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Simón Bolívar

By MAJ. A. L. P. JOHNSON, Infantry

DESCENDANT of Biscayan *conquistadores*, Simón Bolívar, the great Liberator of South America, was born in Caracas on July 24, 1783. Endowed with a restless, eager mind, he came early under the influence of Rousseau's disciple, Simón Rodríguez.

Upon his mother's death, in his fifteenth year, young Bolívar went to Spain to complete his education. Wealth and family ties admitted him to the most exclusive circles. His contact with royalty merely served to strengthen his nascent republican conviction that corruption was inherent in the crown itself.

Barely nineteen years old, Bolívar married the daughter of a distinguished Venezuelan family then residing in Madrid, but within a year the death of his bride left him heartbroken. He vowed never to marry again, a vow he never forsook.

His life now apparently devoid of an objective, young Bolívar once more returned to Europe. He saw Napoleon, with back turned on the Pope, crown himself Emperor of the French. This was impressive and at the same time depressing to the youth reared in republican philosophy. Henceforth he could not bear to hear praise of the Corsican. "Since Napoleon has made himself Emperor," said Bolívar, "his glory seems to me the splendor of Hell: the volcanic flames which cover the prison of the world."

In 1805, Bolívar, with his former tutor, Simón Rodríguez, crossed the Alps on foot and visited Rome. From the Aventine Hill he viewed what once was the glory of an empire. Suddenly Bolívar turned to his preceptor, and with visible agitation invoked God, his forefathers, and his teacher to witness his solemn vow and pledge of honor that he would give rest to neither his arm nor his soul until he broke the chains which held his people in bondage to Spain.

The epic of long years of struggle, his unflagging determination in the face of hardships, reverses and discouragement to ultimate success, have inscribed his name in history as an immortal.

On December 17, all South American countries, but more especially those which owe their independence to Bolívar—Bolivia, Colombia, Ecuador, Panama, Peru, and Venezuela—commemorate the centenary of the passing of the great Liberator. We join with them to pay homage to his memory.

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The Land Problem at West Point

By MAJ. GEN. WM. R. SMITH, Superintendent U. S. M. A.

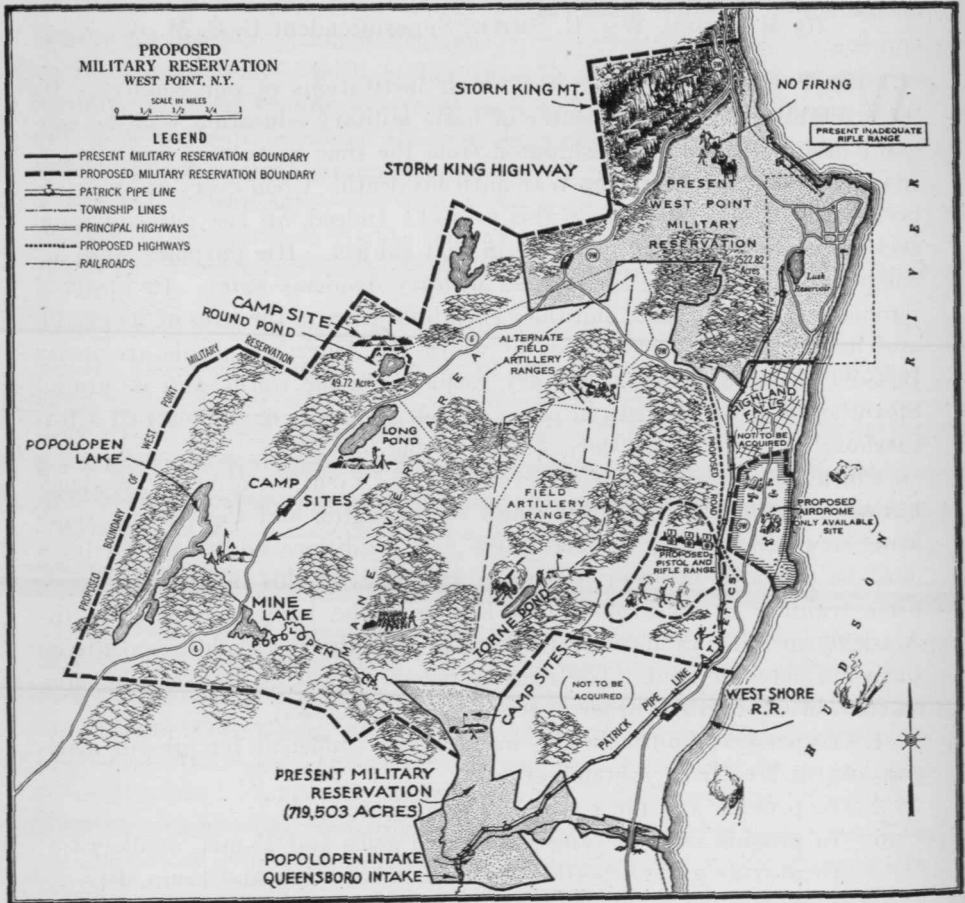
WEST POINT is one of the oldest institutions of our country. Its establishment as the center of basic military education was the constant desire of General Washington from the time he became commander-in-chief in the Revolutionary War until his death. Upon every appropriate occasion he urged action upon this project. Indeed, his last letter, written two days before his death, was upon that subject. His purposes were accomplished and his idea lives in the Military Academy today. Its ideals of patriotism, its traditions, and their exemplification in the lives of its graduates have made it an institution of which the American people are justly proud. It is the foremost Military Academy in the world, and its graduates who have been leaders in peace as well as in war have exercised a far-reaching influence in the development of the nation.

For a century and a quarter every demand upon the Military Academy has been met creditably. But times are changing and the passing years bring new conditions. To meet these new conditions additional facilities must be provided in order to give to graduates of this institution proper basic training in all arms of the service. The immediate need of the Academy in order to make available these facilities is an additional fifteen thousand acres of land. The reasons for securing this land can be summarized briefly in their order of importance as follows:

1. To preserve and make the water supply sufficient for present needs and keep it free from contamination.
2. To provide a landing field for airplanes.
3. To provide suitable ranges for small arms and 75-mm. artillery.
4. To provide ground needed for drill, maneuvers, and camp sites.

This fifteen thousand acres will contain the watershed of our existing water supply; it will insure an adequate quantity of water to meet our needs not only at present but in the future. The lack of water is an acute problem and must be faced as our supply is now entirely too limited. All water for this post now comes through intakes placed on small government reservations along Queensboro and Popolopen Creeks, the former being the overflow from Queensboro Lake and the latter the overflow from Popolopen Lake and Long Pond. These lakes are not owned nor controlled by the Government. During the dry season there is no overflow from these lakes

and Queensboro and Popolopen Creeks sometimes go dry, making it necessary to depend entirely upon the reserve in Lusk Reservoir at West Point. The capacity of this reservoir is small and when the level drops a few feet the automatic chlorinator ceases to operate and it is necessary to chlorinate by hand or to boil the water. The consequences are that the use of water is greatly restricted, and in fact for the last two years an acute shortage



of water has occurred during the dry season. The situation was saved by an arrangement with the New York State Palisades Interstate Park Commission whereby water from their recreation lake (Queensboro) was siphoned over their dam into Queensboro Creek. It was necessary to depend upon this arrangement for some time. An arrangement such as this, whereby a Government institution has to depend on the generosity of outside agencies, is neither desirable, proper, nor safe.

The conformation of the ground around Popolopen Lake is such that it will be possible, at a comparatively small cost, to construct a dam at its

outlet permitting the storage of sufficient water in Popolopen Lake to regulate its flow into Popolopen Creek, and to provide an abundance of water for West Point at all times. The existing six and one-tenth mile pipe line leading from the intake to West Point is Government owned. This pipe line and the present reservoir at the post will be entirely adequate for the increased water supply.

The fifteen thousand acres that it is desired to purchase is indicated on the map. This area, particularly the land adjacent to Popolopen Lake and Long Pond, is being extensively used by summer residents for bungalows, lodges and camp sites. Contamination of the water supply under these conditions is certain. The dangers of pollution are becoming greater and greater each year as the population increases. Chlorination of the water has only been necessary during the past few years, but if this area becomes more thickly populated, it is only a matter of time when the actual pollution of our water supply beyond all possibility of correction will become a fact. The only solution is complete Government control of these lakes and their watershed.

There is no other source to which the Academy may look for water. It is not practicable to bring the New York City water supply across Storm King Mountain, as the expense would be too great. Besides, the City of New York could not afford to deplete its supply, developed with an enormous expenditure of time and money, to provide water for West Point. The water in the Hudson River is brackish and unsuitable for use. The tide is felt many miles above West Point.

The acquisition of these fifteen thousand acres of land, besides providing for the water supply, gives room for needed facilities for military training. A landing field, small arms and artillery ranges are indispensable for the proper training of cadets. A site for a landing field is indicated on the map. This location is the only one available in the vicinity of West Point. It is within a ten-minute ride of Cadet Barracks and will enable every advantage to be taken of seasonable weather for practical instruction and flying. This site has been examined by representatives of the office of Chief of Air Corps, who pronounced it practicable. It will be noted that the long dimensions of this plot are parallel with the river and fortunately the prevailing winds are up and down the river. It is absolutely necessary to have a landing field here, and planes can be brought at suitable times during the year to give cadets basic instruction in aviation. It is neither necessary nor desirable that a large number of planes be maintained at West Point the year round. At the present time the instruction of cadets in aviation is restricted to a week's visit for the First Class at Langley Field, Virginia, where the maximum hours in the air per cadet are not over five. To send cadets to Langley Field is expensive, consequently instruction is now restricted to only the one class. Cadets of the First Class are now sent away for instruction in artillery firing as well as in flying.

This has been made necessary due to the abandoning of all artillery firings at West Point since the construction of the Storm King highway across the artillery range. Other cadets than those in the First Class should receive instruction in this important element of training, but this is impracticable due to transportation costs. At present the yearly cost of transportation for cadets receiving instruction away from West Point in artillery and aviation is about thirty thousand dollars, and only one class is benefited, and that class for only five days, since it must rotate from post to post. This item of expense can be saved if suitable facilities in the way of ranges are available at West Point.

The range facilities that are now at West Point are entirely unsuitable. The small arms range is a pitiable makeshift. Although it occupies the best location available on the present reservation it is woefully inadequate and unsafe. At times the firing points are under water. Due to restrictions imposed by the terrain, it is necessary at some of the firing points to have cadets fire from crowded platforms in tiers one above the other. No attempt is made to give instruction in machine gun firing other than that which is held on the thousand-inch range. No machine gun range can be suitably located on this present reservation. The land desired has been surveyed and the various ranges proposed are shown on the map. The proposed small arm ranges, like the proposed landing field, would be within a short distance of the Cadet Barracks.

It will be noted that the area in question contains certain paved roads that are a part of the United States and the state highway system. There will be no interference with these roads in any way, in fact if they were not in existence they would have to be built. The locations of these highways are such that traffic will in no way be obstructed as the artillery and small arm ranges can be so placed as to make passage along the roads entirely safe at all times.

In addition to suitable locations for artillery and small arm ranges this extra land will also provide suitable camp sites and make it possible to give additional training in practice marches, and open warfare maneuvers. These forms of training have been undesirably curtailed in recent years due to cramped conditions on the present reservation and the difficulties of movement when off the Post.

The present cost of the additional land is estimated to be something about one million five hundred thousand dollars. For an acreage of fifteen thousand this is considered a reasonable valuation. Land values in this vicinity are on the increase. Money will be saved if the purchase is made in the near future.

The acquisition of the fifteen thousand acres of land is not a plan to increase the strength of the Corps of Cadets. The project for the purchase of this land is dictated solely by the urgency for obtaining adequate water and to provide necessary training facilities for the present Corps of Cadets.

Even a decrease in their number would have no appreciable affect upon the urgency of this need. Three courses confront the Military Academy.

First: It can be moved to another locality where a wide expanse of terrain affording plenty of water and space for training can be had. However, it is inconceivable that the American people would permit the transfer of the Academy from its present site. Even if such action could be contemplated the sacrifice of the present improvements and the acquisition and construction of a new establishment would cost the Nation one hundred million dollars.

Second: The Academy can be continued under existing conditions. This would be extremely short-sighted as needs for land to provide a proper supply of pure water as well as facilities in the way of a landing field and ranges for practical military training are so apparent and vital that they cannot be ignored.

Third: The fifteen thousand acres of additional land can be secured. The cost of this additional land is but a very small percentage of the present investment at West Point. The land selected for purchase is adequate for the indicated needs of this institution. The securing of an appropriation from Congress to purchase this land will solve the problem of the lack of water. It will at the same time enable equally high standards to be attained in basic practical military training of cadets as are now maintained in all of the academic departments of this institution.

The people of the United States are justly proud of the Military Academy. They have learned to depend upon her graduates in peace as well as in war. The Corps of Cadets must be given the best training possible while at West Point. The acquisition of this additional land is vital to the Academy for the thorough training of the Nation's future officers.

Naval Limitations and the Coast Artillery

By CAPT. G. J. B. FISHER, C. W. S.

THE passing of the London Conference furnishes a definite trend for future naval development. And naval trends have decided significance, since modern naval establishments are so complex and so static that peacetime tendencies project themselves quickly into war-time actualities.

It may therefore be profitable to examine the likely effect of the London Naval Treaty on the Coast Artillery rôle of naval support.

The London Conference must be viewed as but one step in the progress of post-war naval parleys. These were initiated at Washington in 1921, carried over at Geneva in 1927 and continued at London in 1930. We now have, therefore, sufficient background to form a fair estimate of the agenda of the conference to be held—possibly at Tokyo—in 1935.

The genesis of these limitations conferences was essentially political. Their cumulative effect is technical, since they designate the equipment with which future naval defense may be effected. Some familiarity with both aspects is necessary if the whole is to be properly appreciated.

Among the many political factors bearing on naval limitations, two are outstanding—the challenge to British prestige of our Navy Bill of 1916, and conditions arising out of the non-participation of the United States in the League of Nations.

The unparalleled navy which we projected in 1916 was in reality a necessary precaution against an unknown future. However, the succeeding four years produced momentous, if not stabilizing, changes in the international situation. Among other things they saw British sea power emerge undefeated from war, only to find a decidedly superior navy coming into being on this side of the Atlantic.

No prospect could be more disastrous to British prestige than that of naval inferiority. The urge to modify this situation by diplomatic methods was therefore imperative. The stage was already set in Washington, thanks to changed administrations, financial retrenchments and general war weariness. The very skillful manipulation of these factors, backed by pacifist clamor, brought about the calling of the Washington Conference which gave birth to the principle of Anglo-American parity.

Closely linked with the question of naval relativity was the problem created by the unsatisfactory progress of the League of Nations without the membership of the United States. A primary *raison d'état* of the League was the reduction of armament; yet the futility of this project without the concordance of the United States was obvious.

At the same time there was an insistent demand for at least limitation, arising from the deep-rooted idea among many nations that excessive armaments engender wars. The only means of realizing this purpose

seemed through a pact which, outside the League, could include the United States.

Great Britain especially has been concerned for a century in stabilizing the naval situation without recourse to military alliances. In fact, with unthreatened sea power, the British Commonwealth of Nations can remain as independent of alliances as is the United States. The Haldane Mission to Berlin in 1912 was actuated by this ideal; had it succeeded, the military tie between France and England would have weakened and the localization of the imbroglio of 1914 might have been attained. This principle is equally valid under post-war conditions. The more Britain can escape military commitments under the League of Nations by extra-League naval covenants, the sounder becomes her international position.

These particular, as well as other less important, considerations, have been behind the series of naval parleys already held and will doubtless influence future conferences.

These conferences have already defined national naval aspirations sufficiently to reduce them to a recognized code. These may be considered most easily to categories of fighting craft.

The proposal to abolish the submarine was first advanced by Secretary Hughes, with the adherence of the British Commonwealth. While this issue gained the tentative support of Italy and Japan, it encountered opposition in France, and was so defeated. The subsequent attitude of smaller nations generally has been so definite in favor of the submarine that its abolishment is no longer seriously sought. It will continue to affect naval strategy, but with its usage against merchant shipping somewhat restricted by the London Treaty.

The stand of the United States and Great Britain against the submarine is sustained by interesting humanistic arguments, but it is actually based on more practical considerations.

The submarine is essentially the defensive weapon of the weaker nation. It can destroy a forty million dollar dreadnought at insignificant expense. It may harass commercial shipping most efficiently. Germany proved that, with no other type of craft on the high seas, the submarine still remains a force to be reckoned with. Hence the weak-navy nations cling to it jealously, and the strong-navy nations perforce retain it.

The United States on the other hand resolutely favors the capital ship, although the smaller nations question its desirability and even the British Admiralty at the London Conference tentatively hinted at its abolishment.

The stand of the American delegation at London on the issue of capital ships drew considerable criticism. It was repeatedly pointed out as not in harmony with President Hoover's pronouncement that the United States would match any other nation in naval reduction. Yet here again we were acting according to the certain dictates of self-interest, which were by no means ignored in favor of idealistic impulses.

It is quite obvious that had the London Conference agreed to the forthwith scrapping of all the dreadnoughts and battle cruisers of the three navies concerned, the theory of Anglo-American parity would have been shattered, since with no capital ships afloat to check it, and with bare parity in auxiliary craft, the British merchant marine would have at once assumed ominous proportions.

From this angle, the potentialities of modern British commercial liners increase in direct proportion to the reduction of capital fighting ships. With a relatively small merchant marine capable of conversion to naval use, it is easy to understand why the American delegation held out for the retention of first-line battleships, and, moreover, vigorously opposed any great cut in this category. This matter is bound to be the subject of further and more deliberate study.

Our position regarding the newer class of aircraft carriers is quite similar. While Great Britain offered reductions, the United States declined to accept them for the simple reason that we have insufficient merchant shipping to provide plane carriers in emergency, and must therefore rely on the orthodox naval craft for this important usage.

Since the United States could not bring about the abolition of the submarine, the retention of appropriate destroyers was essential; and so long as any general reduction in carriers and capital ships was opposed by us, the only field for serious discussion at London was the cruiser class.

This was the issue that wrecked the preceding Geneva parley. Since Geneva, however, British foreign policy—reacting to domestic politics—has undergone a profound change. There has been a decided swing away from the Continental-security pact views which under Mr. Baldwin's government animated the so-called Coolidge Conference, in favor of a no-alliance concert of action with the United States. Undoubtedly the latter spirit was greatly stimulated by Mr. MacDonald's visit to the Rapidan.

The inevitable result of this change was a greater tolerance for the naval needs of the United States. We have held it self-evident that since, by mounting 6-inch guns, any self-respecting liner may be converted speedily into a first-class cruiser, our only hope for parity in this class lies in having either a considerable preponderance of 6-inch cruisers or a smaller margin of 8-inch cruisers to offset our deficiencies in merchant tonnage and in naval bases. This view was tacitly accepted by British opinion in advance of the conference, so that there remained only a solution of the technical details to be worked out in order to officially promulgate it.

The solution provided by the London Treaty was to allow the United States eighteen ten thousand-ton cruisers mounting 8-inch guns against fifteen for Great Britain, offset by a slightly greater British allowance in the 6-inch cruiser group. This arrangement provoked sharp controversy in our Navy, as well as criticism in the Senate Military Affairs Committee. As a compromise it doubtless left much to be desired, yet it did not wholly

sacrifice the interests of the United States. It certainly furnished acknowledgment of the American contention that merchant shipping must be weighed as an important naval factor and, more important from a technical viewpoint, it reemphasized the 8-inch gun as a desirable maximum for naval ordnance.

Before examining the latter proposition in detail, some consideration should be given to the Japanese position on naval armaments.

The announced policy of Japan is for a balanced fleet capable of protecting her vital lines of communication, lacking which she would quickly strangle under blockade. These sea lines are restricted to the western Pacific, hence extending cruising radius is not, *a priori*, a factor. The matter of total tonnage, however, depends partly on absolute and partly on relative considerations.

The consistent Japanese stand has been for a fleet as near to absolute needs as attainable, a policy based on frankly economic grounds. The actual level, though, must fluctuate to a determined proportion of United States strength, which in turn leaves Japan with a navy somewhat above her expressed needs. The Japanese delegation attitude may therefore be described generally as seeking a high Japanese proportion of a low level of Anglo-American tonnage.

At London the proportion urgently sought was 70 per cent, at least in 8-inch cruisers. This demand was denied, and the denial was keenly resented in naval circles at Tokyo. Yet the United States services have slight sympathy with this resentment. At the Washington Conference Japan bartered her demands for a full 10-10-7 ratio in exchange for a discontinuance of further American fortifications in Guam and the Philippines, a bargain of greater advantage than Japan willingly admits.

On the whole, however, Japan was probably most disappointed over the failure of the London Conference to effect greater actual reductions, thereby permitting her to operate a less expensive fleet. Yet the European situation is a factor in maintaining Anglo-American levels; Great Britain has never seriously considered a navy of less size than the combined strength of any two European powers, which in turn reacts on the amount of United States tonnage.

At the same time one category, at least, encountered virtual reduction at London. This is the capital ship. And since our harbor fortifications are primarily designed to combat this class of naval vessel, its future is a matter of lively interest to the Coast Artillery.

Since the war we have heard much discussion as to the tactical efficiency of the battleship. Its vulnerability to submarine and aerial attack has been emphasized, while its proponents point to the negligible damage suffered from these sources at the battle of Jutland. The accepted doctrine of the United States is that the dreadnought continues to be the

backbone of naval power. Despite this, our capital ships are slowly but surely approaching extinction through attrition.

In 1921, when the naval powers first met in conference, the deferment of battleship construction was definitely agreed upon. It is true that two super-dreadnoughts—the *Nelson* and the *Rodney*—have since been built, but with these exceptions none has been laid down. This policy has been observed by all nations, whether treaty signatories or not.

At London, when the capital ship holiday presumably terminated, resumption of construction was again postponed, while the retirement of nine dreadnoughts, two hundred and thirty thousand tons, was agreed upon.

There are in existence today, all told, some sixty vessels in the class of capital ships. With no replacement construction for more than a decade past, many of these are approaching obsolescence. By 1936, the earliest year when building may be resumed under the London Treaty, but a quarter of the battleships extant today, it is estimated, will be wholly serviceable.

The question therefore is, will any subsequent naval conference legitimize the enormous expenditures necessary to insure the recrudescence of the capital ship; or will the delegates follow the path of least resistance and permit it to die of atrophy?

A review of the London Conference proceedings indicates that about all the snipping possible has been done in the interest of naval reductions. If anything further is to be accomplished in this direction at future conferences a frontal attack against the principal strong point, the capital ship class, will have to be made. There appears to be little doubt that this will be attempted.

On the number of first-line battleships depends largely the number of submarines, which do not fight each other but exist to prey on dreadnoughts and merchant shipping. The elimination of capital ships must do away with considerable submarine tonnage, which in turn dispenses with many submarine destroyers. The keystone of the arch of naval tonnage is certainly the forty thousand-ton 16-inch gun battle wagon of happy memory, which has bravely defied destruction from land, sea and air to now face a more deadly enemy—diplomacy.

It might appear that the proscription of the capital ship by the three conference powers, the United States, Great Britain and Japan, would be fruitless without the concurrence of all other nations. On the other hand, as has already been indicated, the United States is today the sole full-fledged proponent of this type of vessel. France and Italy have built none for fifteen years, and both nations have already elected to convert allotted battleship tonnage into cruisers. As a matter of fact, the battle against the capital ship is being fought on the field of parliamentary budgets and is being won by smaller, cheaper vessels.

Since it is well appreciated abroad that the United States is the only power that can really afford the tremendous maintenance costs of modern super-dreadnoughts, it is obviously expedient for less wealthy nations to avoid competition in this category. There is good ground for the opinion that unless the United States takes a definite stand to the contrary at the 1935 conference, no more capital ships will be built. And no one who has observed the sidelights of previous naval conferences seriously supposes the United States will withstand world sentiment on this issue.

The abolition of the capital ship will of course place an entirely new emphasis on the cruiser class. It should also involve a radical reallocation of tonnage in this category. Fortunately we have a precedent in the latter direction in the London Treaty, which allows us a measurable advantage in ten thousand-ton, 8-inch-gun cruisers over any other power. But how is the problem of harbor fortification to be effected by this transformation?

The modern ten thousand-ton cruiser is a distinctly post war product, created partly by Germany's ambition to make the most of her Versailles Treaty tonnage allowances, and partly by the importance placed on this ship by the Washington Conference.

The ten thousand-ton cruiser is represented in our navy by the *Chicago* class, having ten 8-inch, .55 caliber guns and four 5-inch antiaircraft guns. This armament has been considered too heavy and is being replaced on later cruisers by nine 8-inch guns arranged in triple turrets, two forward and one aft. The armor is negligible; one and one-half inch metal. Designed speed is thirty-two and five-tenths knots.

The Japanese *Nachi* class corresponds closely to the *Chicago* cruisers, except that 4-inch belt armor is used, involving a corresponding reduction in speed.

The London class British cruisers in the ten thousand-ton category mount eight 8-inch naval guns and four 4-inch antiaircraft guns. Decks are protected by two-inch plate, turrets virtually unprotected.

Germany's *Leipzig* class cruiser fits the same general pattern except that a slightly higher speed, thirty-five to thirty-six knots, is credited it.

As to the power of the 8-inch or 155-mm. guns which all the above cruisers carry, the experience of the French is typical. On their eight thousand-ton cruiser so armed, ranges of twenty-six thousand yards have been attained, with good accuracy at twenty thousand yards.

The cruising range of these ships is in excess of ten thousand miles. Their battle speed must be estimated at thirty-five knots; rate of fire at not less than 6 rounds $\times$ 9 guns, or fifty-four 8-inch shells per minute.

If the foregoing are the essential characteristics of the primary naval ship of the future, we have reason to be concerned with the armament for fighting this vessel.

