

COAST ARTILLERY JOURNAL



HARBOR DEFENSES OF
CHESAPEAKE
BAY

February
1926

17th Annual Prize Essay Competition

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First Prize	\$125.00
Second Prize	\$ 75.00

CONDITIONS

(a) Subject to be chosen by competitor, discussing some phase of policy, tactics, or technique involved in the efficient accomplishment of the mission of Coast Artillery.

(b) Competition will be open to all readers of the JOURNAL.

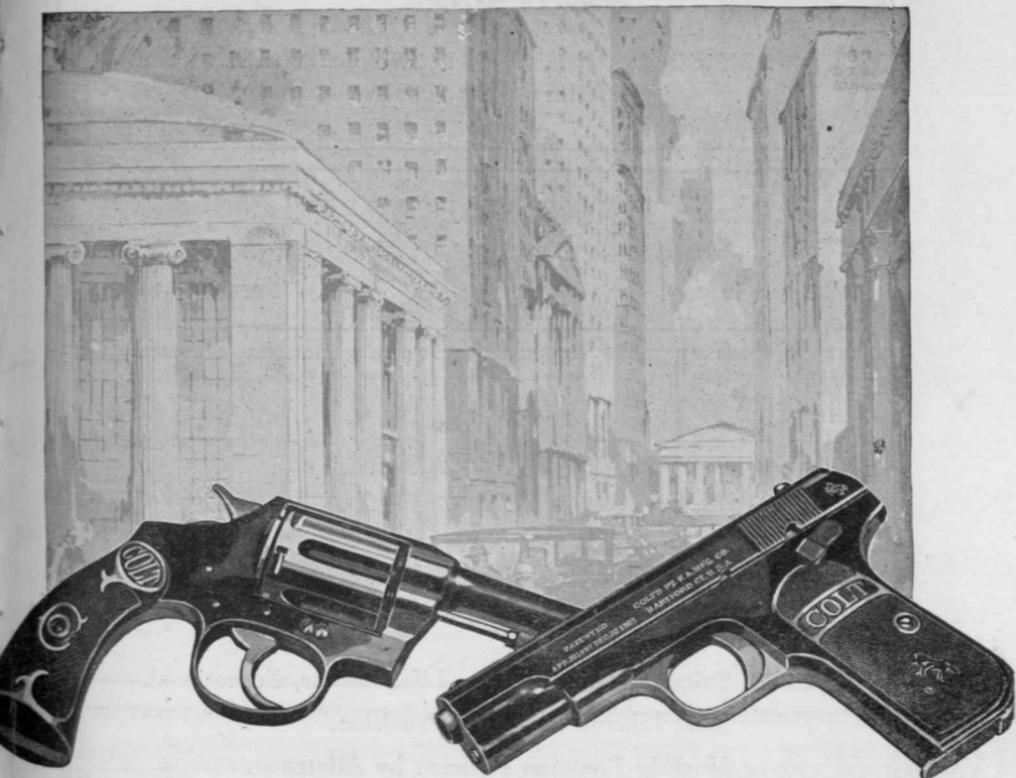
(c) Award will be made by a committee of award, consisting of three persons, to be nominated by the Editor. If no essay submitted seems to the committee worthy of a prize, none will be awarded. Honorable mention may be made of any essay submitted which seems to the committee worthy thereof, but to which a prize is not awarded.

(d) All essays entered in the competition will become the property of the COAST ARTILLERY JOURNAL. These will be published, if valuable and interesting to JOURNAL readers.

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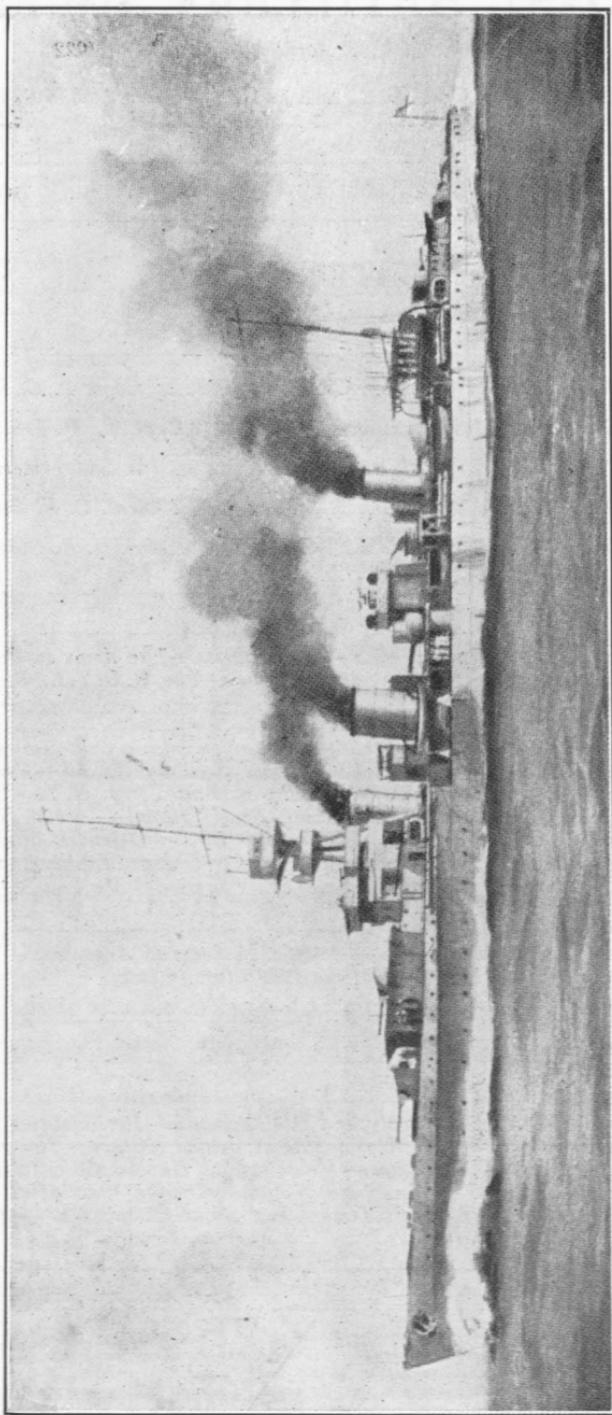
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H. M. CRUISER "EMERALD"

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that Russian sea-power in the Black Sea be destroyed. Out of these circumstances grew the invasion of the Crimea. Most of the history about that campaign is confined to the land operations, notably the great land battles and the actual siege of Sevastopol. What we now have to do with are the maritime operations which led up.

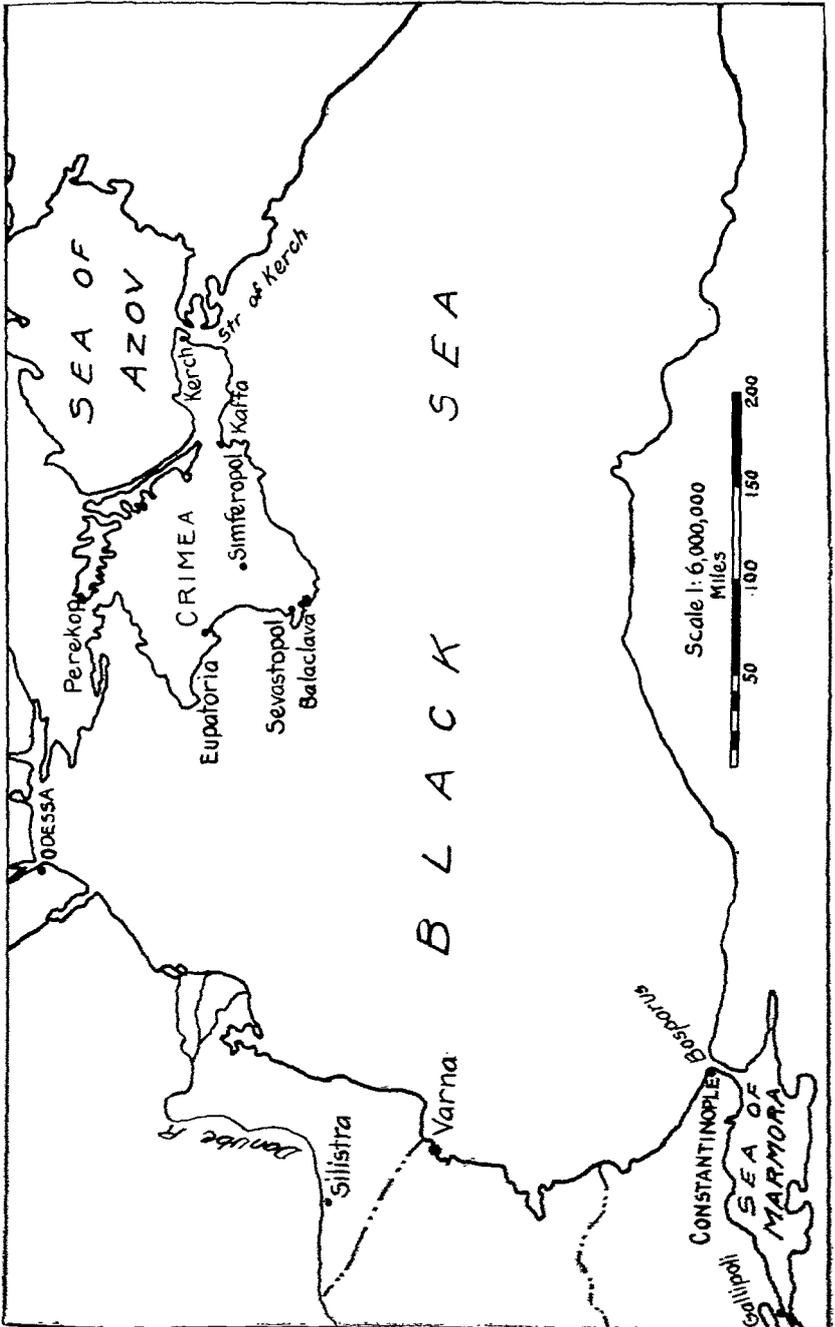
At this period, navies and merchant shipping were in the transition from sails to steam. Small steamers such as tow-boats were becoming plentiful but in most other types steam was auxiliary to sail power. There were battleships with steam power, but very few; the proportion of steam frigates was greater but all were wooden ships which had nearly full sail power also.

The four navies which participated then had about the same relative efficiency that they have always had; the Turks and Russians being good enough as fighters from on shipboard but rarely being efficient as seamen. The French probably approached the British naval efficiency more closely than has been usual; it is evident, however, that in this and in other theaters of the war the British Navy was in several respects below its traditional high quality.

