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PD (Guam) (2).

File No. 4 3

Accession Year 1913

No. 41

Author or Source Joint Board, Army and Naval War Colleges.

Contents REPORT OF JOINT BOARD, ARMY AND NAVAL WAR COLLEGES, ON THE DEFENSE OF GUAM.

Contents:

U.S.Naval War College,
Newport, Rhode Island,
January 6, 1914.

M E M O R A N D U M.

Two copies of this report were made this date; one being sent to the Governor of the Island of Guam, and the other to the Joint Board, Army and Navy, Washington, D.C., via Aid for Operations.

W. S. Tyler
Lieutenant-Commander, U.S.N.,
Secretary.

10,000 yds.
6000 yds
10,000 yds.
6000 yds.
Tunan Bay
Agaña Bay
Reefs
Cabras Id.
Port San Luis D'Apra.
23 18 22 30 38 20 10 25 10 15 24 10 17 20 9
700 ft.
1045 ft.
1025 ft.
Agat Bay
850 ft
7⅓ miles
127 ft.
Umata Bay
1054 ft
395 ft.
Port Ynarajan
Agtayan Bay
6000 yds.
Cocoa Id.
Hills
Hills
Ylic Bay
Port Tarafofo
6000 yds.
26 miles
610 ft.
All this region heavily wooded.
592 ft.
Very steep & high cliffs
7¼ miles
674 ft
all this region is heavily wooded.
870 ft. high cliffs
high cliffs
Port Pago

ISLAND OF GUAM.

J O I N T R E P O R T

Of a Conference of

Army and Naval War College Committees

on the subject of the

Defense of Guam.

Army War College, Washington, D.C.,
March 29, 1913.

Army War College Committee:

Colonel S. M. Foote, Coast Artillery Corps.

Major Wm. W. Harts, Corps of Engineers,

Major B. A. Poore, General Staff (Infantry).

Memorandum by Chief, War College Division, March 19, 1913.

Naval War College Committee:

Commander J. S. McKean, U. S. Navy,

Commander F. H. Schofield, U. S. Navy,

Captain N. H. Ellis, U. S. M. C.

Orders of Navy Department, March 11, 1913.

Appendices.

A. Report of Army War College Committee.

B. Report of Naval War College Committee.

C. Map of Island of Guam.

On December 4, 1912, the General Board of the Navy, in a letter to the Secretary of the Navy, stated its belief that Guam "should be given defenses of a naval base of the first order" and recommended that the "exact character of the defense of Guam to meet the views expressed above be referred to the War Colleges of the two services with directions to confer and submit at an early date a joint report of their preliminary conclusions, based upon such information as may be available in this country."

The recommendation of the General Board was complied with. The War College committees worked entirely independently of each other, completed and submitted their reports without any interchange of views. A copy of each of the reports is hereto appended.

The joint conference was then arranged and the committees met at the Army War College on March 24, 1913. They now submit the following joint report:

1. Although each committee, in its preliminary study, went into a general discussion of the island of Guam as a naval base---including policy and strategy, equipment and supplies, the improvement of the harbor and the measures of defense, the committees conceive the scope of their inquiry in the present instance to be limited to the technical subject of the exact character of the defense of Guam as a naval base of the first order---including the determination of what elements should constitute the defense and the amount of each, with as close approximation as the information available will admit.

2. The defenses should be of such character and extent as to preclude the probability of successful attack by any forces that may be brought against them.

3. The improvements to the harbor should not precede the measures for security.

4. Fixed Harbor Defenses.

Near Piti: 4 - 12" mortars with all-around fire.

Cabras Island: 2 - 14" or 16" guns with sector of fire of about 240°.
2 - 6" guns with sector of fire of about 240°.

Orote Peninsula: 4 - 12" mortars with all-around fire.
2 - 14" or 16" guns near Orote Point, with sector of fire of about 300°.
2 - 6" guns near old Fort Santiago.
4 - 6" guns near Orote Point.

Submarine mines near the entrance and on Calalan Bank, number, type, location, &c., to be determined after a personal examination of the locality.

Boom and net defense stretching from Luminao Reef to Orote Peninsula, inside the mine fields, for the security of vessels in the outer harbor against torpedo attack.

5 - 60" searchlights---

3 near Orote Point and
2 on Cabras Island.

The special function of all the 6" guns will be to cover the mine fields, the booms and nets and possibly other obstructions that may be placed at the entrance and along Calalan Bank from Orote Point to Luminao Reef.

If a breakwater is built on Calalan Bank it may be possible to substitute 3" guns for a part or all of the four 6" guns near Orote Point.

As between the 14" and 16" guns, Colonel Foote, Commander McKean and Major Poore recommend the most powerful guns practicable. Commander Schofield, Major Harts and Captain Ellis recommend 14" guns.

NOTE:- Colonel Foote and Major Poore recommend in addition to the above four 12" mortars, with all-around fire, manned by about 110 officers and men, near Alifan, to supplement the harbor defense and at the same time prevent the enemy from securing a base at one of the landing places in the southern part of the island.

The Naval members of the conference recommend that the heaviest guns be mounted in twin turrets. The Army members of the conference recommend that the type of mount for all guns be determined after a

full consideration of the advantages and disadvantages of the various types and after a personal examination of sites.

Personnel for the fixed harbor defense, including Coast Artillery Supports:

8 companies Coast Artillery -

about 40 officers and 860 men.

5. Mobile Naval Defense.

7 Submarines.

3 Destroyers, 2d Class.

2 Seagoing tugs.

5 Aero boats.

Not to be new construction---except aero boats---but a new distribution of boats already built.

6. Mobile Land Defense.

Field and machine guns should, as far as practicable, take the place of troops. It costs about $1000 per year per man for mobile troops. While the original cost of guns and material is considerable, its later expense will be that of maintenance only.

	Off. & Men
Separate Brigade Headquarters,	15
3 Regiments Infantry (F.S.R. strength) with 84 machine guns, (including those regularly belonging to organizations)	4653

NOTE:- Colonel Foote dissented and recommended 3 Regiments Infantry at maximum authorized strength --- 5661. officers and men.
Major Poore dissented and recommended 4 Regiments Infantry at maximum authorized strength --- 7548 officers and men.

Mobile Artillery:-

16 - 4.7" guns,

8 - 6" howitzers

40 - 3" mountain guns,

18 - 36" portable searchlights.

Coast Artillery for manning mobile artillery - - - - - - 1150

Brought forward - - - - - - - - - - - - - - - -	5818	Off. & men
1 Company Engineers	168	"
1 Company Signal Corps	104	"
Sanitary troops	165	"
Civilian clerks and employees	150	
Total - - - - - -	6405	

The foregoing estimate presupposes the most complete system of wire communications and roads, the fullest use of material obstacles, motor transport for all guns, and motor transport for at least one battalion of infantry.

Roads.

In order to reduce to a minimum the military forces thought necessary for defense against a land attack, a system of interior roads suitable for motor transportation and an adequate signal installation are recognized as being essential. The more perfect this system and the greater the facility with which troops and guns can be moved to a threatened point, the less the number of men required for the proper defense of the island.

Roads have been built for a number of years under the supervision of the local government and they now extend in various directions from Agat, Agana and several other points. This extension is being carried on at the rate of about eight to ten miles per year with island revenues without special reference to the military needs. The materials at hand are said to be sufficiently good for fair roads. Based on the cost of present construction the estimated cost has been placed at about $4,000 per mile, using native labor and local materials, the width being taken as 16 feet with 8 feet of paving. In general a road protected from view and secure from fire from sea is proposed around the entire island, that part lying north of Agana Bay and Port Pago being merely a paved trail about 4 feet wide, the narrowest practicable for mountain artillery. The difficulty of landing in this part, the lack of water, and the dense jungle make an approach over this portion of the island so

difficult as to warrant this narrow width of road. The estimate of cost of this trail is $2,500 per mile. It is proposed to construct all the roads of such grade, surface and curvature as to permit their use by motor trucks or motor cycles at fair speed at all seasons. Connecting with this main belt line are to be spurs to various important landing places. The connecting lines to the various artillery positions along the coast are not shown on the map herewith as their location cannot be accurately placed on the maps available. Their construction, however, is included in the estimate.