Our harbor defense, like our navy, has been built against a background of 14 and 16-inch guns. And while there is no limitation, present or

prospective, as to gun calibers for land use, it is clear that our large coast guns are by no means efficient when fighting any but capital ships. To use them against these new, fleet cruisers is like shooting at rabbits with a .45.

Every officer who has fired the 155-mm. GPF has confidence in the power of this gun to hit the elongated profile of the later ten thousand-ton cruiser. Yet our inherited store of these land warfare guns leaves much to be desired. While accurate, they fail to match the corresponding post war naval ordnance in range, rate of fire or traverse.

There seems to be no reason why the looming elimination of the capital ship should not have the eventual effect of greatly enhancing the relative power of harbor fortifications in resisting naval attack. Before this is realized, however, we must develop an entirely new seacoast installation which, being unrestricted as to caliber, can be made definitely superior to the 155-mm. naval piece—a gun which is receiving the close attention of the world's foremost ordnance experts.

Comments

By MAJ. F. S. CLARK, C. A. C.

The article by Capt. G. J. B. Fisher, C. W. S. entitled "Naval Limitations and the Coast Artillery," is most timely, and its subject should challenge immediately the earnest attention of every Coast Artillery officer, as in time it certainly will that of the War Department and the country at large.

It is probable that Captain Fisher's analysis of the future trend of naval development is correct. It is also probable that his inference in general that the relative power of Coast Artillery weapons will increase, is quite correct.

However, certain of his more detailed conclusions may well be subjected to careful examination before acceptance. In the first place, it is worth while considering Captain Fisher's two statements:

"At the same time one category, at least, encountered virtual reduction at London. This is the capital ship. And since our harbor fortifications are primarily designed to combat this class of naval vessel, its future is a matter of lively interest to the Coast Artillery."

and—

"Our harbor defense, like our Navy, has been built against a background of 14 and 16-inch guns."

Now, the idea represented by these two quotations is correct enough to the extent that it has been considered necessary to match with guns ashore the gradually increasing calibers of guns afloat. But it is not correct if it is intended to mean that anything like the *exclusive* mission of harbor

defense is to combat capital ships. The mission of harbor defense is more accurately to combat *any* and *every* form of naval attack that can be brought to bear against the harbor defense or the installations which it defends. Among the forms of possible naval attack which must be provided against are the bombardment by capital ships and the support by capital ships of torpedo or landing attacks by smaller vessels. For this reason, 14-inch and 16-inch guns have been added to harbor defense armament to stand off capital ships similarly armed.

It has long been recognized by naval authorities that ships should not be brought up against shore guns *unless the imperative urgency of the task* warrants the grave risks to the ships involved in the unequal gun duel. With the limitation on capital ships already in effect, it is less likely than hitherto that the few capital ship units remaining to any power will be risked by allowing them to engage coast forts. If an attack on coast forts is deemed necessary, the task will be assigned to lighter and cheaper vessels, with smaller guns. And it is just this indubitable fact which has already enhanced the relative defensive power of our harbor defenses. Not only will our 16-inch, 14-inch and 12-inch guns overmatch the guns of hostile cruisers, but what is of perhaps even greater significance, our 10-inch and 8-inch guns which we had considered obsolescent can engage cruisers on more than even terms, and have thus achieved a new and quite remarkable lease of life and usefulness.

Nor is this all. Before the limitation of naval armament, an attack to secure a base upon one of our less important harbors, defended by nothing larger than a 12-inch gun, was conceivable with the support of capital ships. With limitation of capital ships, these secondary harbors are rendered much less likely to naval attack.

These observations lead directly to a necessary comment on another of Captain Fisher's ideas, in which his opinion is apparently related to the mistaken notion that a 155-mm. caliber is practically equivalent to an 8-inch caliber, when of course, in fact the 155-mm. caliber is almost identical with the 6-inch caliber. The idea referred to is to be gathered from two more quotations:

"It is clear that our large coast guns are by no means efficient when fighting any but capital ships. To use them against these new, fleet cruisers is like shooting at rabbits with a 0.45."

and again—

"There seems to be no reason why the looming elimination of the capital ship should not have the eventual effect of greatly enhancing the relative power of harbor fortifications in resisting naval attack. Before this is realized, however, we must develop an entirely new seacoast installation which, being unrestricted as to caliber, can be made definitely superior to the 155-mm. naval piece—a gun which is receiving the close attention of the world's foremost ordnance experts."

Here indeed is a new and remarkable argument for additional expenditure for harbor defense guns! Hitherto such additions have been defended on the ground that we must have more big guns to match the big guns of foreign navies. Now we have some of the big guns, and Captain Fisher tells us that if our opponent has only small guns (on small ships) our big guns are no good, and we must meet the situation by accumulating a new supply of small guns. There is a suggestion here of the man who owned a Newfoundland dog, and installed a swinging door for his veranda so the dog could go in or out at will. Presently the same man acquired a kitten, and for its convenience cut another and smaller door so the kitten also could enter or leave at his pleasure.

Categorically, it is *not* clear that a 16-inch gun is inefficient in fighting a cruiser, however new or fleet. Captain Fisher can hardly mean that a 16-inch hit on a cruiser would not be seriously damaging, so what he must mean is either that it would be difficult to get hits, or that the cost of the ammunition would be out of proportion to the destruction of the cruiser.

There can be no possible basis either in theory or experience for doubting the ability of our 16-inch guns to get hits on any cruiser. The 16-inch gun is at a disadvantage with a smaller gun only in respect to its slower rate of fire. To counterbalance this, the 16-inch gun has an advantage in range such that it could open fire and probably complete the destruction of the cruiser before the smaller gun could even open fire, and what would be even more comfortable for the Coast Artilleryman, before the 8-inch guns of the cruiser could open fire on the shore battery.

As to the possible question of cost as an argument for efficiency, which would be cheaper, to use the 16-inch ammunition which is already on hand, or to spend vast sums for both guns and ammunition of a smaller caliber? If we were starting from nothing, and no navy in the world had guns larger than 8-inch, it would of course be unnecessary and unreasonable to provide 14-inch or 16-inch guns for coast defense. But the situation is that we do have the guns, whose very range and power would render them so effective against any cruiser type built or projected as to practically insure that no such cruiser will ever wittingly be placed within range of these guns, unless supported by capital ships.

The actual significance of the effect of naval limitations on the Coast Artillery, which should be impressed on the people of the United States, lies in two facts: first, that a considerable saving in future expenditures for guns is clearly indicated; and second, that a wise expenditure of a part of this saving would be to provide a sufficient Coast Artillery personnel to render certain the effective employment of our existing armament, whose power, so recently enhanced as a by-product of naval limitation, is unique among military weapons in that it is defensive and cannot possibly be used as a threat of aggression toward any other nation.

Latin America and the United States

By MAJ. C. C. BENSON, Cavalry

President Hoover's views on relations between Latin-American nations and the United States appear in many of his published addresses. These views have been assembled and arranged in logical sequence in the following article so as to present in compact form a comprehensive statement on this important subject. To retain the true spirit and significance of the President's public utterances, this material is presented as if Mr. Hoover were speaking.

THE traditions of American republics are deeply rooted in the history of peoples who have struggled towards true democracy.¹ In striving to realize democratic ideals, we are all engaged in the great common task of advancing human welfare.² True democracy is not dependent upon any special form of organization; it may be successful in many patterns.³ I have full confidence in the ability of the great American peoples to govern themselves⁴ and to work out their own destinies in accordance with the ideals of freedom, equality, and justice.⁵

Progress in the building of government for the people and by the people is a long process of trial and error.⁶ The Civil War which steeped our nation in suffering for four tragic years brought this lesson sharply home to us.⁵ Those who look for the millennium over night may be discouraged by mistakes and failures;⁷ yet if we survey the experiences of the whole Western Hemisphere, both in failure and in success, we should be of good faith and confident of the future.⁶ That the world grows better and progresses is not the mere statement of idealists. I know of no better proof than the steady and majestic growth of Latin American nations during the past century. A century is a short span in history, and we who are public servants can do little in our time. But if we can help to diminish destructive forces, if we can strengthen the forces of material and spiritual progress, we shall have done our part.⁸ Our problems are the problems of growth. They are less difficult than those which confronted generations before us. The forces of righteousness and wisdom work as powerfully in our generation as in theirs. The flame of freedom burns as brightly as ever. Our sense of justice, of liberty, of security; our traditions of past glory and sacrifice; the example of our heroes; the spiritual enrichment of our peoples; our confidence in future progress—these are the true glories of America.¹ During the last hundred years the Western Hemisphere has made more progress in human welfare than has been made in any other century of history.⁷ There need be no fear for the future of nations that draw their inspirations from such men as San Martín, Sucre, Bolívar, and Washington.⁵

The republics of the Western Hemisphere are held by particular bonds of sympathy and common interest.⁹ We are each pledged through the blood of our forefathers to national independence, to self-government, to the development of the individual through ordered liberty.² We have a

history of common labor in subjugating the wilderness and developing vigorous economic life, in building a new form of government founded upon a new conception of human rights, in trying to lift the moral and cultural levels of our countries.¹⁰ We know that the nations and the institutions we have created can flourish only in peace.²

I sometimes think that relations between nations are like those between neighbors in our busy private lives. Crowded with domestic problems, we really know but little of our neighbors. We read in the press of sensational accidents, and perhaps descriptions of the material surroundings in which our neighbors live. But we know little of the finer qualities of their home life, their deep affections and sorrows, their self-denials, courage, and ideals. So it is with nations. Appreciation of their national accomplishments, and the great intangibles of national character and ideals, can come only from close contact. Contacts engender mutual respect, good-will and friendship, which are the true basis of international relations.³

Nothing should be omitted to upbuild those contacts and sentiments that create understanding. The exchange of our social and political accomplishments, of our advances in education, of scientific thought, all of those things which contribute to the higher aspects of life, is of primary importance.¹¹ Each of us has something vital to contribute to the others.¹² There are more than twenty American republics working out successes in government, in culture, and in art, under varying conditions—successes from which all can benefit.¹³ We not only learn from each other, but we receive inspiration from the heroism, leadership, and accomplishments of our sister republics.¹⁰ Each nation has developed its own traditions, its own pride of country; each is a laboratory of human welfare, whose daily experience aids the common advancement of all.² Each is building a racial character and a culture which are impressive contributions to human progress.⁹ The preservation of these institutions and ideals in a world of increasing complexity requires that there be many nations rather than a few.⁴ We in the United States have gained much from the experiences of our Latin American neighbors.² We wish only for their independence, the growth of their stability, and their prosperity.⁹ Every American should realize that men and women of every other nation have the same devotion to their flag and are as sensitive to the dignity of their country as we. It becomes our first duty to show by our every act, not alone by our Government but by our citizens, that our guide is justice.¹⁴ The moral weight of a nation is not based upon size or numbers, but upon the character and spirit of its people.³

Cultivation of a mutually sympathetic understanding does not preclude mutual economic interests. Some persons seem to think that trade between nations is solely for money-making purposes; and that it is, therefore, more often a source of friction than of good-will. As a matter of fact, economic interchange is an essential part of our mutual civilization.

An excellent example of mutuality between nations is that of Brazil and the United States. A large part of Brazil lies in the tropical zone and possesses unlimited opportunity for tropical productions. The United States is wholly in the temperate zone. The exchange of products, which neither can produce alone, becomes of more and more vital importance with every advance in human comfort and luxury. A century ago our countries could and did live a more primitive life, without the exchange of products; but without them today a thousand daily necessities and luxuries would disappear. Without these exchanges of commodities, large numbers of workers would be deprived of their customary useful employment.¹² The prosperity of Brazil and Colombia has been temporarily affected by the low price of coffee; Chile, Peru, and Mexico by the fall in silver, zinc and copper; Cuba by the condition of the sugar industry.¹⁵ These conditions have reacted strongly upon prosperity and employment in the United States.⁵ As our neighbors are in greater difficulties than we, our main reliance for speedy recovery must be our own efforts, not only to remedy our situation but to assist and cooperate with them.¹⁵ Economic interests in the Western Hemisphere are reciprocal; progress in prosperity and comfort can only be mutual.

Fortunately there is no basis for economic or other rivalries between the nations of Latin America and the United States.¹⁰ We have no desire for territorial expansion, for economic or political domination of other nations.⁹ We have only one desire, and that is to contribute to improving understanding, to common attainment, to common progress, and to mutual prosperity.² Under the Kellogg Pact we have undertaken never to use war as an instrument of national policy. We have undertaken by covenant to use our military and naval forces solely for defensive purposes.¹⁶ We have again reaffirmed the doctrine enunciated by that far-sighted statesman, Mr. Elihu Root, in his famous declaration at Rio de Janeiro in 1906,¹⁷ when he said:

"We wish for no victories but those of peace; for no territory but our own; for no sovereignty except sovereignty over ourselves. We deem the independence and equal rights of the smallest and weakest member of the family of nations entitled to as much respect as those of the greatest empire; and we deem the observance of that respect the chief guaranty of the weak against the oppression of the strong. We neither claim nor desire any rights or privileges or powers that we do not freely concede to every American republic."¹⁸

The Western Hemisphere stands today upon the threshold of a new era of advancement.⁴ It is a natural economic unit. By voluntary cooperative efforts, the American republics can rapidly increase the mutual benefits to be derived from developing its vast untouched resources.⁵ During the last thirty years great progress has been made in preparing for such development. Immense sums have been spent on the expansion of

transportation facilities, ports, harbors, and terminals; upon the improvement of agriculture, industry, and commerce. Regular air mail and air transportation services now reduce to days journeys that formerly required months. Cable lines and radio stations afford rapid communication.⁷ It is impossible to estimate the important consequences of this revolution in transportation and communication between our peoples. Every expansion in the transmission of intelligence and in daily contacts promotes the growth of understanding which makes for mutual respect and good-will among American nations.⁸ We can now increasingly enjoy in common the fruits of scientific research, the development of literature, art, music, the drama, and the inspiration of lofty thoughts that make for nobility amongst men.¹² We can vindicate magnificently before the world the faith of our forefathers in the ideals of freedom, equality, and justice. We can achieve an effective international solidarity of thought and feeling which will insure the maintenance of peace.⁵

SOURCES

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¹	Address by President Hoover, Kings Mountain,	Oct. 7, 1930	6
²	" " " " , Amapala,	Nov. 26, 1928, PAU	3-4
³	" " " " , Montevideo,	Dec. 17, 1928, PAU	36 and 39
⁴	" " " " , Buenos Aires,	Dec. 14, 1928, PAU	32-33
⁵	Not specifically covered by President Hoover in addresses consulted		
⁶	Address by President Hoover, Guayaquil,	Dec. 1, 1928, PAU	16
⁷	" " " " , Rio de Janeiro,	Dec. 22, 1928, PAU	47
⁸	" " " " , Lima,	Dec. 5, 1928, PAU	22-23
⁹	" " " " , Washington,	Mar. 4, 1929	7-8-9
¹⁰	" " " " , Santiago,	Dec. 11, 1928, PAU	29
¹¹	" " " " , Cutuco,	Nov. 26, 1928, PAU	7
¹²	" " " " , Rio de Janeiro,	Dec. 22, 1928, PAU	58-59
¹³	" " " " , San José,	Nov. 28, 1928, PAU	13
¹⁴	" " " " , Boston (Legion),	Oct. 6, 1930	3
¹⁵	" " " " , Cleveland,	Oct. 2, 1930	2-3
¹⁶	" " " " , Washington,	Dec. 3, 1929	4
¹⁷	" " " " , Washington,	Nov. 11, 1929	2
¹⁸	" " Mr. Elihu Root, Rio de Janeiro,	1906	

NOTE: (a) PAU refers to a pamphlet published in 1929 by the Pan American Union—"Addresses delivered during the visit of Herbert Hoover, President-elect of the United States, to Central and South America, November-December, 1928.

(b) Other references except No. 18 apply to addresses printed by the U. S. Government Printing Office.

Caretaking Activities at Inactive Harbor Defenses

By 1ST LIEUT. T. W. MUNFORD, C. A. C.

I. GENERAL CONDITIONS

SINCE 1922 a large number of our domestic harbor defenses have been on a caretaking status. Following a reduction of the Army in 1922, the policy formed by the Chief of Coast Artillery towards maintaining inactive defenses was to leave at such stations skeletonized forces only large enough to properly care for Coast Artillery Armament and other activities pertaining to harbor defenses equal to standards of preservation set and maintained by the Coast Artillery Corps. The result was that at all stations a small detachment of Coast Artillery troops supplemented by a few men from each of the supply branches of the service was intrusted with the important duty of maintaining everything pertaining to those harbor defenses in a standard satisfactory condition. The strength of these small detachments varied from eighteen to seventy-five enlisted men, and from one to two Coast Artillery officers, according to the amount of armament and other utilities requiring attention. At some of the stations placed on caretaking status, troops of other arms of the service were located for the purpose of economy and taking advantage of better garrison facilities and housing conditions while the Army was awaiting completion of the long promised housing program. The association of the small Coast Artillery detachments with troops of other arms of the service introduced many difficult and delicate problems for solution by the Artillery officer or officers detailed to supervise caretaking activities. This condition resulted in much friction between the Coast Artillery and the other arm of the service and placed the Artillery officers in a most trying position between basic loyalty towards their own branch of the service and properly performing their own specific duty, and loyalty towards the senior officer on duty at such stations which is naturally expected of the subordinate towards a senior. Practically speaking, this resulted in the unfortunate Coast Artilleryman having to serve two masters, and in most cases attempting to carry out policies formed by two different individuals, each policy in many respects conflicting with the other. Such a condition is naturally unsatisfactory and the axiom that "A good dog cannot successfully serve two masters" was forcibly demonstrated. If the senior Coast Artillery officer on duty attempted to fully satisfy instructions issued by the Coast Artillery, he immediately ran into conflicting instructions issued by the local post commander. So much dissatisfaction was evident as a result of such conditions, that there was at first a race between the two branches of the service involved to see who could detail the senior

officer at such stations, so that their arm of the service would have the upper hand. Such actions were not becoming of the dignity of the Army and since the two branches were representing the same Army, an admission that they could not congenially live together and carry out their separate missions was ridiculous on the face of it, and indicated that there was something lacking in the make-up of the personnel placed under such conditions, or that there was something lacking in the policy existing for operating under such conditions. In order to arrive at a definite solution for this difficult problem, there was published in 1925 certain definite instructions regarding the uses for which members of the Coast Artillery Care-taking Detachment at stations occupied by troops of other branches of the service could be employed, and rather definitely established the status of the Coast Artillery officers on duty and all affairs pertaining to the harbor defenses. This policy proved a successful solution to the many difficult local questions, and if loyally adhered to by both the senior Coast Artillery officer and the senior officer of the other arm of the service, prevents grounds for ill feeling and friction. It is of utmost importance to the Coast Artillery officers that no part of this caretaking policy be violated, for once a portion of the restrictions imposed by such a policy be broken down, foundation is laid for completely nullifying the entire policy at that station; and if by permitting violation of certain parts of the policy, friction should arise, there is no one to blame for the existence of such friction except the senior Coast Artillery officer who permits a condition to form and exist in violation of definite instructions and finally resulting in undermining of confidence between himself and the officers of other branches of the service with whom he must deal. In practically every case, a senior Coast Artillery officer is junior to the senior officer of the other arm of the service, and he is, initially speaking, in a subordinate position, which requires tact and diplomacy in avoiding controversies. Should he permit himself to be drawn into a controversy, the probability is that he will be the loser unless his feet are planted upon firm ground and the only solid ground which he can depend upon is strict enforcement of the caretaking policy published and transmitted to all parties concerned by the Adjutant General.

Customarily, the facilities which the Coast Artillery has at hand with which to work are limited when compared with the facilities existing at stations occupied jointly by troops of another arm of the service. There will be many occasions arising when the senior Coast Artillery officer will be charged with the performance of duty, the accomplishment of which, with his own facilities, are beyond all reason and can never be done without resorting to aid and cooperation from some of the other troops with whom he is associated. Consequently, congenial relationship with the commanding officer and all officers of the other arm of the service is of first importance. Successful accomplishment of a caretaking mission

under such circumstances develops into a game of give and take. There will be many occasions when the Coast Artillery officer will have to perform duties far out of proportion to what is normally expected of him. Wherever this can be done without adversely affecting the primary mission of Coast Artillery caretaking, common sense and sound wisdom dictate that he should do so, for by such action he builds prestige and gains the confidence of the senior officer on whom he must depend. If such an attitude be assumed, the Coast Artilleryman will soon find that he can always get whatever he desires within reason. It is particularly easy to bring about this condition because so many important post activities come under the jurisdiction of the Coast Artillery officer, or he is the only officer present who possesses the required technical knowledge in such matters. By displaying cooperation when such cooperation is not injurious to the interest of the Coast Artillery, he is only accumulating the kindness of spirit, from those from whom he will desire aid, on the credit side of the ledger. Diplomacy, tact, and generosity, when such generosity is not to the detriment of Coast Artillery interest, must be displayed at all times for successful relationship.

The problems existing at caretaking stations occupied only by Coast Artillery Caretaking Detachments are somewhat different from those existing at stations occupied jointly by troops of another arm of the service. In such cases, the senior Coast Artillery officer becomes the Commanding officer of the Post, and Harbor Defense Commander. He is, therefore, not only responsible for successful accomplishment of the caretaking mission, but must assume all duties pertaining to the Commander of the Post. The principal problem, usually difficult of solution, is one of providing adequate guards over all activities and at the same time attempting to limit the number of men employed on guard in order not to reduce his caretaking force below a number adequate for properly performing the caretaking duties. He is also the officer responsible for making civilian contacts and rendering the courtesies customarily required of Commanding officers. In some respects the problem is more difficult of solution than is the case where other troops are stationed with the caretaking force; but generally speaking, it should be much easier, since he is in supreme command and can form and direct his own policy without conflicting influences.

II. DETAILS OF CARETAKING

Customarily, in either case, whether troops of another arm of the service are stationed with the caretaking force, or whether the caretaking detachment is alone, the Coast Artillery officer or officers must assume practically every duty pertaining to all departments of the Harbor Defenses and supply branches which exist at active Coast Artillery stations. It is evident that this requires a diversified knowledge which is normally not expected of an officer, nor is it possible for an officer to be thoroughly conversant with all the duties, technical regulations, and instructions exist-

ing pertaining to such numerous duties. An officer on duty at caretaking posts is afforded a rare opportunity of broadening his education in a professional manner and exercising command while comparatively a junior officer, which many senior officers fail to attain during their entire career. The objectionable feature for an officer to be on caretaking duty is the total exclusion of taking an active part in troop training, and keeping in close touch with training methods of the Coast Artillery Corps. However, the advantages presented in exercising command and the opportunities afforded for broadening his education greatly outweigh the disadvantages of being isolated from active training programs of his arm of the service.

Competent exercise of command over caretaking stations is of primary importance. The number of men and facilities available for the accomplishment of this important mission, namely, *prevention of serious deterioration of Coast Artillery armament and fire control and communication system and constant maintenance of everything pertaining to Harbor Defense systems so that the Harbor Defenses can be immediately placed upon active service when required* are limited when compared with the amount of effective work which must be accomplished by the small detachments. Consequently, careful planning of work programs and economical employment of all personnel are absolutely necessary. Work programs and tentative disposition of personnel should be formed and made not less than six months in advance and every effort should be devoted towards adhering to this program and disposition. Unless this is done, no progress will be made. Thorough knowledge by the officer of all provisions, regulations, and requirements pertaining to his duties is of first importance.

After assuring himself that he is thoroughly familiar with his duties, the next step for an officer on caretaking duty, towards attaining success, is the proper education of every member of his detachment in the performance of his duties. Unless each individual of the caretaking detachment fully realizes what is expected of him, a caretaking program cannot be pursued with intelligence. Attention and time must, therefore, continuously be devoted towards instructing the members of the caretaking detachment in their duties. The most competent and most dependable men will naturally be assigned to the key positions. However, in order to continuously maintain an efficient program it is necessary to have in training at all times understudies for those occupying key positions, in order to have available a man in reserve in case a key man is suddenly withdrawn. It must be realized that all members of the caretaking detachment must assume responsibilities far in excess of those normally assumed by enlisted men of all grades in an active organization. The attention and time of the officers are usually so occupied with administrative details that they are unable to personally supervise the work in all departments. It is, therefore, of utmost importance that the key men be men in whom full

confidence and dependence can be placed, and nearly every man of a caretaking force becomes a key man. It is particularly interesting to observe the development and progress made by only average, ordinary men when they are forced to assume important responsibilities. The chief problem of the officer in charge of caretaking activities is, after having made a disposition of men, to check up on the progress and efficiency of their work, make corrections where corrections are required, and without hesitancy eliminate those men who are unable to meet the standards required. Very little time is available for correcting mistakes made and the major portion of the energies of the detachments must be devoted towards intelligent maintenance and progress, if the caretaking mission is to be successfully accomplished.

The following administrative disposition which is applicable to caretaking detachments both in stations occupied by troops of another arm of the service, and at posts occupied only by Coast Artillery Caretaking Detachments, has been employed and found to successfully accomplish satisfactory results in caretaking:

a. One officer assuming command for the Harbor Defenses and forming and directing the policy to be pursued.

b. If another officer be available, he will act as Harbor Defense Adjutant and supervise the numerous details pertaining to the disposition of men and personnel records, correspondence files, and generally carrying out the policy formed by the senior officers. If only one officer be available, he must oversee these details in addition to those named in subparagraph *a* above.

c. Detail a competent and dependable noncommissioned officer over each of the following departments and require that noncommissioned officer to supervise everything pertaining to his department in the same capacity as though he were a junior commissioned officer:

(1) Harbor Defense Headquarters:

Duties

- (a) Correspondence and correspondence files.
- (b) Personnel records.
- (c) Coordination and standardizing of all correspondence pertaining to the Harbor Defenses.
- (d) Requiring all incoming and outgoing correspondence to pass through Harbor Defense Headquarters and proper record of same to be kept.
- (e) Maintenance of reminder file for periodic reports and answers to correspondence with limited suspension.
- (f) General supervision over and contact with all other departments for the purpose of constantly being conversant with all matters of importance existing.

