. Without the security of Guam Manila will never be secure.

When half a million tons of fuel are stored at Guam and our plan for the fleet is based on the assumed security of this fuel, its protection must

be adequate against all comers.

There is still another view of Guam. Assume that we do not need it ourselves, that we can pass it by, it still is important. There is nothing more permanent in world strategy than geographic position. There are few things more disturbing than a hostile stronghold on the flank of military communications. Guam has the position that would make it of great value to an enemy.

The importance of Guam to us is further accentuated by the tendency of naval progress. Guam is an island in the sea with an enclosed harbor. The approaches to it from every direction are through deep water not suitable for mining. These facts give to it a marked degree of security against:-

(1) Hostile air craft that must be launched from friendly and proximate territory.

(2) Torpedo attacks, that cannot penetrate the narrow entrances of a landlocked harbor.

(3) The threat of mines, that is very temporary when they cannot be anchored.

CONCLUSIONS:

Guam by reason of its position and its harbor, by reason of its relation to the efficient exercise of our sea power, and by reason of its almost equal usefulness to a captor must be made secure. Once secure it will stand as a notice to all the world that America is in the western Pacific to stay.

Mr. Corbett, Secretary, Naval Historical Society of England, somewhere points out that oftentimes those events that do not transpire are more important than those that do transpire. The wars prevented mean more towards national progress than those successfully waged. We might never have need for the warlike use of Guam as a naval stronghold; but its strength would doubtless clear away many situations calculated otherwise to adversely influence our progress.

Major Bird of the Indian Staff College, in reviewing the Russo-Japanese War said:-

"The strategical lessons of the war are those which throughout history

have clamored for recognition."

"Often governments have courted disaster by living in the present, by disregarding future possibilities, and by pursuing, regardless of consequences, policies likely to end in disaster."

"So Russia hypnotized by the vastness of her empire * * * embarked thoughtlessly on an ill-considered policy of expansion. This brought her face to face with a determined foe, whose very existence was threatened by Russian pretension."

"Russia's policy * * * outstripped her strategy, that is, her forces were not in position to impose her wishes should they lead to conflict with Japan."

"As the result the great northern power paid the usual penalty for unpreparedness, bad organization, and unsound distribution of force."

This is the lesson after the event. The power that administered the lesson is our chief rival in the Pacific.

Guam must be made secure and capable of lending the needed support to our sea power in the Pacific.

DEFENSE OF GUAM

PART II

THE NATURE AND EXTENT OF THE DEFENSES REQUIRED.

DEFENSE OF GUAM

PART II

THE NATURE AND EXTENT OF THE DEFENSES REQUIRED.

The Nature and Extent of the Defenses Required at Guam flow from a triple source.

(1) From the conclusion arrived at in Part I of this paper, viz:- "Guam by reason of its relation to the efficient exercise of our sea power, and by reason of its almost equal usefulness to a captor, must be made secure from capture against all comers."

(2) From the nature of the island itself and its surroundings and from the character of its most probable powerful assailant, Japan.

(3) From the principle which we accept that the defenses are for the security of the island during the absence of the fleet.

The necessity for entire security has been demonstrated. The part of the island, the security of which is most essential, is the Harbor of Apra and the contiguous shores. Here the attack may be from the sea or from the land. The problem, therefore, divides itself naturally into two parts as follows:-

(1) How secure the Harbor of Apra against attack from the sea.

(2) How secure the Harbor of Apra against land attack.

A study of the island itself is a necessary preliminary to the investigation of these two problems. The remainder of this paper will, therefore, be placed under three general heads:-

(1) Military Geography of Guam.

(2) Defense of Harbor of Apra Against Sea Attack.

(3) Defense of Harbor of Apra Against Land Attack.

MILITARY GEOGRAPHY

OF

GUAM.

DESCRIPTION AND POSITION OF GUAM.

GUAM is the largest and southernmost island of the MARIANA group. The Harbor of Apra is in Lat. 13°-26' N., Long. 144°-43' E. The island is about 30 miles long and from 4 to 10 miles wide. It comprises an area of about 200 square miles. Its longitudinal trend is nearly northeast and southwest.

The Harbor of Apra lies on the western side of the island. It is the only harbor in the Island of any size where capital ships may secure a safe anchorage. Moreover, it is the only harbor within a radius of 750 miles where capital ships may secure a safe anchorage at all seasons of the year. Its position relative to other deep water harbors and strategic points in the Western Pacific is shown in the following distance table:

Distance from Harbor of Apra to:

Pearl Harbor (U.S.)	3,337 miles.
Midway Islands (U.S)	2,301 "
Manila Bay (U.S.)	1,506 "
Camiguin Id.(U.S.)	1,380 "
Polillo Island (U.S.)	1,343 "
Yokahama (Japan)	1,340 "
Bonin Islands (Japan)	800 "
Ponspe, Caroline Islands (Germany)	906 "
Mortlock " " (")	750 "
Eniwetok Islands (")	1,055 "
Admirality Islands (")	1,020 "
Waigin Islands (Holland)	1,200 "
Hongkong (Great Britian)	1,880 "
Shanghai (" ")	1,687 "

Other harbors, or anchorages, nearer to the Harbor of Apra than those names above and where shelter for a few ships may be had during some seasons of the year are:-

Pellew Islands (Germany)	710 miles
Tomill Haven, Yap Island (Germany)	500 "

Tanapag Harbor, Saipan Id. Marianas

(Germany) ---------- 120 miles.

Of these three anchorages, only Tanapag Harbor is near enough, or so situated as to be of use as a temporary base of operations for the reduction of Guam. Tanapag Harbor is formed by a coral reef. It has a depth of water of from 12 to 14 fathoms. It is open to the west and southwest and therefore cannot be used when the southwest monsoon is blowing. The southwest monsoon does not blow with any constancy in this latitude, but is liable to blow at any time from June to October. During the balance of the year the Harbor of Tanapag may be used but there is a heavy swell when the northeast trade is strong. The anchorage is entirely within the three-mile limit.

In addition to Tanapag Harbor, there are small anchorages at Tinian, Sarigan, Pagan, and Agrigan Islands, of the Mariana Group, but they are very bad at any time. All these islands belong to Germany.

Terrain.

The northern portion of the island is generally a low plateau, the only pronounced elevations being the Santa Rose Hills (870 feet), Mataguac Hills (630 feet), and Machanao Hill (610 feet). Near the central part of the island, southeast of Tumhun Bay, lie Barregada Hills (674 feet). Water is scarce in the northern peninsula.

To the southward of the line Agana-Pago Bay the country becomes very hilly and rough. The most important feature in this section is a range of high hills which rise from the sea coast west of Agana and, after skirting the Harbor of Apra, extend along the west coast to the extreme southern end of the island. The average distance of the crest of this range from the coast line is about 1-3/4 miles. Some of the peaks of the range rise to a height of about 1,300 feet. To the eastward of this range, the land, broken by many hills, slopes gradually to the east coast. This portion of the island is well watered by rivers, running generally east and west.