The total length of the new roads necessary is taken at 75 miles and the length of the 4-foot paved trail as 50 miles. These roads are so laid out in the southern half of the island as to permit easy reinforcements from the central reserve near Alifan Hill and the prompt reinforcement of outposts from the supports.

Estimate of Cost:

75 miles of road @ $4,000		$300,000
50 " " trail @ $2,500		125,000
	Total	$425,000

Water Supply.

The suggested location of the main reserve of the mobile defensive force near Alifan Hill, that of the main hospital near Atantano, and of the fixed defenses on Orote Point and Cabras Island, makes the water supply for peace conditions a comparatively simple problem, as an adequate quantity is reported to be obtainable from the Paulana River, supplemented by the Atantano River, if necessary. Reservoirs on Orote Peninsula, if required, can be so placed as to act as pressure reservoirs and for storage in a prolonged defense.

The location of the supports of the mobile defense, it is reported, may always be so placed on streams as to make a separate supply for these points unnecessary over the southern part of the island but in the northern part no streams exist and tanks or small reservoirs would be needed. It is estimated that a water system for the proposed garrison can be built for $250,000, including reservoirs on Orote Peninsula.

Estimated Cost.

The only items of cost which appear to be necessary to include, under the instructions received, are those relating to the military defenses alone. The cost of the utilities and of the other preparations of the island for naval use is not included as this is not thought to be required by the General Board of the Navy. No estimate of the cost of naval defense is made nor the annual cost of maintenance.

Construction Necessary.

Roads (125 miles)	$ 425,000	
Magazines	100,000	
Barracks and Quarters	3,000,000	
Water Supply	250,000	
General Joint Hospital	250,000	$ 4,025,000

Military Defense.

Mobile Artillery and Machine Guns	$ 1,250,000	
Mobile Searchlights	90,000	
Motor Trucks and Vehicles	150,000	$ 1,490,000

Coast Artillery:

8 - 6" guns and emplacements	$ 560,000	
4 - 14" guns and emplacements	1,800,000	
8 - 12" mortars	675,000	
5 - 60" searchlights	110,000	
Ammunition	2,000,000	$ 5,145,000

Power Plant	100,000	
Fire Control	85,000	
Submarine Mines and Accessories	190,000	
Construction Plant	150,000	
Boom and net at entrance	250,000	
Telephone System	50,000	$ 825,000
Total ----------		$ 11,485,000

7. For the purpose of making definite plans and estimates of the requirements necessary to prepare and secure Guam as a first-class naval base it is recommended:

(a) That a thorough military and naval survey of the island be made.

(b) That a joint board of Army and Navy officers be sent to Guam to perfect the plans of defense after a personal study of the situation.

(c) That the survey be undertaken as soon as practicable and that it be well under way on the arrival of the joint board.

S. M. FOOTE,
Colonel, Coast Artillery Corps.

J. S. McKEAN,
Commander, U. S. Navy.

F. H. SCHOFIELD,
Commander, U. S. Navy.

Wm. W. HARTS,
Major, Corps of Engineers.

B. A. POORE,
Major, General Staff.

E. H. ELLIS,
Captain, U. S. M. C.

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No. 21

r Commander Frank H. Schofield, U.S.N.

Captain E.H.Ellis, U.S.M.C.

its Report of Naval War College Committee on Defense of Guam.

Copy No.5

To be returned

DEFENSE OF GUAM.

PART I.

THE RELATION OF GUAM

TO

OUR POSITION IN THE PACIFIC.

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.

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.

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 ecomomic 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 con-

servation 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, Liaotung 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 fore-

seas, 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 Philippines. 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 suspen-

sion 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 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 maintain 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 this 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-Pauncefort 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-borne 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 obe 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 preapred 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 continential 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 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</u>

Hawaiian Islands on which our fleet can depend in time of War. 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 underway. 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) Tropedo 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 somewhere points out that often times those events that do not transpire are more important than those that do transpire. The wars prevented mean more towards national progress that 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.

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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 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 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 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 "
Ponape, Caroline Islands (Germany)	906 "
Mortlock, " " (")	750 "
Eniwetok Islands (")	1,055 "
Admiralty 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 named 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 "

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 Barrigada 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-Summay:- 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 landing difficult. 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 monnlight 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.

Ipao 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. Tumhum 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 Tarague):- Landing is only practicable at high water by a very small boat.

Tarague:- 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 except 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 trasnports. 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 trasnports. Landing is practicable only under favorable conditions.

Sume (River mouth):- Approach through small break in reeff. 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 only 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 800 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, about 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 a considerable distance out covered by about two 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 on 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 about 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 occur 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 serviceability.

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 ft., 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 miles.

That one reef in the outer anchorage, near Cabras 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 $1,500,000.

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 upon 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 Easter 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 contest 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 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 blocking 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 engagement of the two fleets. Any subsequent attack from the sea will be of relatively less importance. The situation of Guam is such that we need not seriously consider blackading 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 naval 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 <u>did</u> use their capital ships for bombarding so long as they could do so with <u>safety</u>. 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 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 turrets and numerous enough to make 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 all masked 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 3/4 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 but 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 Attacks.

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 Orote Point (illuminating light).

1 on Orote 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.

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 sea coast 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 sea coast 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 co-operation of the sea and land forces, the excellent landing organization, and the efficiency of the personnel and material 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 reconnaissances 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 80 to 100 men each and drew not 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-Bella 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 re-entrant 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 sacrific, 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 reconnoitred 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 material 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 sea coast, 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" sea coast 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 underway. 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 these 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 4-1/2 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 5-3/4 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 outline, 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.

Four 6" guns with two 60-inch searchlights ---------- 6 officers, 166 men.

Mobile Army.

2 Regts. plus one Batn. Inf. with 84 M.G. -	117 "	3440 "
1 Batn. 6" Siege Howitzers (12) guns - -	18 "	531 "
1 Regt. plus one Batn. Field Artillery -	60 "	1657 "
1 Co. Engineers, 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 Batn. Inf. with 12 Machine Guns.
2 Batteries Field Artillery.
Engineer Detachment with 4 portable searchlights.

SECTION II. - Facpi Point to Sume River.

Troops:- 1-1/2 Batn. Inf. with 18 Machine Guns.
1 Baty. 6" Siege Howitzers.
1 Baty. Field Artillery.
Engineer detachment with six portable searchlights.

SECTION III. - Sume River to Asiga Point.

Troops:- 2 Cos. Inf. with 12 Machine Guns.
1 Baty. Field Artillery.
Engineer detachment with two portable searchlights.

SECTION IV. - Asiga Point to Pago Point.

Troops:- 1 Batn. Inf. with 18 Machine Guns.
1 Baty. 6" Siege Howitzers.
1 Baty. Field Artillery.
Engineer detachment with 4 portable searchlights.

SECTION V. - Pago Point to Piti.

Troops:- 1 Batn. Inf. with 24 Machine Guns.
1 Baty. Field Artillery.
Engineer detachment with two portable searchlights.

GENERAL RESERVE. - Near Salifan Mountain.

Troops:- 2 Batn. Inf. with 12 Machine Guns.
1 Battery 6" Siege Howitzers.
1 Baty. Field Artillery.

Disposition:- Entire force at reserve station except those which may be detailed as Coast Artillery supports.

WIRE & VISUAL COMMUNICATIONS.

The particular necessity for rapid co-operation 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 coastline 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.

Well which have been sunk on Orote Pen. have not

proved satisfactory either in quantity 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 reservoir. 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 (motor) 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	
Total	31	510

II.

Land Defense.

Coast Artillery.

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

Mobile Army.