(2) Artillery Engineer's Department:

Duties

- (a) Correspondence.
- (b) Property records.
- (c) Historical records.
- (d) Maps, drawings, blue-prints, and plans.
- (e) Communication and fire control systems.
- (f) Power plants.
- (g) Miscellaneous: all other major and minor details pertaining to the Artillery Engineer's Department.

(3) Ordnance Department:

Duties

- (a) Correspondence.
- (b) Property records.
- (c) Store houses.
- (d) Ammunition.
- (e) Procurement of preservation supplies and issue of same.
- (f) Cooperative assistance with resident Ordnance Machinist who will be in charge of Ordnance Machine Shop.
- (g) Miscellaneous other major and minor details pertaining to Ordnance Department.

(4) Supply and Immediate Supervision of Detachment:

Duties

- (a) Maintenance of memorandum receipt records for battery and battalion (regimental) property.
- (b) Supervision over battalion and regimental stock records.
- (c) Supervision over clothing records (Form 32) and individual equipment records (Form 33).
- (d) Supervision over police and barracks discipline.
- (e) Supervision over work details and other major and minor details pertaining to this department.

(5) Outside Work Detail:

Duties

- (a) This detail to carry out work outlined by the senior officer and to be switched about from place to place where most needed.
- (b) Battery caretakers. One battery caretaker is normally detailed in charge of each battery and to work under direct supervision of senior noncommissioned officer in charge of Outside Work Detail.

At posts on caretaking status, the Coast Artillery Detachment is usually supplemented by a small Ordnance Detachment which does not customarily exceed five in number. It has been found better to employ these Ordnance men on purely Ordnance activities or if occasion arises when Ordnance activities do not require the attention of all the Ordnance men,

to place the excess Ordnance men in the outside Working Detail. It is not considered a good policy to detail Ordnance men as battery caretakers. The actual work on the armament is a Coast Artillery function and should be performed by Coast Artillery men. The Ordnance man should be considered as a technical expert in his line, and in order to obtain full benefit from his qualifications, he should be so employed.

Every effort should be made to standardize methods of caretaking throughout the Harbor Defenses and a uniformity of standards cannot be obtained unless specific instructions are issued and kept constantly before those key men responsible for carrying out the caretaking policy. The best means of obtaining uniformity of standards is for the officers in charge of the Caretaking Detachment to make a thorough study of local requirements and publish definite and specific instructions relative to the methods of caretaking in a General Order, distributing a copy of this General Order to each man concerned therewith. Full compliance with provisions contained in such a General Order must be required and frequent inspections must be made in order to discover whether or not all provisions of this Order are being adhered to. A good policy is to require a copy of this General Order to be posted at every place where a key man is in charge. All corrective measures and criticism should then be based upon failure to fully comply with the provisions of this General Order. It has been found that the average enlisted man is anxious to assume responsibility and a poor man will soon develop into an excellent man if he can be made to feel that his seniors have confidence in his ability, and are willing to entrust him with important responsibility. Too much stress cannot be devoted to the importance of continuously maintaining an intelligent instruction program. Men simply cannot be expected to satisfactorily comply with the wishes of their superiors unless they understand what their superiors want. In too many cases, officers are prone to assume that the men under them understand what is desired and unjustly condemn their men for failing to carry out their wishes. In such cases, nobody except the officer who has failed to properly instruct his men is to blame.

III. GRADES AND RATINGS

Caretaking Detachments are normally allotted grades and ratings in about the same proportion to the number of men present as are allotted to active organizations. This may appear correct on the face of it, but when considering the excess responsibility which must be assumed by every member of the Caretaking Detachment, such a proportion of allotments of grades and ratings is inadequate for the successful management and morale maintenance of a small detachment. Since it is of primary importance to develop and retain excellent men for key positions, then it should be just as important that as these men have been developed, they be rewarded for their efforts by adequate promotion commensurate with their value to the government.

At posts occupied by another arm of the service, the efforts of the officers in charge of the Caretaking Detachment in developing valuable men are rewarded with disappointment for the reason that they are unable to reward their good men with adequate promotion after having developed them, usually resulting in the loss of such men by transfer to the other arm of the service which can offer to them rapid and adequate promotion commensurate with their abilities. The policy maintained by me has been to assign only privates first class to the duties of battery caretaking; and if a private first class is not competent of performing those duties, to immediately reduce him and promote another man fitted for such duties. It appears inconsistent to assign a private soldier drawing only \$30.00 per month, to the important position of sole responsibility over a battery valued at several million dollars. On the face of it, the remuneration is not commensurate with the responsibility. Since the caretaking mission is one of such importance, and since it is absolutely necessary to have men of high qualifications, it is just as necessary to have available for these men some grade or rating carrying with it sufficient pay to amply reward them for their value. No such grade or rating exists in the Coast Artillery Corps. It is interesting to compare the attractions offered by the Air Corps to key men with what is available in the Coast Artillery Corps for men of equal ability. In the Coast Artillery Corps the maximum which can be offered to a battery caretaker is \$30.00 per month. In the Air Corps there exist specialist's ratings of mechanics first and second class for men with qualifications about equal to those required of battery caretakers. A mechanic first class draws \$84.00 per month and a mechanic second class draws \$72.00 per month. If there existed in the Coast Artillery Corps ratings as battery caretakers first and second class at the pay of about \$75.00 per month and \$50.00 per month, respectively, there would be no question about obtaining excellent men and retaining them at caretaking posts. The longer a man is retained as a battery caretaker, the more valuable he becomes in the performance of that duty. It is, therefore, evident that such ratings are necessary for the satisfactory accomplishment of caretaking, and some step should be taken toward providing such grades and ratings. At each Harbor Defense which is on caretaking status, there should be allotted caretakers' ratings first and second class equal in each grade to the number of batteries existing in that Harbor Defense. This would provide for a first class battery caretaker in charge of each battery with a second battery caretaker in reserve as an understudy to the first class battery caretaker and make provisions for replacements whenever a first class battery caretaker is transferred or is separated from the service. The allotment of such ratings should be in addition to those already existing since the remainder of the men must have before them some hope of promotion. As they are performing duties and assuming responsibilities in excess of those normally assumed, it is only logical that they should have some hopes of reward for their efforts.

The Sixteen-Inch Aerial Shoot

By LIEUT. BURGO D. GILL, C. A. C.

BATTERY "I," Fourth Coast Artillery, had been planning and dreaming for the year past of nothing but the "aerial" shoot. Actually, preparations for this test began a year ago but due to materiel difficulties it was laid aside until the earlier part of last spring. From the simple problem of "I" Battery handling their sixteen-inch guns with the aid of an aerial observer or two, it turned out to be a regimental affair with the entire officer personnel and most of the men taking part.

Upon receipt at Fort Amador of the War Department's directive for the shoot, it was evident that more was required than the mere shooting of the guns. A study of this directive showed that some ten tests were required. These tests had to do with everything from the service of ammunition to recording velocities by means of a Jeka-Duma. However, this article will only attempt to explain, in abbreviated fashion, the method of fire used by the battery commander, the means by which the aviator located the target, the work of the safety section, and the results. Undoubtedly, the readers of the COAST ARTILLERY JOURNAL would be interested in everything else that pertains to the shoot. But space limits us to the above mentioned problems. This is especially true of Major Woodbury's tests on locating and tracking a target by radio position finding on a plane hovering near the target. This system has particular application in hazy and foggy weather.

A hundred rounds of six-inch ammunition was allowed for the preliminary work. This was fired at an average of eleven thousand yards to test and iron out the system that had been decided upon as a result of numerous drills and conferences. Forty-eight rounds of the big stuff were fired in one velocity shoot and four courses, and—the system worked!

It was indeed gratifying that the last shot of the last course was a direct hit. (Certain scandalmongers whisper that a bottle of champagne changed hands—in Panama where it is quite legal—as the result of a wager made concerning the impossibility of securing hits.)

THE AERIAL OBSERVERS' PROBLEM

The job of the Air Corps was to locate the target, obtain the azimuth of its course, and estimate its speed. All of which is easily said, but it must be remembered that the target was at a range of forty thousand yards. The directive stipulated that the plane must remain sufficiently distant from the target to avoid being hit by the Archies. In other words, the plane must remain at least ten thousand yards away from the target. As an additional precaution, the plane kept the target between itself and shore. Incidentally, locating the target was easier for the airplane ob-

server when he was in this position than if he were flying between ship and shore.

Both the plane and the plotting room of the firing battery were equipped with radio. Next, the intelligence grid map prescribed by the Department, and with which all officers were familiar, was decided upon. This map carried ten thousand-yard grid squares. A photostatic copy of this map was carried in the plane.

The plane could then locate the ship within a thousand yards by referring to the proper square (naturally, all in code) and then giving the proper rectangular coordinates of the ship within this square.

The procedure was carried on somewhat as follows:

The plane reported in, and then a time check was taken. This time check is very essential as will be noted later.

Given the order to locate the (or a) target, the plane then commenced to fly beyond the target in a large circle. The aerial observer constantly kept his eye on the target, and on prominent landmarks such as islands, hills, and river mouths. When the observer could line up the target with two landmarks, he drew this ray on his grid map. For example, "Target, right edge Taboguilla Island—Ancon Hill." Of course, two rays are sufficient to locate the target. Actually, three were ordinarily used. The observer then assumed his target to be located somewhere within this triangle of error.

Next, the plane would fly directly over the path the target was traveling. The azimuth of the course of travel could then be gotten in two ways. First, by reading the compass course of the plane. Second, by noting a point on shore toward which the ship was moving. This ray could then be drawn on the chart and the azimuth noted.

Thus, the plane has four things to report to the battery: Position, azimuth of course, speed (which has been estimated) and time when observation was taken.

The Bay of Panama is "U" shaped, and dotted with many islands. The shore has many prominent topographical features such as hills, towns, and river mouths. These features are ideal for an aerial observer to spot. Were the coast a straight line, devoid of outstanding landmarks, the problem would then indeed be difficult.

This system differs somewhat from that used in the San Francisco shoot. However, regardless of the means the Air Corps uses to roughly locate the target, the essential thing to do then is that which artillerymen have been trying to do the world over—*Hit the target*.

The system that has been devised here has accomplished just such a possibility.

PLOTTING ROOM—*Initial Procedure*

First step—Having received the location of a target from the plane, the battery commander plots this position on his grid map. With dividers

and protractor he quickly obtains the range and azimuth of this point from the battery position.

Second step—From the meteorological message, this range and azimuth are corrected, ballistically. The corrected range and azimuth are then plotted on the plotting board.

Third step—Through this plotted point, the line of travel is then drawn.

Fourth step—All this has taken from three to six minutes. In the meantime the location of the target has changed. From the estimated travel that the planes have reported, the plotter (who should be an officer for obvious reasons) plots the new position of the target based on the elapsed time.

All that remains is for the range and azimuth of the predicted point to be phoned to the gun for the first shot.

SPOTTING

The observer is warned that a shot is on the way. He locates the splash with respect to the target, using polar coordinates. The clock system is used. The bow of the ship is considered as pointing at twelve o'clock. Deviations with the exception of a hit and anything within fifty yards is given in the nearest hundred yards.

Some critics might rise at this point and say that closer approximations should be given. This point is open to discussion but the above worked.

ADJUSTMENT

The beautiful part about the method of aerial adjustment used at Fort Amador lies in the simplicity of the plotting room operation and of the entire system. Although quite a bit of new, complicated apparatus were tested, their presence was only incidental to and not a part of the shoot.

Only one new gadget had to be improvised. This new device (to give it a name, call it "Dunn Locator" after its inventor), consists of a half circle of zylonite with a straight edge radiating from and perpendicular to the diameter. In other words, sort of a modified T square.

The semi-circular portion of the locator is scaled the exact reverse of clockwise. The reason for this is simple. Consider that a shot falls short and to the left of the target. Say at four o'clock, five hundred. The officer conducting the fire then wishes to correct his last predicted point by increasing the range and stepping up the azimuth. Consequently, considering the predicted point as the splash and plotting a point from this in the direction of ten o'clock, five hundred (the reverse of four o'clock, five hundred) this new position may assume to be the correct position of the target, the initial data having been incorrect by the full deviation.

Hence, the opposite scaling on the Dunn Locator. The plotter merely plots his points using the aviator's spots, direct, instead of changing them.

A full correction is always made on the first shot, and even on the

second shot if the deviation is rather large. If a large deviation happens to be "wild" and a full correction is made on it, the next sensing will be in the opposite sense from the first. This might be called a post-mortem test for a wild shot.

To return to where we were!

With the aid of parallel rulers, a new course is drawn parallel to the old course through this newly located point. Care must be taken to carry on correctly the proper numbering of the minute intervals.

So far, nothing has been said about correcting the speed and azimuth of the course.

Provided the course was estimated correctly, and the range was adjusted after several shots (easily done) it will be very apparent if the speed is incorrect. If the spots are always falling behind, the estimated speed is too fast. If always falling ahead—too slow!

If the azimuth of the splashes are all line shots, but the ranges are always too short in spite of corrections, then the azimuth of the course of travel is incorrect. The corrected azimuth is indicated by the centers of impact.

Of course, these suggestions on the adjustment of fire are not full and complete. However, they may be assumed to be a guide for anyone interested in this work.

SAFETY SECTION

Actually, the system that the safety section used caused more preliminary worry than anything else. The preceding explanations of the method of adjustment are probably familiar to some insofar as it has been tried in a somewhat similar fashion before. It is believed here at Fort Amador that the system used in the safety section's plotting room is quite new.

Why should the safety section cause so much worry?

Who of us has not seen at one time or another the splashes creep up on the towline as the shoot progresses? And this with Case II at ten thousand yards! What could happen at forty thousand?

The safety section's plotting room was equipped exactly like any standard plotting room with the exception of only two additions. A buzzer (safe to fire signal) to buzz okeh to the guns; and, secondly, a telephone over which was received data from the range section. Naturally, data phones to the guns were absent.

On the plotting board, three courses were plotted.

First, the track of the tug using a horizontal base.

Secondly, the ballistic course of the tug.

Thirdly, the data received from the range section to hit the target.

This was all done in the following manner:

Readings on the tug were received at minute intervals from the base end stations. This uncorrected data was put through the azimuth and

range correction boards. It is quite obvious that the same meteorological message had to be used by both the range and the safety sections.

This corrected data was then plotted.

Predictions were then received from the range section and plotted. If they came within a thousand yards (towline length) for the first shot, or five hundred on all succeeding shots, "Prediction dangerous" was ordered. If these predictions fell outside this danger zone, "Predictions safe" was phoned to the range section and buzzed to the guns on the buzzer.

RATE OF FIRE

The rate of fire for the 16-inch guns was one round every three minutes, and sometimes even two minutes. Considering the time of flight, eighty-five seconds, it was difficult to fire faster than this and make a correction (or take it under advisement) on each shot. For the present, it looks as though one-minute interval readings were as fast as the safety section could handle them and attend to their three plotted courses.

A certain amount of salvo firing was done with the 6-inch battery for the first one or two courses. It was ordered after adjustment was considered correct. However, it was decided not to do any more of this in order to conserve as many rounds possible for future courses.

RESULTS

The preceding system worked!

Other than that remark (and a few others) it is hardly the place for an innocent bystander to delve too deeply into them. They are for the C. A. Board to discover when it is presented with the ample and complete report rapidly taking shape under the guidance of Capt. J. T. Campbell.

Apparently, the initial estimate of the azimuth of course must be gotten accurately by the aerial observer. It is much more important than the location of the target. In practically all cases, the better the azimuth of the course, the better was the firing.

The accuracy of the initial location was not so important. Provided that the first shot fell anywhere near enough to the target for the aviator to estimate its deviation was all that was needed.

The course of the target should never be changed as long as the splashes are getting closer.

Four courses on the 16-inch guns were fired. Hits were secured on three of them. They totaled one bow-on, one broadside, and a double one.

Not so bad—what?

The Role of Aircraft in Coast Defence

By BRIG. GEN. H. ROWAN ROBINSON, C. M. G., D. S. O.

EDITOR'S NOTE: *In the August number of the COAST ARTILLERY JOURNAL we published an article by Wing Commander C. J. Mackay, M. C., D. F. C., R. A. F., with the same title as above. Wing Commander Mackay's article won the Gold Medal awarded by the Royal United Service Institution and appeared in its JOURNAL. General Robinson's article which received second place also appeared in the JOURNAL of the Royal United Service Institution. We wish to compliment the Royal United Service Institution on the excellence of its periodical as a whole and especially upon the well-written articles which appear therein. The Royal United Service Institution is fortunate in obtaining articles of so much merit, not only in the thoughts expressed, but in the literary manner of expression.*

Our readers will observe that the two articles are diametrically opposed in viewpoint. Yet the authors express themselves with no bitterness or abuse in evidence. It is the article appearing below which more nearly harmonizes with the viewpoint of the Coast Artillery Corps.

Maj. F. S. Clark, C. A. C., now on duty at the Naval War College, has reviewed both articles and has very kindly furnished his comments for publication.

I. OBJECTS OF COAST DEFENCE

COAST DEFENCE has two main objects. The first is to secure the various portions of the Empire, especially the principal ports and their contents, against invasion and damage, so that the fleet, having no anxiety on that score, may move its frontier to the enemy's shores, untrammelled in its strategic plans by the need for static defence measures. The second is to provide for the safety of the various naval bases and defended ports along the sea-communications of the Empire, the loss of which would deprive the Navy of the power both of distant action and of securing the transit of supplies. Whatever the means employed to attain these objects, they cannot be regarded as satisfactory if they are extravagant in men and materials.

II. ATTACKS AGAINST COAST DEFENCES

In carrying out their tasks the defenders may have to deal with enemy action in the following forms:

- (1) Invasion on a big scale, such as that anticipated in our eastern countries in the great war;
- (2) The seizure of a harbour or a beach-head, as, for example, at Port Arthur, as a base for further operations, or, as at Louisbourg, to deprive the enemy of a maritime base at a valuable strategic point;
- (3) The forcing of a passage, as at the Dardanelles;
- (4) Major operations for the destruction of warships, docks, oil depots and magazines, inside defended coastal areas, as at the Helder in 1799;
- (5) Blocking attacks, as at Zeebrugge;
- (6) Minor operations executed by submarines, torpedo craft and coastal motor-boats, as in the Sea of Marmora and Gulf of Finland;
- (7) Raids, as at Hartlepool, executed with the object either of creating panic or causing alterations in dispositions;

- (8) Mine-sweeping and mine-laying near harbour entrances;
- (9) Raids by aircraft.

In the first four of these categories the attacker has generally employed combined forces of all the arms available; and, in the remainder, he has used his navy or air force either apart or in combination as conditions demanded.

History indicates that, unless executed by naval and military forces acting in unison, major operations against coast defences are foredoomed to failure. Minor operations undertaken by a navy alone, such as the attacks of coastal motor-boats in the Gulf of Finland and those of torpedo-boats at Port Arthur, have, of course, often proved successful, but only in a limited sphere. When a navy alone has attempted major operations against coast fortresses the issue has been seldom in doubt. The land gun, with all the advantages of a steady platform, distant control, accurate range finding installations, protection, concealment, and an unlimited supply of ammunition has always been the superior of the ship's gun. When, on the other hand, a combination of naval and land forces has been employed under favourable conditions, and when leadership has been skilful and cooperation good, fortresses have usually fallen. A further postulate is the command of the sea, without which ships cannot be spared for the operation, nor an army be transported and maintained.

If we study the methods by which an assailant conducts his attacks, it will generally be found that he divides them into two distinct operations, in one of which the fleet acts directly against the harbour and, in the other, the army disembarks at a point some miles distant so as to move against the land side of the fortress. The operations round Port Arthur furnish a good example of this, for the army landed some seventy miles from the harbour against which the fleet was operating. The action of a fleet lies in securing control of the sea, in blockade or in bottling up ships in harbour, rather than in any direct attack on shore objectives. Decisive results against the latter have usually been achieved by the army. In modern days, when the two operations will be assisted and coordinated by aircraft, it remains to be seen whether this condition will still hold; and, indeed, whether or not all three Services are always needed.

The Place of Aircraft in the Attack

We have but little direct experience to guide us as to the worth of aircraft in coastal attack operations, for they have as yet played no big part therein. At the time of the Dardanelles landings they were still in their infancy, and, in the Zeebrugge raid, naval work strongly predominated. Their value in this connection has to be estimated from a study of their work in other spheres, from reports of their technical progress since 1918, and from the obvious fact that neither a navy nor an army can operate satisfactorily in modern warfare without them.

We do know, however, that the conditions under which they may have

to act in the attack are not always favourable to the development of their full capacity. The aeroplanes which are most powerful in relation to their weight are those equipped to work from land aerodromes. On the other hand, aircraft carriers are very vulnerable to attack, both from the air and the sea; and seaplanes, flying boats, amphibians, and aeroplanes launched from aircraft carriers and other warships all suffer from disabilities, either as to speed, ceiling or handiness. Nevertheless, they have to be employed unless the coast of the assailant, or other land in his possession, is in close proximity to that of the defender. Therefore, plane for plane, the defender will generally have over his adversary an advantage which will go far to cancel any numerical superiority the latter may possess, and this advantage will naturally grow in proportion to the length of the assailant's stroke.

Strategic surprise has seldom been achieved, since preparations for a major operation can hardly be concealed. And now tactical surprise becomes nearly as difficult, because the early concentration having been observed, the movements of hostile ships can often be followed from the air unless the assailant's base is very near. The mobility of aircraft thus enables the defender to concentrate all his available planes at the threatened point. It follows that the assailant cannot hope to achieve the necessary local superiority unless he has previously attained a marked dominance in the air, if not throughout the theatre of war, then at least over a wide area.

Judging from experience, it would appear that a major operation against coast defences, involving the actual capture of the fortress, is unlikely to be initiated by an assailant unless he is able to launch from fairly short range a combined expedition, containing navy, army and air force units in their correct proportion, at a time when he has command of the sea and a marked superiority in the air, not only local, but general. These conditions will naturally become of less importance as the operations shrink from the major to the minor category.

If, however, it could be shown that a fleet and air force combined, unencumbered with an army and all its paraphernalia, would suffice, not indeed for the capture of the fortress, but for the fulfilment of the task most commonly involved, namely, the destruction of ships and establishments in harbour, the chances of effecting surprise would be greatly enhanced, and operations of this nature might be undertaken far more readily. Such an issue might have a profound effect on naval warfare, because attacks of this type, even if they failed to destroy the enemy's fleet, would certainly force him to a radical alteration of his basic strategy. In addition, there would be no security in any protected commercial port. There must, therefore, be a great temptation to adopt such a method. Whatever the method, however, it will be convenient to consider attacks from the sea on coast fortresses, and attempts at landing separately, though each may form part of a single combined operation.

Attacks on Defended Harbours

It may be presumed that, in whatever position a fleet may anchor to bombard, the area chosen will be within range of the fortress guns. In fact, guns are usually so sited as to be well in advance of the targets an enemy would seek to destroy, and so have the advantage in range. To protect themselves against the fate that has hitherto so often befallen them, the ships will, therefore, in all probability, put up a smoke screen while in action, having first fixed their position as accurately as possible for predicted shooting. They will fire through the screen, and, if they can get observation, will probably obtain valuable results; but if not, the effect will be moderate. Ships will, therefore, in ordinary circumstances, have to depend on their airmen for the efficacy of their bombardment; and it follows that, unless the assailant has local superiority in the air, the ships' gunfire will be of no avail. Moreover, the superiority needs to be so great as not only to ensure observation of the ships' fire, but to deny air observation to the enemy. An even wider margin will clearly be necessary if air attacks are to be combined with sea attacks.

In attempts to block harbours, the assailant will lay special stress on surprise, and will, if possible, initiate and complete his work by night, employing his aircraft to lay smoke screens, and also perhaps to attack the defender's guns.

Landing Operations

As the defender cannot possibly guard his whole coastline strongly, the assailant, if operating from a short range, might hope, by secret preparations and rapid action, to effect a surprise and thus find his chosen point of disembarkation lightly held. Initiated in the dark, the operation could be continued by day under cover of a smoke screen laid by planes along the shore. Then, supported by the fleet and lightly opposed by hostile fire, it might, if well combined, be expected to meet with success, provided hydrographic, topographic and meteorologic conditions were all favourable. A quick landing, the early formation of a beach-head and the organization by warships of covering fire beyond the forward troops complete the first stage of the operation. Superiority in the air will be of great value, as it will simplify for the assailant the difficulties of preliminary reconnaissance, and will enable him, prior to disembarkation, not only to watch the movements of the enemy, but also by photography to discover all his preparations for defence and bring maps of the coast up to date. It will, moreover, give him air observation for ships' gunfire; and this is particularly important since high angle fire has been introduced and reverse slopes can be searched. Finally, it should enable him to impose heavy casualties and a considerable delay on reinforcements despatched by the defender from his central reserve to the selected landing point.

Minor Attacks

In minor operations such as raids, harbour-blocking, and mine-sweeping, aircraft will not be of noteworthy assistance to the attacker except for reconnaissance, searching for submarines and observation of fire.

III. THE DEFENCE—SHORT-RANGE EXPEDITIONS

Organization

The usual organization for defence, except in isolated naval bases, is the division of a country into Commands containing, firstly, field troops of all arms distributed in peace in training centres but available for any threatened point in war. Secondly, the Command generally contains a number of Coastal Sectors, each held by troops, both field and garrison, and including one or more defended harbours with their contingent areas. And finally, there is the Coast-fortress or Defended Harbour, manned solely by garrison troops. Where, as with us, a separate Air Service exists, air units are supplied by the Air Ministry on a basis calculated according to requirements by the Services concerned.