It is to be borne in mind that this expedition was carried out by the French and British at a distance of three thousand miles from their homeland and only source of supplies; that is, about as far as across the Atlantic, and the passages at that distances took three times as long as now.

However, distances in the Black Sea itself are short. It is only one hundred and fifty miles across the narrowest point; from Varna to the Crimea is two hundred and sixty-five miles. The Black sea was so named by the Ancients because its weather was black to them. It is cloudy, there are frequent fogs, and, except in summer, there is plenty of high wind. The direction of the prevailing winds is what had formerly given Sevastopol so strong a strategic situation. During the summer the wind is from the north and northeast; there are only two large and secure harbors in the Black Sea; of these, the Bosphorus is to leeward and Sevastopol to windward, which gave a sailing fleet based there a great advantage. The advent of steam changed the situation somewhat, and, without doubt, the fear of being caught with their sailing ships to leeward of their port had something to do with the inactivity of the Russian fleet.

Sevastopol had been given strong coast defenses and made into a first-rate naval base. It is placed in a pleasant country with some local resources but the upper part of the Peninsula is a barren steppe. There were then no railroads; and the land communications were long, over indifferent roads, via Perekop or cause-ways to the eastward, to Simferopol, which was the principal interior city and once the capital. These routes down the neck of the Peninsula could not be approached closely from the sea because of the large expanses of very shallow water. What was an



even more important communication line was across the Sea of Azov to Kerch and thence to Simferopol. This enclosed sea is entered by a narrow passage, also through shoal water, and is itself quite shoal throughout. The water communication to Kerch could be cut by light naval forces except perhaps in winter when they were uncertain anyhow. The entire south coast of the Crimea is bold and steep; there are no secure harbors except Sevastopol; all others are open anchorages or small ones like Balaclava. A few miles north of Sevastopol the coast flattens out somewhat and there are long sand beaches with a fair depth of water close by.

The Russians had, based on Sevastopol, fourteen sailing battleships, some sailing frigates, and twelve war steamers of which two were powerful frigates. Since the beginning of the year (1854), the allied fleet had overmatched this force, particularly since some of the British and French battleships had steam power. But the Russians were by no means so weak at sea as to justify the inactivity into which they at once fell; except in a very few instances, they stayed in Sevastopol until the end. On the other hand the allied fleet was by no means enterprising; it made a few raids during spring and early summer but never attempted to blockade Sevastopol or even continually to observe it. The Turks were dissuaded from the small projects which they did not plan to carry out in the first half of 1854. They probably could have obtained no lasting results along the lines they proposed. In one respect, however, the French and British Admirals were very decidedly at fault — there was a considerable Moslem population in the Crimea; through them the Turks, if encouraged and supported by their naval allies, could have obtained complete information on the defenses of Sevastopol and about the Russian field forces in the Crimea. On this point the invasion was made with no better information than came from Russia around through Paris and London. There were time and facilities to get all the information that was needed, and not to have done so indicates woeful lack of enterprise on the part of the allied squadrons.

We have then, at midsummer of 1854, very considerable French and British forces of all kinds sitting around the unhealthy port of Varna, with no plans made and beginning to have cholera. Before leaving London the Commander of the British Army had been told to get all important military information about the Crimea *with a view to an offensive against it*. Similarly, the French Commander had been told by his Emperor: “You must concert measures with Lord Raglan for the adoption of one of the following plans:

1. “Either to advance to meet the Russians in the Balkans”
2. “Or to seize upon the Crimea”
3. “Or to land at Odessa,” etc.

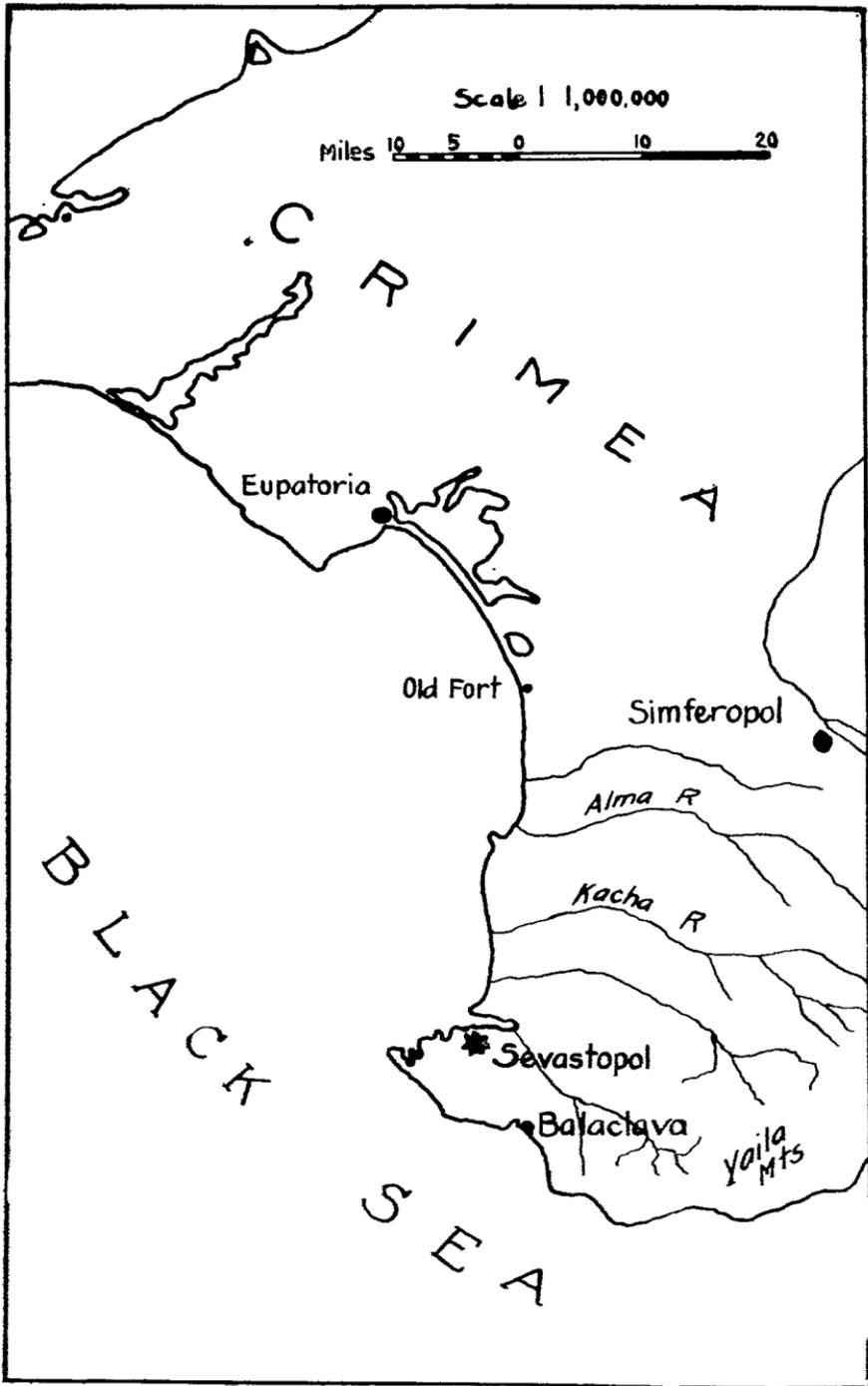
The recent retirement of the Russian Army had eliminated the first alternative. There is no indication that any further steps were taken in plan making until 16 July, about one month after the Russians retired northward, when Lord Raglan received a letter of instructions from London which quite definitely directed the destruction of Sevastopol and the Russian fleet *unless* it was thought by those on the spot that their forces were insufficient. The two governments were plainly in agreement as to the objective for their forces. It may be added that the concept was good and the grand strategy excellent.

Now, as to the Commanders of those forces and their relations to each other—The British Army was under Lord Raglan; he was a young staff officer during the Napoleonic wars and served in important billets. Since then he had been, for forty years, at embassies and in secretarial posts; now at sixty-six, with almost no experience in command even during peace, he was in high command during war. He no doubt was a strong man, very tactful, able to influence and even dominate others, and of high natural ability. Many of the higher subordinate British officers were of similar age and experience.

The British fleet was under Admiral Dundas, aged sixty-nine, with considerable political experience and influence. He was making his last cruise, for which he had chosen the tranquil Mediterranean station. He was of course a capable seaman and seems to have had sound common sense and judgment but his days for dash and enterprise had passed. The second in command, Admiral Lord Lyons, was of different type; he thought he looked like Nelson and was said to try to live up to it. It was he who was in direct charge of the convoy and landing the troops; he retained close personal relations with Lord Raglan before, during, and after the landing—a circumstance which was undoubtedly of great importance.

Marshal St. Arnaud, the Commander of all the French forces was about fifty-seven. His military experience was largely that of a regimental officer in Algeria with the Foreign Legion; he owed his position to his part in the shady conspiracy which placed Louis Napoleon on his throne. St. Arnaud had much innate ability but was uncertain in character and in temperament; he was greatly hampered by ill health and was succeeded by General Canrobert about ten days after the landing in Crimea. The French fleet was commanded by Admiral Mamedin, who was directly under the orders of the Commander of the French Army.

The Russian forces, including the Fleet, were commanded by Prince Mentschikoff; he was the same man who had been beaten in the battle of diplomacy at Constantinople, and as a commander he was equally deficient. General Todleben, who acquired such fame, was the Engineer Officer and was the brain of the siege. The Russian Admiral, Korniloff, and three subordinate naval commanders appear to have had ability and



energy; Korniloff commanded afloat *and* ashore during the first month of the siege and showed high qualities as a combat leader. As has more or less always been the case, Russian naval personnel were soldiers at sea rather than seamen.

The British and French Governments had enjoined their Commanders to "act in concert." In general they did so and gave and took on both sides; in the end Lord Raglan dominated St. Arnaud, when great decisions were involved, and his tact and character enabled him to do so without arousing serious resentment. As stated, St. Arnaud was in supreme command over the French Army and Squadrons (the Turkish contingent accepted his command also). The British forces were under their usual arrangement in which General and Admiral were co-equal and expected to cooperate. Admiral Dundas was usually in disagreement but did comply with all direct requests made upon him. Under these arrangements, the British and French Admirals also were called upon to act in cooperation. In the main they did so and without serious conflict. But, manifestly, these conditions made for difficulties and involved danger, particularly while command of the sea areas was in dispute. At the best, time was wasted when the situation called for quick decisions and rapid movement—as this variety of war always does.