2 Regts. plus one Batn.Inf. with 84 M.G.	117	3440
1 Batn. 6" Siege Howitzers (12) guns	18	531
1 Regt. plus one Batn. Field Artillery	60	1657
1 Co. Engineers, with 18 S.L.	4	164
1 Co. Signal Corps	4	100
Total	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 insofar 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.,
Mar. 5, 1913.

Approved.

W. L. RODGERS.

Captain, 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 force 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, searchlights, 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.

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Accession Year

No.

thor Colonel Stephen W. Foote, Coast Artillery Corps
Commander J. S. McKean, U.S. Navy
Major Benjamin A Poore, General Staff (Inf.)
Major W. D Connor, General Staff (Eng.)

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ntents Report of Army War College
Committee on Defense of Guam

--- CONFIDENTIAL ---

THE DEFENSE OF GUAM.

Prepared by

A Committee consisting of--

Colonel Stephen M. Foote, Coast Artillery Corps,

Commander J. S. McKean, United States Navy,

Major Benjamin A. Poore, General Staff (infantry),

Major W. D. Connor, General Staff (Corps of Engrs.).

January, 1913.

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I.

INTRODUCTION.

Guam, the largest and most populous of the Ladrone (or Mariana) Islands in the western Pacific, came into possession of the United States as a result of the war with Spain in 1898.

The island is about 28 miles long, from N. N. E. to S. S. W., 3 to 8 miles wide and has an area of about 200 square miles.

It has one good harbor, of fair size with deep water, named San Luis d'Apra, on the western side of the island.

The surface is a tableland rising rather abruptly from the sea to a height of 300 to 500 feet. From this tableland there rise a number of hills, mostly in the central and southern portion, to elevations of 600 to 1200 feet.

The island is covered with dense tropical jungle except small tracts now under cultivation. The high ground is covered with sword grass. The lower ground contains some valuable timber. It is estimated that 65 per cent. of the area is adapted to cultivation.

The principal products are cocoanuts, bananas, rice, corn, sweet potatoes, taro. Other agricultural products are raised in small quantities. The United States maintains an Agricultural Experiment Station on the island. It appears that foodstuffs, in considerable amount and variety, can, with proper cultivation, be produced.

The population consists of about 12,000, nearly all of Chamorro stock, intermixed with Philippine Tagals and Spaniards. Their speech is a Malay dialect corrupted by Tagal and Spanish. They are being taught English in the schools since the American occupation.

While the climate of Guam is tropical it is cooler than the Philippines, except during August and September in which months there is a cessation of the northeast tradewinds. The climate is considered naturally healthful.

Normally, the dry season is the first half of the calendar year,

the wet season the second half. Usually there are occasional rains in the dry season, but during the year 1912 the dry season lasted with almost no rain, from January to June both inclusive.

Agana is the principal town and under the Spanish regime was the capital of the Ladrones. It is about 5 miles northeast from Piti, a landing near the northeastern corner of the harbor.

There is an excellent road from Piti to Agana. There are other indifferent roads and trails leading to various parts of the island.

The Ladrone Islands were discovered by Magellan in 1521 and the flag of Spain was formally planted on them by Legaspi in 1565. During Spanish dominion in the Americas the island of Guam was of value to Spain as a stopping place where her vessels sailing between Mexico and the Philippines could secure water and fresh provisions.

On June 20, 1898, the United States and Spain being then at war, the United States Cruiser Charleston on its way to Manila convoying several army transports loaded with troops, entered the harbor of Guam without opposition and received its surrender. The garrison consisted of 1 company of Spaniards and 1 company of Chamorros. The former was taken to Manila, the latter released on the island.

On December 10, 1898, Spain ceded Guam to the United States in the treaty of Paris.

On December 23, 1898, the President, in an executive proclamation, placed the control of Guam under the Navy Department, where it has since remained.

On August 10, 1899, the first American governor of Guam, an officer of the United States Navy, took up his duties on the island.

In February, 1900, General Joseph Wheeler, U. S. Volunteers, visited the island under orders from Washington and later made a report which has been printed as War Department Document No. 28, June, 1900.

From November 28, 1900, to March 28, 1901, a Board of Navy and Army officers surveyed the harbor of Guam and made plans and estimates for improving the harbor and fortifying it as a secondary Naval base. The

members of the Board were Captain John F. Merry, U. S. Navy, Major John Biddle, Corps of Engineers, U. S. Army, and Lieutenant Albert M. Beecher, U. S. Navy. The Report of the Guam Survey Board to the Secretary of the Navy, July 25, 1901, was published by the Government Printing Office, 1902.

In 1905 cable communication was established with the Caroline Islands. Since 1905 connections have been made with the United States via Midway, with the Philippines and with Japan. The cable station is at Sumay in Apra harbor. All messages are relayed at this station. There is a small wireless station on the island. The Navy Department plans contemplate a primary radio station on Guam as one of the naval long distance series.

Guam possesses potential naval and military value to the United States by reason of two strategical factors. 1st. Its deep-water harbor--the only one in this part of the Pacific. 2d. Its position on the central route from the western coast of the United States to the eastern coast of Asia. It lies 3300 miles west of Honolulu, 1300 south of Yokohama, 1500 east of Manila; its latitude is north 13°, Manila is 14°, Honolulu 21°.

On March 15, 1900, General Wheeler reported to the President of the United States that "The general conditions of the harbor of San Luis d'Apra are very favorable to the establishment of a coaling station and landing place for large vessels."

The river and harbor bill approved June 6, 1900, contained an item providing for the survey of the harbor of San Luis d'Apra, and the preparation of plans and estimates for the improvement of the same, the work to be done under the Secretary of the Navy.

In the spring of 1901 the survey was completed, the Board reporting in part under the head of fortifications, that Guam should "be sufficiently protected to prevent a few vessels from seizing the island."

In 1905 the Naval General Board recommended that Guam be fortified as a second-class naval base (coaling and cable station).

In 1906 the National Coast Defense Board recommended the fortification of Guam as a coaling station.

In June, 1907, the Naval General Board recommended that Guam be made a naval advance base and coaling station with requisite defenses, and in October, 1907, the Board stated "At Guam little is needed but a coaling plant with sufficient protection to guard against surprise attacks against it."

In the spring of 1908 the subject of Guam was taken up, incidentally and briefly, at the Army War College by a committee on the Hawaiian Islands. This committee, composed of Commander W. L. Rodgers, U.S.N., Major H. D. Todd, C.A.C., and Captain S. A. Cheney, C. E., considered Guam as the site of a coaling station only.

In February, 1909, the Naval General Board adhered to its recommendations of 1907.

Until 1909 the idea seemed to be held quite generally and consistently that Guam should be a coaling station or <u>secondary</u> naval base only.

Beginning with 1909 the feeling has been growing that we should make Guam a naval base of the <u>first order.</u>

In July, 1909, a committee of the Army War College made a strategical study of Guam and came to the conclusion that "because of its potentialities for the present or for the future, the maintainance and proper preparation of Guam (as a naval base) seem essential for our national self-esteem and safety."

In 1909 the Naval War College made a report of which the following is an extract: "* * * * Guam should be fortified and developed as a base as is now being done in Hawaii."

In 1910 the Naval War College said "We believe that costly though it would be, Guam can be and should be made into a heavily fortified naval base."

In 1911 the Naval War College studies on this subject concluded: "For the protection of the Philippines and for the maintainance of our naval power in those waters a naval base there (in Guam) of the first order is essential."

In 1912 the Naval War College committee on Guam endorsed the con-

clusion of 1911.

On December 4, 1912, the Naval General Board stated "The General Board believes that Guam occupies such a commanding strategic position in the Pacific, and one of such vital importance to our national interests in that ocean, that it is essential to hold it securely against any form of attack, * * * * that it should be given defenses of a naval base of the first order," and recommended that the subject be referred to the Army War College to report its preliminary conclusions, based upon such information as may be at hand, as to the exact character of the defence of Guam to meet the view expressed above.

The subject was so referred on December 9th, 1912, and this report is submitted in compliance therewith. It has been thought well to go rather extensively into the matter in order to present in onepaper a comprehensive view of the entire subject.