Again, it will be convenient to divide harbour from shore defence, for, apart from the fact that the two areas are, as pointed out above, usually subjected to separate attack, the forms of defence are sharply differentiated by the nature of action, the one static, the other mobile, by the troops employed—the one garrison and the other field—and by their relative capacity for dealing with aircraft.

Present Position of Harbour Defence

The present position of harbour defence is that the Navy, Army and Air Force work together under a commander usually chosen from the Army. The part played by the Navy is comparatively small, for naval action is always either directly offensive or potentially so. No portion of it that is available, or that would be useful in a fleet action, is allowed to remain in port for defensive purposes. Its coastal duties are limited to the protective use of mines, booms, and nets, and to the employment of light craft for reconnaissance and patrol work; though, where any units of a fleet are present during an attack, they naturally take part in the action to the limit of their capacity in combination with the land forces. The Army provides the garrison, which consists of gunners to fight the coast and AA guns, engineers to work the searchlights, and infantry to man the land defences and to repel minor attacks on the harbour. The Air Force does not normally form part of the garrison except at large stations abroad, and in some foreign coast fortresses, but is provided, as needed for ranging guns, from outside sources. The form that air attack on warships may be normally expected to take is that of a smoke-screen dropped to windward, followed by a bombing attack at a low height as the screen floats over the vessel. Such an attack may often be effective, but the power to deliver it presumes either equality or superiority on the

part of the defender's aircraft: conditions which, as has already been indicated would per se rule out the hostile adventure. Airships as proved by the Germans in the Bight of Heligoland, are of special value for reconnaissance, and almost preclude surprise except in the case of attacks delivered from a very short range.

The armament of the fortress consists, firstly, of heavy guns on fixed mountings, relatively few in number and inferior in power to the weapons that may be brought against them, but with the compensating qualities already indicated; secondly, of light guns assisted by searchlights for dealing with hostile raiding craft; thirdly, of heavy mobile guns and howitzers suitable either for mobile or static defence; and lastly, of anti-aircraft guns.

For defence against landings every Command and Coastal Sector has some form of defence scheme intended to deal with probable contingencies, utilizing for this purpose all available field troops and heavy batteries, and arranging for the cooperation of aircraft.

Antiaircraft Guns

Hitherto the problem of fort gun versus ship only has been discussed, and no value has been assigned to the AA gun, a weapon that will certainly play a conspicuous rôle in any such operation in the future.

In many directions the sciences of gunnery and war mechanics have made but little progress since 1918. But in AA gunnery a truly remarkable advance has been effected. From being a laughing-stock for many years in France, it has risen to such a standard of accuracy that any aircraft flying below 15,000 feet will have to reckon with it seriously. In coast defence this science can reach its full development, because there it can call into use heavy metal, fixed positions, height-finders, sound-detectors, searchlights and communications; and it enjoys the further advantage that the assailant has no choice but to launch his attack directly against a comparatively small area, which may be further narrowed by the erection of balloon nets, and by guns disposed in carefully selected positions: a very different affair from attacking vast areas such as the port and city of London.

AA guns will thus render both air attack and air observation difficult to the enemy, and will compel his spotting aircraft, if they wish to keep out of reach, to observe from a distance of at least four miles. Now, quite a light smoke haze, which can easily be produced and maintained, would suffice to conceal targets in harbour at that range, and the coast guns themselves would, if well camouflaged, be difficult to discover. The assailant's gunfire would, therefore, suffer considerably in effect. The defender's aeroplanes, on the other hand, though inferior in numbers, would be able to fly unchallenged in the area controlled by AA guns; and, though they might be some eight miles distant from the bombarding ships, observation on such targets would be relatively simple. It looks, there-

fore, as if the coast-gun, its effect but little disturbed by fire, will be able to pump shell as of old into the ship, whereas the latter will not only suffer from a lack of efficient observation, but also from all former disabilities. Thus the relations between attack and defence in this connection remain practically unaltered. And there is yet another point to consider. It is that, although the naval intelligence service has always been able to gauge with fair accuracy the hostile strength in fixed armament, it can make no satisfactory forecast of the subsidiary and movable defences it will have to encounter in the shape of aircraft, submarines and mines: and the increasing efficiency of these weapons is likely to act as a progressively greater deterrent to attack.

But in addition to a fleet attack assisted by air observation, the assailant might, as already suggested, launch an air attack on the fortress on a large scale, should the contents of the harbour and docks appear to justify the risks involved. What would be the prospects? They would certainly be improved; for the simultaneous delivery of the dual bombardment, even though inaccurate, would be very disturbing to the shore gunners. The approach of the bombers would, however, be early detected, by sight during the day, by sound detectors during the night, so that no surprise should be possible. By night, too, the area would be better illuminated than by day. If there were many warships in harbour—and such an attack could hardly be justified on other grounds—their AA guns would join in the battle under conditions far more favourable to them than in a sea-fight. Fighters might, indeed, accompany bombers and make their all-direction swoops, but fire could be organized to deal with that eventuality from the machine guns of the ships, the infantry and the coast gunners. The more planes in a restricted area at a time, the more shell and bullets would find billets. In fact, against a well organized coast fortress, an air attack might be expected to breakdown and suffer such heavy casualties that the air superiority necessary to the execution of the enterprise as a whole might well be lost. The casualties would not, of course, be all on one side, but the advantage in this respect might incline very steeply to the defence.

If these anticipations are even approximately correct, the coast fortress as at present organized would seem to be as strong as ever against attack from the sea, even against a fleet supported by a superior air force. On the grounds of security, therefore, there is no strong case for altering our present system of harbour defence. The new arm appears to be of equal value to either side, perhaps favouring the defence slightly. In fact, the advent of aircraft, instead of effecting revolutionary changes in this branch of warfare as might have been expected, leaves matters much where they stood.

Guns or Aircraft

It has been urged, however, that fixed armaments are obsolete, and that improvements could be effected, both as regards efficiency and economy

were aeroplanes no longer to cooperate with guns in the defence, but actually to replace them. This matter may be examined from several aspects.

In the first place, when the submarine was invented, it was thought by some, although the opinion was never strongly held in the Navy, that it might replace fixed armaments. That delusion quickly passed; and the submarine was absorbed wholly into the naval sphere. Nevertheless, it has inherent in it a strong value for coast defence, which operates automatically; and the aeroplane is in precisely the same position in this respect. Both of these weapons, by virtue of their very existence, and of the uncertainty that must prevail as to their positions and numbers, afford a wide and continual protection to coast lines. It may thus be argued by analogy that although aircraft in their existing form furnish a natural support to coast defences, they should not necessarily replace them.

In the second place, it must *prima facie* appear unnatural to allot such a rôle to aircraft, but although the task is essentially a defensive one, the action must be definitely offensive. Moreover, the rôle of defence, more particularly that of local defence, lies outside their natural sphere. Normally, they reconnoitre, they attack, and they afford distant protection. True, numerical weakness and the knowledge of the issues involved, coupled with the certainty that we shall never be the aggressor and, therefore, never possess the advantages inherent in the initiative, have driven us to give aircraft a defensive rôle in the protection of London. Such employment of the most mobile of all weapons is, however, clearly abnormal.

From generalities we may now get down to details. The superiority of the coast gun in action over the ship has already been indicated. Is the aeroplane equally effective? In attacking a ship it has the advantages over fixed armaments of unlimited range and arc of fire, and of being able to reconnoitre and to direct its own fire. But to draw profit therefrom it would have to leave the shelter of the AA guns of the fortress in the face of a superior air force and would find itself exposed not only to ships' fire, but also to a host of enemies of its own kind. With these rather doubtful credits, it has certain definite drawbacks against which to contend: when it attacks it does so under a fire most disturbing to the aim; it furnishes an easy target in launching a torpedo; bombing, it has to fly at a dangerously low altitude if it is to score hits, and it has constantly to return to its base to refill with ammunition and petrol. Therefore, it cannot strike blows as rapidly, continuously or accurately as the gun. It is, moreover, easily damaged, while it is to some extent susceptible to weather. The latter point is, however, normally of no great importance; for, where both sides are depending on aircraft for certain subsidiary services, the respective failures will cancel out. But where one side depends on aircraft entirely for protection and the other has no vital need for them, a storm may prove decisive of the issue. Another drawback is

that, on shore, the aerodrome will often furnish ships' guns or aircraft with a big target, whereas gun magazines are hardly discernible.

But if we take matters not directly connected with harbour defence and actual engagement of targets, there is much to be said for the aeroplane. It can detect submerged submarines; it can operate from the fortress against passing ships far more effectively than can the gun; it can assist in the prevention of a landing or in offensive land operations in the neighbourhood of the fortress; if the harbour is not in danger it can be employed elsewhere; in peace it can be used for combined training with other troops, whereas guns' crews are kept boxed up in a fortress to the detriment of their fitness for all other services. Most important of all, we need every aeroplane we can raise to ward off air attack against London which, though not a probable event, would be fraught with the gravest peril to our national existence. Any scheme, therefore, that would produce more aeroplanes for home defence, without loss of efficiency elsewhere and without additional cost to the taxpayer, would deserve a warm welcome. These are all factors that could count strongly towards the displacement of the gun by the plane were it possible to show—which it is not—that the two weapons were of even approximately equal defence value.

Whether or not the mobility of aircraft should count as a credit in this connection is a point that is much debated. The armament of coast defences is carefully adapted to the scale of attack it is likely to meet, and the guns are sited to meet all probable contingencies. There is, in fact, a constant state of readiness suited to the importance of the task. The immobility of the guns not only confers many technical benefits, but is also, in one sense, of strategic advantage, in that it enables the fleet to operate without anxiety as to its bases and line of communication. On the other hand, the mobility of the new weapon would be a constant source of anxiety to the fleet. Nor would the plan recently adumbrated by a high authority, namely, to hold distant outposts lightly and despatch reinforcements as required, either from areas not under direct attack or from central reserves, appeal to the Naval Staff, however sound it might appear superficially. In the first place, they would perceive the possibility of the loss of naval bases by a whole series of coups de main while temporarily depleted of protection. In the second place, they would feel that coast guns are, owing to their immobility, practically speaking, under their control, whereas the activities of aircraft would not only be outside their control but might, with a little mismanagement, be even outside their knowledge. The result would be that the fleet would never be able to act with its traditional enterprise, for boldness is natural only when based on security. In the third place, the reinforcing aircraft might be delayed by bad weather, and they would, in any case, be new to the theatre: facts that would militate against their efficiency and effective cooperation with other fighting units. Lastly, it is notorious that commanders are prone

to exaggerate either the immediate importance of their commands or the dangers threatening them. They might accordingly make strong objections to the despatch of reinforcements from their exiguous garrisons, or continual demands on the pool. Moreover, if, as may be presumed, the enemy has won air superiority, the pools will already have been seriously depleted. Hence only the actual presence in the coastal area concerned of a large number of aeroplanes would satisfy the naval requirements for security.

It is not, however, for the Admiralty to settle the matter. The Government, with whom the decision rests and which has to think imperially, might regard the mobility of aerial coast defence as a valuable asset. Guns and their crews locked up all over the world entail a dispersion of force, and can fulfill their own specific duties only. Moreover, as the political situation changes so does the need for coast defences alter, in one quarter vanishing and in another arising or becoming specially insistent; and it is almost as expensive to uproot and transfer the paraphernalia of fixed armaments as to renew them. Aircraft, on the other hand, can be transferred from place to place at inappreciable expense. Such action represents the true strategic use of force.

There is, therefore, in the matter of the value of mobility much to be said on either side; but, on the whole, the balance is more heavily weighted for the aeroplane; and, if no other point in this connection had to be considered, the views of the Navy, sound as they are purely from its own point of view, might have to be disregarded.

There is yet another point that might be urged in favour of aircraft. Coast defences are, of course, only required if there exists a danger of attack. And it has been shown that there is no such danger unless the opponent has command of sea and superiority in the air. We are always aiming at the one; why not aim definitely at the other and thus gain complete immunity? In view of their mobility and the consequent feasibility of their transfer when unemployed to decisive areas, the substitution of aircraft for fixed armaments would be a step in this direction. One answer is that the substitution mentioned is but a single, short step, for the savings that would accrue from the abolition of long-range coast defence guns would provide and maintain but few aeroplanes. Many other steps might be required, therefore, before the desired end could be attained. Another answer is that we can never be certain of permanent dominance in either sphere. While suffering a temporary eclipse of our powers, we might, therefore, if without out guns, see naval bases taken from us, and we might see our merchant shipping destroyed in harbour. Warfare is an even more speculative affair now than of old. Not long ago we thought—and in the main rightly—that we could estimate changes by battalions, batteries, battleships and railways, but such estimates may now be vitiated, less perhaps by the genius of leadership than by the appearance of some wonder-

ful new weapon: a tank, submarine, or aeroplane, endowed with peculiar properties, which may have profound effects before the antidote is found. While aiming, therefore, at constant progress and the utilization of the benefits of science, we must hold tight to security and make all our advances from that solid base.

A third answer lies in the difficulty of definition—in degree, compass and range—of such terms as “command” and “dominance,” and in the possibility of different interpretations being placed on them by the parties concerned. One belligerent might be satisfied with a slight command, another with a surface command, a third with a local command on which to base his enterprises. Yet a further might think any form of command unnecessary: and if no fixed defences existed he might find he was right.

We could, therefore, never be sure of the necessary dominance in the air and on the sea that would render any attack abortive. Nor, even if we had obtained it, could we be certain of placing an interdiction on the ventures of an enterprising enemy. And the doubt that would prevail as to the safety of our harbours might impose an intolerable drag on the operations of both Navy and Air Force.

Then there is finance to be considered. Owing, however, to lack of relevant information, it can only be treated here in nebulous fashion. But even if the most accurate data were available and in the hands of experts, it would still be no simple matter to pass a definite judgment, owing to the intricate side issues, tactical and strategic, involved, and because it is not only a case of the relative cost of the two weapons, but also of the establishments and buildings required for their creation and maintenance. Certainly, however, whatever evidence there is seems to indicate the gun to be the cheaper weapon. It is more effective for the immediate purpose in view; more durable; less likely to be hit; less exposed to damage and destruction; subject to fewer fashion changes; and, therefore, fewer guns than aeroplanes are likely to be needed. It must be borne in mind, too, that when the political atmosphere is peaceful, guns can be placed on a “care and maintenance” basis with a minima employment of personnel, whereas aircraft must always be in use; and for one aeroplane in the air there may be thirty men on the ground working to keep it there. It would, moreover, be necessary, however many aeroplanes were present, to maintain quick-firing armaments and searchlights against light surface craft and submarines whose attack would be difficult to repel from the air. On the whole, therefore, it seems reasonable to suppose that the provision of sufficient planes to give a security approximately equivalent to that of the fixed armament they would replace would entail considerable additional expense. The one strong argument in support of the claim that aircraft would be economical, as compared with guns, is that, when an alteration in the political situation entails a reshaping of coast defence policy, the cost of the change would be infinitesimal with

aircraft, whereas with fixed armaments it would be a serious matter. But the argument lacks force so long as the aeroplane is ineffective in defence.

From the points of view of technique, finance, tactics, and even to a certain extent of strategy, it would appear, therefore, unsound to replace the coast-defence gun by the aeroplane. To remove any other doubts that might arise, however, we may enter those higher regions where policy and strategy merge into one another, and at the same time cast an eye upon the future.

In the history of amphibious warfare, right down to Dardanelles days, ships of the line have continually attacked forts and, in spite of repeated failure, seem inclined to pursue the same course in future, calling smoke and aircraft to their aid. It has, however, been shown that the new processes offer no greater hope of success than the old. And there are other factors at work not hitherto mentioned. Battleships—the only vessels employed in the direct attack because all others would be too vulnerable—are already huge, expensive and, if comparison be made with former days, relatively few in number. Seldom would the strategic situation justify a nation in risking one of these costly and scarce creations where a disaster might alter the whole balance of naval power. Moreover, if we study our commitments and scan the political horizon we shall search in vain for a power to whom such a course is not further prohibited, as regards our home ports, either by distance or by relative strength. And these truths will become more evident as governments succeed in effecting the naval reductions at which they are now aiming.

Bombardments, therefore, if not already an obsolete form of warfare, may become so as soon as the test of war shall have exposed their futility. That being the case, why keep the coast gun? The answer is that, if it were absent, naval attacks might again become popular, since temporary dominance in the air—a condition precedent to any form of attack on a coast fortress—would enable ships to bombard harbours at short range with but little danger to themselves. Were the AA guns also removed, the contents of the harbour would be completely at the mercy of the assailants.

As regards the present and immediate future, therefore, our doubts are resolved, and we find there is no case for replacing the gun by the aeroplane for dealing with short range attacks. The obvious benefits, however, that would accrue from the exchange of a static for a mobile weapon where the latter can fulfill all necessary requirements, coupled with the urgent need of increasing our Air Force, demand that this matter shall be continually reviewed in the light of advances in science, remembering always that, whereas improvements in gun armaments take years to materialize, progress in aircraft construction is more rapid.

Repulse of Landings

It has already been pointed out that, given the premise of air superiority, the assailant might draw profit from his aircraft in reconnaissance.

observation of fire and the imposition of delay on enemy reinforcements. The defender, however, may draw an even greater profit from his aircraft. Unless the enemy venture is of a very short range nature, no conceivable degree of air inferiority should prevent him from bombing transports far out at sea, in addition to attacking them close in shore during the operation of landing; and transports are much more easily sunk than warships. Nor should it deter him from reconnaissance; and, therefore, unless the whole undertaking could be executed under cover of darkness or fog, aircraft would certainly discover it and prevent the assailant from obtaining that surprise which is almost an essential to success. As regards observation of fire, on the other hand, the defender is at a disadvantage, for there will ordinarily be but few AA guns available at the landing point, and his spotting aircraft will thus be unprotected against their more powerful antagonists. On the whole, however, the employment of aircraft appears to confer rather more benefits on the defender, even should he be the weaker in that arm, than on the aggressor, and will render the operation of an opposed landing more difficult and doubtful than ever. Were the defender to have a superior air force, the attack would certainly fail, even against quite moderate opposition from land forces. In fact, though fixed armaments cannot be satisfactorily replaced by aeroplanes, it would appear to be a sound policy to reduce the strength of any troops specifically allotted to mobile coast defence to admit of a corresponding increase in strength of the air force. At home, this might imply an access to the strength of the Auxiliary Air Squadrons at the expense of the Territorial Army.

IV. THE DEFENCE—LONG-RANGE EXPEDITIONS

The Importance of Air Bases

It is a commonplace that fleets and armies lose power, progressively, the further they advance from their base, partly owing to natural exhaustion and partly to the need of protecting their lines of communication. The handicap imposed is to a great extent removed from a fresh base if found and formed, the operations of British armies from India and British cruisers from Singapore being cases in point. With the air arm the same principle not only holds but is sharply accentuated. However great an air superiority a nation may have attained, it cannot hope to maintain it for long with an expeditionary force despatched beyond the range of its land aircraft; for neither aeroplanes on carriers nor seaplanes will be able to deal with an enemy possessed of serious air power and able to operate from a land base. If, however, while the expeditionary force is still in being, new bases can be found for the employment of land-planes, where they can also be protected and supplied, then there is every chance of the maintenance of their original superiority without which the expedition has but small prospect of success.

Distant Protection

These rather obvious facts are of peculiar interest to the British Empire, and furnish the key to the problem of coast defence in our Dominions, in India and in some of our more distant maritime bases. Let their implications be sought, for example, in the defence of India. No expedition could reach that country by sea with any large residual air power. Nor is there any point on the Indian coast or in its proximity where it would be possible to establish an air base free from the striking power of the British Army in India. Early news would have been received of the start of the expedition, and aircraft would have concentrated from all parts of the country to oppose it. Transports and aircraft carriers would probably be destroyed as soon as within aircraft range, and continual bombing attacks would be made on the fleet as it approached. The expedition might succeed in reaching Bombay, say, and, in the absence of fixed armaments, might even bombard the town and harbour, causing a certain amount of damage; but it could do no more. Then, having suffered considerable damage from bombs, it would return and probably become a prey to the weaker fleet on the return voyage. The prospects of success of such an expedition would be so hopeless, provided an adequate, though not necessarily large, air force existed in India, that heavy fixed armaments in coast defences would not be needed to repel its incursion. The latter might indeed save a port from bombardment by a raider, but the known existence of an air fleet-in-being in the objective country would act as a complete deterrent from a greater enterprise. The same arguments apply with regard to Australia, and if, as we may, we exclude from consideration the possibility of war with America, also to Canada; and this with added force, because their coast lines are much more susceptible to serious attack than those of India, where hydrographic and climatic conditions are adverse and communications with the interior difficult.

Singapore will be found to react differently to the test. An expeditionary force, though out of air range from its home aerodromes, might easily establish air bases either in the mainland or on islands within the necessary range of Singapore harbour. With fixed armaments the attack on the harbour might be repelled on the lines already discussed; but, in their absence, the defender's aeroplanes would be driven down, ships in harbour could be bombarded and bombed, and the hostile fleet, after a process of minesweeping, could enter the harbour. It might, of course, be possible to send air reinforcements from India, but only at considerable risk, and they might not suffice, given the premise that the enemy had original air superiority.

All naval bases on the eastern, southern and south-western coasts of Great Britain come into the short range category; and it might be a little risky to omit from it even those on the western coast and in Ireland. Obviously, too, Malta and Gibraltar need fixed armaments. AA guns,

supplemented by balloon nets, would be of particular value because although the fleet might be able to retain command of the sea, air superiority would probably be won by an enemy specially favoured by position in that region. In fact, given good antiaircraft protection, a fleet in the Mediterranean should be safer in harbour than at sea; without such protection harbours would be untenable. Aden must also be defended by guns, for it would be possible for an enemy, were the Arabs among his allies, to establish aerodromes within easy reach; and it is a fortress that might become of vast importance to us as a guard to the European flank of our Cape route, should we have temporarily lost the command of the Mediterranean. Bermuda comes into the same category, but for a different reason: namely, that owing to its isolated position, it would be more than ordinarily wasteful of mobile power to keep aircraft there.

In fact, in making a world-wide application of the test, we find that coast protection can be safely entrusted to aircraft only in India and the Dominions; and even there light, fixed armaments with searchlights should be emplaced for repelling raids on the principal harbours. Fortunately, in these continental areas, the development of air transport will be rapid, and the necessary increase in aircraft can, therefore, be made partly on a civilian basis. Incidentally, too, should our eastern traffic be forced to move by the Cape in war, and should no previous arrangements have been made to furnish harbours with adequate defences along that route, it would, given a sufficiency of aircraft, be both feasible and advisable to afford coast protection to it, temporarily, from the Air Force. Again, in the great hinterland of Africa there is the probability of aerial development which might prove of value in the quick change over of bases.

V. COMMAND

Into this rather intricate problem, the question of command must enter. It is important to ensure in the first place that no doubt shall arise as to who is the commander and, in the second place, that the direction shall be in the hands of the predominant partner.

Where defence is mainly a matter of fixed armaments, the difficulty as to command does not arise, because such aeroplanes as may be available will be used for reconnaissance and spotting either for naval or for military forces. Nor does it arise in the absence of guns; for the Air Force is naturally then supreme. But where in addition to fixed armaments there is an independent air force, as, for example, there might be at Singapore, Hong Kong or Aden, the matter needs careful consideration. The fixed armaments have been emplaced because the harbour is of strategic importance. If the independent air force is present for the same reason, the relative strength of the respective forces might decide the issue. On the other hand, if the independent air force is there for a subsidiary purpose, such as the control of neighboring tribes, then the fortress commander should be a soldier.

In the Dominions the matter is simple. The primary domestic business there is coast defence; and it might well be entrusted to an air commander: wholly in peace, and, in war, until such time as the enemy might begin an actual attempt at landing, when control would pass to the army commander on the spot. In India, the affair would be more complicated, and the question of command would need close definition. Probably the whole air force would be placed in war under the Commander-in-Chief with delegation of responsibility to the air officer commanding for distribution of units in accordance with the general plan of the former. The Navy, too, must have a say in the matter for the safety of its bases depends on the solution of the problem. Naval activities in this connection should, therefore, be combined as far as possible with that of the Air Force. Fortunately, nowadays, common problems of this nature are thrashed out in peace by the heads of the fighting services sitting in conclave. They would certainly cause endless discord if tackled for the first time in war.

VI. CONCLUSION

Our conclusions may now be summarized. The primary object of the Navy is to gain and keep the command of the seas. That of the Air Force is to win and maintain superiority in the air. If they fail in these objects, the two services will not be able to play their full part towards the security of our trade and the preservation of the Empire. To achieve these aims freedom of strategic action is essential; and such freedom is denied where each has to consider the protection of bases. The existing system definitely commits coast defence to the care of the Army, in whose element it lies and to whose low order of mobility and naturally defensive capacity it is well suited. It has stood the test of time throughout a long series of naval operations and in the Great War. Any big change in it should, therefore, be made only when the operation of some new weapon of war makes the need clear and insistent. It has been shown that aircraft do not have this effect at the moment. The superiority of fixed armaments in relation to ships remains, largely by virtue of aid from the air, much where it stood. Aircraft, too, have a far lower defensive power than coast guns. To attempt, therefore, to replace the latter by the former without any reduction of power would entail vast expense.

There are, however, certain tasks for the Air Force in coast defence, apart from spotting for artillery, and apart also from that distinct, though imponderable, protective influence due to its mobility that are implicit in its very existence. It has definitely reduced the probabilities of attack by its capacity for reconnaissance which, combined with the speed and certainty of wireless communication, has greatly enhanced the power of the defender to bring his mobile instruments, whether they be men, aircraft, submarines or guns, to the danger point in time to meet the threat. If in superior force, it will definitely prevent the success of any hostile enter-

prise against our shores, however powerful an armada the enemy may produce. Then, unless considerably inferior in force, it can make enemy attempts at landing practically impossible. Finally, in certain distant regions, such as India and the Dominions, it might with advantage replace all heavy coastal armaments, and in war it might furnish temporarily the principal defence of any new maritime bases. It will be seen that these duties will not interfere with the primary task of gaining air superiority, except that it may not often be possible to draw reinforcements from the distant countries employing aircraft for coast defence.