Upon receipt of the British Government's instructions to Lord Raglan, a Council of War met, 18 July, attended by Army and Naval Commanders of all allied forces at Varna. All brought forth their instructions and such information of the enemy's situation as was available. It was clearly the sentiment that this information was so meager and unreliable as to make an invasion of the Crimea inadvisable. Under his own instruction, Lord Raglan did not, and in a way, could not emphasize such a view. Admiral Dundas, who seems not to have believed in the war anyhow, was decidedly opposed, basing his objection upon the risk to the British Army; he contracted to land it but would not insure keeping it supplied or bringing it back. The French Commanders did not favor the expedition but were not emphatic in their objections. The seconds in command of the two Fleets were the only ones who wholly favored the project. It was in this state of mind that the Council decided to embark upon the invasion—because their Governments desired it. Preparations were instituted by the British—the French having already begun theirs—which it was estimated would require ten days to complete.

On 25 July the Allied Fleets sailed to reconnoiter the ground. The bulk of the Fleets lay off Sevastopol while a small steamer with all the seconds in command of the allied armies and fleets deliberately examined the west coast of the Crimea. As the result of this reconnaissance from the sea, the mouth of the Kacha River, about six miles north of Sevasto-

pol, was tentatively chosen as the landing point. Little pains were taken at deception or in concealment of the design; incidentally, there had been so much public discussion, particularly in England, that the Russians should at least have had suspicion of their enemies' intentions—even before this wide-open reconnaissance. The Allies failed, even on this occasion, to make any attempt to gain information through the affiliations between the Turks and inhabitants of the Crimea or even by landing their own agents.

Furthermore, the Allied fleets all returned to Varna by 30 July. They had ample forces with which to blockade Sevastopol but made no attempt to do so and did not even keep it under observation. The Russian fleet was therefore left entirely free to move, and this condition lasted up to the time that the expedition actually arrived to land.

The Allied preparations consumed all the month of August instead of being complete at the end of July. A very severe outbreak of cholera, a fire at Varna, and an incursion in force which St. Arnaud insisted upon making into the Dobrudja all hampered these preparations. Talk of abandoning the project was continuous—particularly on the part of the French. So late as 26 August another formal Council of War met to finally decide the matter. Admiral Dundas repeated his objections, specifically pointing out that the good weather would be nearly ended, and that with no good ports from which to supply and insure support by the fleet it was hazardous to land the army against land forces of unknown composition. He stated, however, that the fleet was fully prepared to transport their army and to land it wherever it wished to go. To go was finally decided. From what has come down to us, it seems clear that the idea was to land, march upon Sevastopol, beat any troops encountered on the way, seize and destroy the port and the Russian fleet—and then re-embark. In other words, to carry Sevastopol by a *coup de main*, which was to be executed with extreme rapidity and vigor; all a matter of a few days.

The land forces that composed the expedition were about 60,000 infantry and field artillery, with 130 guns, and 1200 cavalry, the total number of horses being about 6000; there were also stowed in the ships' holds a large number of siege guns. These figures include ten battalions of Turks, who were under St. Arnaud; otherwise, the force was fairly equally divided between French and British. All the cavalry was British. The French took only half teams for their guns and prepared to land with rather meager ammunition supplies but with a reasonable amount of baggage. On the other hand, the British took full gun-teams and prepared to land with much larger ammunition reserves but with a most scanty baggage train—for instance, no shelter whatever.

The Russian Army in the Crimea numbered about 50,000, of which four-fifths was under Mentschikoff's personal command in or near Sevas-

topol. Besides these there were 6000 fortress troops and 18,000 naval personnel who manned the defenses during the first few weeks. The information about these forces which had been sent out by the Allied Governments was actually not far from the truth; that from other sources, apparently mere rumors which reached the Allied Commanders, was at variance—with figures running as high as 120,000 Russians. The Russian Army was strong in cavalry; generally, it was deficient in arms and equipment, and for open warfare the troops were not nearly as good as the French and British.

The embarkation was made at Varna, a somewhat open harbor with no waterfront improvements except some temporary piers which had been built in preparation. The British had collected chartered merchant ships which were sufficient to carry their entire contingent; furthermore, a third of them were steam ships, able to tow the remainder which were all sailing ships. The French (including the Turkish contingent) had agreed similarly to provide themselves but did not succeed. When the time came they lacked transports for 20,000 men and had to fill all their own warships to the absolute limit of capacity. Also, the French were so deficient in their total of steamers that the sailing ships could not all be towed, and they used such small ships that excessive numbers had to be included. All told, about 375 ships were in the combined fleets and convoy. The French had provided forty square-ended scows for handling troops—and particularly horses and heavy equipment—between ship and shore. During the passage these were lashed alongside the ships or were towed. This was a highly valuable preparation, for the scows could carry two field guns complete, including personnel and animals. During exercises at Varna it was found that both guns could be gotten ashore and ready for action in fifteen minutes after a scow touched the beach. The British prepared twenty-four “gun-flats” which were merely platforms built over pairs of boats lashed together. Ordinary ships’ boats were depended upon for landing infantry, and of these the British had 326 in all.

Loading of some of the heavy stores began on 24 August. After the Council of 26 August embarkation began in earnest. It was planned to assemble the entire fleet and convoy, as loaded, in Baljik Bay, a few miles north of Varna, and to sail from there in company. The second of September had been set as the date for sailing and the French were ready on that day. The British were not and did not complete until the evening of 6 September. The reason for the tardiness is not fully known; the British said it was because they had so many more horses to load and that for two days the harbor was too rough to handle them.

Anyhow, by the fifth St. Arnaud’s temper could hold no longer and he put to sea with a part of his force, all under sail. All the French (and Turkish) warships were jammed so full with troops and baggage

that they could not have fought their guns. As a matter of fact the only protection that the expedition ever had while en route lay in Admiral Dundas' squadron which, on paper, was weaker than the Russian fleet. Yet St. Arnaud was at sea until the eighth, reaching a fourth of the distance to the Crimea, with a mass of defenseless ships crowded with troops. He should not have gone out, of course, but having done so Admiral Dundas should certainly have gone out to cover the movement.

The remaining French and all the British ships finally sailed on the morning of the seventh. The British had been very slow but they had loaded and organized well. The convoy, under Admiral Lyons, was all in tow (at about four knots), in six columns, so arranged as to keep the British Army organizations together and all disposed with a view to an orderly landing. Personnel was mostly carried in the steam transports. Admiral Dundas detached himself from the conduct of the convoy and, with the remaining British naval forces, acted on the "covering fleet" principle; he seems to have covered only the British ships and from close to them. The French and Turks moreover were largely under sail and were considerably scattered throughout the voyage. However, there was a juncture of a sort on the eighth, and the expedition proceeded, more or less in company, toward a rendezvous forty miles west of the landing point.

While en route there, St. Arnaud asked Lord Raglan and Admiral Dundas, by signal, to come on board his ship. Arriving there, the Marshal was found too ill to move and could scarcely speak. He presented a paper which went at length into the relative advantages of different plans for future operations, pointing out great objections to the landing on the west coast, and recommended changing the destination to Kaffa, a port over one hundred miles east of Sevastopol. This paper was probably prepared by the French second in command and supported by other subordinates. St. Arnaud indicated his willingness to leave the decision entirely to Lord Raglan. The only decision reached at this conference was that the theater should be further reconnoitered.

Accordingly, on the ninth, the expedition was anchored in deep water, forty miles at sea and badly scattered. The British convoy was anchored together and covered by its own fleet; but the defenseless French and Turkish ships were all over the ocean and mostly toward Sevastopol at that. The following morning Lord Raglan himself, accompanied by most of the seconds in command, examined the coast from Balaclava northward, with no attempt at concealment. Objections of a local nature were seen to the landing point first chosen and a better place was found at Old Fort, twenty miles farther to the north. Here was a longer and more open beach, the ground inshore was flatter and two shallow lakes would be in the way of any opposing forces. Decision was reached to follow the

original plan, with this modification, and seems to have been at last unreservedly accepted by all commanders.

Yet the inexplicable delays continued. It took until the thirteenth, three more days, to get the expedition over the few miles to Eupatoria, a rendezvous near the landing point. The weather had been very fair throughout, really too good for progress under sail; no doubt the very light winds were accountable for some of the delays and scattering, but it is mostly chargeable to the failure of the French to provide steamships and to not fully realize what they had.

There had now elapsed twelve days between the date on which the expedition should have sailed and that on which it was finally prepared to land. With proper management the passage itself should have taken only two days. The British had lost four days by bungling their loading. The rest of the time was lost in reconsidering a decision, which was the fault of the French, and by their own blundering about at sea. French transports were at sea for eight days, absolutely without protection for two of them and in large part vulnerable to Russian naval attack for the remaining six. In view of what had happened, and of what came forth subsequently it seems quite likely that even moderate losses at sea would have caused the French Commander to entirely break off from the invasion. The Russians could, almost beyond doubt, have inflicted severe losses by action of their best steam frigates alone. Looked at from their probable viewpoint at the time, there may be some excuse for the Russians in not bringing out their whole fleet, which was mostly sailing ships. It has been written that Admiral Korniloff wished to make some effort at keeping the sea but was held back by Prince Mentschikoff, who was High Admiral as well as General. Had the venture been made, the Russians might have lost their fleet, but in all probability they would have saved their port for a long time. By staying in harbor, both fleet and port were lost. That has been the almost invariable result, for over a century, when a fleet stays in a harbor which is besieged in order to destroy that fleet.

Mentschikoff had not foreseen the probability of an attack during 1854, though rumors of it must have been all over Europe. But he had, somewhat late though in good time, actually been given very good reason to think that an attack was imminent. Prince Gortschakoff, who commanded in the Dobrudja, having concluded that such were his enemy's intentions had sent Todleben himself to convey that information and, incidentally, to make the best engineer of Russia available to Sevastopol. Todleben arrived and gave his information on 22 August, but Mentschikoff would not believe in any possible invasion by the Allies so late in the season and not only made no preparation in the Crimea but did not take the step so obviously necessary of getting his naval forces at work—whether they were inclined to or not.

We have seen how the expedition, after muddling through a hazardous voyage and blessed by fortune, finally arrived to invade a little known country against enemy forces almost unknown. A feint was made at the mouth of the Kacha and the landing began at Old Fort on 14 September.

The French were the prompter in beginning it and got along faster. They were probably better equipped with boats and scows and also had their naval forces to assist. On the other hand, most of the British fleet lay off, toward Sevastopol, to cover the landing. There was no opposition and on the whole the landing during the first day was very well executed indeed. By evening over 40,000 infantry and thirty field guns were ashore; considering that it was all done by man-power alone and on an open beach, this performance was creditable. The remainder of the landing operation was much slower; the surf caused interruptions and, under any weather conditions, it seems to have been very difficult to handle horses and heavy equipment. Four additional days were required to complete the landing and prepare to take up the march; the French were ready first.