II.

STRATEGIC STUDY OF THE PACIFIC.

See Appendix C.

The Pacific Strategical Area divides itself into two parts: (1) The North Pacific extending as far south as the line Panama--Galapagos Islands--Tutuila--Singapore and (2) The South Pacific south of, but including this same line.

The North Pacific Area divides naturally into the Eastern and Western Areas.

The Eastern North Pacific Area is, with the exception of three (3) strategic points---Esquimault--Magdalena Bay and the Galapagos Islands entirely controlled by the United States who owns all the other strategic points in this area, the Strategic Center of which is the Sandwich Islands.

The Western North Pacific---west of the line Tutuila--Midway--Kiska---is divided among all the military and maritime powers (except Austria and Italy) each possessing one or more strategic points. The Strategic Center of this Area is the Island of Guam.

The Eastern South Pacific is of importance only from the fact that certain powers might use routes through this area to reach strategic points in the Eastern North Pacific. The important strategic points are the Straits of Magellan, Valparaiso, The Galapagos Islands, Tahite, Tutuila.

The Western South Pacific is of importance only because Australia and New Zealand form part of the British strategic front extending from Hong Kong through Singapore--Australia--New Zealand--to the Cape of Good Hope and has numerous available bases in its rear and a few points available for small Advance Bases in front of it.

An examination of the accompanying Strategic Chart of the Pacific shows such a coincidence in the lines of operations, communication and supplies for the various powers that for our purposes the Pacific can best be considered as a single strategic area.

The important strategic points are as follows:

(1) Belonging to the United States.

The Philippines, Guam, Honolulu, Kiska, Unalaska, Puget Sound, San Francisco, Panama, Tutuila.

(2) Belonging to Great Britain.

Cape Town, Wellington, Auckland, Melbourne, Singapore, Hong Kong.

(3) Belonging to Japan.

Yetorofu, Hakodate, Yokohama, Inland Sea, Bonin Islands, Loo Choo Island, Formosa and the Pescadores.

(4) Belonging to Russia.

Vladivostock.

(5) Belonging to Germany.

Kiao Chao, The Carolines, Samoa.

(6) Belonging to France.

Tonkin and Tahiti.

(7) Belonging to China.

Gulf of Pechili, Shanghai, Amoy, Canton.

(8) Belonging to Portugal.

Macao.

(9) Belonging to Mexico.

Magdalena Bay.

(10) Belonging to Ecuador.

Galapagos Islands.

(11) Belonging to Chile.

Valparaiso--Punta Arenas.

If strategic lines connecting these various points be drawn---see Strategic Chart of the Pacific---the numerous intersections of these lines in and near Guam and Honolulu will at once mark these two points as the strategic foci of the whole Pacific, Guam the focus of

the Western part and Honolulu of the Eastern. Each of these Strategic Centers used as the Base of a Fleet dominates the strategic fronts opposed to it. For example, a fleet based on Honolulu threatens or protects our strategic front from Unalaska to Panama and in the same way a fleet based on Guam (supposing it developed and equipped as a first-class naval base) threatens every strategic area from Vladivostock and Yetorofu to Singapore; lies on the flank of the line of communications or operations from Australia and New Zealand to Esquimault. It is to be further noted that even as to Australia, New Zealand and Cape Town that the combination of Guam and Honolulu cuts the lines of communication or operations between Great Britain's bases in the Western Pacific and her only strategic base, Esquimault, in the Eastern Pacific.

Each of these centers when held by a friend protects the same area and front that it threatens when held by an enemy. The two centers in a single hand furnish the best of protection and the gravest of threats. When held by opposing forces they are practically of equal value and, with equal naval forces based on each, the fight would be a draw as neither fleet would dare pass the other's base to advance on his coast as he would leave the enemy's fleet on his line of communication and supply, nearer its base than he, and would certainly meet disaster. A general fleet action is the only solution.

Strategically, with both these centers in our hands properly fortified and equipped as first-class naval bases with an advance base in the Philippines our Pacific frontier is on the China coast.

Both Guam and Pearl Harbor possess, as shown above, the primary and essential characteristics of a naval base---position, and are unique in being the only available positions in their respective areas.

Guam has no resources but being a small island can be given the other requisite of a naval base---resources and strength---at a minimum cost of men and money.

Pearl Harbor has limited resources available and can be made strong, but, at an expense of both men and money greatly in excess of that required

for Guam. Roughly the cost of defenses of Guam and Oahu would be in the ratio of the size of the two islands---200 sq. miles - 600 sq. miles - or 1 to 3.

With Guam converted into a Pacific Gibraltar, Honolulu behind our western frontier, covered by Guam, near home ports, becomes a secondary base and can be less strongly held as against attacks from the west. Any other attack, assuming the Canal in our possession, would have to come through the Straits of Magellan or from Cape Town via Australia and would be so long in reaching its objective that we would have ample time to reinforce the garrison from the mainland. For the same reasons and to the same degree the fortification of Guam and Oahu reduces the necessary permanent garrisons at our naval bases on the mainland. In effect this fortification would be an expanded and intelligently elaborated coast defense, which, combined with an adequate fleet to bind them together would keep the enemy from ever approaching our coast and would permit our sea trade between the Canal and our west coast ports to be carried out in almost the security of times of peace.

As is shown above and by the Strategic Chart all lines of approach to our coast, whoever the enemy, mustpass by either Guam or Pearl Harbor or both. Their general, almost universal importance, is readily seen. Their particular importance against our most probable enemy in the Pacific will become clear on a further study of the controlling conditions in the Western Pacific.

Our weakness in the Philippines makes them the most probable first point of attack by any nation having a sufficient army available to capture the islands and drive out our small army of occupation. Taking the Pacific powers in order we know that Russia has a large mobile force in Siberia and Manchuria but that she will not have a naval force available for ten years with which to escort an overseas expedition, cover its landing, etc., and that her whole effort---military and naval---will probably be expended in other directions, which offer better rewards, than would the Philippines. Russia can therefore be left out of consideration.

China has neither army or navy (though the Philippines could she take and keep them would be of immense value to her) and therefore we need not consider her further.

Germany, with a base at Kiao Chao, owning the Carolines and Ladrones (except Guam) is our nearest neighbor and undoubtedly covets the Philippines for colonial and commercial exploitation; Guam for its strategic position and the fact that San Luis D'Apra is the only good harbor in either the Carolines or Ladrones. Germany has, and will for some years continue to have, a superior navy, but she is forced, under present international political conditions, to keep her navy at home. She has a large army but no organized expeditionary force for foreign service and she will not use any units of her home army as such expeditionary force for the same reasons that keep her navy at home. For the present, or at any time when we build a superior fleet, she can be left out of consideration.

France in Annam and Tonquin, with Tahiti to develop as a naval and commercial base in the Pacific and Fort de France, Martinique for a like purpose in the Caribbean, with a growing and only slightly inferior fleet, would, if she had a mobile force of sufficient size in the Far East, have to be considered in reference both to the Philippines and the Canal, but not having any such force of sufficient size to make it of importance she also can be put aside.

Portugal with Macao, and Helland with her island possessions have neither an army or navy available and need not be considered.

Great Britain has a superior fleet but like Germany, and for the same reasons, is compelled to keep it at home. She has comparatively few available soldiers at home, in India, or elsewhere to undertake the capture and holding of the Philippines though she would very much like to own them for commercial and political reasons. Her forces in Australia are colonial forces for colonial purposes only and it is not believed that that colony would permit their use for other than home defense and therefore under present political conditions Great Britain---with Canada and Australia---can be eliminated. This leaves only

Japan. She is building as rapidly as her finances will permit a

navy that may soon equal or even surpass our own. She has a very large trained army. She already owns Formosa; has a large fortified naval base in the Pescadores; and in view of her surplus population, the failure of her people to succeed as colonists in Manchuria, Corea and Formosa, she feels she needs the Philippines and that there, competing with Filipinos instead of Chinese, as in the other colonies, her people could succeed. She not only needs room for her people but appreciates fully the strategical position, both from a military and commercial point of view, of the Philippines, and the strategical value of Guam from the naval point of view. She tried to buy the Ladrones from Spain in 1890 and again in 1897-98 under the pretext of extending her fisheries. Further, Japan has never agreed to our annexation of the Sandwich Islands and has announced that she never will, and has a grievance against our country for our discrimination against her immigrants and does not like the Monroe Doctrine or the "Open Door" policy. From these conditions it appears unquestionable that Japan is our most probable enemy in the Pacific and it is therefore necessary to determine the value of the Philippines, Guam and Honolulu, with her as a possible enemy.