Cooperation is now as ever the secret of success, and it should find its best expression in the subject under discussion, in allowing the static elements to act defensively within their narrow compass, thus releasing the mobile elements to operate freely over wide ranges in accordance with the needs of the strategic situation.

Comments

By MAJ. F. S. CLARK, C. A. C.

I am moved to comment on the republication in the COAST ARTILLERY JOURNAL of the two papers on the subject "The Rôle of Aircraft in Coast Defence," originally appearing in the Journal of the Royal United Service-Institution. The first of these papers, by Wing Commander C. J. Mackay, M. C., D. F. C., R. A. F., appeared in the August, 1930, issue of the COAST ARTILLERY JOURNAL, while the second, by Brig. Gen. H. Rowan Robinson, C. M. G., D. S. O., appears in this number.

You are to be congratulated on your decision to republish these papers, for several reasons. In the first place both of them may well serve as models to our own officers who may be tempted to enter the literary field in discussion of military problems, by reason of their dignity and clarity of diction, as well as by the "tranquillity of expression and tolerance of opinion" which you have already remarked. In the second place they open up for extended consideration a subject which can be of no less importance to the United States than to the British Empire. Finally, taken together, they express a profound divergence of belief on the part of two capable officers, which suggests the necessity for further examination to be sure of correct conclusions as to the rôle of aircraft in coast defense.

In the comments I am prompted to offer on the papers of Wing Commander Mackay and General Robinson, I ought to make clear that I fully appreciate the fact that both authors were concerned primarily with the subject only as related to the problems of the British Empire; and that the justification, if any, for my comments is the fact that these two papers having appeared in a military journal of the United States, a certain neces-

sity flows therefrom that any deductions to be made be correctly related to the specific problems of the United States.

So then, I must frankly admit that while I can only partly concur in Commander Mackay's arguments and conclusions, I find myself in almost complete agreement with General Robinson. Therefore my comments are intended to direct further examination of some of Commander Mackay's views, rather more explicitly than is done by General Robinson's paper, and to bring out certain points of view on which General Robinson does not touch at all.

Commander Mackay states "That the ideal deterrent is the big gun *and* the aeroplane, and that but for the urgency of economy it would be unnecessary to suggest the substitution of the one for the other." (P. 147, August, COAST ARTILLERY JOURNAL.) The whole thesis of his argument is that under certain conditions the big gun in coast defense can and should be replaced by the airplane, on two grounds: first, relative economy, and second, mobility and new forms of attack. It is in this thesis that I must disagree with him. Throughout his discussion, Commander Mackay lends plausibility to his argument by such a disarming frankness, and at the same time by such a sincere but none the less subtle play of emphasis, that the reader may well be misled by the inferences for and against his main contention, losing the objections in the shadow and seeing only the support brought out into high light.

First, let us examine a little this question of *mobility*. Commander Mackay's argument here is summed up in the following quotation:

"Again, the entire tendency of modern armaments is towards increased mobility; this is plainly to be seen on land, on sea and in the air. To such tendency the big coast defence gun with its concrete emplacement runs counter, for it is the antithesis of mobility. This fact alone demands serious consideration before large sums of money are invested in weapons which may never be used, or of which, perhaps, it would be more accurate to say, they may never have the opportunity of exercising their deterrent influence."

Here we part company on what to my mind is so fundamental an issue that I shall take the liberty of stating my point of view in some detail, especially as some of our own officers share with Commander Mackay a regard for mobility *per se*, which in some cases borders on idolatry, and like many idolatries is uncritical. At first blush the paragraph quoted sounds logical as well as plausible. But to my mind the argument is loaded with several fallacies. It is quite true, for instance, that there is a profound and necessary tendency toward increased mobility in land, sea, and air weapons. But why is this? Fundamentally because these weapons are directed at hostile *forces*, themselves generally of some mobility. The weapons of these hostile forces, when acting on the defensive, have in general developed so tremendous a deterrent power, that the attacker is obliged to seek through increased mobility the means, by the application

of the principles of *mass*, *movement*, and *surprise*, to overcome the deterrent strength of the defensive weapons. In order to meet this threat, the defender is obliged to add increased mobility to the power of his own weapons. So the circle is complete, the race is on, and the attempt to increase mobility will continue. However, what of the problems of coast defense? In this case the harbor, naval base, or landing beach is stationary, and from the nature of the case cannot meet attack by movement. Without splitting hairs, whatever the ultimate mission of an overseas attacking force, its *immediate objective* is a *place* and not a *force*. Consequently when the military and naval situation has arrived at the point where a direct attack on a portion of the coast is to be made, not only cannot the place attacked move away, but the weapons assigned to the defense are perforce extremely limited in the extent of mobility which they can use to offset the mobility of the attacker. That is to say, as far as the defending weapons actually engaged in the defense are concerned, *strategic* mobility is for the time being out of the question, and *tactical* mobility is variously limited, severely so for such weapons as tractor and railway artillery, less so for aviation. Of course, this is not to say that strategic mobility has no place in the defense, for by it reinforcements may be brought to the scene, or the enemy may be forced to withdraw by attacks on his communications, for instance, or elsewhere. But when the reinforcements arrive, their strategic mobility is of no further use in the immediate defense, and like the defending forces originally on the ground, they are constrained to sit down and take it, if possible making up for their lack of mobility by the superiority in power of their weapons. Now this is just what the big gun does do, making a virtue of necessity. It is just these factors of weight and caliber, a stable platform, ample ammunition supply, extensive fire control and communication system, that lend to the gun on shore its superiority over the gun afloat. The only important point right here is that so long as the harbor has got to sit still when attacked, lack of mobility is no argument against the guns on the ground to defend it.

However, the argument does not end here. It is urged that if heavy guns had strategic mobility, they could be used to defend the point of attack, wherever the attack may fall, while lacking that mobility, either each possible point of attack must be fully defended at great expense, much of which will be futile because if any attack comes, it will fall on only a few places, or else the defense everywhere will be inadequate. The answer to this argument involves several considerations. It is quite true that a full gun defense against a combined naval and military operation of the first order established everywhere would be prohibitive in cost. Like every question of defense policy involving expense, the solution lies in a series of sensible compromises. First, the scale of fixed defenses for the several areas is graded in accordance with categories corresponding to the location and strategic importance of the objective to an enemy.

Second, the need for reinforcing high-power artillery with strategic mobility, is recognized, and is met by the provision of railway artillery. But the consideration of most importance is that the fixed guns actually on the ground can be counted on to do two things: first to deter a hostile attack being attempted unless the game is definitely worth the candle; and second, in the event of attack, to enforce delay sufficient to permit reinforcements to be brought in. Looked at from these last two viewpoints, I am convinced that the immobility of the big gun should be considered an advantage rather than otherwise. In the first place, if it cannot be moved, the political demands prompted by the hysterical population of the cities subjected to hostile feints, cannot cause the guns to be withdrawn from the point of the intended main effort of the enemy. In the second place, the knowledge of guns in place will surely deter an enemy from many subsidiary attacks on ports, with attendant bloodshed and property destruction for the inhabitants. So, not *though* the guns may never be used, but *because* they are not used in war, the expense of their installation would be well justified. Commander Mackay implies that if coast guns are not engaged in war, they have no opportunity of exercising their deterrent influence. In view of what has been said, it is believed that this implication may be in the future, as it has often been in the past, just contrary to the fact.

Commander Mackay's second argument for the substitution of plane for big gun, is *economy*. Situated as I am at the moment, I lack access to comparative cost data which would enable me to attempt definite refutation of the argument for economy. However, this is a matter which I know to have been given detailed consideration in our service, and the data are available. I can only suggest here the direction that such an examination should take.

In making this comparison, it is fair, initially at least, to compare the expense of the guns immediately available, and of the planes immediately available. While a part of Commander Mackay's argument is to the effect that economy inheres in the plane by reason of its mobility, so that the necessary number can be concentrated at the point of attack, yet he recognizes and admits the possibility that for strategic and diplomatic reasons—

“In the case of a first-class naval base where big issues are involved, the principle must, for the present, be accepted that the defending aircraft must be stationed in its vicinity, and only moved temporarily elsewhere after the proposed move has, on each occasion, been examined in relation to the existing international situation. As aircraft improve in performance and range, this conclusion may quite possibly be modified. Meantime, security should not be staked, even in appearance, on too nice a calculation of chances.”

So then, the first question is, how many planes, with their personnel and accessories, are necessary to afford a defense equivalent to one big gun, its personnel, and accessories? Commander Mackay states that hits

by three two thousand pound bombs will put a battleship out of action. Let this be admitted as a basis for a comparison. On the side of the big gun we may conservatively say that *hits* for the several sizes of coast guns in our service are necessary, on the average, to put a battleship out of action as follows:

16-inch gun	9
14-inch gun	12
12-inch gun	16

Of course, these values are highly questionable, as they depend upon whether deck or side penetration is to be expected, striking velocity, fuse action, the actual ship taken as target, and so forth. However, as criteria for a comparison, they may as justly be accepted as the ability of three two thousand pound bombs to accomplish the same result.

Now the next question involves probability of hitting. I shall not attempt an answer, but we all know that as far as the gun is concerned it is a complicated function involving such variables as the number of guns in concentration, uniformity of powder, accuracy of position finding, accuracy of spotting, and skill in adjustment. However, it is the fact that both the probability of hitting, and to a certain extent the effectiveness of the hits attained, fall off rapidly with increase in range. We should also notice four things; first that spotting and adjustment of each shot fired, whether or not a hit, increase the chances of subsequent shots being hits; second that in much the same way the fire of the several guns in the concentration increases the effectiveness of the fire of each gun; third that ammunition is immediately available so that each gun can maintain a continuous attack on the ship until the ship is either disabled or withdraws; and fourth that all this time, as compared with the bombing airplane, the gun and its crew are comparatively immune from destruction.

Now considering the bombing plane, it is at once obvious that its probability of hitting a vessel is practically independent of the distance of the vessel from the shore, up to the cruising radius of the airplane. On the other hand, even if a plane carries more than one bomb, it is next to impossible to improve the effectiveness of fire by observation on any one dropped. At least this is true as far as the succeeding planes of a flight, certainly other than the one or two nearest to the first bomber are concerned. Furthermore, as some of our best airmen have been heard to admit, the accuracy of bombing is going to be seriously reduced when the plane itself is subject to attack from above and below. Finally, if with the planes available, the disablement of the enemy vessel has not been completed when all the bombs carried have been dropped, the attack must be discontinued until the planes return to the airdrome, reload, and return again to the proper position and altitude to resume the attack, by which time the meteorological conditions, speed and direction of the target will have so changed that no benefit from the previous fire can be expected in increasing the probability of hitting.

Returning to the direct comparison, it is probably true that the individual bomb dropped has a much greater probability of hitting than the individual shot from the gun. But when we consider the effect of concentration of enemy targets, and the consequent number of hits and concentration of weapons essential to disable these targets, the advantage in favor of the plane will very probably disappear.

Meanwhile, as between gun and plane, the plane cannot expect to get its effect in one attack even if it could carry three bombs, unless the chances of its actual probability all occurred in its first three shots, while the gun may intersperse misses with hits and keep right on till the cumulative effect desired is obtained. Consequently, as between gun and plane, the only thing that counts is the probability of hitting of the plane. Under battle conditions this is pure guesswork, but certainly a probability of hitting of fifty per cent is all that the most optimistic airman could claim, and more than any other person would admit. The heaviest military bomber now in service, or likely to be for some time, can carry no more than two two thousand pound bombs. So on this most favorable of hypotheses, we would need three planes to get the desired effect. But in order to insure that by temporary disablement other than that caused by enemy action, we had the three planes in the air, we should need at least one spare plane on the ground. But we have now repulsed only one attack, and experience shows that a serious percentage of casualties in action is to be expected, and if our defense is to be adequate, we must be prepared to repel more attacks to come. Meanwhile, in a similar action, the gun would have had nearly a hundred per cent chance to come off unscathed. It is one thing blithely to claim the ability of the plane to replace the gun, and quite a different thing to accept the responsibility of deciding on what scale an air defense would be adequate. I will not accept such a responsibility, but I believe that if an air man had to, he would set the ratio at not less than ten bombers per gun.

But having done this, he has not done all, for he would be the first to recognize that his bombers would have to be protected by pursuit or fighting planes. He would surely want to match each bomber by a fighter. If so, we already may tentatively consider twenty planes as required.

Now as to personnel, on a war basis, sixty men per gun would be ample, of whom not more than half a dozen need to be highly trained to fill the key positions. A fair allotment for plane operation and maintenance is thirty men per plane, of whom more than half require thorough specialist training. So for a passive defense mission, instead of sixty men unavailable to the field army, to replace the gun we require at least six hundred. Incidentally, this increase of nine hundred per cent of men withdraw from the field army is another answer to the *mobility* argument, during such period as coast defense would need to be maintained.

Then we have to consider the permanent ground establishment of

shops, hangars, trucks, barracks and airdromes that would be required, all of which must be figured into a comparison of expense.

Even this is not all. The life of the gun, its accessories, and its ammunition (except powder) is practically unlimited under peace conditions. While even under peace conditions, the life of the plane is extremely limited, so that our original number of twenty (or what would you?) planes per gun is subject to an indefinite multiplication for replacements. Furthermore, replacements of planes would be required at intervals to avoid relying on types that had been rendered obsolete by aviation progress, whereas by an ironic by-product of the international trend toward limitations of navies, all our guns are enjoying a rejuvenation of defensive power, even the 10-inch and 8-inch guns which before the war we had begun to consider obsolescent.

To summarize, it is believed that a computation of costs and maintenance expense, for an air defense equivalent to our already installed and projected gun defense, if compared with the outlay on gun defense, would effectively nullify the argument of relative economy for the plane.

I think that I have pointed the way in sufficient detail for a further examination of mobility and economy as valid arguments for the substitution of aircraft for the big gun in coast defense. Having done so, it is perhaps pertinent at this point to emphasize that in opening this discussion, I am not arguing that aircraft should not be employed in coast defense. On the contrary, I believe, as probably do nearly all Coast Artillerymen, that the employment of aircraft in coast defense is not only desirable, but quite necessary. And when I refer to aircraft I have in mind not only observation planes to be used for spotting gunfire, and for tactical and distant reconnaissance, but equally the pursuit planes and bombers, to assume a distinct and active share in the task of repelling hostile naval and air attack. If Commander Mackay had insisted that aviation share with heavy artillery and *all other arms and weapons* a certain rôle in coast defense, there would have been no argument. My only contention is that aviation is not competent to assume an exclusive rôle in coast defense.

And this leads me to the gist of my objection to his proposal. Even if the considerations for and against the arguments relating to *mobility* and *economy* were to be left out of the reckoning, an exclusive rôle in coast defense should not be allotted to aviation unless full assurance could be had that the plane can provide an adequate defense under all conditions.

It is by this time a commonplace in detailed military and naval studies that if your enemy is strong in the air, your first requisite in a combined operation is to cripple his air force. Along with this go several corollaries: first, that an attack on the hostile air force is most likely to be decisive if your own air force can catch his planes sitting on their airdromes; second, that while naval aircraft carriers are most unpleasantly vulnerable air-

dromes, yet by reason of their high speed they can remain offshore outside the range of land-based aviation and still come in during the night close enough to get off their planes, which after rendezvousing can bomb land airdromes and get back to the carriers by dawn; third, that command of the air, even by a superior air force is a temporary, unstable and wholly unpredictable condition.

Taken in combination, all these considerations mean simply this, that if an enemy were aware that the only bar to the success of his overseas attack lay in our air force, he would find it both necessary and possible to provide the sufficient concentration of his air force essential to gain the temporary ascendancy over ours, so that his other weapons, naval and military, could then proceed without interference to the accomplishment of their mission. In making this statement I am only too well aware of the variety of conditions which may be cited as possible for both contenders, which if existing in concurrence would invalidate my contention. Space and time forbid an exhaustive examination of the strategic and tactical combinations which would be possible in an overseas attack under modern conditions. Yet so long as there can be conceived by a professionally experienced mind a reasonable combination of conditions under which an air defense alone would break down, and I conceive that this would quite generally be accepted, then if we are to envisage at all the possibility of attack and the necessity for defense, reliance on aviation alone for coast defense would be an unwise and an unnecessary gamble. The fundamental thought which should never be lost sight of, but frequently is, has been well brought out by General Robinson, namely that under modern conditions an overseas attack in force will hardly even be attempted unless the attacker is able to enforce a high degree of superiority in the air.

In support of his position, Commander Mackay has made numerous other statements, which invite critical comment in detail, but it is not my purpose to go to picayune lengths. I will cite one such point only, to indicate that a statement quite true in itself still omits one or more important qualifying considerations. I refer now to his observations with regard to the effect of fog. He states in part:

“The only weather which will prevent the operation of land-based aircraft is fog, but fog will also prevent bombardment by hostile ships.”

This statement invites two comments. First, it is a matter of common observation that frequently along parts of our coast line we have a condition of low ceiling, with clouds above it so dense as to be fog for the airplane, and yet with good visibility for either ships on the sea or the guns on the land. This condition prevents air operations, and yet would permit naval bombardment, which could well close the range so as to avoid the need for air spotting, *provided there were no guns ashore*. This leads to the second comment, which is that we should never forget that coast

defense guns are not under the same necessity to have air spotting as are the bombarding naval guns. For the naval gun must have air spot for its bombardment to be effective at long range, while lacking air spot it must close the range to a point where the shore gun with its long base lines and its own relative immunity, will have an overwhelming advantage. Indeed it is not too much to say that the Coast Artilleryman could ask nothing better than to have a naval opponent come in to a range where air spot would be unnecessary, and where the greater weight per caliber of the Coast Artillery projectiles would multiply their advantage over naval projectiles of the same caliber.

In conclusion, referring to Commander Mackay's statement—

“That the United States spend generously on both (coast defense and naval strength) proves nothing except their wealth,”

perhaps I may suggest the possibility of its proving rather that *in proportion to our wealth* we are willing to ensure adequately the two distinct functions of national defense, mutually complementary: the mobility of the fleet at sea, and the static integrity of our harbors and bases behind the fleet.

“It has been my fortune to encounter everywhere, from the highest commander to the men in the ranks, an earnest desire to measure up to their responsibilities. In this connection it is only fitting that mention should be made of the work of the War Department General Staff, which during my incumbency has been characterized by loyalty, industry, harmony and mature judgment that are worthy of the highest praise. Its accomplishments have been seconded by an unusually capable group of civilian personnel.

“This response by the whole Army, regardless either of rank, grade or assignment, constitutes a priceless recompense for whatever it may have been my privilege to accomplish for their welfare or efficiency. They have given me a legacy of pride in having been one of them and of enduring gratitude for their unfailing response and support. For the future I would enjoin upon them a continuance of industry and fidelity and of that consecration to duty which places the service of the Nation above personal interest in all the relationships of life.”—Farewell address of Gen. C. P. Summerall, Chief of Staff.

Modern Methods of Off Shore Hydrography

By MAJ. S. S. WINSLOW, C. A. C.

ABOUT two hundred and fifty miles east of Boston, lying between Nova Scotia and the Island of Nantucket, is a very interesting, important and dangerous area of shoal water, known as Georges Banks. It is interesting as a geological formation; important because of the fisheries; and dangerous because of the shoal water, erratic currents, and frequent fog. The present charts are based on data which has been accumulating since Colonial days. They show a least depth in places of twelve feet, but everywhere among fishermen is heard the legend that a large area is bare in bad weather.

The banks cover about ten thousand square miles, and constitute one of the most difficult areas in the world to survey. It is far off shore and well out of sight of land. It is foggy about seventy-five per cent of the time and usually rough. The currents are strong and erratic. Soundings are easily taken, but locations are hard to determine. Good astronomical observations for latitude and longitude, taken with a sextant, are generally considered to be accurate to within about one mile. Here they are hard to get on account of fog, and the uncertain currents make dead reckoning of doubtful accuracy. Also the trans-Atlantic liners skirt the banks and frequently cut across them. Smaller ships listen to their fog sirens with mixed emotions.

Most of the old style fishermen have navigated the banks successfully by instinct and the use of a lead line. The new steam trawlers are using more modern methods. They have Fathometers.

The fishing industry is more important than formerly, and better organized. There was a severe earthquake in that section last fall, which parted most of the trans-Atlantic cables. The newer type of fisherman with the scientific equipment, begins to find that the charted depths do not agree with his ideas, and a new survey has been requested. He believes the bottom has been changed by the earthquake. The bottom has undoubtedly changed although the earthquake probably had little to do with it. The surveys are known to be not too accurate, and as better methods are available a new survey has been ordered and is in progress.

In 1908, while an officer of the U. S. Coast and Geodetic Survey, I worked on the southern part of the banks in the old U. S. S. *Bache*. Then we took soundings by the pressure tube method. The ship steamed at about six knots, and about every five minutes dropped a lead line with a glass tube sealed at one end, attached. The depth, up to perhaps seventy-five fathoms, was determined by the distance the pressure forced water up

into the sealed tube. The soundings were fairly satisfactory, but the locations were difficult. Nantucket South Shoals Lightship was anchored there, about eighty miles southeast of Nantucket, and it was possible to get a mean value of her location from a long series of astronomical observations. We also had a whistling buoy anchored, which could be located by astronomical observations. We tried to run a series of lines radiating from the lightship and buoy and tying in to them. In the occasional spells of clear weather this worked out very well, but all too frequently, as we ran a line back to the lightship the fog would shut in thick. We would have difficulty in locating the lightship and would frequently lose the line of soundings because they could not be accurately located on the chart. Radio was almost unknown. If the lightship could not be seen, our only chance was to pick up the sound of her submarine bell, with an underwater listening device. This saved us on one occasion, but everything was crude and uncertain.

Through the courtesy of the Director of the U. S. Coast and Geodetic Survey, I made a cruise on Georges Banks in July on the U. S. *Oceanographer*, to observe the new methods. The *Oceanographer* was formerly Mr. J. P. Morgan's yacht *Corsair* and very well adapted for off-shore hydrography. The contrast between the new and old methods is of interest to a Coast Artilleryman because of the resemblance to some of our own Sub-Aqueous Sound Ranging Equipment.

In the new method, two ships worked together, the *Lydonia*, a former yacht, went out with us, anchored at a selected spot, and became our main reference point. Her officers took all possible astronomical observations, to get a mean position of reasonable accuracy. Positions obtained by radio compass bearings with the Navy shore stations are not sufficiently accurate for this work. They also took continuous current observations, and made frequent weather observations, with particular reference to temperature of water and air, wind velocity and direction. These were reported to the *Oceanographer* at half-hour intervals, by short wave radio. They also had a magnetophone (a new type of microphone) submerged in the water, so as to be well clear of the ship. This magnetophone was connected through amplifiers into her short wave sending set, so that underwater sound signals picked up were automatically sent out by radio.

The currents are interesting. There is no regular ebb and flow of current, with periods of slack water between. The currents are rotary and vary in direction and velocity from hour to hour through a cycle of three hundred and sixty degrees. At times they reached a maximum of three knots per hour.

The *Oceanographer* would start a line from a point near the anchored ship and run off on a straight line to a desired distance; turn off at right angles for a time, and then run a return line back to the ship. A record of position by dead reckoning was kept. Distances were measured by two

taffrail log lines, towed astern, and one mechanical log. The latter consisted of a small free propeller located on the ship's bottom and electrically connected to dials in the chart room. The course was corrected at half-hour intervals for current and wind, in accordance with the *Lydonia's* observations radioed to us.

At half-hour intervals a lighted bomb was thrown overboard from the *Lydonia*. The sound of the explosion would be recorded on a Gaertner chronometer on the *Oceanographer*. The sound would also be picked up on the *Lydonia's* magnetophone, automatically transmitted by radio to us and recorded on the chronograph. Knowing the velocity of sound in water, this time interval, correct to one one-hundredth of a second, corrected for temperature of the water, gives the distance from the station ship.

At half-hour intervals, when the bombs were exploded, a direction was obtained on the station ship by radio compass bearings. This with the bombs, gave us a direction and a distance to our point. Radio compass on both ships were used and bearings taken by both ships simultaneously. Our bearings usually checked well with the other data. Those obtained by the *Lydonia* were frequently erratic for some unknown reason. It is barely possible that fog banks have the effect of deflecting short wave radio waves affecting the bearings. This work is all in the nature of pioneering work, and some of the methods have never been used before. It is still somewhat experimental.

Soundings were taken by the Fathometer, as produced by the Fessenden Oscillator Co. of Boston. This consists essentially of an oscillator, located in the bottom of the ship, which automatically sends out a sound at regular intervals. This sound strikes the bottom and is reflected back, the echo actuating a Neon light which glows when the echo is received. There is a disc bearing the neon light, revolving at constant speed, and an outside ring, graduated in fathoms, up to one hundred fathoms. The light glows when the signal is sent at the zero reading, and glows again when the echo is received, allowing the depth to be read to the nearest fathom on the outer ring. This allows four soundings a second to be taken up to depths of one hundred fathoms, with the ship running at full speed. Beyond one hundred fathoms there are complications, but soundings can be taken at any depth. There are also difficulties due to ship noises. The sound of the engines and various other ship noises also actuate the sound receiving mechanism, but these are irregular and there is little difficulty in picking out the sounding.

Using these methods, the sounding ship can work night and day, regardless of fog or low visibility, up to the limit of physical endurance of the officers and crew. The fog adds an element of worry but should have no other effect.

Anchored buoys are also used, forming a triangulation net, as a further

reference point. Their positions are determined by running course and distance from a known point, sound bombs and radio bearings, and astronomical observations, when time allows.