The armies began the march, carrying everything along, on 19 September, south along the shore and fought the battle of Alma on the twentieth. Mentschikoff's force of about 35,000 was driven out of a position there, but at a considerable cost, and the march was not resumed until the twenty-third. Arriving near Sevastopol, the plan to attack it from the north was abandoned, largely because of the uncertainty in the Allied communication line, and the British led a very dangerous march by the flank around the city. The remains of the Russian field army marched out of it just ahead of them and did not take the very favorable chance to attack. Upon receiving notice of the change in plans, a detachment of the British fleet went around and attacked Balaclava. Its small garrison surrendered as the Allied troops drew near.

The Allied armies were in the new positions on the twenty-eighth; in ten days they fought a battle and marched about forty miles in all. In spite of all the blundering and succession of delays there was still a good chance for the *coup de main* upon which was based the conception of the expedition. Mentschikoff had taken out all the field forces, and those remaining in Sevastopol regarded themselves as a forlorn hope, expecting an immediate attack and one most likely to succeed. But the Allied Commanders could not agree upon an immediate assault; so, with Balaclava as the British base, and Kamiesch for the French, the work of getting the siege guns up was started. It was slow work and the batteries were ready for a bombardment only by 17 October.

All this time the Russian fleet had made no move toward going to sea. After Alma had been fought, they moored a line of seven heavy ships across Sevastopol entrance. During the allied march south, Ment-

schikoff ordered these ships sunk in place, which had the effect of locking the remaining Russian ships in and their enemys' ships out of the harbor. Thenceforth the Russian fleet's part was directly in the siege; it landed guns and all its 18,000 personnel and they were a very considerable proportion of the strength of the Russian lines—during the most critical time, over two-thirds of that strength. Such a part seems, in the light of history, almost bound to be a losing one. But the Russian fleet had lost its chance upon the landing of the invading force; having done so, the action which it subsequently took was quite likely the best thing open. In their only explanation of the supineness of the fleet as such, the Russians have confessed that the appearance of the expedition when about to land was a complete surprise. The Allies had done little or nothing toward making it a surprise.

The bombardment of 17 October failed of results. The Allies thus embarked upon the long siege, never able to invest the place and usually menaced by enemy field forces. What had been intended as a swift blow turned into a most costly siege that lasted a year.

The Allied naval forces handled the oversea supply problems during the siege; eventually supplies became sufficient but conditions were far from satisfactory during the autumn and winter. The Allied warships bombarded the harbor forts at times, never effectively, and landed personnel to assist with the siege batteries. The most important later naval work, really a combined operation in itself, was the tardy destruction of Russian communications across the Sea of Azov and of large quantities of supplies in its ports, in the summer of 1855.

So much for the combined operation. The forces were large and acting at a long distance from home. It was an allied expedition, with the disadvantages attendant therein. Command of the sea was at least in dispute. The landing was on an open beach, though not against opposition. Finally, weapons and ships were not so dis-similar from those of the present day as to prevent lessons being drawn.

Such lessons are not complicated by any errors on the part of the Governments concerned, for the strategy behind the invasion was entirely sound. Now in searching for our lessons it is not becoming to be too critical. Criticism is easy for even ordinary minds *after* the events of almost any war. It is to be remembered that the Commanders did not particularly believe in the invasion; virtually, they made it because they were told to do so. But the lack of enemy information, on which they based their objections, was their own fault.

It is to be noted that, in not doing all that could have been done toward surprising the enemy, the Allied leaders lost sight of one of the most important and valuable factors in maritime warfare.

Also, the extreme slowness in execution tended to nullify the unique power inherent in an army moving by sea, with several objectives thus laid open to it. Correct application of the principle of movement, rapid and unexpected movement, must be made by commanders in maritime war.

From the naval standpoint the lessons mostly point out how not to do it. If the Allies had blockaded Sevastopol—and no serious obstacle to so doing is apparent—their command of the sea might have been assured. That seems a strategical error which might have been fatal had the Russian fleet been used as a fleet instead of as fortifications. Piled on that mistake were the tactical errors which left half the expeditionary forces without effective protection. The “covering force” idea is not unsound, but execution must be such that the transports are actually covered.

We at the War Department are often annoyed by some judge offering to refrain from sentencing a young public offender on condition he will enlist in the Regular Army. We are justly annoyed because the Army is not a corrective institution, because of our strict requirements, because the American uniform is a badge of honor, because the Army code of conduct is so exemplary, and because of the unintentional reflection upon the character of our soldiers. But actually the judge is paying the Army a genuine compliment. He has recognized that the boy is worth saving and believes that he can be made a useful and law-abiding citizen. The judge realizes that military training and discipline will bring out whatever latent good the culprit possesses and help him find his better self, even when his own community has not and probably can not.—*John W. Weeks.*

Aviation In Coast Defense

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AVIATION has furnished a powerful weapon for coast defense. It also has made more difficult the problem of coast defense by introducing the possibility of hostile air raids. Everybody knows that aircraft can fly over land and water, and that they can carry bombs that can sink surface craft. This has created an impression that air forces acting alone, without support of the other elements of the Army or Navy, can effectively defend our coasts and protect shipping along our coasts. Some persons have gone so far as to propose that the duty of patrolling the coastal sea lanes be taken away from the Navy and turned over entirely to the Army Air Service. It is unimportant to the people of the United States who does this work so long as it is done well. Herein is the crux of the whole question.

I. CONTROL OF THE SEA AREAS

In considering the subject of coast defense it is necessary to visualize the conditions we shall find in actual warfare at sea. To conduct and to control mercantile and military transportation by sea in time of war requires naval power. As long as men and merchandise are transported in ships in the sea—and there is no likelihood that this mode of transportation ever will be superseded—navies will be required to safeguard overseas interests. The great bulk of the world's maritime trade must always be carried in surface ships, for submarines and aircraft are inherently uneconomical as freight carriers and never can compete successfully with surface ships in oversea commerce. Therefore, the principal task of naval forces—whether submarine, surface, or aerial—is to control the highways on the surface of the sea.

Unless supported by seacraft, aircraft probably never will be able to exercise uninterrupted control over large or remote sea areas. Aircraft and seacraft are both limited as to the time and the distance that they can operate away from a base, but the time that aircraft can remain in the air compared to the time that ships can remain at sea is so short that ships probably will always be the controlling factor in the larger sea areas, with aircraft acting to assist them.

II. MISSION OF COAST DEFENSE

Coast defense is defense not only against invasion in force from overseas, but against all other forms of hostile coastal activities. It involves protection of shipping, of cities, and of vital communications against attack by sea craft, aircraft, and landing parties. Against all these forms of attack every force that can contribute to the enemy's defeat should be utilized. Naval forces alone may be sufficient in some cases, army forces alone in other cases, and sometimes it may be necessary to combine both forces to defeat the enemy.

Attacks against coastal areas are of two kinds: major attacks by large forces, and minor attacks or raids by small forces.

It is the duty of the United States fleet to intercept on the high seas any large expedition contemplating a descent in force on the coasts, and to engage it before any actual damage can be effected or landing made. If the fleet is defeated the task of repelling invasion falls to the Army. Major attacks of this character will not be discussed, as we are here concerned with the forces established for the specific duty of coast defense.

Minor attacks or raids in the coastal areas by small enemy forces, such as submarines, destroyers, cruisers, and aircraft carriers, cannot always be met by the main fleets and armies, and it is to provide for such contingencies that coast defense forces are required.

The main fleet should not be confined to the duty of defending particular sections of the coast against minor attacks. It should be free to carry out its greater mission of gaining and maintaining control of the sea, which is most effectively accomplished by destroying, neutralizing, or bottling up the enemy's naval forces. Control of the sea will of itself forestall any invasion in force from overseas and free the mobile army to engage in other missions.

III. INFLUENCE OF SEA POWER

In our last three wars the Navy controlled the seas, and the Army fought in Europe, in Cuba, and in the Phillippines. In the Civil War, and the war with Mexico, we had little opposition at sea. The Army was not needed for coast defense, and was able to win the war by defeating the enemy's armies on their own soil. The Navy prevented supplies reaching the enemy by sea, and was able to transport troops and supplies by sea to the enemy's ports. But, in the War of 1812, when England was "Mistress of the seas," our little Navy and our merchant ships were bottled up at home, save a few ships that escaped the British blockading forces and reached the high sea. Some of these ships succeeded in raids on British shipping. In this war a British squadron landed sailors and soldiers on American soil, marched to Washington, and destroyed the Capitol, White

House, and other buildings. The deciding battle of the Revolution, at Yorktown, was won because the French fleet in Chesapeake Bay cut off Cornwallis from the British fleet outside. The daring exploits of Paul Jones in this war illustrate a type of raiding operations which must be guarded against, and the Navy is obligated to take defensive measures against such attacks as well as against the threats of a major force.

IV. COAST DEFENSE FORCES

What forces are available for coast defense? Leaving out the main fleet and main army, the forces available for defense are the local defense forces of the Army and Navy. The local coast defense forces of the Navy include surface craft, submarines, and naval aircraft, armed with guns, mines, bombs, and torpedoes. The surface craft include destroyers, mine sweepers, tugs, salvage vessels, sub-chasers, and small patrol craft. Other elements of the Navy in coastal areas are: the industrial establishments for the maintenance, repair and supply of the naval forces; the communication system including radio and radio compass stations; the intelligence system, including the life saving and lighthouse services, and detachments of marines.

The army coast defense forces are composed of the various arms of the Army, the fixed and mobile artillery, including railway and tractor-drawn heavy artillery, searchlights, antiaircraft guns, army aircraft, the mine planters for laying observation mine fields, and fixed obstructions.

V. CAPABILITIES OF NAVAL TYPES IN COAST DEFENSE

Let us now examine the capabilities of the various types of naval craft for coast defense.

Aircraft. The development of bombing has given to aircraft great offensive qualities against sea and land forces. Aircraft provide the best defense against other aircraft. The high speed and great range of vision of aircraft make them particularly valuable for scouting. They are superior to seacraft for searching out a given area in a minimum time. Seacraft are better adapted for maintaining a continuous patrol in areas distant from a base, because they can patrol day and night, in fair and foul weather, for a long time without returning to their base for fuel. Airplanes cannot do this unless based on sea craft; they must fly from their shore base out to the scouting area, and return to their shore base daily for fuel. Flying back and forth from the base consumes a large amount of fuel and reduces the number of hours available for scouting and patrolling the area. This wear and tear on engines and planes is considerable, and if the patrol is to be maintained indefinitely over an extensive line, large reserves of planes and engines for replacement are required.