The Philippines are undoubtedly of great strategic value from both commercial and military points of view. From the military point of view they have position, some resources, but are absolutely and relatively weak and we cannot hold them against the military forces Japan could land there in the absence of our fleet. Nor does there seem to be any point in the whole group of islands that possesses or can be supplied with the necessary characteristics to enable us to hold it as a naval base. Its nearness to Japan and her advanced base in the Pescadores when taken in connection with the above weaknesses compels us to find another available point from which the Philippines can be defended. The best and only one is Guam. With Guam developed as a first-class naval base, with an equal fleet based thereon, Japan's home coasts, her lines of supply and communication to Formosa and the Pescadores, and of an expeditionary force landed in the Philippines would be so menaced that she would not attempt an invasion of the Philippines. The same is true of Alaska and our West

Coast and she would not attempt landing at either until a fleet action had been decided in her favor.

From the above considerations it seems clear that in any operations in the Pacific either offensive or defensive, whether we hold the Philippines or give them up, Guam and Pearl Harbor furnish the best bases and lines of operation, supply and communication; that there are no other points that will take their places although their value can be enhanced by having strong flanking supports at Tutuila and The Galapagos Islands on the south; Unalaska or Popoff Bay on the north and an advance base in the Philippines.

Having in view the opening of the Panama Canal, our widening interests in the Pacific, and the growing activities not only of Japan but of European nations in that part of the world, we agree with the Navy General Board in its opinion that

"Guam occupies such a commanding strategic position in the Pacific, and one of such vital importance to our national interests in that ocean, that it is essential to hold it securely against any form of attack. It is axiomatic that a campaign involving the United States in the Far East rests primarily upon the control of the sea. To maintain, or under any circumstances, to attain that control, the fleet's line of communication must be beyond the probability of successful attack. The distance from Honolulu direct to the Philippines or to any destination of our fleet in the Far East is too long to traverse without an intermediate point of support, and Guam furnishes that point geographically. If, however, it be undefended, or insufficiently defended, it will be taken by our enemy, who, resting upon Guam, will certainly be able to dispute the control of the sea for a long time, and may be able to prevent us from ever getting it in these waters. The possession of Guam under naval control is a vital necessity to our country in engaging in war in the Far East. The General Board therefore believes that it should be given defenses of a naval base of the first order."

THE TACTICAL VALUE OF GUAM.

San Luid d'Apra can unquestionably be developed at a comparatively small cost into a harbor adequate in all respects for a first-class naval base for our whole fleet.

This does not mean for the berthing of the whole fleet in security at one time, but does mean the berthing for discharging and receiving stores of a large number of the fleet auxiliaries; the berthing for repairs of a number of the fighting ships; of the docking of at least one capital ship, one Cruiser or Auxiliary; one Destroyer and one Submarine, at the same time; and finally of sufficient moorings to permit of the simultaneous refueling in calm water of at least a squadron (including all its units of all types).

The remainder of the fighting fleet would be cruising at low speeds outside the port on watch for the enemy and assisting in the defense of the island, or in suitable weather they might lie at anchor outside Cabras Island or even on the shoal southwest of Guam.

In the absence of the fleet the Harbor and Island can be defended by - 1st. A mobile naval defense consisting of Destroyers, Submarines and Aëro-boats; 2d. Permanent fortifications and mines; and 3d. By a force of Infantry and Mobile Artillery. The only places available for landing large bodies of troops are San Luis d'Apra, Umata, and Tarafofa Bays. The numerous small openings suitable for small boat expeditions can either be closed or covered by field guns located in prepared positions connected by military roads with central garrisons. The field guns supported by Infantry can deny a landing to any force which could use the limited water approaches to these places. The prepared positions would be so selected as to be screened from the fire of ship's guns covering the attempt to land.

III.

Improvement of Harbor required.

1. To dredge both outer and inner harbor connecting channel as shown in Report of Guam Survey Board, with arrangements for increasing the dredged areas as needed in future, least depth 30 feet. $500,000.

2. Build breakwater on Calalan Bank as suggested by Guam Survey Board. $2,000,000.

3. Mooring buoys with their anchors and chains, (50) - $250,000.

4. 5 Piers - 50' x 1000' = 250,000 sq. ft.
5 " - 50' x 500' = 125,000 " "
10 " - 25' x 250' = 62,500 " "
437,500 sq. ft. @ $3.00 per sq. ft.
$1,500,000.

Equipment as Naval Base.

1. A drydock of sufficient capacity to take the largest ship that can pass through the Panama Canal - say 1000 feet long, 110 feet beam, displacing 50,000 tons. This dock to be capable of being divided by caissons into 2 or 3 sections.

A dock for Auxiliaries and Torpedo Destroyers 110' x 650' ---
1. $ 3,500,000.
2. 2,500,000.

2. A Coaling Plant of 500,000 tons capacity, water storage,---
$ 500,000.

2a. An Oil Fuel Plant. The underground tanks with pumping plant, capable of storing 250,000 tons of fuel oil, located so as to give gravity supply,----- $ 250,000.

2b. Magazines for resupply of whole fleet, $ 100,000.

3. Storehouses adequate for three months' stores for the whole fleet and 12 months' supply of all forces on the island in addition,---
$ 250,000.

4. Repair shops adequate for whole fleet, $ 250,000.

5. Hangars for aeroplane flotilla of 10 units,-- $ 25,000.

6. A barracks for the yard forces in shops, storehouses, etc., (all of these men should be enlisted)----- and 500 mechanics, clerks, foremen,

leading laborers, and helpers. $100,000.

Quarters for Officers of Station. (1 R. A., 1 Captain, 3 Commanders, 2 Constructors, 2 Paymasters, 5 Doctors, 1 Civil Engineer, 2 Lieut. Commanders, 6 Lieutenants, 10 Warrant Officers), $250,000.

IV.

Naval Defenses required.

1.	Ten (10) Coast Defense Submarines.	$ 6,000,000.
2.	Ten (10) Destroyers,	10,000,000.
3.	Ten (10) Aero-boats.	100,000.
4.	Five (5) sea going armed tugs fitted for mining and trawling.	1,000,000.
5.	One (1) Wrecking, Repair and Mine Depot Ship.	750,000.
		$ 17,850,000.
6.	Personnel of above about 1500, Annual Cost,	1,500,000.
7.	Maintenance of Material, (per year)	1,500,000.
		3,000,000.

Note. The above force would be a part of the Navy needed by the country whether we develop Guam as a 1st class naval base or not. It is believed that the total fleet required would be materially less with this base than without it, that is to say for operations in the western Pacific a fleet "x" based on Guam would be stronger than a fleet "y" consisting of a somewhat greater number of ships based on Oahu and than a fleet "z" of a still greater number based on San Francisco or Panama.

V.

FIXED DEFENSES.

After the breakwater is constructed on Calalan Bank and a bridge built from the mainland to the eastern end of Cabras Island the only entrance to the harbor will be the deep water entrance, six or seven hundred yards wide, between Orote Point and the western end of Calalan Bank.

The anchorage will have Luminan Reef on the north, Calalan Bank on the west, Orote Peninsula on the south and two miles of shallow water between it and the mainland on the east.

The navy yard and basin will be southeast of the anchorage, where the inner shore of Orote Peninsula turns to the southeast. It will thus be protected from the west by the high ground of the Peninsula and partially protected from the south by the lower ridges of the Peninsula. It is wholly exposed to fire from the north.