The low lands of the island that are not under cultivation are generally covered by dense jungle and the high lands by thick long grass. The grass areas are fired yearly to obtain fresh pasturage.

Infantry can operate off the roads only with considerable difficulty. Artillery and cavalry must keep to the roads.

The only good roads in the island are those in the immediate vicinity of the Harbor of Apra and those that radiate from Agana. The other roads (bull cart roads) are few and bad - almost impassable in the rainy season. The main roads are:

Agana--Agat-Sumay:- A beach road; leads westward from Agana, skirts Harbor of Apra.

Agana--Port Talafofo:- Leads south from Agana to a point about one mile west of Port Talafofo.

Agana--Pago Bay:- Two roads lead across the narrow part of the island to Pago Bay.

Merizo--Inarajan:- A beach road; passable for carts at all times.

In addition to the foregoing, there are five roads leading to the east and northeast from Agana which with trails permit communication with the north coast and northern interior.

The terrain along the coast is especially favorable to defense against landing parties. In the vicinity of all possible landing places there are good positions for troops, which may be easily protected from observation and fire from the sea.

All land approaches to the Harbor of Apra lead through a rough and difficult country abounding in good defensive positions.

Coast Line.

The coast of Guam, in general, does not favor landing operations. The greater part of the island is fringed by a coral reef awash in places. The shore line is bold, especially on the east side of the island where the reefs are few.

The coral reefs are steep-to. Vessels can approach everywhere close to shore. There is no satisfactory anchorage outside the Harbor of Apra.

From October to June the east coast is exposed to the northeast monsoon making difficult landing. During these months the sea is usually smooth on the west side of the island. From July to September the southwest monsoon blows occasionally. In general, however, this is a period of variable winds and occasional very heavy seas without wind.

On account of the bold shore line, reefs, wind and sea, landings are practicable only at the following named places:-

Piti and Tepungan:- Approach through breaks in reef. Beach space, about 300 yards. No shelter for transports. Landing can be made practically at all times. Difficult.

Assan:- Approach through break in reef. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 40 yards. No shelter for transports. Landing can be made only under favorable conditions.

Agana (Agana Bay):- Approach through break in coral reef. Beach space, about 50 yards. Agana Bay affords shelter from E.N.E. by East to South winds, but there is always a heavy swell. Landing can be made practically at all times.

Near Alupat Island, (Agana Bay):- Approach via channel through reef, close to and south of the Island. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 600 yards. Agana Bay affords shelter as noted above. Landing possible only under favorable conditions.

Ipac Point to Hilaan Point (Tumhun Bay):- Approach through small breaks in reef. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 150 yards. Tumhun Bay affords shelter from N.E. by East to South winds but there is always a heavy swell. Landing is practicable only under favorable conditions.

Hilaan Point to Uruno Point:- Approach through five small breaks in reef. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 50 yards. No shelter for transports. Landing possible only in fair weather or when sea does not break in two fathoms.

Ritidyan Point:- Approach through three breaks in reef. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 40 yards. No shelter for transports. Landing is practicable only under favorable conditions.

Jinapsan (between Ritidyan and Taragua):- Landing is only practicable at high water by a very small boat.

Taragua:- Approach through small break in reef. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 20 yards. No shelter for transports. Landing is practicable only under favorable conditions.

Pago Bay:- Approach landing through small break in reef. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 275 yards. No shelter for transports except from north and west winds. Landing is practicable only under favorable conditions.

Yllig Bay:- Enter through channel about 80 yards wide and 8 fathoms deep. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 275 yards. No shelter for transports. Landing can be made practically at all times.

Togcha:- Approach through reef by channel about 45 feet wide. Local knowledge, sunshine or bright moonlight needed unless range marks or lights are used. Beach space, about 150 yards. No shelter for transports. Landing can be made practically at all times.

Talafofo Bay:- About 300 yards in width and 1000 yards in length. Depth of water, 2 to 8 fathoms over mud. Beach space, about 2,000 yards. Affords anchorage at all seasons of the year for one transport drawing 10 to 12 feet and 150 feet long. Landing may be made at all times except when the sea is running directly in or nearly so.

Port Inarajan:- About 300 yards in width and 500 yards in length. Open to eastward. Beach space, about 850 yards. Affords anchorage for one transport drawing 10 to 12 feet of water and 150 feet long. Landing may be made at all times exdept when the sea is running directly in or nearly so.

Acfayan Bay:- About 200 yards in width and 500 yards in length. Steam launches can enter. Beach space, about 150 yards. No shelter for trans-

ports. Landing can be made practically at all times.

Ajayan (River mouth):- Approach through small break in reef. Beach space, about 25 yards. No shelter for transports. Landing is practicable only under favorable conditions.

Sume (River mouth):- Approach through small break in reef. Beach space, about 15 yards. No shelter for transports. Landing is practicable only under favorable conditions.

Merizo:- Bay formed by a coral reef. About 700 yards in width and 700 yards in length. Wading necessary to get ashore. Beach space, about 600 yards. No shelter for transports. Landing can be made practically at all times.

Umatac Bay:- About 600 yards in width and 700 yards in length. Open to westward. Beach space, about 900 yards. Affords anchorage for one transport drawing 15 feet and 200 feet long. Landing may be made at all times except when the sea is running directly in or nearly so.

La Su Fua (River mouth):-Small bay, open to west and south. Beach space, about 125 yards. Can be used in good weather. No shelter for transports.

Jati Bay:- About 600 yards wide and 700 yards long. Open to westward. Beach space, about 300 yards. Affords anchorage for one transport drawing 15 feet of water and 200 feet long. A vessel of the largest size could anchor almost in the entrance of the bay. Landing may be made in all seasons except when the sea is running directly in or nearly so.

Sella (River mouth):- Small bay, open to south, west, and northwest. Beach space, a bout 200 yards. Landing can be made only in fine weather.

Agate:- Approach through break in coral reef. Beach space, about 25 yards. Agate Bay affords anchorage during northeast winds. Open to west, northwest and south. To make a landing local knowledge, sunshine or bright moonlight is needed unless range marks or lights are used. Landing is practicable only under favorable conditions.

Dadi Beach:- Long stretch of beach bordering Agate Bay. Beach space

about 2500 yards. Agate Bay affords protection as noted above. Landing generally impracticable. Landing cannot be made with winds from north to south by west. From high water mark on Dadi, there is, at high water, a practically level bottom for considerable distance out covered by about 2 feet of water and from where it begins to get deeper the bottom appears to be covered with coral boulders. A single line of transports may anchor off the beach.

With proper small craft, artillery and stores may be landed at any of the above mentioned places when men can be landed.

There is a plentiful supply of water at all points mentioned from Yllig Bay by south around to Agate.

From the foregoing it may be concluded that:-

1. Landing, except by small parties, is impracticable along the coast from the vicinity of the Harbor of Apra north and around to Yllig Bay.

2. The remainder of the coast is more favorable for the landing of a considerable force but the ease and rapidity with which it is done will depend to a great extent on the weather conditions. Landing on the east coast is less favorable than the West coast.