The bombs used were simple crude affairs, consisting of a commercial "tin can," with push down top, filled with TNT with a lighted, waterproof fuse and a commercial blasting cap attached. The cans contain a half pint, pint or quart of explosive, according to the distance from the station ship. On the Pacific Coast, distances of over two hundred miles have been recorded. We measured distances of seventy miles in this way without losing contact. On the coast of Florida, this system did not give distances great enough to be useful. Apparently the effective distance is affected by temperature of water, character of bottom, depth of water and intervening shoals. These effects are not well understood. It is very possible that the Army Sub-Aqueous Sound Ranging system would not be effective in warm and shoal water. A fair percentage of the bombs failed to explode. Apparently the detonators did not detonate.

The ships used short wave radio transmission, to avoid interference with other radio activities, in the continuous work. The work was much hampered all one day by the short wave transmission set of the *Leviathan*. As soon as she gets within radio range of New York, a short wave radio telephone service is made available to the passengers, who can talk directly with their friends on shore, the latter receiving the message over their home telephones. For one whole day the air was full of love and business messages, much to the disgust of our radio staff.

The Coast Survey problem differs so much from that of the Army Sub-Aqueous Sound Ranging System that there may be no direct application. They have found the magnetophone far superior to the microphone which has been used in our service. When distances are not too great their magnetophones are located in water close to the shore, connected to stations on the beach. The distance of the ship from two known stations determines a position.

They make water-tight joints, using material normally used in repair of automobile inner tubes. Wires are scraped, joined and soldered, then coated with a thin coat of rubber cement. When this is nearly dry, the joint is covered with a number of layers of Para rubber, self vulcanizing, splicing tape, extending one inch over the insulation on each side. This is covered with several layers of electrical rubber tape, and finally covered with a coat of shellac. They do not heat the joints.

An adaptation of this system might be used for spotting. One of the Gaertner chronometers could be located at a battery, with a microphone located in the water and connected to it. With low sited batteries as at Fort Monroe, it might be possible to sink the microphone down to the ground water level, at the battery. The shock of discharge of the gun would be recorded on the chronograph. It would be a simple matter to

have the chronograph record the instant the shot was seen to strike the water. The sound wave caused by the shell striking the water would also record on the chronograph. Knowing the velocity of sound and the sound in water and the elapsed time between the time the projectile struck and the sound reached the microphone, it would be possible to determine the range of the point of impact of the shot from the battery. One man, with one set of apparatus, could determine this, perhaps to the nearest fifteen yards. This may or may not be simpler than the present Sub-Aqueous Sound Ranging Spotting Methods.

In the community of effort men from all walks of life learned to know and to appreciate each other. Through their patriotism, their discipline and association they became virile, confident and broad-minded. Rich in the consciousness of honorable public service, the men who served in our Army and Navy brought into the life of our country a deeper love for our institutions and a more intelligent devotion to the duties of citizenship.—From the Armistice Day address of Gen. John J. Pershing.

Coast Artillery Reserve Problems

By COL. H. C. BARNES, C. A. C.

WE ARE informed that during the past two years the Organized Reserve Corps has lost approximately twenty per cent of its strength due to inactivity as regards training on the part of a very large number of our available Reserve officers. This condition strikes me as having a very serious bearing upon the future success of our efforts to carry into effect the provisions of the National Defense Act as they pertain to the Officers Reserve Corps. With such a percentage of loss, it will never be possible to build the Reserves up to their proper strength, if indeed it does not result in their dwindling down to a negligible quantity. I have been greatly concerned over this situation among the Coast Artillery Reserves in the Sixth Corps Area since my arrival in Chicago in December, 1929. As a result of my study of the situation, the following remarks are submitted for what they may be worth in assisting others concerned with this phase of our military training in building up and maintaining their Reserve units.

The following figures, published by the War Department, give the accomplishments of Coast Artillery Reserve officers in the Army Extension Courses (including Group Schools, I think) for the School Year 1928-1929, arranged by Corps Areas and in the order of hours credit earned per officer for each Corps Area.

<i>Corps Area</i>	<i>Strength</i>	<i>Sub-courses completed</i>	<i>Total hours</i>	<i>Hours per officer</i>
First Corps Area.....	464	457	10,132	21.8
Ninth Corps Area.....	525	410	10,383	19.7
Fifth Corps Area.....	238	151	3,686	15.5
Seventh Corps Area.....	492	207	6,205	12.7
Third Corps Area.....	600	175	5,041	8.4
Sixth Corps Area.....	428	107	3,307	7.7
P. C. Department.....	19	5	140	7.4
Second Corps Area.....	585	114	3,194	5.3
Fourth Corps Area.....	723	162	3,688	5.1
Eighth Corps Area.....	133	9	231	1.7
Hawaiian Dept.	19	0	0	0
P. I. Dept.	3	0	0	0
	4,229	1,797	45,916	10.9

The hours earned per officer varies from twenty-one and eight-tenths in the First Corps Area to one and seven-tenths in the Eighth Corps Area, the average of all Corps Areas being ten and nine-tenths hours per officer—forty-five thousand nine hundred and sixteen hours earned by a total of four thousand two hundred and twenty-nine officers.

As will be seen from the third column of the table, these forty-five thousand nine hundred and sixteen hours of credit were earned by the completion of one thousand seven hundred and ninety-seven sub-courses. If we assume that no one officer completed more than one sub-course, then, out of our four thousand two hundred and twenty-nine Coast Artillery Reserve officers, there were but one thousand seven hundred and ninety-seven who were active in this work—approximately forty-two per cent, and the percentages of officers active in this work in the different Corps Areas varies from approximately one hundred per cent in the First Corps Area to less than seven per cent in the Eighth.

Of course, the assumption I have made is not a correct one, because there were, without doubt, some officers in each Corps Area who completed more than one sub-course. If data on this point were available, it would reduce somewhat the percentages given. However, even though it is known that the assumption is somewhat incorrect, it has given us a basis for the figures obtained, which will serve the purpose of estimating the individual activity of Coast Artillery Reserve officers in the various Corps Areas and in the Coast Artillery as a whole, the latter figure (forty-two per cent) being the one to which the attention of all concerned with the inactive duty training of Coast Artillery Reserve officers is invited.

The results along these lines for the School year 1929-1930, have not yet been published by the War Department and it is, therefore, not known whether the activity of our Coast Artillery Reserve officers in this work has increased or otherwise. However, I am sure that all concerned will admit it to be most desirable that improvement of this condition be brought about. The fact that less than half of our available Coast Artillery Reserve officers are taking advantage of the facilities offered them for inactive duty training is somewhat disturbing and constitutes food for thought on the part of all concerned with the execution of this most important mission of the Coast Artillery Corps.

The allotted strength of the Coast Artillery Reserve is (approximately) twelve thousand officers, computed from the war strength of all units now included in the War Department procurement objective. The present strength of the Coast Artillery Reserve is four thousand four hundred and thirty-seven, not counting six hundred and ninety-eight on the inactive list. Even if inactive officers are included there is a shortage, at present, of nearly seven thousand Reserve officers for the Coast Artillery alone.

There are two methods by means of which we can hasten the filling of these vacancies; first, by procuring additional officers, and second, *by holding on to the officers we now have.*

Our means of procurement are the appointment of graduates of R. O. T. C. Coast Artillery Units, transfers of officers from other arms to the Coast Artillery and the procurement of candidates from among the graduates of the C. M. T. C. Officers on duty with the Organized Reserves

seldom have any opportunity to influence the output of R. O. T. C. Units. They can, however, in ways which are entirely proper, bring about the transfer to the Coast Artillery Reserve of qualified Reserve officers who are surplus in the other sections of the Organized Reserve Corps. As an illustration of what can be accomplished along these lines, correspondence conducted by me in the Sixth Corps Area last winter with about two hundred second lieutenants of Infantry Reserves, whose names were kindly supplied by the Chief of Staff of one of the Infantry Divisions in this Corps Area and who were surplus officers in that Division, resulted in bringing about the transfer to the Coast Artillery Reserves of a number of these officers. Efforts along these lines in other Corps Areas will doubtless bring about similar desirable results.

As to the second and, in my opinion, the most important method by means of which we can hasten the filling of our vacancies—that of holding on to the officers we now have—stopping up the leaks, as it were—this is in a great measure up to Unit Instructors, Unit Commanders, and individual Reserve officers themselves. The principal cause of our losses is a lack of activity on the part of individual officers, resulting in their failure to accumulate, during their five-year appointment period, the credits necessary for active reappointment. Whenever they fail to do this, they are offered a reappointment on the inactive list and are virtually lost to us. In the Sixth Corps Area a number of Reserve officers who recently had gone on the inactive list were circularized by me with a view to rearousing their interest and getting them to take the necessary steps to regain an active status. The results were disappointing and simply serve to show that an officer, once lost to us in this way, is in all probability lost for good.

The best way to prevent these losses is by making a proper use of the Group Schools and Extension Courses. Every Unit Instructor should carefully analyze the records of each of his officers and use every proper effort to induce them to take appropriate Group School or Extension Course work, so as to insure, *as a minimum*, the accumulations by each officer of sufficient credits to insure his reappointment on an active status.

This is the bed rock minimum which should be done along these lines. It is fair to assume that any man, who accepts a Reserve commission, is motivated, at least in part, by a recognition of the fact that, in the event of war, his station in life, education, etc., will demand that he serve his country as a commissioned officer rather than as an enlisted man, and by a desire to qualify himself to meet the responsibilities which would devolve upon him in that event. This same motive should dictate to each Reserve officer, after his acceptance of a commission, the desirability of pursuing such study of military subjects and of taking such practical military training as is necessary to qualify him for promotion to each successive higher grade, when age, experience and length of service make him eligible therefor. These promotions will, of course, be made hereafter as the result of

examinations to determine the officers' qualifications for the next higher grade. Group Schools and Extension Courses are the means by which an officer may gain the necessary theoretical knowledge of military subjects and it should be the goal of every Reserve officer to have successfully finished, by the time he becomes eligible, in point of time in grade, for promotion to each successive higher grade, the prescribed course in each subject in which he must qualify for that promotion. This can be done by systematic and properly directed effort and, I feel sure, without the occupation of any undue proportion of the time available to the average man outside the requirements of his business.

It should be the goal of every Unit Instructor to insure that this condition obtains with respect to all Reserve officers under his control or supervision.

This should, likewise, be the goal of each Regimental, Battalion and Battery Commander with respect to all Reserve officers assigned to his unit, to the end that a call to active service will find him with subordinate officers who are qualified to assist him in meeting those responsibilities which necessarily devolve upon any commander in time of war, rather than with officers who, because of a lack of knowledge of their duties, will be liabilities instead of assets.

In this connection it should be constantly borne in mind that the best results along these lines are accomplished through personal contact in a spirit of helpfulness. Much of this effort must necessarily be put forth by Unit Instructors, and they should, therefore, keep in the closest touch with the status of each of their Reserve officers and, by helpful and *timely* suggestion and advice, insure their qualification for promotion at the proper time.

If all concerned will bear this situation in mind and bend their efforts to the accomplishment of these results, our losses will be negligible and will be confined to those exceedingly few Reserve officers who really do not have at heart their own progress or the welfare of their unit.

An article in the *COAST ARTILLERY JOURNAL* for March, 1930, set forth the fact that one Reserve antiaircraft regiment in Minnesota, with an assigned strength of sixty-four, has enrolled one hundred per cent of its officers in Extension Course work. The following is quoted from that article:

"The method used by the instructor to secure this high percentage of enrollment is one of personal contact, where practicable, and by personal letter (no mimeographs) where the officer cannot be interviewed in person."

Now, just a few words about helpful suggestion and advice. In many cases, Reserve officers have in the past year enrolled in and pursued courses which were not appropriate courses for them to pursue. Cases in point are where R. O. T. C. graduates have pursued courses in basic sub-

jects which they covered in their college course. They gained credits, it is true, but they did themselves and the Government little, if any, good. The subjects, a knowledge of which is required for promotion to each grade, are listed in the regulations and those lists should be the guides for Unit Instructors in giving their helpful suggestion and advice, to the end that the time devoted to this work by Reserve officers may be systematically employed and that benefit may result therefrom to all concerned.

Needless to say, the Group School method of instruction is preferable to the Extension Course method. In many cases, however, the Group School method cannot be employed. Furthermore, Group School instruction cannot be offered in all subjects at all times. In certain cases, therefore, resort must be had to a combination of the two methods. Each Reserve officer's record should be carefully analyzed and the proper method adopted to accomplish for that officer the end desired. Unit Instructors should bear in mind the desirability of utilizing the services of qualified Reserve officers as instructors in Group Schools. By doing this, courses in several subjects can be carried on simultaneously, the Unit Instructor exercising general supervision over the several classes.

In the British service a general officer may retire at any time but his vacancy may not be filled until he reaches the age of sixty in the case of a major general and sixty-five in the case of a lieutenant general or general, or till three years after retirement. A field marshal never retires.

COAST ARTILLERY ACTIVITIES

Office of Chief of Coast Artillery

Chief of Coast Artillery
MAJ. GEN. JOHN W. GULICK

Executive
COL. H. L. STEELE

Plans, Organization and Training Section

MAJ. J. B. CRAWFORD
MAJ. R. V. CRAMER
MAJ. S. S. GIFFIN
CAPT. J. H. WILSON
CAPT. H. N. HERRICK

Materiel and Finance Section

MAJ. J. H. COCHRAN
MAJ. C. H. TENNEY
CAPT. F. J. MCSHERRY

Personnel Section
MAJ. G. F. MOORE

General Gulick Completes Tour of Inspection

Shortly before this number of the JOURNAL went to press the Chief of Coast Artillery completed (November 29) a tour of inspection which included Panama and the Pacific Coast. Details of his inspection are not available at the present time but will be given in a later number. It is known that he was very enthusiastic over the Coast Artillery situation in Panama and he expressed his satisfaction with the manner in which the Coast Artillery is doing its job there. This is one of the best Coast Artillery "plants" which the United States possesses. It was General Gulick's first visit in a number of years.

On the Pacific Coast all Coast Artillery stations were visited. At Los Angeles and San Francisco General Gulick was the guest of honor at several large dinners and receptions given by officers of all components of the Army. The entire west coast is a Coast Artillery stronghold sharing honors only with our friends of the Navy and the Air Corps. The sentiment might be said to be almost militaristic. Since this word hardly expresses the real idea it should probably be expressed as "anti-pacifist."

In a later number the JOURNAL will report General Gulick's thoughts and reactions which are the result of this inspection. In this way they will become known to the entire Corps (or as many of them as read the COAST ARTILLERY JOURNAL). This is believed to be, properly, one of the missions of the JOURNAL. The responsibility of the Chief of Coast Artillery is enormous. If a future enemy ever sets foot on American soil it will be primarily because the Coast Artillery has failed. We of the Coast Artillery look to its Chief for leadership and guidance and are entitled

to know his thought and plans in order to assist him in accomplishing the mission of the Corps. The COAST ARTILLERY JOURNAL will assist in informing its readers of the policies and beliefs of its Chief and his staff.

Before this becomes an editorial we desist and close with the announcement that General Gulick will visit Hawaii and the Philippines on a tour of inspection starting in March. Further details of his itinerary will be published at the proper time.

Officers of Other Arms to Be Detailed with Coast Artillery

At the present time considerable excitement has been caused among officers of other arms by a War Department circular recently issued calling for volunteers for foreign service with the Coast Artillery. In addition to the circular the Adjutant General has addressed a letter to officers of the Infantry, Cavalry, Field Artillery and Engineers who have volunteered for foreign service asking if they would be willing to accept a detail for foreign service with the Coast Artillery.

At the present time foreign service for Coast Artillery officers, especially in the battery officer grades, comes more frequently than for any other arm of the service. Since the two-year regulation has become effective for Panama and Hawaii, tours of foreign service are still more frequent. So that the amount of time spent by a Coast Artillery battery officer on foreign service is approaching fifty per cent. This is relieved somewhat by the Coast Artillery volunteer service roster. It is believed that foreign service is no bugbear for Coast Artillery officers. Our stations in the Philippines, Hawaii, and Panama are the best in the service. A Coast Artillery officer generally looks forward to foreign service with pleasure unless there are personal reasons unfavorable to his leaving the States. Officers of other arms can not obtain foreign service so easily. The recent circular has resulted in a large number of inquiries from officers of other branches, including all grades from colonel to second lieutenant.

The detail with the Coast Artillery is attractive to the officer who desires foreign service and who can not obtain it in his own arm. It also offers an opportunity to serve with an arm other than his own and to add to his professional knowledge. No policy governing the assignments of detailed officers has been published. It is believed that officers of other arms obtaining a detail with the Coast Artillery will be offered every opportunity not only to obtain instruction in Coast Artillery tactics and technique but actually to command organizations appropriate to their rank.

Battery I, Fourth Coast Artillery (HD), Fort Amador, Wins the Knox Trophy

The Knox Trophy, the most coveted honor which may be won by competition in the Coast Artillery was recently awarded to Battery I, 4th Coast Artillery, commanded by Capt. Ben Bowering.

As is well known this trophy is presented annually by the Massachusetts Chapter of the Sons of the American Revolution. The battery commander, as the representative of the battery, is generally ordered to Boston to personally receive the trophy in a presentation ceremony conducted at the annual dinner of the Society in January. This custom will be continued and Captain Bowering will be ordered to Boston at the proper time.

In some ways the winning of the Knox Trophy is a disadvantage. Immediately after the battery is selected to receive the trophy the Editor of the COAST ARTILLERY JOURNAL immediately starts in pursuit of the battery commander in search of an article. Blessed with a little advance information the pursuit started a little earlier this year with the result that said article is expected in almost any mail. The limelight has its drawbacks. Further details of the practice will appear in Captain Bowering's article.

Meeting of the West Point Branch of the United States Coast Artillery Association

The West Point Branch of the United States Coast Artillery Association held its first meeting November 10 for the purpose of organizing. Col. Walter K. Wilson, the senior Coast Artillery officer on duty at West Point, called the meeting to order, made a few brief but appropriate remarks concerning the object of the Association and then called on Maj. Sanderford Jarman to read a proposed set of by-laws drawn up by a committee of which Major Jarman was chairman. The by-laws were unanimously adopted.

Major Richard M. Levy, chairman of a nominating committee that had been appointed to prepare a slate of officers, then informed the meeting that his committee nominated Maj. Sanderford Jarman as president and Capt. Wm. H. Donaldson as secretary and treasurer. These officers were elected by unanimous consent.

After appointing a committee to handle the entertainment for the following meeting, the president presented an interesting moving picture showing a regiment of antiaircraft artillery equipped with the latest materiel. At the termination of the picture the meeting adjourned.

There are approximately forty officers on duty at West Point who are eligible to membership in the Association. The by-laws provide that the local branch will meet four times each year and at such other times as the president may direct.

Contributions Requested for Swimming Pool at Corregidor

Brigadier General C. E. Kilbourne, commanding the Harbor Defenses of Manila and Subic Bay, has addressed a memorandum to all Coast Artillery officers requesting contributions for the construction of an officers'

swimming pool. Since all officers have received this memorandum it is not republished, with the exception of the outstanding features. The cost of the pool is estimated at three thousand—four thousand dollars. This would indicate a three-dollar contribution from all Coast Artillery officers, with, presumably, more from those of higher rank. This amount is a small payment for the use of the pool during a tour in the Philippines. The need for a pool is appreciated by officers who have served there and will be understood by all when informed that the salt water beach is two miles from the club and five hundred and fifty feet below the level it occupies.

New Coast Artillery R. O. T. C. Unit at University of Illinois

At the beginning of the present scholastic year a new Coast Artillery R. O. T. C. unit was established at the University of Illinois, Urbana, Illinois. The University of Illinois (near Champaign) is about one hundred and twenty miles from Chicago and almost directly south of it. In addition to being known as one of the leading universities in the middle west it is also known for its football teams. It is pro-military and for a number of years has been anxious to secure a Coast Artillery unit in addition to the other units. Other units established prior to the Coast Artillery are Infantry, Field Artillery, Signal Corps, Engineers, Cavalry, and Air Corps. The addition of the Coast Artillery brings the University of Illinois to a tie with the Massachusetts Institute of Technology, the only other institution in the country with seven units. Twenty-five officers are on duty at Illinois with the R. O. T. C. Col. Charles W. Weeks, Infantry, is the P. M. S. and T.

Major Charles A. Chapman and Capt. Robert W. McBride are the Coast Artillery instructors. Both began their duties under difficulties, having been detailed near the beginning of the course. Major Chapman states that Colonel Weeks deserves much credit for starting the Coast Artillery unit. He detailed an infantry officer in charge and did everything possible to secure a C. A. enrollment, even obtaining authorization for a number of students to transfer from other courses to the Coast Artillery Advanced Course. Major Chapman calls this "damned descent" (or words to that effect). The Coast Artillery unit, therefore, was off to a good start with over three hundred students enrolled, including about a dozen in the Advanced Course. Competition among the various arms is very keen in enrolling students. For this reason the cooperation of all arms in assisting the Coast Artillery unit is more significant.

Major Chapman is very enthusiastic over the "plant" at Illinois. The unit is too young to predict the number of Reserve officers which it will turn out but the facilities are, to quote Major Chapman again, "beyond the fondest imaginings."

The Coast Artillery School

NATIONAL GUARD UPSETS DOPE

Strange as it may seem in this seat of learning the average score of the seacoast target practices fired in the course of instruction of officers' classes under the direction of the Coast Artillery School has been in the neighborhood of forty. The reason for these consistently low scores has been conjectured by many: Experimentation with new apparatus and methods, lack of experience of officers in the mechanics of computing data, no attempt to beat the score or other insinuating reasons. Whatever the reason the scores have invariably been between thirty and fifty.

Considering this fact the 1930 National Guard and Reserve Battery Officers' Class has reason to be puffed up over their firing of the battery of 155-mm. guns. This practice is probably the finest firing on record at the School:

High Spots of the Firing

Gun pointers and principal members of plotting section were student officers.

Gun crews from 51st C. A. (plenty of credit here).

Firing rate—fifteen second per salvo.

Par was exceeded for every component of the score.

Seven broadside hits	} 32 shots
Six bow-on hits	
Score, 101.7	

Captain Wm. C. Jones, 250th C. A. (Calif.), battery commander.

Major Leroy Cowart, 246th C. A. (Ga.), range officer.

Captain Calhoun H. Cunningham, 252nd C. A. (N. C.), executive officer.

The 10-inch D. C. gun practice also fired by the National Guard and Reserve officers resulted in a lower score due to circumstances over which the students had no control. (Seems as if we've heard that last clause before.) This was the first Case II practice conducted at the School in recent years. Officers acted as gun pointers and the accuracy of "direction" attained, attests to the value of this method of pointing when it is possible. Capt. Claudius F. Black, 242nd C. A. (Conn.), was battery commander.

These firings were the culmination of the most comprehensive instruction ever given. The first two weeks were devoted to basic gunnery. The class was then split into AA and HD sections and each section received two weeks theoretical and four weeks practical work with materiel.

A pleasant and profitable interruption was introduced in the latter period by a trip to Aberdeen Proving Ground. In addition to witnessing the firing of all new antiaircraft weapons under test the latest types of seacoast materiel were inspected. Among the most interesting spectacles at Aberdeen was the penetration firing of twelve-inch armor piercing projectile through a thirteen-inch armor plate.

The 61st Coast Artillery (AA), Fort Sheridan

Once more the 61st was inspected by an officer of high rank. During October the Corps Area Commander, Maj. Gen. Frank Parker, conducted the annual tactical inspection of the regiment. This inspection came to the attention of the JOURNAL through a letter of commendation written to the War Department by General Parker in which he commented in unusually favorable terms on the solution of the tactical problem and upon the appearance of the personnel and equipment. It is a source of pride to the entire Corps to observe the favorable impression which this regiment has created in the Sixth Corps Area towards the Coast Artillery. During its short time at Fort Sheridan it has been commended several times in official communications.

The 62nd Coast Artillery (AA), Fort Totten

The outdoor season of the 62nd Coast Artillery (AA) was officially ended on October 3 when Maj. Gen. Hanson E. Ely, commanding the Second Corps Area and Brig. Gen. Henry J. Hatch, commanding the Second Coast Artillery District held their annual tactical inspection of the regiment.

General Ely accompanied by Col. Wm. K. Naylor, G-2, Chief of Staff, Second Corps Area; Lieut. Col. H. Clay M. Supples, Inf., Ass't G-3, Second Corps Area, and Maj. Joseph N. Dalton, A. G. D., aide, arrived at Fort Totten during the afternoon of October 2. The regiment was reviewed after which the officers and ladies of the post were presented to the Corps Area Commander at a tea given in his honor.

A dinner was given by Col. Edward Kimmel, commanding the 62nd Coast Artillery (AA), for the general officers and their staffs, and the training film, "The Tactical Handling of an Antiaircraft Regiment," made this past summer by the 62nd, was shown.

The tactical inspection began with an inspection at Fort Totten of all equipment. At 7:45 a. m. a situation was handed the regimental commander directing the regiment to proceed with all expedition possible to Mitchel Field prepared to furnish the antiaircraft protection of that place. Mitchel Field is about eighteen miles from Fort Totten. At 7:53 a. m. the regiment moved out.

At 8:49 a. m. a second situation was received stating that a Black force was in the vicinity of Block Island accompanied by airplane carriers carrying bombardment and attack planes and that a Blue air force would be concentrated at Mitchel Field commencing at 8:30 a. m.

The Headquarters Battery and 2nd Battalion arrived at Mitchel Field and were in position at 9:10 a. m. The gun batteries of the 1st Battalion were in position at 10:00 a. m., the searchlight battery completing its occupation at 10:31 a. m. The commanding general observed the going into position and inspected all installations.

At 9:50 a. m. a formation of attack planes attacked the field and were brought under fire by the machine gun batteries. At 10:35 a. m. a formation of bombardment planes, simulating an attack on the field, were brought under fire by the gun batteries. A situation involving the arrival of reinforcing antiaircraft artillery but not requiring the actual movement of troops brought the inspection to a close.