If the enemy appears in force and our fleet is not present the defenses must keep the enemy from entering the harbor, must keep him from bombarding the navy yard and any shipping there may be in the harbor and must keep his transports as far away as possible. If our fleet were present it would be part outside and part inside the harbor. Our guns should cover the water area as far as possible outside the harbor entrance to assist the fleet in formation for action and in the action itself.

The areas, therefore, to be covered by our fixed defenses are as follows: 1st, the entrance, with submarine mines and all guns and mortars; 2d, the approaches to the entrance, with all guns and mortars; 3d, the water areas north and south of the harbor to prevent firing upon the navy yard or upon shipping in the harbor and to cover the deployment of the fleet,—part of the guns and all of the mortars; 4th, the approaches to landing places on east and west shores of the island,—all or part of the mortars.

The armament recommended is the following:

On the mainland near Piti.

8 - 12" mortars with all-around fire. New type 18,000 yard range.

Cabras Island.

2 - 14" guns with a sector of fire for one or both guns from Facpi Point to Saupon Point

2 - 6" guns at a lower level than the 14" guns with about the same sector of fire.

~~2 - 3" guns near the western end of Cabras Island at a lower level than the 6", with all-around fire.~~

Orote Peninsula.

8 - 12" mortars with all-around fire.

2 - 14" guns near Orote Point, facing northwest, the limit of the left gun to be Facpi Point and the right, Saupon Point.

2 - 6" guns near old Fort Santiago, at a lower level than the 14", to cover the entrance, thence to the north, the limit of the right gun to be Saupon Point.

4 ~~X~~ - 3" guns at a lower level than the 6" between the 6" and 14" batteries, with about the same sector of fire as the 6".

Submarine Mines near the entrance. Number, type, location, etc., to be determined on the spot.

6 - 60" searchlights.

Coast Artillery troops to handle the armament, accessories, etc., and furnish supports for the batteries.

Near Piti	2 companies.
On Cabras Island	2 companies.
On Orote Point	4 companies.
Submarine Mines) Mine Planter) Power Plant) Searchlights)	1 company. —
	9 companies with a strength of 150

each makes the number of Coast Artillery 1350 for the fixed defenses, including the necessary Coast Artillery Supports.

The map accompanying this report marked "B" shows approximately the location of all the elements of the fixed and mobile defenses.

VI.

MOBILE LAND DEFENSE.

This shows the minimum defense considered adequate to prevent the landing and accumulation of a hostile force large enough to attempt land operations against the naval base and the harbor defenses.

The land defense should not be confined to passive resistance, but should be such as to meet actively any move that an enemy could make. It is not believed to be necessary to have at all possible landing places permanent garrisons of strength equal to an opposing force; but by means of improved communications, garrisons may be so disposed as to be promptly assembled in force at threatened points.

Within their field of fire, the harbor defenses should delay landing sufficiently to enable the mobile troops to cover threatened points in ample time for successful resistance. At other points, mobile heavy guns must accomplish this purpose. The mobile force must be in such a state of preparedness and so entirely independent of reinforcements, as to assure land control of the island until such time as our navy shall secure complete control of the Pacific.

There is little information at hand regarding the water supply of the island. It would appear, however, that in the southern portion, it could readily be obtained with little cost or labor, from the numerous rivers. Water systems are already established in the towns of Agana, Piti, Umata, Merizo and Ynarajan, more or less complete and satisfactory. Other systems are projected in the southern portion of the island. North of the line Agaña Bay---Port Pago, no rivers are shown on the map; and in the reports of the governors of Guam no reference to water supply appears, other than that it is proposed (in 1913) to make experimental boring for water in the northern part of the island. This part is stated to be extremely fertile; but so far as known, no water supply exists other than in native wells. This fact alone, apart from the difficulty of landing on the northern coast, would seem to deny occupation of this portion of the island to any considerable hostile force; and even presents a problem

regarding the proper supply of our own garrison.

Information regarding roads is also meager; and it is assumed that practically all the roads herein recommended as necessary, would have to be entirely new construction. There seems to be an impression that the rainfall in Guam is great and fairly constant; but the report of the governor for 1912 states: "The long dry season (January to June), surely the worst for many years past, held back and hurt all crops and has caused a severe financial loss, as well as much suffering to animals. In some instances water has been hauled eight miles."

With the information at hand, it is impossible to do more than indicate in a general way where mobile troops and material should be located. Intrenchments should be constructed preferably by the labor of the troops themselves, covering all practicable landing places; and the troops should be so located as to be able to occupy the intrenchments before the enemy's boats could come within effective rifle fire. Forces of considerable strength may then be stationed at central points, and each cover several possible landing places.

A report of reconnaissance conducted under direction of the Commanding Officer, U. S. S. Supply, in June, 1911, copy hereto appended and marked "A" gives the following information regarding practicable landing places, allowing 40' space and 25 men for each cutter, and 30' space and 10 men for each 20' dinghy: Conditions of weather and wind in which landings can be effected, number that can be landed simultaneously; whether or not guns and stores can be landed.

Point	Weather	Wind	No. of men	Guns?	Stores
Dadi Beach	Favorable	Except from N. to S. by W.	1200 to 2000	Yes	Yes
Umata	Except gales and heavy swell.	Moderate	1700	Yes	Yes
Cetti Bay	do	do	1500	Yes	Yes
Tarofofo Bay	do	do	2500	Yes	Yes
Ynarajan Bay	do	do	1600	yes	Yes

Point	Weather	Wind	No. of men	Guns?	Stores
Yllic	Practically any	Moderate	500	?	?
Tocha	do	do	250	?	?
Merizo	do	do	1500	?	?
Piti and Topungan	do	do	600	?	?
Agana	do	do	100	?	?
Agfayan	do	do	300	Yes	Yes
La Sa Fua River	Fine	No	250	?	?
Sella River	do	do	400	?	?
Alupan Id.	?	?	400	?	?
Point Saupon to Point Amantes	?	?	300	?	?
Point Amantes to Point de Nigo	Fine	No	100	?	?
Pt. Ritidian	?	?	75	?	?
Taragay	?	?	25	?	?
Port Pago	Practically any	Moderate	250	?	?
Ajayan	?	?	50	?	?
Sumo River	?	?	25	?	?
Assan	?	?	75	?	?

The report indicates that from Agana around by north to Port Pago, landing must be by small parties, with local knowledge, and by daylight or moonlight, unless range marks or lights are used. A few riflemen in pits, assisted by field guns, should be sufficient to deny this portion of the coast to an enemy.

It also indicates that all other points of landing can be effectively denied by the use of artillery, placed in selected and prepared positions and screened from fire of naval guns.

It is believed that many of the places indicated as practicable landing places may be rendered impracticable by placing obstructions

at the entrance; and that fewer troops will then be needed for the regular garrison. Road construction, when completed, will also tend to the same end. The committee, therefore, recommends as an adequate garrison for the present and until the above work can be accomplished, the following:

Between Agaña and Port Pago, to guard the northern portion of the island, one regiment of infantry and 8 mountain guns. Motor transportation for at least one battalion and for the guns, positions for which should be selected and prepared for occupancy in case of need.

To cover Yllic, Tocha and Tarofofo, one regiment infantry, two 4.7" guns, two 6" howitzers, and two mountain guns.

To cover Ynarajan, Agfayan, Ajayan, Sume River and Merizo, same personnel and material.

To cover Umata, Cetti, and the La Sa Fua and Sella Rivers, same personnel and material.

To cover Dadi Beach and furnish support for the harbor defenses, same personnel and material.

One regiment of infantry, with four 4.7" guns and four 6" howitzers and 8 mountain guns as reserve.

The estimate of field guns required is tentative, and their number /and proportion are subject to change after local examination of the terrain.