3. The stretch of coast from Umatac Harbor to the Sella River is the most favorable for landing generally, especially during the season from October to June when operations are most likely to occur. The anchorage along this stretch of the coast is fair in all seasons and the landing places are as good as any on the island, close together, and connected by a coast road. Moreover the ridge of hills to the westward forms a good position for the force covering the landing.

The above description and conclusions as to coastline, landings, anchorages, etc. are from the best available information but should not be finally accepted without further investigation.

Guam is governed by a naval governor.

The population is composed of Americans, Spaniards, Japanese, Chinese, and Chamorros (natives). The total population numbers about 12,500, of which about 400 are foreigners. The natives have no military qualities and are easily controlled.

Agana is the capital and largest city, and has a population of 7,000.

Sanitary conditions are good.

The climate is tropical but is not especially hard on white people as it is tempered by the northeast and southwest monsoons--the former blowing from October to June and the latter very intermittently from July to September. There is no fog. The island is occasionally visited by severe typhoons. These may occure at any time but generally during the months of October and November.

The products of the island consist of maize, copra, rice, sugar, hardwoods, and live stock. Practically all the foodstuffs raised on the island are consumed by the natives themselves. The imports amount to about $150,000 a year and exports to about $50,000 a year (all copra). The live stock on the island consists of about 4,200 head of cattle and about 800 water buffaloes.

The military resources of the island are few, but there is an abundance of unskilled labor (native), hardwood timber, and aggregate material for the construction of fortifications, roads, etc. A limited amount of bull cart transportation is available.

The island is visited by army transports monthly, and by Japanese trading schooners occasionally.

The island is connected by cable with the Bonin Islands, Yap Island, Menado in Celebes, Manila and Honolulu.

Description of the Harbor of Apra.

The Harbor of Apra is an irregularly shaped body of water with a total area of about 6 square miles. It is formed by the mainland on the east, the Orote Peninsula on the south, and Cabras Island and Luminao Reef on the north. On the west side the harbor is partially protected by Calalan Bank, which extends about 2,000 yards southwest from Luminao Reef. The depth of water on this bank averages about 30 feet. Between the southern end of this bank and the western end of Orote Peninsula is the entrance to the Harbor - a deep water channel, about 600 yards in width at the narrowest point and with a depth of about 24 fathoms.

The eastern and southeastern portions of the harbor (a total of about 4 square miles in area) are blocked by extensive coral reefs. The western

portion of the harbor (about 2 square miles in area), although broken by several coral pinacles, affords anchorage room for at least ten capital ships, besides many smaller craft. The depth of water in this area varies from 17 to 30 fathoms, over sand and coral bottom. All reefs are steep-to. The anchorage is open to view from the sea on the north and west.

The currents are weak and vary with the wind.

Tides:- Mean, 1.5 feet; spring, 2 feet; neap, 1.1 feet; great tropic, 3.8 feet.

The land forming the harbor is generally high. To the east and southeast, on the mainland, lies a range of high hills, more than a thousand feet in height at points. The average distance of the crest of this range from the shore line of the harbor is about 2 miles; from the limits of the outer anchorage, about 4 miles.

The Orote Peninsula is about 4 miles in length and about 1-1/2 miles in width at the widest part. It is of coral formation and the terrain is rough and difficult. The highest ground is on the southern side and western end where it rises to a height of over 200 feet.

Cabras Island is about 1-2/3 miles in length and about 1/5 mile in width at the widest point. It is of the same formation and has the same terrain characteristics as Orote Peninsula. The highest ground is on the north side of the island where it rises to a height of about 100 feet. At the western end of the island the ground rises to a height of about 50 feet.

Luminao Reef extends to the westward from Cabras Island for a distance of about 1-1/2 miles. It is of coral formation and is generally awash at low tide.

Sites for salient batteries may be found on both Orote Point and Cabras Island.

While the harbor, as it now stands, would be of invaluable use to the fleet of the United States a few improvements would greatly enhance its service-ability.

The matter of the improvement of the harbor was thoroughly considered in 1901, by a board of officers of which Captain John F. Merry, U.S.N., was president. This board recommended in substance as follows:-

That the channel through the reef near old Fort Santa Cruz be dredged to a depth of 30 feet, thus connecting the basin inside the reef with the outer anchorage; and that certain reefs inside the basin be removed to form a clear inner anchorage with an area of about 2/3 square mile. That one reef in the outer anchorage, near Cabra Island, be removed.

By carrying out this work the protected anchorage would not only be considerably increased but easy access would be gained to the best available site for a naval and coaling station. The estimated cost of the work was $394,500.

In addition to the above named improvements, the board considered the construction of a breakwater on Calalan Bank, from the western end of Luminao Reef to Spanish Rocks, (in order to completely shelter the outer anchorage) but did not recommend that the work be done.

This board also recommended that a naval base and coaling station be established near the town of Sumay and that water works be constructed to bring a water supply from the Paulana River.

The total cost of the harbor improvements and the establishment of the station as described was estimated at about $1,500,00.

DEFENSES OF GUAM

AGAINST

SEA ATTACK.

DEFENSES OF GUAM AGAINST SEA ATTACK.

GENERAL

Before entering into the details of the defense of Guam it is first necessary to determine, as far as possible, the probable course of action of Japan in the event of war with the United States.

Japan, by reason of her position, cannot impose her will unpon the United States with Sea Power alone; she must use field armies in addition. Her armies, to act against us, will have to be transported overseas. To support her armies Japan will have to keep open their sea communications. It will then become the Mission of the United States to sever those communications, to isolate her armies and finally by the exercise of sea power to bring sufficient pressure to impose peace on our terms. This means that the final decision of the war must flow directly from Naval operations.

Compared with the United States, Japan has an inferior navy and a vastly superior army. Her first mission will therefore be to reduce the naval superiority of the United States and thereby secure for herself as favorable conditions as possible for the decisive fleet action. Being initially inferior in naval strength, she will endeavor to carry out her mission with her land forces and lesser naval craft (those of doubtful value in a fleet action). She will only hazard capital ships when she is in a position to engage enemy capital ships with a reasonable chance of victory, or when she can effect damage to enemy naval strength without danger to her own.

If, in the beginning, the United States fleet is in home waters, Japan will have undisputed sway in the Western Pacific for a short time. It may be expected then that she will immediately occupy the Eastern possessions of the United States in great strength and endeavor to capture and deny all points which might aid enemy naval operations. From a naval standpoint, Guam is the most vital point in the Eastern possessions of the United States. This fact must be well known to Japan, and she will act accordingly.

That this course of action is the correct one under the circumstances, and the one most likely to be followed by Japan, may be seen by a study

of the strategy of her late wars, which were waged under conditions more or less similar to those likely in a war with the United States.