The regiment remained at Mitchel Field for the night and returned to its home station the following morning.

October 28 was celebrated by the 62nd as Organization Day, it being the eighth anniversary of the organization of the regiment. The regiment was first reviewed by the commanding general, Second Coast Artillery District, Brig. Gen. H. J. Hatch, after which it was massed and the recruits presented to the colors. Col. Edward Kimmel, the regimental commander, and General Hatch then made brief talks to the regiment outlining its past history and what was expected of it and its personnel at the present time.

The 69th Coast Artillery (AA), Fort McClellan, Ala.

The 69th, under the able leadership of its regimental commander, Lieut. Col. J. B. Taylor, assisted by his executive officer, Maj. G. B. Robison, departed from Aberdeen Proving Ground on schedule (November 13) and has now reached its new station at Fort McClellan (but not when this was written). The starting day proved to be a miserable, drizzly, sticky day which slowed up the rate of travel but did not dampen the spirits of the personnel. The next few days were little better so far as weather conditions were concerned. Fortunately an early rest period of three days was scheduled at Richmond which gave the weather a chance to act reasonable and the regiment an opportunity to shake down.

At Richmond the 69th parted company with 2nd Lieut. Frank T. Ostenberg and one platoon of nineteen men of Battery E who proceeded to Fort Eustis to join the mechanized experimental force of all arms operating there. They took with them to Eustis three trucks, one carrying the multiple machine gun mount, T-2, with four-caliber 50 machine guns. The stay of this detachment at Eustis is indefinite. It will remain a part of the mechanized force until the experimental period is ended. Its particular function is connected with the antiaircraft defense of the mechanized force.

The 69th also carried with it and delivered to the Field Artillery at Fort Bragg one Director M1 (Vickers) which will be used for tests with the 75-mm. all purpose gun in tests to be conducted there. This director will be returned by February 1.

Before the date this article appears the regiment will have arrived at Fort McClellan. A complete account of the trip is expected since the Adjutant will keep a comprehensive diary and log of the trip. The follow-

ing officers are assigned to the regiment and should now be addressed at Fort McClellan.

Lieut. Col. J. B. Taylor, Comdg.
Maj. G. B. Robison
Capt. H. A. McMorro
Capt. D. M. Griggs
Capt. A. M. Lawrence
1st Lieut. John L. Goff

1st Lieut. D. B. Herron
1st Lieut. Lloyd Shepard
2nd Lieut. W. A. Weddell
2nd Lieut. D. T. Smith
2nd Lieut. H. A. Brusher
2nd Lieut. R. J. Wood

Harbor Defenses of Honolulu.

Although the JOURNAL lacks a recent report of activities in Honolulu it is known that the batteries of the harbor defenses were busy with anti-aircraft instruction during the fall months. Practices were held at Fort Weaver, a fort new to some of us, but located in the Harbor Defenses of Pearl Harbor. Batteries "A" and "D," 16th C. A. (HD), conducted practices at Weaver after approximately eight weeks of preparatory instruction. If this seems a long period of preparation to the 63rd it should be remembered that the 16th is a harbor defense regiment with anti-aircraft as a side line. "Side line" is an erroneous designation, however, because the two missions are of equal importance. The practices were conducted very smoothly, the personnel functioning with alertness and smooth team work. One hundred and forty-nine rounds of three-inch shrapnel were fired by each battery. Although the scores are not available it was stated that the time required to bring effective fire on the target was only twenty-five seconds.

The 249th Coast Artillery (HD) (Oreg. N. G.)

The standing of batteries of the 249th during the last target practice season has recently been announced as follows:

1. Battery C
2. Battery B
3. Battery D
4. Battery E
5. Battery A

Captain Forest S. Campbell commands Battery C, the junior officers being 1st Lieut. Everett E. Terhune and 2nd Lieut. Kenneth F. Bloom. This battery is stationed at Ashland, Oregon.

Although Battery D did not win first honors in target practice it has distinguished itself in other ways. Its energetic battery commander, Capt. Walter W. Abbey, has interested the people of Klamath Falls and Klamath County in the welfare of the battery to such an extent that the county and city recently appropriated one-half the cost of a proposed armory (ninety thousand dollars). The armory is to serve as a community center as well as the center of military activities of two units. If the prospective

plans are approved the building will include an auditorium, swimming pool, gymnasium, and other features.

Klamath County contains the famous Crater Lake, or would contain it if the Crater Lake section had not been set aside as a national park. While the county is almost as large as some eastern states it is not thickly populated. It invites trouble to state the population of cities, especially those in the west, but we will accept correction gladly if five thousand is too low an estimate of the population of Klamath Falls. When a community of this size expresses a willingness to obligate itself to the extent of ninety thousand dollars for a state armory there is no lack of community spirit and local good-will towards the National Guard and National Defense.

Captain Abbey and the others who assisted him are to be congratulated on their efforts and all JOURNAL readers will wish them success.

Reserve Officers Association (California) Holds Its Third Annual Ball

There is no question as to the interest of Californians in National Defense. If it were otherwise the Third Annual Military Ball, held by the Reserve Officers' Association of California on October 30, would not have been attended by more than two thousand officers and ladies representing all branches of the armed forces of the United States. It is claimed that this annual affair boasts an assemblage of military, naval, and marine corps personnel not equaled in any city of the country, excepting the National Capital.

Major General and Mrs. Malin Craig attended and the assemblage served to welcome them to the city where General Craig recently succeeded to the command of the Ninth Corps Area. The top rank of the Navy was represented by Rear Admiral William C. Cole who has recently assumed command of the Twelfth Naval District. Maj. Gen. Logan Feland, commanding the (Marine) Department of the Pacific was present with Mrs. Feland. Other guests of high rank were Rear Adm. G. W. Laws, Gen. and Mrs. R. E. Mittelstaedt, Gen. and Mrs. F. M. Caldwell, Capt. and Mrs. L. B. Porterfield, U. S. N., and Capt. Eugene Blake, Jr., of the Coast Guard.

Dreamland Auditorium was the place selected for this affair. It was appropriately decorated for the occasion. The band of the 6th Coast Artillery was present and entertained the guests with concert music. An added feature which was much enjoyed was a guard mount de luxe in which fifty noncommissioned officers from the Presidio took part and which Reserve officers conducted in the capacity of officers of the day and officers of the guard. Maj. W. W. Breite, Ca-Res., National Vice President (for the Ninth Corps Area) of the Reserve Officers' Association, served as head of the committee arranging this brilliant affair.

The guests list included six major generals, eight brigadier generals, four admirals, one hundred and fifteen colonels, forty commanders, one

hundred and ninety-four lieutenant colonels, two hundred and ninety-seven majors, three hundred and eighty-five captains, and four hundred and nineteen lieutenants.

Coast Artillery Reserves—Hartford, Conn.

Captain Arthur Adams, Chaplain Reserve, was promoted from the next lower grade on October 25, 1930. Upon promotion, Chaplain Adams was reassigned to the 543rd Coast Artillery (AA). In civil life, Chaplain Adams is the Dean of Students, Registrar and Librarian, also Professor of English and Anglo-Saxon History, at Trinity College in Hartford.

The inactive training season started with vim with a get-together dinner on October 3. This dinner was well attended and everyone had an opportunity to express their individual views as to the program of training to be adopted. The final program adopted and approved by Corps Area headquarters covers the various details of mobilization and also certain tactical studies. The majority of the lectures will be given by Reserve officers and the remainder by the unit instructor, Lieut. Col. John Lee Holcombe, C. A. C. (DOL).

The new Extension School year has started favorably from the point of view of enrollments. The three units under the jurisdiction of this office having enrollment percentages as follows:

543rd C. A. (AA).....	64.5%
904th C. A. (AA).....	66 %
618th C. A. (HD).....	15 %

It is expected that a high number of subcourse completions will be reported at the close of the school year. This headquarters stood very favorably with the remainder of the First Coast Artillery District at the close of the School Year 1929-30.

PROFESSIONAL NOTES

Classification of Officers

The annual classification of officers was completed in October. This classification was based on officers' records up to June 30, 1930. For purposes of comparison the following Coast Artillery Corps tables for the years 1929 and 1930 are reproduced.

1930							
	<i>Superior</i>	<i>Excellent</i>	<i>Satis- factory</i>	<i>Unsatis- factory</i>	<i>Inferior</i>	<i>Not Rated</i>	<i>Totals</i>
Colonels	8	29	17	.....	.....	.....	54
Lieutenant colonels...	8	35	12	.....	.....	.....	55
Majors	22	138	58	.....	.....	.....	218
Captains	8	155	91	1	.....	1	256
First lieutenants	3	130	119	.....	.....	2	254
Second lieutenants ...	1	36	89	1	.....	30	157
Totals	50	523	386	2	.....	33	994

1929							
Colonels	8	28	16	.....	.....	.....	52
Lieutenant colonels..	7	32	20	.....	.....	.....	59
Majors	12	127	87	.....	.....	.....	226
Captains	2	138	140	1	.....	.....	281
First lieutenants .....	.....	81	138	.....	.....	1	220
Second lieutenants ...	.....	25	117	1	.....	34	177
Totals	29	431	518	2	.....	35	1,015

The scarcity of superior lieutenants and captains is still rather striking but there has been an increase over the preceding year, which is encouraging. Approximately two per cent, only, of the battery officers are rated superior while those in the field grades are nearly fifteen per cent. It seems reasonable that a greater percentage of the field grades should be rated superior (having been under observation longer and therefore having been "weeded" more intensively) but the disparity in percentage in the two classes is still too great.

During the past year the efficiency report has been undergoing considerable study to determine the suitability of the present form or to devise a more suitable one. In general, opinion is divided between two schools. One school maintains that the present form is suitable but that reporting officers are not careful and conscientious in its preparation. The other school maintains that the form is faulty and that no officer, no matter how conscientious he may be, can furnish a correct estimate of another on the present form. Probably the solution lies between these two extremes. It should be realized that an efficiency report is probably the most important record of the individual. When the Army was smaller perhaps its importance was not so great because nearly all officers who had been in the service any length of time were personally known to each other. Opinion as

to the efficiency of an officer more often was based on personal knowledge of him and not on the opinion expressed on a card by some one else. Today the records are consulted more frequently and classification boards determine the officer's rating almost entirely from his efficiency report. In time of war it is not expedient to try out the officer on a job. He is selected on his record, in most cases, especially the junior officers.

For this reason more consideration should be given to the rating of the junior officer lest injustice be done. After all many of our lieutenants are getting to be old timers. Some of them were under fire in France. Nearly all the seniors were in the service in 1918. They have been lieutenants twelve years. How long does it take to produce a "superior" lieutenant? It does not seem reasonable that we can produce only one out of a hundred in this length of time. The most obvious answer is that junior officers, in general, deserve higher ratings than are being given at present. The question which reporting officers should ask themselves is "Is this lieutenant an excellent (superior) *lieutenant*?" and not unconsciously compare him with captains or officers of greater rank, experience, and opportunity.

British Combined Air-Naval Exercises

In summing up the recent Naval exercises off the Isle of Wight the *London Times* makes the following comments:

"The ships which the aeroplanes were really anxious to avoid on their journeys were those cruisers which carried the most modern antiaircraft guns; they were expected to make things unpleasant at fairly long range. That is the type of defence which raiding aircraft will have to reckon with more and more, and the best answer to it is greater speed, with a consequent reduction of the chances of a hit. It is obviously no part of naval policy to assume that the Fleet can be deflected from a duty by missiles from the air. Last night it stuck rigidly to its target, though its two biggest ships had been torpedoed and several of the others bombed. It allowed itself an area ten miles long by five miles wide while it was bombarding Cowes, and it never sought to upset raids by moving into unexpected positions.

"This was undoubtedly sound tactics for the aeroplanes would have thought little of an extra ten miles in any direction, though they might have had to disclose their presence a little sooner in looking for the enemy. Aircraft in such a situation cannot intimidate a Fleet and put a stop to a bombardment. It can only hope to be effective at all if it operates in large numbers, making the ships continually alter course and frequently interfering with gun laying."

Pay and Promotion, Japanese Army

By 1ST LIEUT. E. CARL ENGELHART, C. A. C.

Japanese Army Officers of combatant branches are all graduates of Japan's West Point. Appointments to the Military Academy are governed by a system very like the American. A certain number of candi-

dates are chosen from each Division Area, a military district corresponding to the American Corps Area. Applicants average eighteen years of age, and must be students of at least fourth-year standing in an accredited high school. Successful candidates are selected by academic examination.

The new cadet proceeds to the Military Academy in Tokyo, but does not immediately become a Japanese West Pointer. He must first attend—and pass—a two-year preparatory course which is conducted as a sub-school of the Academy. Graduates of this preparatory course are sent to Line regiments for six months' duty, and receive practical instruction in the duties of Lance Corporal, Corporal, and Sergeant.

Thus, it is only after two years of specialized study and six months of military experience that future officers first become full-fledged cadets at the Military Academy. The length of the course at the Academy is two years, but upon graduation the cadets do not immediately receive their commissions in the Army. Again they are sent to regiments for duty, this time as Probational Officers.

At the end of three months a Board of Officers consisting of all officers in the regiment meets to consider whether or not the Probational Officers serving with that regiment should be commissioned. One dissenting vote dooms a Probational Officer, and he is discharged from the Service. Usually, however, the number of men "found" in this manner is very small, less than one per cent of the class graduated from the Academy.

New second lieutenants are assigned to branches in accordance with the desires of the graduated cadets, their academic standing, and the quota for branches allotted by the War Department. As is indirectly true in the United States Army, the Japanese Engineer Corps and the Artillery require officers proficient in mathematics.

The Japanese Government also maintains a Military Prep School. Students entering this school are of the average age of fifteen. The course is three years, and the graduates then begin the complete curriculum at the Military Academy as outlined above.

The Japanese officer receives no uniform allowance. He does not receive allowances for rations or lodgings except when in the field. Upon change of station, the Japanese officer receives an allowance which is usually more than sufficient to cover all expenses of the move, both for himself and his dependents.

It is said that a Japanese officer cannot save money from his pay, another point of remarkable similarity to the American Army officer. However, the Japanese pay schedule cannot equitably be compared with the American pay schedule because of the great difference between the Japanese and the American high cost of living. Pay of Japanese officers is dependent on promotion, and promotion is entirely dependent on vacancies. To prevent promotion from being too rapid, there is a required mini-

imum length of service in each grade. Even so, promotion is considerably faster than in the American Army:

<i>Grade</i>	<i>Annual pay</i>	<i>Required in grade</i>	<i>Average in grade</i>
2nd Lieutenant	\$450	2 years	3 years
1st Lieutenant—lower half	510	2 years	6 years
1st Lieutenant—upper half	600	—	—
Captain—lower third	800	4 years	7 years
Captain—middle third	900	—	—
Captain—upper third	1,050	—	—
Major	1,300	2 years	3 years
Lieutenant Colonel	1,800	2 years	3 years
		<u>12 years</u>	<u>23 years</u>
Total before promotion to Colonel:			
Colonel	\$2,300	3 years	4-5 years
Major General	2,750	2 years	—
Lieutenant General	3,250	4 years	—
General	3,750		

There is no grade of brigadier general in the Japanese Army. Promotion to the grade of colonel is practically by selection as less able lieutenant colonels are retired to the First Reserve. Promotion of general officers is by selection, but since the number of general officers is greater than the number in the American Army, a brand-new 2nd lieutenant in the Japanese Army stands a much better chance of eventually wearing stars on his shoulders than an American Shave-tail.

The French Command and Staff School

The present teachings in the French Army are fundamentally in conformity with French experience in the World War. These teachings are likewise conditioned by their military organization as laid down in law and by the fact of large colonial possessions. The doctrinal fount of their tactical thought is the Ecole Superieure de Guerre at Paris. For several years the American Army has sent officers to France to pursue the two-year course at this school. The practice continues.

The methods of instruction, the tactical doctrines, in fact, the whole structure of the school are all laid down on a foundation that was put in place by Marshal Foch, then colonel. To him is attributed the credit of forming the pre-war French command and staff. He exerted this control over a period of years, first as a professor, later as commandant. During the war his teachings bore fruit in the excellent maneuvers of the French armies.

The dominant principle of instruction at the Ecole Superieure de Guerre is that teaching shall be concrete. Everything taught is applied or demonstrated. The central fact is the problem. All methods are illustrated on the terrain. Sharp lines are drawn between methods and principles.

Detail as Student. The French officer who is detailed as student must first undergo a period of candidature and preparation. This consists primarily of details with all arms in turn and is followed by written tactical and cultural examinations. Selections are carefully made.

Instructor Staff. The instructor personnel is made up of officers who have a background of concrete war experience in the subjects they are detailed to teach. Nearly all of them have in addition a record of African service.

Situations and Terrain. The situation assumed as the basis of a problem is given a very life-like character. Pedantry is avoided. Information of the enemy is usually meager in quantity at the beginning and is furnished in successive stages as separate reactions to dispositions made in solution. Forceful emphasis is placed on the development of decision in the leader. Units employed in any problem are those that would be encountered under actual conditions as distinguished from those of organization tables.

The influence of terrain is regarded as basic. It must be disposed of as a fundamental before solution can proceed. Problems are preceded by a terrain study with the map folded up and out of sight. During solutions on the ground operations orders must often be dictated without recourse to the map other than memory.

Lectures. Lectures are of daily occurrence during the strictly academic period. They embrace a wide field of instruction. Although predominantly tactical and strategical, they include politics, finance, industry, government, economics and technical developments. Civilian experts who are leaders in their fields are freely employed.

Map Exercises. The map exercise takes place indoors, two or three times a week, and lasts about four hours. It is conducted by an instructor in charge of a group of students. Situations are posed and a student is designated to represent and command each of the arms of the services. As each stage of development in the maneuver is reached the various commanders are called on for discussions, opinions, and finally orders. Minutest detail of the maneuver is studied as the action advances and the instructor, assisted by specialist staff where necessary, will often defer to a student's solution of the step as better than his own. As presented these problems reach the highest attainable semblance of reality and a student's interest never lags.

Home Work. Four home work problems are given each year. Each problem requires two weeks of study, preparation and solution. A lecture to the entire class orients the individual student toward a proper study. The solution required includes all of the command and staff work of a given situation, step by step. For instance, if at a given point it is decided to fire a rolling barrage this part of the solution must show where, how long, how much ammunition by rounds and types, transport and issue

of these rounds, the traffic circulation in the unit's area as affected by the expenditure. Road capacities are listed and must not be exceeded. The repercussions of all decisions must be traced through and justified in all sections of the staff and affected services. Arithmetical calculations which form the basis of a movement's justification must contain a factor of safety to meet the unexpected shock of actual experience. Liberal provisions are made for supervision during execution and to "parry the unknown." The first test applied in correction is the test of workability. All correction is followed by a personal conference between student and instructor. Problems, when returned to students, will be marked in one of the following ways: "*Very Good*," "*Good*," "*Satisfactory*," or there will be no mark on the problem at all. No mark at all has its obvious meaning.

French Tactical Doctrine. It cannot truly be said that the French school possesses or seeks to inculcate any set of rigid precepts on which might be erected a system known as doctrine. Their view seems to be one of rather complete rationalization regarding the effective in combat. The tendency is to base decisions on fundamentals and apply pure reason independently to a set of given factors. Marshal Foch held that no two tactical situations would ever reach identity—and therefore the most a school could do would be to elevate an officer's military culture to a point where he could reason correctly when confronted by the necessity of decision.

However, certain leanings toward doctrine can be traced as a sort of pattern uniformity in regulations, solutions of problems, and practices of command. Some of these items of uniformity are pure method, others might be called principles; the two together can without great error be grouped under the name of doctrine. For instance, great stress is laid on the necessity for grouping units in "compartments of terrain" for the accomplishment of mission. By "terrain compartment" is meant the natural ground character as subdivided by hills, ridges, woods and streams. Such grouping facilitates liaison of combat arms and therefore helps to solve this first difficulty of command. Besides being a convenient method of limiting lateral responsibility that excludes confusion and intermingling of units, the method provides means in proportion to mission as a function of frontage. The idea is extended logically to the one of bounds, phases, or successive objectives and bases of departure. These become control points in an attack's progress and assure an orderly execution which is at all times subject to the will of the commander. Detailed prescriptions of these phases or successive lines are nearly always made as steps in an attack's progress on scheduled time so that if halts and reorganization become necessary they will and can take place under conditions of time and place chosen by the command and not imposed by the enemy. The French conception would seem to be that combined arms in cooperative action may lose cohesion, that this cohesion is the affair of command, and that a com-

mander should be assured the constant possibility of intervening in an action for which he alone is responsible. The phase line or limited objective is therefore not to be thought of as a brake on the initiative of a subordinate unit but rather as a means to confer momentum on a disrupted attack.

There is, of course, firm insistence on the dominant character of infantry's mission and on the principle of the offensive, as "the disorganization of the enemy forces is the object of military operations, it can be obtained only by battle. Battle is made up of an ensemble of combats, led by infantry with the support of other arms. Infantry is charged with the principal mission of combat, it is the principal arm."

In all attacks it is deemed necessary to have superiority of fire as a prerequisite of success. An infantry unit ordered to advance is intended to be supported by fire means which will make its advance possible. If such means are not available on its front it will act by fire alone, constitute the secondary attack, and its forward movement will not be ordered or expected. It is very generally held that an attack against an organized enemy possessed of well-adjusted fires over the terrain of assault is doomed to failure. This dependence on fire means of support has conferred an important role on artillery and at times leads one to say that the French belief is: "The artillery conquers, the infantry holds." This is perhaps an overstatement, but it certainly indicates a tendency. For instance, in meeting engagements, advance guard and main body move by bounds so that artillery may be in position for support of action *immediately* on contact. On establishing contact there often follows what the French call the engagement to determine the value of the enemy resistance. This is really our old reconnaissance in force. The method saves lives but at times might be called cautious.

Finally, it may be said that the Ecole Supérieure de Guerre, together with French maneuvers, has evolved what may be called the "tactics of munitions." Munitions are thought to present both a tactical and a supply problem. Although not entirely new the question is faced with a candid boldness and presented with original insight in the following introduction entitled:

"The Maneuver of Munitions:

"Munitions invaded the domain of tactics on the day when great differences were revealed in the needs of large units according to their general situation—because, that day, it became necessary for the commander to intervene in its allotment. Today, tactics can no longer ignore the problem of munitions, first because it requires time to be solved, lost time which conditions the conceptions of the commander; next, because the quantity and kind of munitions vary sharply according to the maneuver to be realized.

“In his plan, a corps commander must say in principle:

- (1) I want such a quantity available by such a date and in such zones;
- (2) I fix at so much the authorized expenditure for such and such operation.

“The tactical study of the question of munitions is forced upon the commander and upon staff officers.

“Supply requires a great deal of time. Therefore, the higher the commander, the farther in the future he must plan his needs. The more shells one wants, the more time one is obliged to give the enemy. Thus, the heart of the problem placed before the commander is to choose between *power* and *speed*.”

COAST ARTILLERY ORDERS

Col. Harry C. Barnes, will retire and proceed to his home, January 31.

Col. Jay P. Hopkins, to home and await retirement, December 31.

Col. Harrison S. Kerrick, to appear before the Army Retiring Board, Omaha, revoked.

Col. James L. Long, Letterman General Hospital, Presidio of San Francisco, will appear before the Army Retiring Board for examination.

Col. George A. Nugent, 12th, Fort Monroe, to 11th, Fort H. G. Wright, November 1.

Col. Allen D. Raymond, 538th C. A., Topeka, Kansas, to Omaha, Nebr., to Army Retiring Board for examination.

Col. Marcellus G. Spinks, detailed in Inspector General's Dept., Washington, D. C., upon expiration of foreign service.

Col. Robert F. Woods, appointed member Retiring Board, San Francisco.

Col. Robert E. Wyllie, retired, December 31.

Lieut. Col. Henry T. Burgin, Office of the Chief of Coast Artillery, Washington, D. C., to San Francisco, sailing New York, December 17.

Lieut. Col. Mathew A. Cross, from instructor, Coast Artillery School, Fort Monroe, to 63rd, Fort MacArthur, Calif.

Lieut. Col. Arthur L. Fuller, promoted colonel, October 1.

Lieut. Col. Francis H. Lincoln, promoted to colonel, October 1.

Lieut. Col. James L. Long, promoted to colonel, September 1.

Lieut. Col. R. I. McKenney, Org. Res., Providence, R. I., to 11th, Fort H. G. Wright, October 1.

Lieut. Col. Charles H. Patterson, from 52nd, Fort Hancock, to Chief of Staff, Washington, D. C.

Lieut. Col. Edward P. Powers, promoted colonel, October 1.

Lieut. Col. James F. Walker, retired from active service, October 31, on account of disability.

Lieut. Col. Will Paul Watson, ordered to active duty, October 15. He will proceed from Hamilton, Ohio, to Aberdeen, Md.

Lieut. Col. William H. Wilson, promoted colonel, October 1.

Maj. Robert Arthur promoted lieutenant colonel, November 1.

Maj. Joseph D. Brown, 6th, Fort Winfield Scott to Panama, sailing San Francisco, October 23.

Maj. Joseph F. Cottrell, to New York General Depot, Brooklyn, N. Y., instead of 8th, Fort Preble, Maine.

Maj. George D. Davidson, from Hawaii, to 6th, Fort Winfield Scott, Calif.

Maj. Cyril A. W. Dawson, from instructor, Oregon Nat'l Guard, Salem, to 7th, Duluth, Minn.

Maj. Edward B. Dennis, from Org. Res., Columbus, Ohio, to 10th, C. A., Fort Adams, R. I.

Maj. Barrington L. Flanigen, to Air Corps Tactical School, Langley Field, September 8.

Maj. Charles A. French, to Air Corps Tactical School, Langley Field, September 8.