To secure proper communications, a military road should be constructed practically as follows: From Agaña through Assan, Piti, Atantano, thence south, passing near to Alifan, Alamagosa and Bolanos, east to the vicinity of Asdona, , thence generally north through Laguina to Agaña. From Agana to Port Pago, and thence around the north of the island, close to the coast line. The present road system should be kept in good repair. All roads here recommended should be screened from view from the sea. Stations selected for occupation by troops should be connected up with the main system by branch roads.

The expense of the field guns may be much reduced if traction power is substituted for animals. There should be practically no

movements off the roads. The troops for manning these guns should come from the coast artillery.

Observation stations should be established at Machanao, Barrigada and Santa Rosa Peak, and these points as well as all stations of troops, should be connected not only with each other but with the naval base.

Two pioneer companies of engineers should be available to assist in the laying out and construction of the field works, roads, etc. A half company of signal troops should be sufficient to insure complete lines of information at all times. Hospital service will be required for at least 10% of the inhabitants, civilians as well as military.

It is thought that the mobile garrison would be greatly aided by the installation of mobile searchlights, located near the principal possible landing places. Such places are Cetti Bay, Umata Bay, Port Merizo, Imarajan Bay, Tarofofo Bay and Ylic Bay. Other points on the north would be sufficiently covered by the searchlights of the permanent fortifications.

The total garrison recommended for the immediate future would be approximately:

HARBOR DEFENSES	
9 companies coast artillery, 150 men each,	1350
BASE	
Sanitary troops, 250, clerical force, laborers, etc.,250	500
MOBILE TROOPS	
6 regiments infantry, at maximum authorized strength,	12000
8 companies coast artillery, for manning field guns, 150 each,	1200
2 companies pioneers,	325
½ company signal troops,	50
Sanitary troops,	200
Total,	15625

When practicable, landing places have been reduced to a minimum and the road system is complete, two regiments of infantry and one

company of pioneers may be withdrawn, reducing the garrison by about 4000 men. The permanent army garrison will then be about 11,625 of which 1400 will be noncombatants.

The committee has given considerable attention to the subject of an inner line of defense, to be used in case an enemy succeeds in piercing the outer line and undertakes siege operations. The maps available give too little detailed information of the terrain definite for a recommendation at this time. It is hardly possible for any considerable hostile force to accumulate in the northern portion of the island, or to maintain itself there in view of the scarcity of water. If, however, such a force could begin operations, a reasonably strong line of defense might be prepared from Fonte through Macajna and Subana Batna to the vicinity of Yona, and the enemy confined to the northern portion.

If a landing in force is accomplished, it will in all probability be in the southeast or southwest portion of the island out of range of the harbor defenses; in either case the inner line of defense must be as far south as Facpi Point--Tocha Point, in order to keep hostile field guns and mortars from firing from the vicinity of Facpi Point into the naval base, the inner basin and the docks, a distance of some 6 miles. Such a line must be very long, and could not be strong enough at all points to promise success against a siege.

It is suggested that a careful survey and reconnaissance be made by military persons of the entire island; and that the question of an inner line be left for determination by a board, such as is suggested in the recommendation of the Naval General Board. For the present, our line of resistance must be at the water line, where a smaller number of troops would be required than for the defense of an inner line.

The location of shelters for the mobile garrison, for the garrison of the harbor defenses, buildings for hospitals, offices, storehouses, shops, etc., should be determined by a board of officers appointed for that purpose to meet in Guam. Permanent shelter should be provided only for what is herein recommended as the permanent garrison.

VII.

COST.

Initial Cost of Creating a First Class Naval Base at Guam and Providing an Adequate Defense for the same.

Preparation of the Harbor as a Base.

Survey of Island	$ 40,000	
Dredging harbor (to 30 ft. depth)	500,000	
Calalan Breakwater	2,000,000	
Mooring buoys and anchors (50)	250,000	
Piers and wharves (437,500 sq. ft.)	1,500,000	
Docks (1 - 110 x 1000 ft.)	3,500,000	
(1 - 110 x 650 ft.)	2,500,000	
Coaling plant (500,000 tons)	500,000	
Fuel Oil Plant (250,000 tons)	250,000	
Storehouses	250,000	
Repair Shops	250,000	
	$11,540,000	$11,540,000

Construction Incident to Defending the Base.

Roads (112 miles)	$ 800,000	
Magazines	100,000	
~~Hangars for aerocraft~~	~~25,000~~	
~~Naval Barracks and Quarters~~	~~200,000~~	
Army Barracks and Quarters	3,000,000	
Water Supply	250,000	
General Joint Hospital	250,000	
	$ 4,725,000	$ 4,725,000

Naval Defenses for Base (see note at end).

10 Coast Defense Submarines	$ 6,000,000	
10 Destroyers	10,000,000	
10 Aero boats	100,000	
5 Sea-going Tugs	1,000,000	
1 Wrecking Repair and Mine Ship	750,000	
	$17,850,000	$17,850,000

Brought Forward - - - - $ 34,115,000

Military Defenses of the Base.

Mobile Artillery ..... $ 1,000,000

Mobile Searchlights 60,000

Auto Trucks 150,000

Coast Artillery:

	Guns & Carriages	Emplacements.	Fire Control		
4 - 3" guns	$ 20,000	36,000		56,000	
4 - 6" guns	113,000	140,000	80,000	333,000	
4 -14" guns	528,000	960,000	100,000	1,588,000	
16 -12" mortars	400,000	300,000	100,000	800,000	
				2,777,000	2,777,000

Searchlights (60") 60,000

Power Plant (central and reserve) 180,000

Submarine Mine Defense 168,000

Submarine Mine Planter 140,000

4,525,000 4,525,000

Total Cost ..... $ 38,640,000

Annual Cost:

Fixed Defenses	$ 200,000	
Roads	40,000	
Auto Trucks	30,000	
Barracks and Quarters	100,000	
Hospital	10,000	
Water Supply	30,000	
Artillery and Searchlights.....	15,000	
Harbor and Naval Base constructions.....	500,000	
Military Garrison	12,500,000	(See note at end).
Naval Defenses	1,500,000	(See note at end).
Naval Garrison	1,000,000	(See note at end).
Base Personnel	500,000	
Total .....$	16,425,000	$ 16,425,000

NOTE.

The following items:

Naval Defenses for the Base....	$ 17,850,000	original cost.
Military Garrison	12,500,000	annual cost.
Naval Garrison	1,000,000	annual cost.
Naval Defenses	1,500,000	annual cost.

are included because both the men and material are tied to the naval base

and while forming a part of the military and naval forces of the country they are not available for use at any other place.

On the other hand if the complete mastery of the Pacific is considered as a whole these items of expense at Guam will be more than made up for by the reduction in the military and naval forces that would be necessary at Oahu and the Philippines to accomplish the same end without holding Guam as an intermediate point.

VIII.

Conclusion.

1. Courses that may be followed by the United States.

1st. Leave Guam as it is, unimproved and undefended.

2nd. Improve the harbor and leave it undefended.

3rd. Improve and fortify the harbor as a second class naval base.

4th. Improve and equip the harbor as a first class naval base and so maintain it. Fortify the harbor and garrison the inland to hold the base securely against any and all attacks for one year.

The 2nd and 3rd courses should be rejected absolutely, for the reason that if undefended or inadequately defended our enemy may take it and if so we had better let him have an unimproved harbor than one that is improved.

The question as to whether the first or fourth course is to be followed depends upon the policy to be pursued in the Pacific. If that policy contemplates abandoning the Philippines and is to be non-aggressive as to the extension of our trans-Pacific commerce, the first course may well be followed for the present.

Pearl Harbor is being developed into a naval base of the first order and is to be so maintained. A fleet based on Pearl Harbor protects our strategic front from Unalaska or Popoff Bay, (if one of the latter be developed as a secondary base) to Samoa, and no enemy, not overwhelmingly superior, need be expected to attempt a lodgment within the area covered by this front.

But, if the United States wishes to control the Pacific or to dispute its control, to hold a base in the Philippines, to extend her trans-Pacific commerce to maintain the Open Door policy, to be in a position to conduct aggressive naval or military operations in the Western Pacific, Guam as a first class naval base is absolutely essential, and the fourth course should be followed.