At the outbreak of the Chino-Japanese war, 1894-5, the navy of Japan was inferior in strength to that of China. China had two naval bases in the theatre of operations, one at Port Arthur and one at Wei-hai-wei. Command of the sea was vital to Japan for without it her land forces could not act in China. At first the Chinese fleet was inactive and the Japanese fleet, being inferior, remained on the defensive, simply guarding the transportation of troops to the Manchurian coast. Then came the battle of the Yalu, in which the Japanese were victorious. After this battle, the Japanese bent all their efforts toward the capture of the two naval bases and the destruction of the Chinese ships sheltered therein. This action was considered necessary as the bases formed points of refuge for possible "interfering naval forces" and would flank the Japanese line of communications in an advance on Pekin, the ultimate objective of the land forces. Besides this there was a southern Chinese fleet which might appear in sufficient strength to place conditions as they were in the beginning. A force of 15,000 men was employed in the capture of Port Arthur, and a force of 20,000 men in the capture of Wei-hai-wei. The entire naval force co-operated, but the main work was performed by the land forces and torpedo craft. The Japanese loss in these operations was slight owing to the inefficiency of the Chinese.

In the Russo-Japanese war, the command of the sea was as vital to Japan as in the previous war and for the same reason. Her fleet was equal in strength to the Russian fleet in Asia but vastly inferior to the Russian combined fleets. From the beginning everything was subordinated to gaining and maintaining the command of the sea. The war was begun by Japan before her army could act because that time best suited the naval situation, the Russian Asiatic fleet being divided at the time. From this time on every effort was made to prevent the junction of the Russian detachments and to destroy the major one at Port Arthur before the Russian European fleet could arrive on the scene of operations.

The main object in besieging Port Arthur was the destruction of the naval base and the naval detachment harbored there. The Japanese army that landed in Korea was intended (in addition to occupying that country) to cover the siege of Port Arthur. The capture of Port Arthur cost the Japanese 60,000 men in killed, wounded, and missing, and forced them to employ there for eight months an army of from 50,000 to 75,000 effectives. These men were expended to decrease Russian Naval Power. Had the Port Arthur army been free to proceed north the battles of Liao-yang and Mukden might have been decisive.

Vladivostock was not besieged on account of its relative unimportance, the weakness of the detachment harbored there, the great effort necessary, and the fact that, with the Port Arthur detachment out of the way, the Japanese fleet could reasonably be expected to prevent the Vladivostock detachment from joining the European fleet before a decisive engagement.

In both wars until the sea contact was decided the Japanese conserved their capital ships and expended land forces and auxiliary naval craft lavishly to lessen enemy naval power. This was especially true in the last war, at the beginning of which the Japanese navy was so greatly inferior. They knew that men could be replaced but that battleships could not, and so when it was possible for the former to do the work it was right and proper that they should be hazarded. The desperate torpedo, mine and blockading operations, and the fierce land assaults against Port Arthur, contrasted with the hesitancy with which the Japanese capital ships approached close action with the guns at Port Arthur and with the Russian ships, which might be destroyed by other means, shows how well the principle of using auxiliary and land forces to lessen naval power was realized. In general, the siege of Port Arthur, with its 60,000 casualties, conveys a very fair idea of the Japanese point of view as to the vital importance of gaining command of the sea and as to the relative value of ships and men in the operation.

It may be concluded then that, until the sea contest is decided, Guam will be liable to land attacks in great force, combined with every form of naval attack in great force applicable except close bombardment by capital ships.

Sea Defense of Harbor of Apra.

We come now to a consideration of the defense of the Harbor of Apra against attack from the sea. Our Mission is to provide a defense against sea attack that will give security to the harbor.

Attacks from the sea may be bombardment by capital ships, torpedo attacks, mine attacks, channel blockading attacks, and possibly aerial attacks. ---

First as to bombardments:

From the preceding examination of Japanese strategy it is evident that attacks on the harbor from the sea will be undertaken in those cases only where they are profitable. Since these attacks, if made, will be made with a view to a resulting advantage in naval strength to the assailant, we need not expect any nation to greatly hazard its fleet before the engagment of the two fleets. Any subsequent attack from the sea will be of relatively less importance. The situartion of Guam is such that we need not seriously consider blockading operations similar to those of Port Arthur. Any effort directed at Guam will have for its object the embarrassment of our fleet mobility.

Let us examine into the tactics of Japanese attacks from the sea to determine how their execution will be affected by the natural characteristics of the harbor of Apra.

The Japanese fully appreciate the efficacy of coast batteries. They realize that it is extremely wasteful to risk modern ships in a contest with coast batteries unless the chances are good that such action will result indirectly in a corresponding reduction of enemy navaly strength.

In the present day it is not likely that a serious attempt would be made to force an entrance into, or to closely attack, a well defended port, although feints may be made at it by second class ships in the execution of a demonstration intended to keep the sea defense occupied while a landing is attempted.

Bombardments.

During the Russo-Japanese war, the Japanese ships bombarded Port Arthur five different times but in no case were the shore batteries the main objective. Their objective was either the ships and material inside the harbor or ships operating outside under cover of the coast batteries. All of these bombardments were at long range from the coast batteries or from positions upon which they could not bear. Observing ships were stationed to report the results of the fire. Only slight damage was done to ships in the harbor and to material on shore. After the first three bombardments, when the Russian gunfire became more accurate and all bombarding positions were endangered by gunfire or mines, the Japanese did not employ their major ships in such operations. But they did use their capital ships for bombarding so long as they could do so with safety. When conditions changed less valuable ships were employed, but with care, as the failure to afford naval support to the army in its assault on Takushan showed.

At the present time capital ships, where fire results can be observed, can bombard large targets effectively at a range of about 18,000 yards. On account of the higher velocity of their guns, they can do this safely even when opposed by coast defense guns of the same calibre at the same range. To render bombarding dangerous to an enemy (and make use of the inherent advantages of coast defense guns --- accuracy of fire and great protection) it is then necessary to emplace the coast guns in advance of the area which they are designed to protect.

In the case of the Harbor of Apra, the conformation of the land forming it precludes the placing of the batteries very far in advance of the harbor to the north and west. A battery placed on Orote point would be advanced only 5000 yards from the inner harbor, and one on Cabras Island only 3500 yards. Both batteries would be located just on the limits of the outer anchorage. Great range for these batteries would therefore be necessary to render a bombardment of the harbor dangerous to an enemy.

The harbor is also so formed that an enemy may choose a bombarding position at any point throughout an arc of 230°. The advanced batteries

would therefore be exposed to fire from the flanks and rear unless batteries were constructed on the mainland to ward off enemy ships. In order then that a reasonable number of guns may cover the necessary water area and adjacent coast line and be adequately protected from all points they should be mounted in turrets so situated that they may have practically an all round arc of fire.

Owing to the depth of water off the harbor, mines cannot be used to prevent an enemy attaining a bombarding position. This work must be performed by the heavy guns and the floating defense.

We therefore conclude that defense against bombardment of capital ships must be primarily by heavy direct fire guns mounted in turrests and numerous enough to made a bombardment so hazardous as to be unprofitable under any expected conditions; and that these guns should be supported each by a pair of intermediate calibre guns in turrets. We recommend for this purpose:

Two 14-inch guns, in turret, on 60 ft. contour on the west end of Cabras Id. This battery commands the entire water area and coast line within range except those areas masked by the high land west of the battery and by Orote Peninsula. All water approaches to the masked areas are covered either by direct or indirect fire.