Carriers. By using aircraft carriers as bases, the scouting area for airplanes can be extended seaward, but it must be remembered that aviators will experience greater difficulties in operating continuously from carriers at sea, and locating them when returning from a scouting mission than when returning from a scouting mission to an air base ashore. An aircraft carrier while on her station in a patrol area would be subject to submarine and possibly surface attacks.

Submarines. Submarines are especially valuable for patrol and scouting duty, and are excellent either for offensive or defensive work. They can operate independently and continuously in distant areas without supporting forces, for long periods of time, and they are less liable to be seen or destroyed by hostile forces than any other type of patrol craft, but they have the disadvantages of slow speed and limited vision.

Airships. Rigid airships possess some, though not all, of the advantages of aircraft and seacraft for scouting and patrol duty. Like airplanes, they have extensive vision and great speed. Like ships, they can slow down, stop, and even back, and have an extensive operating range. But, though vulnerable to gunfire they may, by keeping out of gun range, pierce a screen of hostile surface vessels which surface scouts themselves might be unable to pierce. Although they can easily keep out of range of surface craft, they cannot outrun or outclimb the airplane, but may carry airplanes to a limited extent for protection. They have no great offensive value in sea warfare, and are less reliable as operating units than seacraft. Under favorable conditions they can cover larger areas in a given time than seacraft, and can supplement light cruisers to a certain extent for scouting, but not for screening duty.

VI. COORDINATION OF TYPES

Each type, submarine, surface vessels, airplane, aircraft carrier, and airship, has advantages and disadvantages peculiar to itself. A skillful naval commander will carefully consider every available type of craft in organizing his forces and in planning their work. He will use each type to the best advantage, assigning each unit to the task that it is best fitted to perform and coordinating the efforts of all to accomplish most effectively the mission of the whole organization. Such an organization composed of different units is like the human body which is composed of different members, each performing its allotted task, all directed by one mind. In a scouting or patrol force each unit is an eye that watches over its allotted sector, and instantly communicates by radio—the Navy's nerve system—what it sees to the mind of the organization, and, at the direction of this mind, force is applied most effectively. Only such an organization can effectively perform the manifold duties connected with high sea scouting and coastal patrol.

VII. CHARACTER OF COASTAL OPERATIONS

The operations necessary for coast defense are of two kinds: precautionary measures and counter attacks. Precautionary measures include scouting and patrolling, escorting and convoying, mine sweeping and mine laying, and operations of the intelligence and communication systems. Counter attacks are those operations designed to repulse the enemy attack when it is developed by the precautionary measures. Both functions require combination of forces to accomplish best results.

VIII. SCOUTING AND PATROLLING

An enemy's best chance of success lies in surprise attacks. To prevent surprise by the enemy he must be discovered far enough away from our coast to give sufficient time to our forces to concentrate, intercept, and attack him. The farther away the enemy is discovered the greater time our forces will have to concentrate and attack him. The Navy's far flung scouting forces at sea afford the best means of locating him at the earliest moment. After locating him they should maintain contact with him and continually report the position, strength, and disposition of his forces. While the enemy approaches the coast our forces can concentrate and advance to meet him under the most favorable conditions. For scouting and patrolling in the coastal areas the Navy uses aircraft, both lighter-than-air and heavier-than-air, surface craft and submarines. They are based on naval coastal shore bases, which are also used for fitting out, repair, replacement, supply, and mobilization of material and personnel, and on mobile tenders operating along the coast. They are disposed in such manner as to cover given areas most effectively and permit the maximum concentration of force on the enemy in minimum time.

The nationality and character of shipping encountered in the coastal areas must be ascertained by patrol craft. To do this they must exercise the right of search, and therefore must be surface vessels. How can the duty of visiting and searching vessels for contraband be performed by aircraft unassisted by surface vessels? A seaplane may land on the water in fair weather close to the vessel and send a man on board. The Germans, in the last war, tried this with their submarines. It worked well at first. But later, when guns were mounted on merchant ships, and were turned with deadly effect on the submarines, they were forced to abandon the practice of searching vessels at sea. The submarines retaliated by firing torpedoes and sinking ships on sight, remaining submerged without danger to themselves until the ships had been sunk. This violated international law and practice. A seaplane on the water would be helpless if exposed to gunfire from a ship. To avoid danger to themselves pilots of airplanes, if they wished to do so, could bomb merchant vessels on sight, whether

prohibited by international law or not. Such practices by any country would force it into the same situation with respect to neutrals in which Germany found herself when her submarines began sinking neutral ships without warning. An airplane could drop a note on the ship or give her radio or visual signal instructions to proceed to a designated port for examination, but it would be impracticable for the airplane to escort the ship into port to insure that the instructions were carried out.

For detecting the presence of submarines certain classes of vessels of the coast defense forces are equipped with listening devices. These "hear" the sounds made by submarines running submerged and it is possible to locate the submarines when the "hunting squadrons" equipped with these devices are skilfully handled. Submarines also use listening devices in their work against surface craft and other submarines. Combination of all types of naval forces is necessary for the most effective scouting and patrolling of sea areas.

IX. ESCORTING AND CONVOYING

If we are to safeguard our own shipping where it is subject to repeated attack we must protect it with escorts. Consider a twelve knot convoy escorted by airplanes. These have a cruising speed of say ninety miles an hour and a flying radius of a thousand miles. Assume that they can remain in the air twelve hours. They will have to leave the convoy after about ten hours of escort duty in order to return to their base before running out of fuel. This would furnish a twelve knot convoy with an airplane escort for about 120 miles beyond the shore line. To escort further by airplanes would require a relief escort. In thick weather, the airplane might lose sight of the convoy and would then fail to afford it protection. At night when the convoy was running without lights, as would be necessary in time of war, the same thing might happen. If one of the ships of the convoy were torpedoed she could not be salvaged or towed back to port by airplanes. She might sink, as often happened in the last war, but airplanes could not rescue the passengers.

This all means that surface ships are absolutely essential for the efficient performance of patrol and convoy duty at sea, both inshore and offshore, and that means a navy—a navy like the United States Navy, with its own aircraft. The need for the latter, in addition to ships, is shown below.

We know that during the World War the Navy, in cooperation with the allied navies, kept open our sea communications and effectually intercepted the sea communications of the enemy powers. During this period, while the Navy was escorting and conveying over two million army troops and all of their supplies overseas, the Navy played a most important part in "winning the war." The air forces of the United States Navy flew over

two and one half million miles, patrolling the seas from various coastal air stations in the United States, England, Ireland, France, Italy, and Canada. Four hundred of our naval airplanes were engaged in this work abroad while the army air forces were being carried overseas or fighting on the western front. Thirty-seven enemy submarines were attacked by naval aircraft. These naval aircraft were working in cooperation with hundreds of surface ships and submarines, all of which were commanded by and operated under the immediate orders of naval officers in accordance with a definite joint plan. Aircraft surface vessels, and submarines were mutually helpful, and the best results were obtained by a combination of all types.

Let us see how these operations were carried out. Take a convoy assembling in one of our great harbors, and suppose that enemy submarines and raiders may be actively operating in that vicinity.

The naval commander of the coastal area is the officer appointed to direct and coordinate the work of the naval coastal defense forces, which include all types of naval craft, surface, submarine, and air. He is charged with the responsibility of assembling the convoy. He must furnish it with radio and signal instructions and sailing directions, must provide the necessary naval escorts, including naval aircraft, and must assure himself that the coastal waters through which the convoy is to pass are clear of mines and enemy craft.

The convoy is assembled; the orders to the commanding officers have been given; the course, speed, formations to be taken within and without the coastal areas have been made known to the commanders of all units, merchant and naval, engaged in the operation. All is secure inside the anchorage. The convoy and escorting vessels are ready to sail. Outside the anchorage naval aircraft and other naval units have been scouting over the area through which the convoy will pass to drive clear any hostile surface craft or submarines. Other naval aircraft are flying over the channel to see if they can locate any enemy mines, and the mine sweepers are at work in the channel. The naval district commandant, in touch by radio and telephone with all of his units, knows exactly what is going on outside of the harbor. He receives reports as to when the channels have been swept clear, and knows when it is safe to move the convoy.

The harbor defense net is opened to permit the convoy to pass out, and the convoy gets underway. The van of the coastal escort, consisting of sub-chasers and other vessels, precedes the convoy out of the harbor and takes station ahead and on the flanks of the convoy column as the ships in pre-determined order pass down the swept channel. They steam out to sea, and as they reach the open water they deploy to their designated positions in the formation to be maintained during the voyage and commence zigzagging as prescribed in their instructions. The smaller ves-

sels and aircraft of the escort that have been safeguarding the convoy through the narrow waters now begin to leave the convoy to return to their base, while the destroyers and larger vessels of the escort continue with the convoy until relieved by the high sea escort.

The responsibility of the naval district commandant, who has been in charge of all these arrangements, ends only when the coastal escort has safely turned over the convoy to the commander of the high sea escort, who becomes responsible for insuring the safe passage of the convoy over the sea. The fleet will have disposed units strategically to safeguard further this and other convoys in their transoceanic voyages.

Meantime, other convoys, and shipping, are approaching the coast. Their movements are made known to the naval headquarters in the district through the naval communications service, and the same provision must be made for the safety of incoming vessels as was made for the safety of the outgoing convoy just described. These great arteries of sea commerce must be protected by the Navy day and night throughout the war.

During the last war, when the submarine campaign was so active along the coasts of our allies, the allied convoys on approaching the war zone were met far out at sea by properly organized and instructed escorts of naval vessels, which automatically carried the convoy on to the coastal areas, all under the control of naval officers. As they approached the coast they were met by other types of naval craft, including naval aircraft, which continued to safeguard the convoy through the narrow submarine-infested waters. These convoys were made up of ships from all parts of the world, flying the flags of the allied nations. There were fast troop convoys bound for the coast of France. There were convoys of food and munition ships, of moderate speed, supplying the fleet in the north of Scotland and the armies on the western front. There was a continuous flow of small and large convoys bound for the channel ports and the Mediterranean, carrying valuable cargoes of food stuffs and merchandise for the millions toiling in the factories behind the allied lines. Provision had to be made by the Navy for continually safeguarding this incessant flow of shipping, outbound and inbound, from shore line to shore line. The elaborate organization to maintain the necessary escorts of the proper type, to provide them at the proper time and place, and to collect and disseminate the information necessary to coordinate all work was completely under the control of the naval service. The success with which the Navy carried out these duties during the last war was due solely to the fact that the Navy is organized, trained and equipped for this kind of work. It can be said, without exaggeration, that the organization and discipline of the convoys and escorts was as nearly perfect as it is humanly possible for any organization to be. Here, again, we see the combination of air and sea forces.