It appears to have been decided that Pearl Harbor shall be made a first-class naval base and that Manila Bay shall be a secondary naval base. The fortifications for their defense are nearing completion, the troops for the inland garrisons are being provided.

Guam can be made secure with a much smaller garrison than can either Oahu or Manila Bay.

With Guam secure, the garrisons of Oahu behind and Manila Bay in front may be made smaller than they would have to be if Guam were not held. In fact it is believed that the strong chain Oahu-Guam-Manila Bay can be held with no greater number of men than would be required for Oahu-Manila Bay without Guam.

2. Whatever our policy may be at present it is subject to change in the future. It is therefore recommended, as the first step to be taken, that a thorough military survey of the island, including a detailed hydrographic survey on a large scale of its surrounding waters and of all possible landing places on its coast, be made as soon as practicable, so that the surveying parties may be on the ground during the visit of the joint board of Army and Navy officers which should be sent to Guam to complete the details of the scheme of defense.

In order to keep the number of men and animals required for the Guam garrison down to the minimum special attention should be given to the physical obstruction of the openings in the corral reefs, which furnish the only practicable landing places: to the use of field guns to defend openings that cannot well be closed; to the construction of good roads and use of motor vehicles.

3. Preliminary conclusions as to the defense of Guam as a first-class naval base, the data available being in many respects incomplete and of a general character.

1st. Build breakwater, improve deep water anchorage, dredge channels and inner basin, construct the necessary wharves, storehouses, coaling plant, dry dock, repair shops, etc.

2nd. Fortify the harbor with four 14", four 6" and four 3" guns, sixteen 12" mortars, system of submarine mines. Provide 10 destroyers, 10 submarines, 5 sea going tugs and suitable aircraft, for harbor defense.

3rd. Garrison the island with 11,000 to 15,000 men, provided with necessary movable artillery, searchlights, etc.; build roads and provide motor vehicles for ready communication; obstruct with material some of the openings in the surrounding corral reef; to secure the island against any forces that can attempt a landing.

4th. The cost of the foregoing is estimated to be approximately as

follows:

Original, thirty-nine millions;

Annual, seventeen millions;

The greater part of which would be required for increasing the defenses and personnel in other places if Guam were not defended.

App. "A"

(COVER)

Year 1911
No 87

Author Navy Department, Division of Operations.

Contents Information relative to Guam in answer to certain questions by the President of the Naval War College.

Copy of Letter
#12-2-2.

Naval War College,
Newport, Rhode Island,
Mar. 6, 1911.

From: President of Naval War College

To: President General Board.

Subject: Information desired for use in preparing War Plans- Guam.

The number and location of the practicable landing places on the Island of Guam, outside the harbor of San Luis d'Apra affect the number of troops and the amount and locations of the fixed defenses necessary to properly defend the island. This information is lacking and reports from officers who have been out there are conflicting. This information can be had by an examination of the ground and it is recommended that the Governor be directed to supply it.

In order that all the information desired may be supplied it is recommended that the following questions be submitted to him for reply.

(a) Can transports be anchored in the following bays? Umatac Bay, The bay at the mouth of the Juti river, Port Tarafofo, Ynarajan bay and off Dadi beach?

(b) How many troops could be landed simultaneously at the above named places assuming that the number to be landed depended solely on the beach space available?

(c) Can artillery and stores be landed at any or all of the above named points?

(d) Are the places above mentioned suitable for landing at all seasons of the year?

(e) Are there any other places where landings could be effected? If so what are they and what force could be landed at each place?

(f) Could field artillery effectively deny any or all of these landing places or would the fire of naval vessels accompanying the transports cover the landing of the troops?

In all of these questions the names used are those given on H.O. chart No. 2186.

CONFIDENTIAL.

U.S.S.SUPPLY,
Guam, M.I.,
June 25, 1911.

From: Commanding Officer.

To: Commandant

Subject: Information desired for use in preparing War plans-Guam.

In obedience to your orders, I have made a reconnaissance of the coast of Guam from Tarague on North coast, by way of West and South to Yilig on the East coast, and report as follows, the headings being in accordance with those contained in the letter of the President of the Naval War College of March 6, 1911.

2.a. One transport drawing 15' and 200' long can anchor in Umatac and Jati (Juti). One drawing 10' or 12' and 150' long can anchor in Ynarajan or Talofofo. A single line of transports of any size can anchor off Dadi beach. A single line of transports could probably anchor almost anywhere around the coast from Tarague by West to Yilig.

Except from Facpi point to Merizo, the holding would be bad for offshore winds and when the breeze was directly onshore vessels of 500' might have to get underway. If anchored in 30 fathoms, I do not think it would be necessary except in onshore gales or when a heavy swell is running.

3. b. Allowing 40' space and 25 men to a cutter and 30' and 10 men to a 20' dinghy, I estimate that men could be landed simultaneously as follows:-

Umatac 1700, Jati 1500, Talofofo 2500, Ynarajan 1600.

The landing at Dadi beach is generally impracticable but under favorable conditions 1200 might be landed in dinghies and at very high water and most favorable conditions possibly 2000. From M.W. mark on Dadi, there

at high water
is/a practically level bottom for a considerable distance out covered by about two feet of water and from where it begins to get deeper the bottom appears to be covered with coral boulders.

4. c. Artillery and stores can be landed at all the above places, but at Dadi beach subject to the foregoing remarks.

5. d. They are suitable for landing at all seasons except Dadi beach. With heavy seas running directly in or nearly so landing would be impracticable at any of them. This rarely occurs at any season for any of them for any length of time but the number of men that could be landed simultaneously would be much reduced with a heavy swell from any direction. With winds from North to South by West a landing could not be made at Dadi beach, so that ordinarily during SW. monsoon it could not be used.

6.e. Yes. Yllig 500, entrance about 80 yards wide and eight fathoms deep. Togcha 250, entrance about 45 feet wide. Merizo 1500, an excellent place but wading is necessary to get ashore. La Sa Pua river mouth 250 in fine weather. About mouth of Sella river 400 in fine weather. Agat 50. Piti and Tepungan 600 in all at both places. Asan 75. Agana 100. Through channel close to and south Alupat Island 400. From Ipao point to Hilaan point, several small channels 300. From Hilaan to Uruno point there are about five small breaks in line of reef that make landing possible in fine weather or when the sea does not break in two fathoms, about 100 could be landed in all at one time. Ritidian (3 inlets) 75 men. Tarague 25. I saw the above mentioned but at different stages of tide. Of places I did not see, Pago is probably about like Togcha. Ajayan river mouth probably 50 and Sume river probably 25, could land at once. There is a landing called Jinapsan between Ritidian and Tarague but can only be used at high water for

very small boat. There is said to be a landing on East coast north of Pago but if so it could probably seldom be used.

I visited Acfayan where 300 could be landed and where steam launches can enter.

7. Of the above places Yllig, Togcha, Merizo, Piti, Agana, and Acfayan could be used practically at all times; the others only under favorable conditions. At Togcha, Yllig, Agat, Tepungan, Asan, and at all points North of Agana local knowledge would be needed or a sunshiny day or bright moonlight night unless range marks or lights were used.

7.f. If roads are built screened from sight from the sea so that field guns can be moved from one place to another without being seen, and positions for guns selected and prepared, I believe that they could effectively deny these landing places. It would be almost impossible to find locations for the field guns where they could not be reached by fire from covering ships, if those ships were in the exact position needed, and as the beach is generally clean and steep large vessels could come close in. A vessel of largest size could anchor almost in the mouth of Jati bay. From Agana to the northward around to Talofofo, riflemen in prepared pits would be all that would be required as it would only be necessary to pick off the coxswain, except possibly at Yllig and Pago.

The chart 2186 appears to be accurate as far as it goes but a survey of the coast and bays would be needed to answer with certainty these questions.

E.L. Bisset.