Two 14-inch guns, in turret, on 200 ft. contour on Orote Pt. This battery commands the entire water area and coast line within range except a dead space of about 800 yards immediately around battery and those areas masked by the high land to the east and by Cabras Island. Water approaches to masked areas are covered by the battery.

Two 6-inch guns, in turret, on 40 ft. contour on the west end of Cabras Id. This battery commands the entire water area and coast line within range except those areas masked by the high ground to the east and by Orote Peninsula. It commands water approaches to masked areas either by direct or indirect fire.

Two 6-inch guns, in pair in turret, on 200 ft. contour on Orote Peninsula, near Ft. Santiago. These batteries command the water area and coast line within range except a dead space of about 800 yards around batteries and those areas masked by the high ground in vicinity

and by Cabras Island. The batteries cover all water approaches to masked areas either by direct or indirect fire.

Four 12-inch mortars, near Sumay. This battery is intended to supplement the gun defense, covering allmasked areas.

Torpedo Attack Against Harbor.

It seems of vital importance that the Harbor of Apra, which is to be used as a point of refuge for the fleet while being refueled and overhauled, should be protected as securely as possible against this form of attack. When the fleet arrives at this point it will have just finished a long voyage of 3,337 miles (from Pearl Harbor) and will be entering the danger area. It must stay at this point until it is in full readiness to proceed. The enemy will know its exact location, which will be within striking distance of his torpedo craft, upon whose successful operations so much will depend. If the fleet has to provide for its own protection against these attacks, the operations rendered necessary will at least lengthen the period of stay, if by good fortune the fleet does not sustain damage. Of course, the present capacity of the anchorage will not permit the sheltering of the entire fleet, but what a relief it would be to all concerned to know that when night fell $\frac{2}{3}$ of the capital ships were absolutely secure against torpedo attacks.

The Japanese torpedo craft were very active during the late war, sometimes operating in very bad weather. Time and again they dashed up to the entrance of Port Arthur and discharged torpedoes at ships lying at the outer anchorage or in the entrance. The net results of their attacks were small, due, it is said, to the short range of the torpedo and to the difficulty in estimating ranges in the face of gunfire and searchlights. They generally attacked successively in groups of from three to six boats each.

The outer anchorage of the Harbor of Apra is much exposed to this form of attack, as the boats need not enter the harbor bur may discharge their torpedoes from out at sea. Boats equipped with a long range torpedo (6000 to 10,000 yards) need not find this a desperate

undertaking nor a difficult one, when opposed only by batteries which can be placed on shore. The distance between the western end of Luminao Reef and Orote Point is 3000 yards and a torpedo fired through this entrance passes directly into the anchorage.

The proposed inner harbor is well protected from torpedo attacks as the entrance through the reef is only about 200 yards wide and the depth of water on the reef is only one to three feet at high tide. The entrance could easily be closed by a boom and net.

The outer harbor could not be made absolutely secure against torpedo attack without building a breakwater from the west end of Luminao Reef along Calalan Bank to Spanish Rocks and then placing a boom and net across the deep water entrance. But the provision of a boom and net defense from Calalan Bank to Orote Island is considered adequate if it be designed to stop any torpedo fired from outside the harbor.

Submarines were not used by the Japanese during the late war. However, owing to the greatly increased steaming radius and seaworthiness of the modern submarine, its use in an attack upon Harbor of Apra is likely when there is enough shipping there to warrant it . The anchorages could not be secured from submarine attacks except by providing the same protection as outlined above for surface torpedo craft and supplementing it with a mine defense as follows:

Mines:- (As recommended by the Board of Army Engineers, 1901). Two grand groups of mines in the deep water channel and two skirmish lines on Calalan Bank -- the latter to be planted so as to be effective against torpedo craft.

In trusting to a mine, boom, and net defense against torpedo attack - a passive defense, it is necessary to provide a battery to prevent hostile craft from interfering with either the mines or the booms. We recommend:

Four 6-inch guns, in barbettes, on 50 ft. contour near point just east of Orote Island. These guns should bear directly on the entrance to the outer harbor and its approaches.

Mine Attack.

In the Russo-Japanese war, the Russians first demonstrated the value of mining operations. The Japanese then took it up on a large

scale, using mines both defensively and offensively. The anchored contact mine was mostly used, the generally shallow water off the South Manchurian coast favoring the use of that type. During the course of the war, 62,000 tons of naval shipping (Russia, 22,000; Japan, 40,000) were destroyed by mines, and much more damaged. Both belligerents laid hundreds of mines off Port Arthur, and finally sweeping operations were absolutely necessary in order to approach or leave the harbor in safety.

The waters off the Harbor of Apra are too deep for mining operations with the anchored mine, the coral reefs being steep-to from great depth. However, Japan is not a signatory power to the Hague Mine Convention and is free to use any type of floating mine that she desires. These are not to be feared much as the set of the current is generally to the northeast or southwest and they are not likely to float into the harbor. No permanent provision against such attacks is recommended.

Blocking Attacks.

During their late war, the Japanese made three desperate attempts to block the entrance to Port Arthur, and although the entrance is very narrow and the water very shallow, all failed. In these attempts the Japanese expended a total of 48,000 tons of merchant shipping and many valuable lives.

This form of attack is not to be feared in this instance as the entrance to the outer anchorage is too deep and wide and the entrance to the inner harbor is so located that searchlights alone would prevent an attack from succeeding.

Aerial Attacks.

These attacks may be expected, but until air craft are further developed their operations will probably be confined to reconnaissance work and observation of fire.

Four 3-inch guns (movable), with aerial mounts, held in the vicinity of the naval station, to attack aerial scouts, and contest landing of raiding parties, are recommended.

Conclusions as to Sea Defense.

Searchlights.

Four 60-inch searchlights are required as follows:

1 on west end of Cabras Island (illuminating light).

1 on point west of 6-inch batteries (covering mine fields).

1 on extreme end of Crote Point (illuminating light).

1 on Crote Island (searching light).

Personnel.

To man the armament of the sea defense the following personnel is required:-

Four 14-inch guns	(approx.)	150 men.
Four 6-inch guns	(")	100 "
Four 6-inch guns	(")	100 "
Four 3-inch guns	(")	30 "
Four 12-inch mortars	(")	80 "
Mine defense	(")	50 "
	Total	510 "

Floating Defense.

To supplement the shore armament and assist in the prevention of landings on the island, four submarines, four large torpedo boats, and two seagoing tugs are required. The submarines can here be used to the fullest advantage--both in attacking bombarding ships and troop transports--as all enemy operations must be carried out within its submerged cruising radius. The torpedo boats and tugs will be especially useful in night patrol duty and in mining operations.

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DEFENSE OF HARBOR OF APRA

AGAINST

LAND ATTACK.

DEFENSE OF HARBOR OF APRA

AGAINST

LAND ATTACK.

General Considerations:

The object of the land defense is to cover the rear of the seacoast batteries and all objectives of an enemy which cannot be protected by those batteries.