X. MINE LAYING AND MINE SWEEPING

Mining operations are important in coast defense because all classes of ships are vulnerable to mines. Many vessels, including battleships, submarines and merchant vessels, were destroyed by them in the last war. Channels must be swept clear of mines in the shipping lanes to insure the safe passage of vessels. Mine layers acting on the offensive lay mines off the enemy's coast, and when on the defensive lay mines to protect given areas off our own coast. An American mine squadron laid a mine barrage of over 50,000 mines in the North Sea during the last war, and cleared the barrage by sweeping up the mines at the end of the war. Mines may be laid by surface craft and by submarines equipped for the purpose. It would be possible for an airplane to lay a mine, but neither submarines nor aircraft are capable of sweeping up mines. All this work must be under the direction of the naval commander who must coordinate all activities of the coast defense forces to insure the safety of shipping.

XI. INTELLIGENCE AND COMMUNICATION SYSTEM

In all military operations, in every theatre of action—on the land, at sea, and in the air—accurate and timely information concerning enemy movements is essential to success. The service of information at sea is maintained by the naval scouting and patrol forces which are inseparable from the organization they serve—the Navy. The contacts of all these forces with the naval commander-in-chief must be direct, accurate, and swift. The information must be guarded and flow uninterruptedly to the directing centers of operations ashore and afloat where it is analyzed, acted upon and despatched to all forces having need of it. All units of the fleet and naval coast defense forces, including the naval radio stations on shore, the radio direction finders and the coastal signal service, are integral parts of the naval communication organization.

XII. COUNTER ATTACKS

If an attack develops after the precautionary measures have been taken, it should be met by counter attack. The strong arm for counter attack at sea is the main fleet, but to meet attacks by seacraft or by aircraft within gun range or within flying range of the coast, there are available the naval coast defense forces, and the aircraft and artillery of the Army. Beyond flying range of the coast, only naval forces would be available. For counter attacks against surface vessels, guns, torpedoes, mines, and aerial bombs may be used. In addition, the depth bomb would be used against submarines, but for counter attacks against aircraft the machine gun carried in aircraft is the most effective weapon.

Picture a situation in which an overseas enemy plans an aircraft attack upon one of our principal cities. He must transport his aircraft

across the sea in ships to some point within flying range of the objective before he can launch the attack. The attacking airplanes will have to operate from aircraft carriers or from suitable shore bases in his possession. While the enemy is at sea, and until his ships have reached the point of attack, the problem is distinctly a naval one.

The Navy may prevent the enemy from bringing his aircraft carriers to a favorable point, or may prevent him from establishing a shore base within flying range of the coast. But, once the enemy aircraft have taken the air to attack our cities, only our own aircraft can intercept and defeat them. Fast combat planes are necessary to intercept and defeat the enemy bombers and combat planes accompanying them. The attacking aircraft have an initial advantage difficult to overcome because they can choose their time and their objective, take advantage of weather or darkness to insure surprise, and reach the desired ceiling before the defending planes can do so. Naval aircraft of the coast defense forces consist principally of patrolling, scouting, torpedo, and bombing planes, designed principally for use against seacraft, and are not intended primarily for use against air attacks. Against air attacks of this kind, which by whatever means have avoided our fleet, we rely entirely upon the army pursuit planes which are provided for this purpose. The Navy does not maintain pursuit planes on shore bases or stations other than for training purposes. The Army Air Service has the responsibility of meeting attacks of this kind and should be adequately equipped for the purpose. Our main reliance against air attacks of this kind is in the greater number of army pursuit planes available.

XIII. UNITY OF COMMAND

For coast defense the Navy is the first line, and the Army is the second line. If the first line falls back upon the coast the two lines merge into one. It is generally recognized that when these lines merge, or whenever there is joint action between the Army and Navy, there should be unity of command, but it is not always clear exactly what is meant by unity of command. Some persons unfamiliar with the many activities connected with coast defense believe that all coast defense should be placed under control of the Army. Others believe that all such activities should be placed under the Navy, because coast defense activities are mostly naval.

History abounds in striking illustrations where violation of the principle of unity of command has resulted disastrously. The difficulties of coordinating operations of joint forces—particularly in coast defense—would be greatly increased if, instead of having to coordinate the two existing organizations of the Army and Navy, it were necessary to coordinate with them a third independent organization, as would be the case if there were a separate air force.

Unity of command of joint forces should be directed command which is only general in character. The commander states in general what is to be done, but does not say how it is to be done. The commands of the separate task forces are absolute, the commanders specifying in detail both what is to be done, and how it is to be done. There should be no conflict between the two kinds of command. There will be none if the primary functions of the army and navy forces are adhered to. When forces are joined for a combined operation to accomplish a definite objective, maximum results can be secured only by cooperation and coordination. The Joint Army and Navy Board has laid down the guiding principles to be followed by the Army and Navy to provide unity of command in joint operations in coast defense. Under ordinary circumstances, if the operation is primarily naval the supreme command should be naval. If the operation is primarily military, the Army should command. The same principle should apply to the lesser commands in minor or local operations in which the objectives are subordinate to the main objective.

In the United States both the Army and Navy have functions in coast defense, but the control is not wholly in the hands of either. In Europe the system differs from ours. The coast defense of France is entirely under the Navy until the actual landing of hostile forces takes place. In England it has been a naval function heretofore, all under the control of the naval officer commanding the coast defense forces. Since the formation of the Royal Air Force, where naval aviation and army aviation have been consolidated into an independent organization, the exact status of the Army, Navy and the Air Force with respect to coast defense seems to be indefinite. In Germany coast defense was all under the Navy.

Operations in coastal areas are primarily naval, but the commander of naval coast defense forces should always keep the commander of the army forces advised regarding the development of any situation at sea in which the Army subsequently may be called upon to take part, directly or indirectly.

Should the naval commander request the assistance of the army forces to repel an attack he should advise the army commander as to the situation. He should specify what forces are desired, when and where they will be needed, and the objective. The forces should be furnished if available, and should be directed to report to the naval commander for operation under his direction in cooperation with the naval forces. If an enemy force is greatly superior to the naval force available for use against it, and the naval force is unable to cope with the situation, the naval commander should so notify the army commander. The Army would then have the paramount interest. The naval forces should be turned over to the Army and the joint forces should operate under the direction of the army commander.

XIV. CONCLUSIONS

Until airplanes, loaded with bombs, can fly back and forth with impunity across the Atlantic or Pacific Oceans, as they can now do across the English Channel and other inland seas, the problem of coast defense against hostile air raids will remain a much simpler one for the United States than it is for European powers.

A strong navy, composed of all types of craft—submarine, air and surface craft, balanced in numbers, and coordinated in action to insure mutual support, provides the most effective means of repelling overseas attacks and of protecting shipping on the seas. A navy that is strong enough to protect shipping on the high seas certainly can effectively control it along the home coast lines.

If we were to assign exclusively to the Army Air Service the duty of protecting the coastal sea lanes within flying radius of the shore bases, it would still be necessary for the Navy to protect the sea lanes beyond the range of aircraft. There would have to be an imaginary boundary line on the surface of the sea, on one side of which the Army, and on the other side of which the Navy would be responsible. The bordering area would probably develop into a "no man's sea" over which neither service would claim responsibility. Aircraft, unsupported by seacraft, could never perform efficiently the work required of a naval coast defense force in time of war, no matter how great their flying range. The natural line of demarkation is the shore line, and the natural service for work beyond this line is the Navy. Our Navy, with its aircraft, its submarines and surface vessels of all types, and its complete intelligence and communication system, is amalgamated into an efficient and well balanced organization to do all work from shore line to shore line. The Army Air Service is by nature incapable of doing the Navy's work.

When submarines were first introduced in our Navy there was some discussion as to whether they should be placed under the Army or under the Navy. Now aviation has become an important and integral arm of the Army and of the Navy. It has supplemented other weapons of both services, but has not supplanted any of them. It has not changed the relation between the Army and the Navy. The Navy has its duties in connection with coast defense which are naval in character, and the Army has its own characteristic duties.

To restrict the Navy in the choice of its weapons or in the facilities for operating them would deprive the Navy of the full play of its power to meet all of its responsibilities. To turn over coastal patrol, or the control of shipping in our coastal sea lanes, now a responsibility of the Navy, to the Army Air Service would duplicate existing functions of the Navy, would confuse the entire problem of coast defense, and would weaken army aviation by diverting it from other important missions.

The Army of the United States from the Revolution to 1821

By

IDA SALLEY REAMER

THE Revolution ended in 1783. Washington, before resigning his commission, recommended to the Governors of the States the urgent need for the adoption of a standing army or "peace establishment." He wrote:¹

It is necessary to say but a few words on the third topic * * * which regards particularly the defense of the Republic; as there can be little doubt that Congress will recommend a proper peace establishment for the United States, * * *. If this should be the case, I would beg leave to urge the great advantage of it in the strongest terms. * * * It is essential, therefore that the same system should pervade the whole; that the formation and discipline of the militia of the continent should be absolutely uniform, and that the same species of arms, accouterments, and military apparatus, should be introduced in every part of the United States. * * *

Governor Clinton of New York and others of the Revolutionary leaders joined Washington in urging upon the States and Congress the necessity of a standing army.²

These appeals for a peace establishment for the common welfare and the adoption of a uniform system of defense were disregarded by the States and by Congress, which felt that a standing army "was dangerous to liberty" and a relic of despotic government.³ The people had not yet grasped the difference between the "hireling of a despot" and an army of citizens created by the representatives of a free people. Washington, as early as 1776, had realized the unreasoning jealousy of a standing army, which was existent even during the war, and had written to the President of Congress from Harlem Heights on September 24 of that year:

The jealousy of a standing army, and the evils to be apprehended from one, are remote, and, in my judgment, situated and circumstanced as we are, not at all to be dreaded; but the consequence of wanting one, according to my ideas formed from the present view of things, is certain and inevitable ruin.⁴

¹Upton, *The Military Policy of the United States*, 68.

²Sparks, *Letters to Washington*, 29.

³*North American Review*, Oct., 1826, p. 246.

Hildreth, *The History of the United States of America*, III, 245.

⁴Upton, *Military Policy*, 16.

Sparks, *The Writings of George Washington*, IV, 110-16.

Hildreth, *History of the U. S.*, III, 477.