Maj. Robert P. Glassburn, promoted lieutenant colonel, November 1.

Maj. Royal K. Greene, promoted lieutenant colonel, October 1.

Major Francis P. Hardaway, St. Louis, Mo., to Panama, sailing New York, December 2.

Maj. Paul J. Horton, promoted lieutenant colonel, November 1.

Maj. Edward L. Kelly, from 7th, Fort Hancock, to Fordham, N. Y.

Maj. Allen Kimberly, promoted lieutenant colonel, October 1.

Maj. Howard K. Loughry, promoted lieutenant colonel, November 1.

Maj. J. P. McCaskey, Jr., Org. Res., Harrisburg, Pa., to Providence, R. I., October 1.

Maj. Reinold Melberg, to 3rd, Fort Stevens, Ore., instead of 14th, Fort Worden.

Maj. William E. Shedd, Jr., to lieutenant colonel, October 1.

Maj. John P. Smith, from 10th, Fort Adams, to 12th, Fort Monroe, November 10.

Maj. Albert H. Warren, from Hawaii, to Org. Res., 5th C. A., Fort Hayes, Columbus, Ohio.

Capt. Aaron Bradshaw, Jr., instructor, New York, to 62nd, Fort Totten.

Capt. Nelson Dingley, 3rd, promoted major, November 1.

Capt. George W. Dunn, Jr., 7th, Fort Hancock, to A. and M. College, Miss., and report for duty.

Capt. Norman E. Hartman, from Coast Artillery School, Fort Monroe, to student, University of Michigan, February 16.

Capt. Arthur L. Lavery, from student, Harvard University Law School, Cambridge, to Hawaii, sailing New York City, February 17, 1931.

Capt. J. T. Lewis, instructor, Coast Artillery School, Fort Monroe, to Coast Artillery Board, Fort Monroe, December 1.

Capt. Parry W. Lewis, from Coast Artillery School, Fort Monroe, to student, University of Michigan, February 16.

Capt. R. W. McBride, 62nd, Fort Totten, to University of Illinois, Urbana, Ill.

Capt. Albert Mossman, from Fort Howard, Md., to Hawaii, sailing New York, February 17.

Capt. Joseph F. Stiley, from the Philippines, to 12th, Fort Monroe.

1st Lieut. Arnold D. Amoroso, from Nat'l Guard, Providence, R. I., to Hawaii, sailing New York City, February 17, 1931.

1st Lieut. Edward Barber, from student, Coast Artillery School, Fort Monroe, to Panama, sailing New York, February 19.

1st Lieut. John C. Delaney, 3rd C. A., Fort Stevens, to Panama, sailing San Francisco, December 13.

1st Lieut. Edward A. Dolph, 62nd, Fort Totten, to the Philippines sailing New York, January 13.

1st Lieut. Howard O. Douglas, from the Philippines, to 51st, Fort Monroe.

1st Lieut. John W. Dwyer, 52nd, Fort Monroe, to Hawaii, sailing New York, February 20.

1st Lieut. Escalus E. Elliott, to 12th, Fort Monroe, instead of to Hawaii.

1st Lieut. E. Carl Engelhart, from student, Tokyo, Japan, to 12th, Fort Monroe, March 31.

1st Lieut. George A. Ford, from the Philippines, to 52nd, Fort Monroe.

1st Lieut. Porter T. Gregory, Paris, to 62nd, Fort Totten, October 1.

1st Lieut. Frederic L. Hayden, from Panama, to U. S. Military Academy, West Point.

1st Lieut. Herbert B. Kraft, to his home and await retirement, October 31.

1st Lieut. John A. McComsey, sailing New York City for Panama, October 23, instead of September 11.

1st Lieut. Donald McLean, from 61st, Fort Sheridan, to the Philippines, sailing New York, May 5.

1st Lieut. H. E. Magnuson, Fort McDowell, to Hawaii, sailing San Francisco, November 20.

1st Lieut. Clarence M. Mendenhall, Jr., sailing New York, January 13, instead of December 5, to Hawaii.

1st Lieut. Lew M. Morton, from Philippines, to 12th, Fort Monroe.

1st Lieut. Glenn Newman, 52nd, Fort Hancock, to 7th, Fort Mott, November 22.

1st Lieut. Howard H. Newman, Jr., 63rd, Fort MacArthur, to Panama, sailing San Francisco, December 13.

1st Lieut. James F. Pichel, from 11th, Fort H. G. Wright, to 9th, Fort Banks, Mass.

1st Lieut. H. W. Smith, 6th, Fort Winfield Scott, to Fort McDowell, Calif.

1st Lieut. Guy H. Stubbs, from 62nd, Fort Totten, to the Philippines, sailing New York, May 5.

1st Lieut. George E. Waldo, retired from active service on account of disability, September 30.

1st Lieut. Fred B. Waters, from 6th, Fort Winfield Scott, to Hawaii, sailing San Francisco, March 10.

1st Lieut. Alan D. Whittaker, Jr., Philippine Dept., will proceed to his home, October 8, and await retirement.

1st Lieut. Walter J. Wolfe, Fort Totten, N. Y., to 11th, Fort H. G. Wright.

1st Lieut. G. E. Young, 62nd, Fort Totten, to Panama, sailing New York, December 2.

1st Lieut. Nevins D. Young, 10th, Fort Rodman, to Panama, sailing New York, December 2.

2nd Lieut. Alvin T. Bowers, promoted first lieutenant, November 1.

2nd Lieut. Robert C. Broadhurst, to Fort Sheridan, Ill., sailing San Francisco, September 23, via New York City.

2nd Lieut. A. Ward DeWees, promoted first lieutenant, November 1.

2nd Lieut. Edward A. Dodson, Air Corps, Kelly Field, to Hawaii, sailing San Francisco, February 5.

2nd Lieut. Robert T. Frederick, from 13th, Fort Barrancas, Fla., to Panama, sailing New York City, January 8, 1931.

2nd Lieut. John F. Gamber, promoted first lieutenant, November 1.

2nd Lieut. Burgo D. Gill, from Panama, to 62nd, Fort Totten.

2nd Lieut. Edwin G. Griffith, from 13th, Fort Barrancas, Fla., to Panama, sailing New York City, December 2.

2nd Lieut. Henry J. Heoffer, from Philippines, to 13th, Fort Barrancas.

2nd Lieut. Carl W. Holcomb, promoted first lieutenant, October 1.

2nd Lieut. Armand Hopkins, promoted first lieutenant, October 1.

2nd Lieut. John W. Huyssoon, promoted first lieutenant, October 1.

2nd Lieut. Paul A. Jaccard, 62nd, Fort Totten, to 9th, Fort Warren, Mass.

2nd Lieut. John R. Lovell, to 12th, Fort Monroe, Va., instead of to 14th, Fort Worden.

2nd Lieut. Cyril H. McGuire, to 13th, Fort Barrancas, Fla., upon completion of present tour.

2nd Lieut. W. F. McKee, Fort Sam Houston, to Panama, sailing New York City, October 23.

2nd Lieut. Nathan A. McLamb, to 13th, Fort Barrancas, Fla., upon completion of present tour.

2nd Lieut. William L. McNamee, from Hawaii, to 63rd, Fort MacArthur.

2nd Lieut. Paul B. Nelson, from Hawaii, to 6th, Fort Winfield Scott.

2nd Lieut. Cyrus L. Peterson, from 63rd, Fort MacArthur, to the Philippines, sailing San Francisco, February 4.

2nd Lieut. K. E. Rasmussen, 62nd, to the Philippines, sailing San Francisco, November 19.

2nd Lieut. Montgomery B. Raymond, is granted leave of absence for three months, to take effect December 12.

2nd Lieut. John A. Sawyer, from Philippines, to 11th, Fort H. G. Wright.

2nd Lieut. Lawrence E. Shaw, from Hawaii, to 6th, Fort Winfield Scott.

2nd Lieut. William F. Steer, promoted first lieutenant, October 1.

2nd Lieut. Carl F. Tischbein, promoted first lieutenant, November 1.

2nd Lieut. Arthur E. Watson, Jr., from Presidio of San Francisco, Calif., to 6th, Fort Winfield Scott.

Mast. Sgt. E. E. Feehley, 7th C. A., retired, September 30.

Mast. Sgt. Frank J. Forbing, 7th, retired, Fort Worden, November 30.

Mast. Sgt. Carl Mortensen, Hq. Bat., 9th, retired, October 31.

Mast. Sgt. Joel W. Rowan, Bat. E, 3rd, retired, Fort Stevens, November 30.

1st Sgt. Wilfred A. Audette, Bat. E, 2nd, retired, Fort H. G. Wright, November 30.

1st Sgt. James Chadwick, Bat. B, 41st, retired, Fort Kamehameha, November 30.

1st Sgt. Lafayette F. Decker, 14th, retired, Fort Worden, September 30.

1st Sgt. Price Hounshell, Bat. A, 12th, retired, November 30.

1st Sgt. John C. Mullane, 69th, C. A., Aberdeen Proving Ground, retired, October 31.

1st Sgt. John E. O'Neill, Bat. I, 64th, retired, Fort Shafter, November 30.

1st Sgt. G. S. Painter, Bat. D, 60th, retired, September 30.

1st Sgt. David J. Reardon, Bat. B, 63rd, Fort MacArthur, retired, October 31.

1st Sgt. Samuel T. Sullivan, Bat. G, 14th, retired, Fort Worden, November 30.

Tech. Sgt. Michael J. Buckley, 6th, retired, Fort Winfield Scott, September 30.

YOU TELL EM

What Do You Mean "Current Copy at the General Electric?"

(Good Intentions Appreciated)

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

I am inclosing my application for membership in the Coast Artillery Association.

I don't think that I will sign up for the JOURNAL just yet since I have just bought a uniform and the dollars are still scarce. Then too, I work with the General Electric Company and there is always a current copy available.

However, I expect, at some later time, to have the JOURNAL sent to me and I will write you at that time.

Sincerely,

Second Lieutenant, Ca-Res.

A Letter Which Means Something

262 John St.,

South Amboy, N. J.

Sept. 1, 1930.

Col. J. C. Johnson,
Fort Hancock, N. J.

Dear Sir:

It is with a feeling far deeper than we can express in words that we try to convey to you our gratitude for what you have done for our boy during his month's training in your C. M. T. C. camp. To stand by good morals and keep himself physically fit mean more to him now than ever. What a pity that every boy in our country does not benefit through this great privilege.

We thank you and all those who have made this camp what it is.

Sincerely,

NELLIE and ROBERT WELDEN.
(his parents)

BOOK REVIEWS

George Washington: Commander in Chief. By Thomas G. Frothingham, Captain, U. S. R. Boston: Houghton Mifflin Company. 405 pp. Illustrated. \$5.

As 1932 approaches we come to the two-hundredth anniversary of the birth of our first president, and of course there will be many biographies in commemoration. The author of this excellent work has fulfilled well his object as stated in the preface of "setting forth in its true light, and with the right perspective, the military record of George Washington, American Commander in Chief through the Revolution."

This is a military biography and takes us from the self-tuition of the boy of sixteen to the farewell to the victorious army in 1783. The book, and may we give thanks, avoids the "conglomerations of anecdotes and controversies" which have so often magnified and glorified with an historical glamour the life and works of this paramount soldier and gentleman.

We are told of Washington's help in strategic matters to the British commanders in the French and Indian Wars, and then of the outbreak of the Revolution and the inculcation of fear into the enemy through the battles of Lexington and Bunker Hill:

"At that time, all European wars were fought by the regular armies, in formal battles and with formal tactics. The idea that the people of any country would be able to resist a regular force was so contrary to all European military formulas that it was out of the question. . . . The formulas of contemporary European military doctrines could not be applied to the unconventional warfare of the Americans. . . . The British Regulars, drilled in the formal battle tactics of Frederick the Great, were pathetically helpless in the countryside against the irregular tactics of the Americans."

The author reiterates time and again this difference between the formal tactics of the highly trained European armies and the irregular methods of the Americans, who, under Washington, went so far contrary to formal tactics that they turned retreat into a victory.

We are told of the "deliberate methods and indolent nature" of General Howe, his procrastination and "incurably sluggish temperament," the "uncoordinated plans of the British," and have quoted to us several "curiosities of military sapiency." Enough for the enemy.

The author retells the story of General Washington's ascendancy over the raw militia and the undisciplined troops, of the horrors of the winters, of the wholesale desertion when battle was lacking, of the incessant appeals to a vacillating Congress, of the trouble over promotion with his own and the foreign officers, of the lack of money, food, clothing, and materiel. But finally, with the aid of Rochambeau and de Grasse, we see the magnificent plans of Washington carried to a conclusion with the surrender of Cornwallis at Yorktown.

The author, with many quotations, makes use of the voluminous correspondence of Washington, particularly with Congress and in his orders and suggestions to his officers. Also there are many passages from Stedman's "History of the American War," and Fortescue's "History of the British Army." In fact we really do not know what Frothingham would have done without his predecessor, Stedman. Included are many contemporary maps of the various campaigns and battlefields, but sad to say, these ancient maps do not print very clearly; modern tracings or reproductions would have served the purpose of military study better.

The publishers, Houghton Mifflin, and the printers, Riverside Press, are to be congratulated on having produced mechanically an excellent volume, one well worthy to take its place among the gift books of the season. We recommend it as a present to any officer or others interested in military tactics or American history. It gives a new insight into the failures and successes of the Revolution.

We wish also to thank the author for a biography which, unlike other modern biographies, still leaves our foremost national hero firmly fixed upon his pedestal.—E. W. T.

Malta of the Knights. By E. W. Schermerhorn. New York: Houghton Mifflin & Co. 1930. 6½" x 9½". 307 pp. 35 illustrations. \$7.50.

The vast change which has taken place in the world during the past hundred and fifty years cannot fail to impress the reader of Miss Schermerhorn's latest book. The life led by the Knights of Malta, their manners and customs, their method of fighting, the state of internal and international politics are so different from those of the present day that one seems to be reading of a different world. But yet the characters portrayed are the same. We see the same motives, the same aims and ambitions, the same courage and devotion, the same greed and selfishness. The men are alike, but they live in an entirely different atmosphere, one which Miss Schermerhorn describes in an alluring and romantic manner, and therein lies the interest of this book. We see a military force, the most renowned of its time, the bulwark of Christendom against the Turk, operating more on the water than on the land, but under conditions so different that everything is strange, as much to the professional soldier as to the tyro in military tactics.

It is not a history but a story that Miss Schermerhorn tells. She skips about among the centuries in a most agile manner to illustrate some particular point and is more concerned with personal anecdotes and descriptions of life and customs than in the historical setting; but these are not defects, on the contrary they constitute the charm of the book, making it of universal interest.

The Order of the Knights Hospitallers of St. John was founded in Jerusalem at the time of the First Crusade. When the Holy City fell to the Saracens the Order moved to Arce, then to Rhodes and, in 1530, to Malta where it remained till Napoleon captured the island in 1799 on his way to Egypt. The Order, as a military body, then came to an end.

The Knights were recruited from the best families of Europe, all countries contributing members and only scions of nobility were taken. A severe apprenticeship was undergone before the would-be Knight was given the accolade. They were then sworn to obedience, poverty and chastity and were a peculiar combination of soldier and monk, being under the Rule of St. Benedict and wearing a monk's habit over the armor. Many members of the Order became cardinals, bishops and priors and all were exempt from both lay and clerical courts, being answerable only to the Grand Master of the Order. The rule was of course despotic and the entire island of Malta, including the Maltese inhabitants, were governed by the Grand Master and his Council. The Grand Master was really a sovereign, being represented in foreign countries by ambassadors and using the closed crown of royalty with his coat-of-arms.

Being composed of representatives of all nations the Order was neutral in wars between Christian countries; its enemy was the Moslem, against whom it waged unceasing war; never was there peace between the Knights of Malta and Islam. Every year the galleys of the Order put to sea and attacked the galleons of the Turks and the Barbary pirates, returning to Valetta with

the booty taken. This was their main source of income. In this manner the Mediterranean was policed and the Christian nations enjoyed the benefits thereof. Occasionally the Turks attacked Malta, but the island was well fortified and the Knights were courageous, so all such attempts failed.

As the records of the Order was quite voluminous it can be seen that its history offers a wealth of material for a narrator to depict deeds of heroism and adventure and Miss Schermerhorn has taken full advantage thereof.

This book should have a special appeal to the 65th Infantry, the Porto Rican Regiment, as its coat-of-arms bears the white eight-pointed cross worn by the Knights on a black mantle. The regiment adopted that insignia because the city of San Juan was so named in honor of the Knights of Malta, and the banner of the Order was placed on the city's arms in 1511.

The illustrations are many and excellent, being views of Malta and its buildings and portraits of the most notable leaders. The craftsmanship of the book is particularly good.—R. E. W.

Rags: The Story of a Dog Who Went to War. By Jack Rohan. New York: Harper and Brothers. 242 pp. Illustrated. \$2.00.

Soldiers and war form the background on the stage of this story, but the spotlight is kept focussed on the mascot of the First Division, A. E. F., a canine of uncertain ancestry yclept Rags.

"He was just a shaggy little terrier, undoubtedly partly Irish, but with a goodly sprinkling of various kinds of Scotch—a mixture, incidentally, that seems to run strongly to warriors."

The story takes us from Montmartre to the Meuse-Argonne forest where Rags learns to carry messages from the front lines back to the supporting artillery, is then wounded and gassed, sent back to the hospital "by orders of the commanding officer," recovers, emigrates to New York and Washington, becomes famous, gets photographed and soon finds himself the center of First Division publicity.

There are many good lines in the story, some by sergeants, others by generals; the one we liked best is a dirty crack at our friends the gyrenes:

"Marine Corps history has it that a great victory was won by a few marines with the help of the Deity. The Army version is that the marines certainly were few, but that in their excitement they mistook certain crack Regular Army regiments for Omnipotence."

We like the story because it is a good dog story, and a good army story. Besides that it's true, for with all the worshippers of such a famous full-blooded thoroughbred mongrel believing the story in toto, why should we think otherwise.—E. W. T.

Hindenburg, the Man and the Legend. By Margaret Goldsmith and Frederick Voight. New York: William Morrow & Co. 1930. 5¾" x 8½". 293 pp. \$3.50.

Margaret Goldsmith is an American wife of the co-author, educated at the University of Berlin. During the war she worked with the War Industries Board in Washington and was later at the American Embassy in Berlin. Frederick Voight is an Englishman and was control European correspondent of the *Manchester Guardian* after the war. It is evident that the authors have had excellent opportunities for studying conditions in Germany.

Strictly speaking this is not a biography, it is rather a history of the war,

with special emphasis on the military and political strategy. Supplemented by a brief account of Hindenburg's previous life, sufficient to give the reader an excellent idea of his character.

Hindenburg was a military man, above all else. The authors relate that he even considered it a waste of time to read anything but military books, so his knowledge of politics was virtually nil. Loyalty was his dominating characteristic. "He obeys his leader and his implicit obedience is in itself his moral code. Hindenburg's gifts are not imaginative or intellectual, they are talents of character; he has almost a genius for sincerity and loyalty." It was this characteristic which caused him to return to active service in 1914 at the call of his Emperor, after three years in retirement. Again in 1918, when the monarchy fell, his loyalty to Germany prompted an offer of his services to lead the armies back to their homes and the same characteristic has led him later, as President to preserve and strengthen the Republic, notwithstanding his known royalist sympathies.

That Hindenburg was virtually unknown, even in Germany, until the battle of Tannenberg, will be a surprise to many. He retired in 1911 after forty-five years of honorable, but not distinguished, service. "His promotions were all granted largely because he reached the age when not to have been promoted was to have been insulted," yet he became the outstanding figure of the war, on the German side at least, all due to the "legend of Tannenberg." In that great victory Hindenburg and Ludendorff became associated for the first time, and Hindenburg is credited with the victor's laurels, although it appears that he simply carried out the plans already formulated under the general he superseded. According to our authors the real credit in the victory should go to General von Francois, one of the subordinate commanders, while Capt. Liddell Hart, the British author, in his recent work, "The Real War," gives the palm to Gen. von Hoffman. The truth seems to be that Hoffman was mainly responsible for the plan, while Francois, by brilliant execution of more than his allotted task, insured the virtual annihilation of the Russian army. Be that as it may, Hindenburg became the idol of Germany after the victory, and so continued, although the subsequent strategy afterwards was largely Ludendorff's.

The authors completely puncture the German idea that the war was lost, not because of military defeats, but on account of the revolution at home. In September, 1918, they tell us, the High Command not only lost all hope of victory but fearing complete defeat in a decisive battle, began to press for an armistice. Numerous quotations are given from Hindenburg and Ludendorff during September and October. Showing that, in their view, the military situation was so dangerous that an immediate peace was an imperative necessity for Germany, while it was not until the end of October that the naval uprising at Kiel commenced the revolution. Not until November 9 was the republic proclaimed in Berlin and the Kaiser forced to abdicate. Yet many Germans still believe that their military power remained supreme till the end.

The real cause of the German defeat, according to our authors, was the "preponderance of the military." The political leaders were powerless, the General Staff was in complete control of all phases of the war, and it knew military matters only, "it never understood the meaning of sea-power. That politics, propaganda and blockade might be instruments of deadly warfare was never realized in Germany until it was too late. The political leaders might have made up for the mental limitations of the military leaders but the whole German system gave the military leaders a fatal preponderance." This is something our own officers should take to heart. It is unwise for a military man to

keep within his army shell, he should study politics, naval affairs and international relations, so as to avoid the "mental limitations" of the German officers, and so he can discuss such matters intelligently with the civilian leaders of the government who are, fortunately, supreme in our system. That civilians can have an excellent idea of military strategy has been shown repeatedly. The strategy of England during the seven years' war was dictated by Pitt, against the advice of his general, yet it was evidently successful and is acknowledged today to have been the correct strategy. Winston Churchill's strategical conception which led to the fateful Dardanelles expedition was fundamentally sound, its failure was due to the conduct of the expedition and especially to the half-hearted support given by military authorities who appeared unable to grasp its strategical significance.

The book under review is further evidence that a clear conception of military strategy can be acquired by civilians, as the discussions on the strategy of the war are lucid, thorough and better presented than in many books written by military men. There is not one of us that cannot benefit by a careful perusal of this book.—R. E. W.

Espionage. By H. R. Berndorff. Translated from the German by Bernard Miall. New York: D. Appleton and Co. 268 pp. \$2.50.

If you want a thriller, a detective story, true confessions, stories of love and intrigue, all rolled into one, and still feel that you must improve your mind professionally, here's your book. The volume is filled with disconnected tales of the inside workings of the espionage systems of the military intelligence services of Germany, France, Russia and England, from 1913 to 1920, including many deeds of the Great War. Spy follows spy, double-crossing and triple-crossing with none of the flat-footed crudity of the modern Ruth Hanna vs. Gerald Nye case. Youthful subalterns succumb to the seductions of beautiful courtesans in the employ of the "dastardly enemy powers"; important secrets are sold for love; the net draws closer, and we are left with a firing squad at dawn, or bichloride of mercury in the filthy attic of the Boul 'Saint Mich' or the Tiergartenstrasse.

The stories of Mata Hari, the dancer, Annemarie Lesser, the lady doctor, Alexander Szek, who stole the "most secret" code from the Germans, and of many others are retold. A slight glorification of the German intelligence system, to the detriment of others, may be forgiven as the author's patriotism.

Three quotations: "For the officer, strangely enough, and quite unjustly, regards the activities of the secret agent with dislike and disdain." . . . "The accused was an officer, who had acted as a spy in the service of his country, so that he had not acted dishonorably, since an officer who performs such service for his country is not dishonored thereby." . . . "These women agents began by inducing the young officers to spend more than they could afford." Take your choice.

If you must have your happy endings, and your cloying fade-outs, don't read this book. Otherwise we recommend it for pleasure and profit. Another claim for who won the war—the spies.—E. W. T.

Kitchener. By C. R. Ballard. New York: Dodd, Mead & Co. 6" x 9". 341 pp. 17 maps. \$3.50.

General Ballard has written in terse and illuminating language, free from hero-worshipping adjectives, this discussion of the life of Lord Kitchener. From

his earliest manhood Kitchener's appointments gave him an independence of action which accounts for his self-opinionated manner so objectionable in later years to the members of the British Cabinet and the military leaders on the Western Front. As Kitchener never made explanations his biographers can judge him only by an analysis of the success or failure of his acts.

He was not a great organizer but his driving-power and his infinite attention to detail combined with the assistance and devotion of Wingate created in Egypt a great organization. There he was the autocrat. Wingate knew all about the Kalipha's army; they could spend four years in preparing for the campaign which ended at Omdurman with such brilliant success that Kitchener won for himself the abiding confidence of the British people. But in London, his relentless insistence that only men and more men could win on the Western Front bred hostile opposition. He had to fight jealousy, the discussion of his plans with the civilians of the War Council, the machinations of politicians whom he did not understand, until finally Robertson was made C. I. G. S. and he could devote himself to his duties as Minister of War.

Those difficult years, however, reveal a growth of character and understanding for he came to see the need for certain political decisions, the attack on Gallipoli and the sending of troops to Saloniki, to both of which acts he was unalterably opposed from a purely military standpoint. But nothing availed to change his decision that at least seventy divisions would be needed by Great Britain, and the last contingents of these were on their way to France when Kitchener set out on his ill-fated journey to Russia. They were his creation from the people who believed in him and his contribution to the defeat of the Central Armies.

General Ballard refers to the mystery surrounding the destruction of the *Hampshire* with the loss of nearly all on board. He shows a map whereon he locates the mines which had been laid a week before the *Hampshire* sailed. The choice of this route depended on the weather so the blowing up of the *Hampshire* was purely accidental although the result was an irreparable loss to Great Britain. In his concise evaluation of men and events General Ballard has made valuable contribution not only to our knowledge in regard to the services of one of her great military leaders, but also in regard to the service rendered by the British Empire in the World War.—Mrs. F. S. Clark.

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