If the aim of the enemy is to secure the harbor for his own use it will be necessary for him to completely reduce the seacoast batteries and all that part of the land defense that bears on the harbor. If his aim is simply to destroy the material in and around the harbor or to deny the use of the harbor to the United States fleet it will only be necessary for him to secure and maintain a position from which siege guns can be brought to bear on the harbor.

The island is small and there is no point thereon, where an enemy can land in force, that is over 14 miles (direct) from the proposed site of the naval station and inner anchorage. Therefore, if an enemy once gained a foothold ashore he might have to advance only a short distance to accomplish his mission.

A landing once effected and secured would enable the enemy to reenforce his force on shore at pleasure. His superiority of numbers would make certain the ultimate retirement of our forces from advanced positions. They could not retire beyond the crest of the hills surrounding the harbor without yielding to the enemy the real object of the whole defensive scheme---the security of the harbor. It would be necessary to the security of the harbor from attack by land of forces already on shore to hold a line eleven miles long. This could not be done against a great superiority of numbers by any force ever likely to be found in the island when the attack is made.

For the foregoing reasons, together with the fact that in this case the coast line is favorable to the defense and unfavorable to the offense, we conclude that the security of the Harbor of Apra from land attack must result from the prevention of a landing on the Island of Guam. We are,

therefore, led to examine landing operations.

JAPANESE LANDING OPERATIONS.

Japan had her first experience in modern landing operations during the Chino-Japanese war. Her operations were very successful. In fact, the capture of Wei-hai-wei has often been cited as a model for such operations. Her success was due to thorough preparation. Thus experienced, and again thoroughly prepared, Japan, during the Russo-Japanese war, embarked, transported, and disembarked her expeditionary forces with a dispatch and ease that had never before been known. All foreign observers were united in the praise of thorough cooperation of the sea and land forces, the excellent landing organization, and the efficiency of the personnel and materiel for the work in hand.

Most of these operations were carried out under unfavorable conditions. The coasts of Korea and Manchuria are not adapted to landing operations. The mountains being near the sea, the coast is generally steep. The adjacent waters are shallow, the range of tide is great, and the ebb tide uncovers vast mud flats. As a consequence, transports cannot generally approach within three miles of the coast and sometimes small boats cannot land, thus necessitating the construction of landing stages or forcing the men to wade through long stretches of mud and water to gain the shore. Dalny was the only landing place of the Japanese where there were any dock facilities. They carried out disembarkations at night as well as day and often under very bad conditions of sea and weather. It may be truly said that during this war the Japanese experienced almost every difficulty that landing operations can develop.

The Japanese being past masters of the art of secrecy and of the ruses of war, and the expanse of available coast line being so great, their landings were generally unopposed. Their general procedure was to make reconnaissance along a stretch of coast with gun boats and mine sweepers. These were partly feints. When this was completed, and the sea communications appeared reasonably safe, the transports were dispatched direct to the point selected and the disembarkation began. Marines, thoroughly trained in landings, were always landed first as a temporary covering force.

When the transports were once in position the disembarkation was carried out with great rapidity. Each transport generally carried all the materiel needed for the landing and coolies to handle it. The troops and materiel were transported from ship to shore in sampans or small flat bottom lighters. These held from 30 to 100 men each and drew nor more than two feet when loaded. Each sampan or lighter when filled dropped astern where they were lashed two abreast and formed into trains of from five to ten each. When a train was made up it was towed in near the beach or landing stage and cast off. Coolies then sculled the boats into the landing. Some idea of the rapidity with which this work was done may be gained from the following summary of the landings at Chemulpo and Alkova.

Landing of the Advance Force at Chemulpo, Feb. 8, 1904.

Two transports, carrying about 2500 men and a few horses and anchored about three miles from the beach, were discharged between the hours of 6.15 p.m., and 3 a.m. The landing was affected at an old jetty in the harbor. Troops and material were transported from ship to shore in sampans, each holding from 30 to 60 men or 5 horses and 10 men. The sampans were towed in trains of from five to ten each by steam launches. The weather was favorable; landing unopposed.

Landing of Expeditionary Force at Alkova, Saghalein July 24, 1905.

The transports were anchored off a sand or shingle beach where they could discharge simultaneously. There were ten steam launches available and each transport carried two or three small lighters (approx. 9 ft. x 36 ft.), each holding about 100 men. The infantry transports were emptied inside two hours. Weather favorable; landing unopposed.

Japanese landing methods are the result of long experience in disembarking field armies at restricted landing stages on the south Manchurian coast. They favor the rapid landing of a large number of men simultaneously on a limited beach space. It is probable that ten Japanese transports, carrying 20,000 troops and anchored off the coast

(Umatac-Sella River), could, if unopposed, land at least 1500 men with light guns in forty minutes.

There is no record of the Japanese ever having landed in the face of a determined prepared enemy. They have so conducted their past operations that it has never been necessary. But if it is necessary in the future, it is believed that they will make the attempt if there is a reasonable chance of success. It is true that with modern artillery and terrain favorable to the masking of guns and troops on the side of the defenders, and only restricted reentrant landing places available to the attackers, it would be a desperate undertaking and could only be carried out at a great sacrifice. But the Japanese will make the sacrifice, for their past operations plainly show that, where it is possible to succeed, the only limit to losses is that one set by the requirement of success.

If the past tactics of the Japanese may be taken as a criterion, it is probable that for several days prior to attempting a landing the entire coast line will be reconnoitered by cruisers and all landing places bombarded in an endeavor to locate and develop the strength of the defense. The real attempt at landing, accompanied by several feints, will be made at dawn and will be supported by a heavy fire from the naval escort.

Although the Japanese will doubtless have good local knowledge of the various landing points, it is not likely that they will attempt a landing in force at night on account of the forbidding nature of the coast. They will, however, probably attempt to land small parties at different points with the idea of destroying materiel or of securing temporary covering positions for a landing in force at dawn. Past events show that a limited number of men, thoroughly trained in landing on a difficult coast and possessing local knowledge, can effect a landing at night under very adverse conditions.

Conclusions as to Land Defense:

In view of the considerations stated, the following land defense is proposed:

The defense includes a Main Line (first line), and provision for a Second Line and Strongholds which are to be occupied in force only in event of the defenders not being able to hold the line in front.

Main Line.

This line, following the seacoast, defends all possible landing places on the island, and it is assumed that an enemy is liable to land at any point where a landing is possible. (While weather and sea conditions may sometimes permit of the withdrawal of the major portion of the defense from one quarter and concentrating it in another, yet these conditions cannot be counted on in planning an initial defense).

The disposition of the armament and personnel in the Main Line is made with the following objects in view:

(a) To delay the transportation of troops from ships to shore.
(b) To deliver a sudden volume of shrapnel, machine gun, and rifle fire on enemy as he is landing, or about to land.
(c) To contest the advance of an enemy inland from the moment of landing.
(d) To protect the defenders from fire from the sea.
(e) To ensure a safe retirement of the defending force to the Second Line.