The inherent fear and distrust of a standing army was so great at this time that, in spite of these appeals of the Revolutionary leaders, Congress, on January 2, 1784, disbanded all that remained of the Continental Army, except eighty soldiers who were necessary to guard the public stores.⁵

Thus we see our new republic started off with no regular army and no system of national defense.⁶ This ideal of a free people was soon disturbed by the depredations of the Indians on the frontier. The necessity of a system of national defense was soon realized, but there was a diversity of opinion as to the power vested in Congress to raise troops in time of peace for any purpose. Henry Knox wrote to Washington in 1784: ⁷

There appears but one sentiment respecting troops for the frontier. * * * The Southern States are generally of opinion that the Confederation vests Congress with sufficient powers for this purpose; but the Eastern States are of a different opinion. The Eastern States are willing to recommend the raising of troops for the western frontier posts, but the Southern say they cannot consent to be recommended when they ought to require.

Congress however was soon convinced that a certain number of regular troops were absolutely necessary for the protection of the frontiers and the garrisoning of the posts. In April, 1785, it fixed the military establishment of the United States at one regiment of infantry and two companies of artillery, or about two hundred men.⁸

We see now, two years after a war with one of the most powerful nations of the world, with its frontier filled with hostile Indians and its own people in an unsettled state, the nation yet practically without an organized defense and with no military strength. The nation was in the condition of China and its military policy like it, in that it had no military strength but had good military resources.

In 1786 the nation realized that it had need for a standing army, not only for the protection of its frontier against Indians, but to keep down unrest and rebellion among the people themselves.

There was a general dissatisfaction among the people with the state laws and also a demand for cheap money. The farmers of Massachusetts were much in debt and were being continually brought into court because of it. This aroused antagonism against the courts.⁹ Therefore, in 1786, the people rebelled, broke up the courts, and besieged the town of Springfield. In this crisis the United States Government was helpless, for its small army was on the frontier. The rebellion was crushed and order

⁵Upton, *Military Policy*, 69.
Hildreth, *History of the U. S.*, III, 477.
N. A. Review, Oct., 1826, p. 246.

⁶*Ibid.*

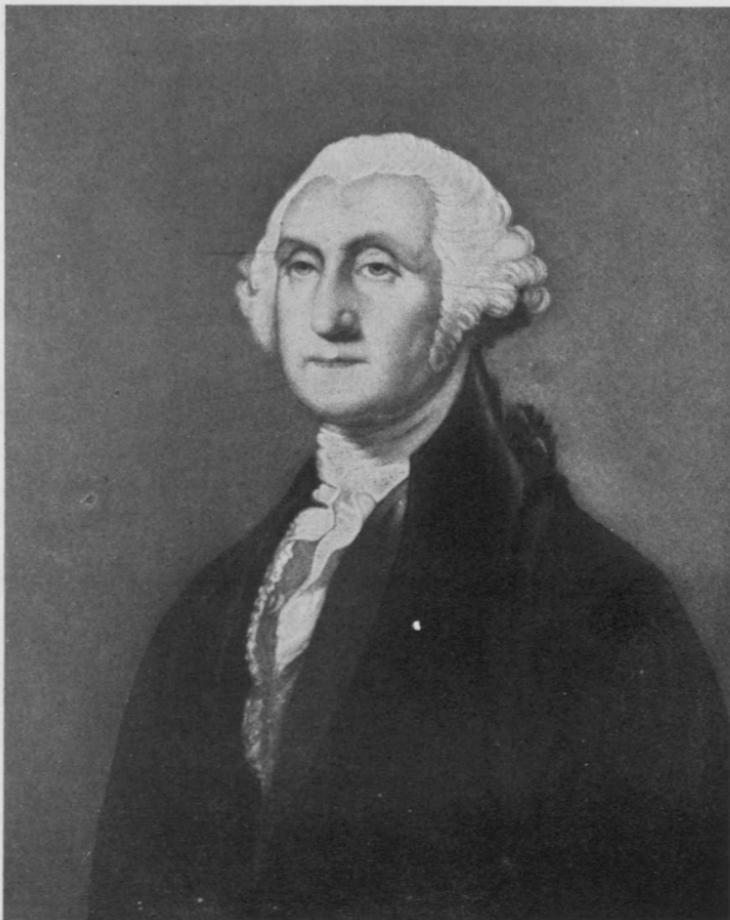
⁷Sparks, *Letters to Washington*, 69.

⁸Upton, *Military Policy*, 69-70.

Heitman, *Historical Register and Dictionary of the United States Army*, I, 50.

⁹Bassett, *A Short History of the United States*, 236.
Hart, *Formation of the Union*, 113.

restored by the state militia under the governor of Massachusetts. This rebellion (Shay's) brought out the need of greater national defense, and John Adams, in speaking of it, said,¹⁰ "National defense is one of the cardinal duties of a statesman." Necessity, therefore, forced Congress to increase the army by seven hundred men with a period of enlistment of



GENERAL GEORGE WASHINGTON

three years;¹¹ at which number it remained until after the adoption of the Constitution.

The Acts of Congress up to this time amounted to little more than appeals and recommendations to the several states, which was one of the causes of the weakness of our military policy. The Constitution, adopted

¹⁰Upton, *Military Policy*, 71.

¹¹*Ibid.*
Heitman, *Historical Register*.

in 1789, gave Congress the authority "to raise and support armies," "to provide and maintain a navy," "to levy and collect taxes," and "to borrow money on the credit of the United States,"¹² thereby placing in the hands of the President¹³ and Congress an unlimited power and responsibility, greater than that of the most despotic ruler.

The Department of War was one of the first branches of the executive portion of the government to be established under the Constitution, being organized four weeks before the Department of the Treasury.¹⁴ The Act creating it was very general in its scope, providing:¹⁵

That there shall be an Executive Department to be denominated the Department of War; and there shall be a principal officer therein, to be called the Secretary for the Department of War, who shall perform and execute such duties as shall from time to time be enjoined on or intrusted to him by the President of the United States, agreeable to the Constitution, relative to military commissions, or to the land or naval forces, ships, or warlike stores of the United States, or to such other matters respecting military or naval affairs as the President of the United States shall assign to the said Department, or relative to the granting of lands to persons entitled thereto for military services rendered to the United States, or relative to Indian affairs; and, furthermore, that the said principal officer shall conduct the business of the said Department in such manner as the President of the United States shall from time to time order or instruct.

This Department was thus organized on such a substantial basis that up to the present day it has not been radically changed.

It is worthy of notice that, besides the broad scope of this act creating the Department of War, it made the Secretary of War responsible to the President instead of Congress, showing a diminishing of the fear of a standing army and of the President as a despot. The breaking down of this prejudice is further shown by the Act of Congress of September 29, 1789, by which the power of appointing officers was vested in the President, all officers and men were required to take the oath of allegiance, and the President was authorized to call out the militia as he thought necessary for the defense of the frontier.¹⁶

In 1790 the first general organization of the army under the Constitution took place,¹⁷ and the military strength was fixed¹⁸ at one regiment of infantry and one battalion of artillery. The President was given the power to call out the militia, but he could not increase the regular army.

A short time after the formation of this organization, General Har-mar, who was in charge of this army, was ordered on an expedition

¹²*Constitution of the United States*, Art. I, Sec. 3.

¹³*Constitution*, Art. II, Sec. 2.

¹⁴Ingersoll, *A History of the War Department of the United States*, 19.

¹⁵*Ibid.*, p. 20.

Act of August 9, 1789, *U. S. State at Large*, I, 49.

Upton, *Military Policy*, 74-75.

¹⁶*Ibid.*, p. 75.

¹⁷*Ibid.*

N. A. Review, Oct., 1826, p. 247.

¹⁸Heflman, *Historical Register*, I, 50, 81.

Upton, *Military Policy*, 75-76.

against the Miami Indians in Indiana.¹⁹ With a force of "regulars" and militia as authorized under this act, he attacked the Indians and was severely defeated. An investigation of this defeat proved that it was due largely to the inefficiency of the militia, which was composed of very old, infirm men, substitutes, or very young boys who behaved badly because not



MAJOR GENERAL HENRY KNOX

accustomed to discipline. There was little inducement for able-bodied men to enlist in the army or the militia as the pay was very little. The highest ranking officer, — Lieutenant-Colonel, received sixty dollars per month; majors, forty; surgeons, thirty; and privates, three.²⁰

Politically, the question as to whether the national defense should depend on regulars or militia was one on which the Federalists and anti-

¹⁹*Ibid.*, p. 77.

²⁰*Ibid.*, p. 76.

Federalists were violently opposed. Thomas Jefferson²¹ opposed the regular army and demanded the use of local militia. "The least rag of Indian depredation," he writes, "will be an excuse to raise troops, for those who love to have troops, and for those who think the public debt is a good thing." He argued that as we were "uncertain as to what point an enemy should attack," "the only force which can be ready at every point and competent to oppose them is the body of neighboring citizens as formed into a militia." This seemed to be the general sentiment, but after General St. Clair's defeat²² about a year after that of General Harmar and for the same reason — the want of discipline and experience of the militia — the regular army was increased by the addition of another regiment of infantry.

The President was authorized²³ by the Act of Congress giving this increase to raise two thousand "levies," later known as volunteers, with power to appoint the officers.²⁴ This was the beginning of our volunteer system. The next year the infantry was further increased by three additional regiments, each containing nine hundred and sixty men.²⁵ These volunteers were wholly distinct from the militia or state troops, the difference being that the volunteers were enlisted for a stated period in the service of the United States and were everywhere subject to the commands of the officers of the United States Army and to all army regulations, whereas the militia were not bound to serve except under their own state officers or under the command of the President himself.

Public opinion still believed in the militia and was now demanding an increase in national defenses; so General Knox, Secretary of War, in 1789 recommended plans²⁶ for the establishment of "an uniform militia throughout the United States," that being one of the powers conferred on the general government by the Constitution. His plans were too rigid in the requirements of military duty and were rejected, but the discussion of his plans led to the passage of the Act of May 8, 1792, providing for the establishment of "an uniform militia throughout the United States" which, in "the respective States, shall be arranged into divisions, brigades, regiments, battalions, and companies." It further provided²⁷

That each and every free, able-bodied, white male citizen of the respective States resident therein, who is or shall be of the age of eighteen years, and under the age of forty-five * * * shall * * * be enrolled in the militia by the captain or commanding officer of the company, within whose bounds such citizen shall reside * * *.

²¹Jefferson's *Complete Works*, IV, 106; V, 159.

Waite, *American State Papers*, IV, 324.

²²*Life and Works of John Adams*, IV, 581; VIII, 11; IX, 194.

Upton, *Military Policy*, 79.

²³*N. A. Review*, Oct., 1826.

²⁴Upton, *Military Policy*, 78-79.