Included in the Main Line are the following:

(a) Two batteries (2 guns each) of 6" seacoast guns, mounted in turrets---one battery emplaced in the vicinity of Facpi Point, and one in the vicinity of Talafofo Point. These batteries, so located, cover all the best landing places on the island (other than those covered by the guns, of sea defense) and the anchorage ground in their near vicinity, and will therefore force an enemy to disembark in boats while under fire, or at a distance while under way. Being mounted in turrets they will be protected from fire from both land and sea.

(b) A line of well fortified and masked infantry and machine gun positions within effective range of and flanking the beaches where landings may be made; so located when possible as to afford mutual support. Also positions to the rear from which an effective fire may be brought to bear

in support of those in front and on probable initial covering positions which the enemy might attempt to occupy directly upon landing.

(c) A line of portable searchlight positions covering the main landing points. These positions are located so as to not only enable the defenders to detect an approach of landing parties at night but also to render navigation as difficult as possible.

(d) A line of defiladed field artillery positions (about 1000 yards in rear of infantry positions) from which an effective fire may be brought to bear on landing places and approaches thereto, and with alternative positions near at hand from which a direct fire may be brought to bear on those objectives and on the fronts of infantry positions.

(e) A line of defiladed siege artillery positions, somewhat retired from the field artillery positions and near the main belt road, from which fire may be brought to bear on landing places and their approaches, and on the fronts of infantry positions.

(f) A line of section supports, in or near fortified positions, so located as to:

1. Best support the positions in front.
2. Best support each other.
3. Best contest approaches to the second line in case retirement became necessary.

(g) A general reserve so located as to best support the Main Line.

Second Line:

This line, which should be prepared for occupancy in case it is necessary to retire from the first line, follows the range of high hills to the east and southeast of the Harbor of Apra with an average distance of 4½ miles from Sumay. It has a length of 11 miles. The holding of this line alone will not protect the harbor and naval station from bombardment and it will be necessary to hold the advanced positions. Jumullong Manglo (vicinity), Cannon and Macajna, in addition. These positions are about 5¾ miles distant from Sumay, and by holding them effective bombardment by the enemy will be rendered very difficult, if not impossible, and his advance will be greatly delayed.

Strongholds:

Orote Pen. and Cabras Id. should be prepared as strongholds to be occupied as a last resort. The holding of these points will not prevent the destruction of materiel at the naval station nor protect the harbor from the land side, but it will deny the use of the harbor to the enemy, which is very desirable.

In order to determine as near as possible the strength of the mobile force and armament necessary for the land defense as outlined, a scheme of defense has been worked out with as much accuracy as the information at hand will permit. (See accompanying chart).

In this scheme, the apportionment of forces to advanced positions, supports, and reserve, is governed by the following considerations:

(a) The force necessary for the initial defense of the various landing points in case the enemy attacks under favorable conditions.

(b) The time necessary for the supports and reserve to act.

(c) The provision of reliefs for the forces in permanently occupied positions.

The distribution of forces presumes a good system of communications, a carefully designed road system, with entanglements and other suitable obstacles at all landing places, and a constant readiness of the supports and reserve for instant movement. This scheme also contemplates the fullest possible employment of natives for all non-combatant duties.

The scheme requires the employment of the following troops for defense against landings:

Coast Artillery.

	Officers	Men
Four 6" guns with two 60-inch searchlights----------	6	100

Mobile Army.

2 regts. plus one Bn. Inf. with 84 M.G. ----------	117	3440
1 Bn. 6" siege howitzers (12 guns)----------	18	531
1 regt. plus one Bn. Field Artillery----------	60	1657
1 Co. Engrs. with 18 S.L.----------	4	164
1 Co. Signal Corps----------	4	100
Total Mobile Army-------	203	5892
Grand Total----------	209	5992

The following is the detailed scheme of defense forming the basis of the above estimate:

SCHEME OF DEFENSE.

AGAINST

LANDINGS.

The coast is divided for defense into five sections as follows:

I. Piti to Facpi Point.

II. Facpi Point to Sume River.

III. Sume River to Asiga Point.

IV. Asiga Point to Pago Point.

V. Pago Point to Piti.

SECTION I. - Piti to Facpi Point.

Troops: 1 Bn. Inf. with 12 machine guns.

2 batteries field artillery.

Engineer detachment with 4 portable searchlights.

SECTION II. - Facpi Point to Sume River.

Troops: 1½ Bn. Inf. with 18 machine guns.

1 Btry. 6" siege howitzers.

1 Btry. field artillery.

Engineer detachment with six portable searchlights.

SECTION III. - Sume River to Asiga Point.

Troops: 2 Cos. Inf. with 12 machine Guns.

1 Btry. field artillery.

Engineer detachment with two portable searchlights.

SECTION IV. - Asiga Point to Pago Point.

Troops: 1 Bn. Inf. with 18 machine guns.

1 Btry. 6" siege howitzers.

1 Btry. field artillery.

Engineer detachment with 4 portable searchlights.

SECTION V. - Pago Point to Piti.

TROOPS: 1 Bn. Inf. with 24 machine guns.

1 Btry. field artillery.

Engineer detachment with two portable searchlights.

GENERAL RESERVE. Near Salifan Mountain.

Troops: 2 Bns. Inf. with 12 machine guns.

1 Battery 6" siege howitzers.

1 Btry. field artillery.

Disposition: Entire force at reserve station except those which may be detailed as coast artillery supports.

WIRE AND VISUAL COMMUNICATIONS.

The particular necessity for rapid cooperation renders necessary two systems of wire communication---one for command purposes and one for artillery fire direction. To ensure good service under all conditions, these systems should be double and the parts near the coast line securely protected against fire from the sea, and from small raiding parties which may effect a landing.

A system of visual communication in readiness for operation is required for use of the cyclist patrols and for general use in case the wire communications are interrupted.

ROADS AND TRAILS.

The road system is outlined below. (See accompanying chart). In planning it, in addition to rapid communication between various parts of the defense, the following points were considered: Concealment from view, and protection from fire from the sea; facility in executing counter-attacks; the safe retirement of the defenders to the Second Line; and the covering of the roads leading thereto by the advanced positions of that line.

The system consists of the following roads:

(a) Radial roads leading from the General Reserve to the Section Supports.

(b) A belt road, formed partly by the radial roads, extending around the Main Line in rear of the defensive positions.

(c) Spur roads leading from the Section Supports to defensive positions in front.

(d) Roads leading from Orote Pen. to that part of the belt road in

rear of the Second Line, thus connecting that point with the Road System of the Main Line and providing for the interior communications of the Second Line. The total mileage of roads in the system, in addition to those already constructed, is about 75 miles.

In addition to the road system, there is required a beach trail around the island for the use of cyclist patrols. The mileage of this trail, in addition to that already available, is about 50 miles.

WATER SUPPLY.

The Merry Board, in 1901, recommended that the water supply for the proposed naval station near Sumay be brought from the Paulana River and that the necessary water works be constructed. In its report the Board stated that the supply from that source could be easily augmented by constructing an open ditch between the proposed reservoir and the Atantana River, near by. If this scheme is carried out, the station water supply will be secure except in the event of the defenders being forced to retire to the strongholds. It is believed that this event should be provided for.

Wells which have been sunk on Orote Pen. have not proved satisfactory either in quanity or quality of water. Distilling plants, afloat or ashore, cannot be depended on as they are liable to destruction during operations. The best solution of the question seems to be the construction of reserve reservoirs. They will at least be partially filled by rainfall and the balance may be provided by pumping from the regular system.

It is thought that with little trouble potable water for troops in the Main Line of land defense may be obtained from streams near positions, as there are streams in abundance in the southern portion of the island. In the northern part of the island, where there are no streams, wells and small reservoirs will have to be depended on to supply the few troops stationed there.

TRANSPORTATION.

Regular animal transport is very costly in the tropics as animals do not thrive well and the cost of maintenance is great. Experiments carried out in recent years show that even in this country, provided that the roads are such as to allow of free use, motor transport is more

economical. The main objections to motor transport for military use in the past have been its mechanical unreliability and its inability to traverse bad or hilly roads. In later types of motor transport, these objections do not apply to nearly the same extent and all nations are now supplementing their animal transport with it.

It is believed that this form of transport is well adapted for use in Guam and should entirely replace animal transport. A proper system of military roads will permit of its free use all the year round and under war conditions. It will also be more rapid and more economical. There will be no difficulty with the fuel supply as the Navy will have to keep a large reserve there for its own use. Motor lorries may be used not only to transport supplies and ammunition but, parked at the reserve and support stations, may also be used to transport guns and men to positions.

Mobile reserves are of the utmost importance in this case and therefore any means by which their mobility can be increased should be adopted. For the same reason also part of the infantry at the reserve and support stations should be equipped with bicycles. With reliable means for the rapid transportation of guns and men at hand, the forces in the advanced positions could be considerably decreased and the reserves increased. This is very desirable.

RECAPITULATION.

I.

Sea Defense.

	Officers	Men
Four 14-inch guns in turrets	6	150
Four 6-inch guns in barbettes	3	100
Four 6-inch guns in turrets	6	100
Four 12-inch mortars	3	80
Four 3-inch guns (mobile)	2	30
Mine Defense	2	50
Four 60-inch searchlights	1	
Battle commanders, Fire Commanders, etc.	8	
T o t a l	31	510

II.

Land Defense.

Coast Artillery.

Four 6-inch guns with two 60-inch searchlights	6	100

Mobile Army.

2 regts. plus one Bn. inf. with 84 M.G.	117	3440
1 Bn. 6" siege howitzers (12) guns	18	531
1 regt. plus one Bn. Field Artillery	60	1657
1 Co. Engrs. with 18 S.L.	4	164
1 Co. Signal Corps	4	100
T o t a l	209	5992
Grand Total	240	6502

MOBILE NAVAL DEFENSE.

4 Submarines.
4 large torpedo boats.
2 Seagoing tugs.

We desire to invite particular attention to that part of the preceding report (See Page 17, Part I.), which says that "Guam is essential first as a harbor of refuge and refreshment, and, second, as the storehouse of fleet mobility". The proposed defense of Guam cannot be justified except in so far as it actually increases the effective mobility of the fleet.

Coincident with the fortification of Guam there must be extensive harbor improvements similar to those recommended by the Merry Board, and there must be accumulated and stored at Guam not less than half a million tons of fuel.

FRANK H. SCHOFIELD,

EARL H. ELLIS.

Naval War College,
Newport, R.I.
March 5, 1913.

APPROVED: W. L. RODGERS, Capt. U.S.N. President.

APPENDIX

TO

DEFENSE OF GUAM.

RECOMMENDATIONS OF PAST BOARDS REGARDING THE DEFENSE OF GUAM.

MERRY BOARD.

The question of the defense of Guam was first seriously considered in 1901 by the Merry Board, heretofore mentioned. In its report the board states:-

"The importance of Guam lies in its becoming a cable station, a coaling station, a naval base, and a port where merchant vessels can seek shelter. In the last three points it will be of use to any nation with whom the United States may be at war. The destruction of the cable station would prevent direct communication with the Philippines after the cable has been laid, which communication could, however, be generally maintained through Hongkong.

"The importance of Guam does not warrant sending a strong fleet to attack it, especially as its distance makes injuries to the attacking vessels difficult to repair, and almost all the larger nations have possessions that could be used for preparation of attack on the United States possessions. It should, however, be sufficiently protected to prevent a few vessels from seizing the island."

On the foregoing assumptions, and after a thorough study of the local conditions, the board concluded that the following defense was necessary:-

One 10-inch, two 6-inch, and two 3-inch guns to be mounted on Orote Peninsula.

One 8-inch, two 6-inch, and two 6-pdr. guns to be mounted on Cabras Island.

Submarine mines, searchlights, etc.

It was estimated that a garrison of about 250 men was required to man these defenses. No estimate was made as to the strength of the mobile forces necessary for land defense.

ARMY ENGINEERS.

Later in the same year, 1901, a board of Army Engineers, of

which Colonel Peter C. Haines, Corps of Engineers, was president, considered and reported upon the defense necessary for the Harbor of Apra. This board differed from the Merry Board in the "conception of the dangers to be avoided and of the amount of defense necessary."

The board, after considering the danger of attack from the desire of an enemy to inflict financial loss, seize coal, destroy a necessary U. S. naval base, acquire territory, and interrupt cable communications, and after studying the possibilities of defense, states in its report:-

"The above course of reasoning has led the board to recommend a system of defenses designed to make any sudden attack by a comparatively small number of vessels, probably cruisers, so dangerous as to be improbable, and to impose on any fleet making a serious demonstration the necessity of an attack in force, with land operations, and the attendant delays and dangers."

The board concludes that the following defenses are necessary:-

Four 12-inch B.L. mortars; four 6-inch R.F. guns; four 15-pdrs.; four 6-pdrs., movable; 10 machine guns, Colt's automatic .30 cal. gun and mount; submarine mines; searchlights, etc. All guns to be mounted on Orote Peninsula.

It was estimated that it would require about 300 men to man these defenses. No estimate was made as to the strength of the mobile force necessary for land defense.

NATIONAL DEFENSE BOARD.

The defense of Guam was next considered in 1906 by the National Coast Defense Board. This board considered Guam as of secondary importance and recommended that the following defenses should be provided:-

Eight 12-inch mortars; four 6-inch guns; three 3-inch guns; submarine mines; serachlights, etc.

No recommendation was made as to a mobile force.

ARMY WAR COLLEGE.

An Army War College committee, session 1908-9, also considered the question of the defense of Guam. In its report the committee recommended the following defenses:-

Four 12-inch mortars; six 6-inch guns; four 3-inch guns; submarine mines, searchlights, etc., and two submarines. Mobile defense to consist of two battalions of infantry.

The committee states:- "The Committee regards that such a defense of Guam is essential for transferring the fleet across the Pacific in the event of war with an Asiatic power."

It will be gathered from the foregoing reports that the great importance of Guam to the United States, with the consequent inducements to enemy attacks, has not been generally realized in the military services,---that the tendency in the past has been to consider Guam as a place of secondary importance and consequently recommendations as to its defense have been made on that assumption.