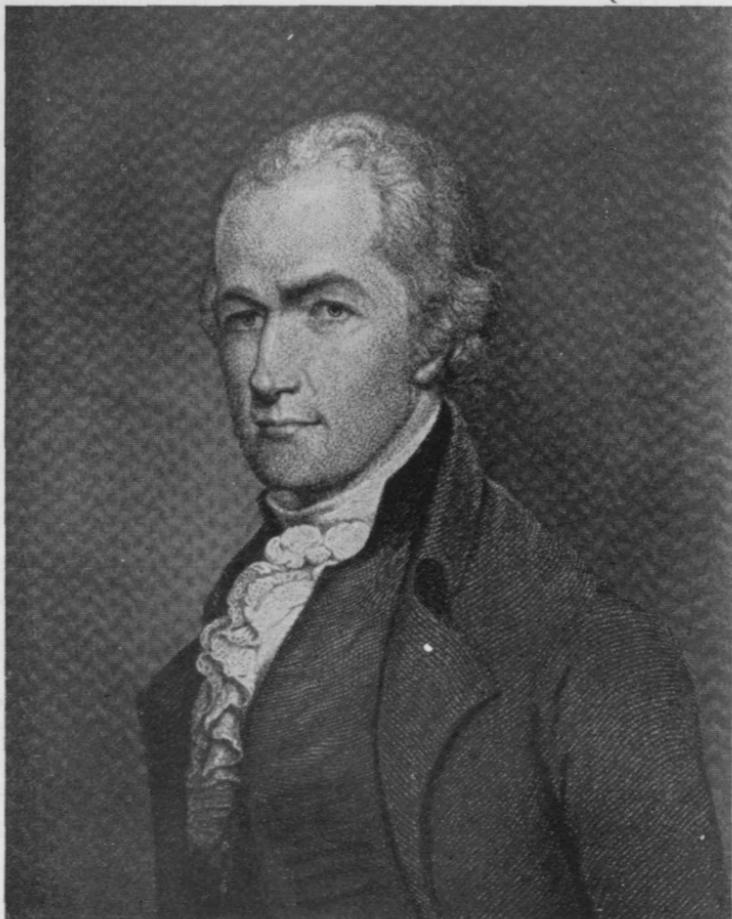
²⁵*Ibid.*, p. 80.

²⁶Ingersoll, *History of the W. D.*, p. 22.

²⁷*U. S. State at Large*, I, 271.

Upton, *Military Policy*, 84.

The importance of this act is that it shows the recognition of the need of a greater national defense, the recognition of the need of a uniform system of defense; and it establishes the democratic doctrine that every able-bodied citizen owes military service to the country. Its weakness is that it placed the burden of national defense again on the states, who



MAJOR GENERAL ALEXANDER HAMILTON

were to keep up the militia and had control of it, thus substituting for one national army thirteen or more state armies.*

Hamilton's excise law was very unpopular, particularly in the western counties of Pennsylvania where a large number of Scotch-Irish were settled and who furnished much of the whiskey to the colonies. They held popular meetings and threatened the tax collectors with violence and broke up the stills of those who paid the tax. In 1794 warrants were

* EDITOR'S NOTE.—The author fails to note that the Act, if strictly enforced, would make enlistments in the Regular Army impossible, or at least illegal.

issued for persons participating in these acts. This caused a general uprising, and Governor Mifflin, of Pennsylvania, fearing to make himself unpopular with the farmers, refused to call out the militia to enforce the federal law.²⁸ This rebellion showed the weakness of the nation depending on the states for the defense or law enforcement, for if all the states militia should refuse to obey the President's call, the United States Government would be helpless. Therefore in 1795 the military establishment was again increased or fixed at about forty-eight hundred men.²⁹

President John Adams, in a special message to Congress, May 16, 1797, urged an increase in our forts and navy, an increase in the regular artillery and cavalry, and arrangements for forming a provisional army. He further recommended a revision of the laws for organizing the army and disciplining the militia.³⁰

About this time there arose political and economic differences with France,³¹ who had refused to receive our minister, Charles C. Pinckney, and who was restricting American trade.³² Therefore an appropriation of \$1,200,000 for the construction of fortifications and for the purchase of arms and munitions was made in 1798. The great alarm of the country is shown by the sudden change of policy from sparing, scanty measures of national defense to an exceedingly liberal one; from a distrustful policy to one placing the whole strength of the nation at the disposal of the Executive.

An additional regiment, artillerists and engineers, was raised, and the President was authorized to raise a force of ten thousand men for the term of three years and to accept any company of volunteers which should be offered for service. This provisional force was to be officered by the President and organized according to his judgment. This shows how far the people had gotten from their fear of the power of the Executive, for they placed the full strength of the nation at his disposal. Later the number of volunteers which could be accepted by the President was limited to 75,000 men. The total force which the President could raise at this time exceeded 100,000 men. At this period we have the nation relying on Regulars and Volunteers, instead of Regulars and Militia as formerly.

The difficulties with France were adjusted by 1800, and this greatest American Army immediately reduced to four regiments of infantry, two regiments of artillerists and engineers, and two troops of light dragoons, in all about four thousand and fifty men.³³ This provisional army was an important issue in the campaign of 1800.

²⁸Bassett, *Short History of the U. S.*, 267-69.

²⁹Upton, *Military Policy*, 86.

³⁰Richardson, *Messages and Papers of the Presidents*, 238.

Sparks, *Letters to Washington*, 456.

Waite, *American State Papers*, III, 37.

³¹*N. A. Review*, Oct., 1826, pp. 248-49.

Upton, *Military Policy*, 87.

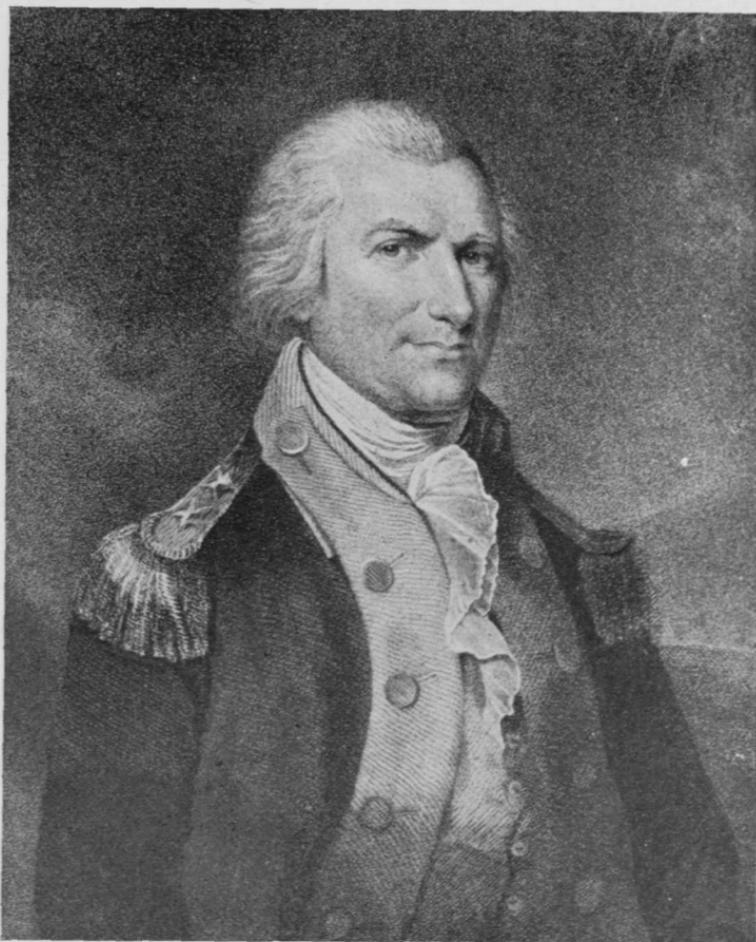
Waite, *American State Papers*, III, 497.

³²*Ibid.*, p. 267.

³³Upton, *Military Policy*, 89.

N. A. Review, Oct., 1826, p. 249.

Thomas Jefferson and the Republicans were still believers in the militia,³⁴ and under his pacific policy in 1802 the peace establishment was further reduced to about two thousand five hundred men. In Jefferson's second annual message to Congress he said: "Considering that our regular troops are employed for local purposes, and that the militia is



MAJOR GENERAL ARTHUR ST. CLAIR

our main reliance for great and sudden emergencies, you will doubtless think this institution worthy of a review." In his fourth annual message he still urged that the attention of Congress be given to the militia, and on February, 1803, he wrote to the state governments urging them to carry into effect the "militia system adopted by the national legislature."³⁵ "None but an armed nation can dispense with a standing army."

³⁴*Messages and Papers of the Presidents*, I, 329, 345, 372, 476.

³⁵*Ibid.*, I, 469.

Jefferson's Complete Works, IV, 178-223.

The Act of Congress of 1805, provided that a Corps of Engineers be organized and "that said corps * * * shall be stationed at West Point, in the State of New York, and shall constitute a military academy."³⁶ It further provided that the Chief Engineer should have superintendance of the academy under the direction of the President of the United States, and the Secretary of War was authorized to procure the necessary books, implements and apparatus for the use of the academy. General Upton says the establishment of West Point "was the one great and lasting military benefit from our experience, during the long struggle for independence." Washington, Hamilton, and Knox had urged the establishment of a military academy from the beginning of the nation's existence,³⁷ for, as leaders of the Revolution, they realized the necessity of keeping a uniform and scientific knowledge of the military profession. Washington, in his annual message in 1796 had said:³⁸

The institution of a Military Academy is also recommended by cogent reasons. However pacific the general policy of a nation may be, it ought never to be without an adequate stock of military knowledge * * * the art of war is at once comprehensive and complicated, that it demands much previous study, and that the possession of it in its most improved and perfect state is always of great moment to the security of a nation.

The Continental Congress in 1776³⁹ had resolved that a committee be appointed "to prepare and bring in a plan of a Military Academy." From these things we see that the establishment of West Point was due to the needs as shown by the Revolution and not to the influence of any political party. The academy was very small from 1802 to 1812, but just before the War of 1812 it was greatly increased and improved. It then provided for the training of about two hundred and sixty cadets, who were supposed to be used in time of war in training the raw troops.

Little change was made in the military force during Jefferson's administration after the reduction of 1802, but in 1808 our disputes with England over the seizure of our ships and the impressment of our sailors so aroused the people that the pacific policy of Jefferson and Madison was overthrown and Congress authorized an additional regular force, to consist of five regiments of infantry, one regiment of artillery, and one regiment of dragoons.⁴⁰ This brought the standing army to about six thousand. It also provided that every officer appointed should be a citizen of the United States. Up to this time many foreigners had been appointed some of whom had never taken the oath of allegiance.

³⁶Upton, *Military Policy*, 89-90.

³⁷*Ibid.*

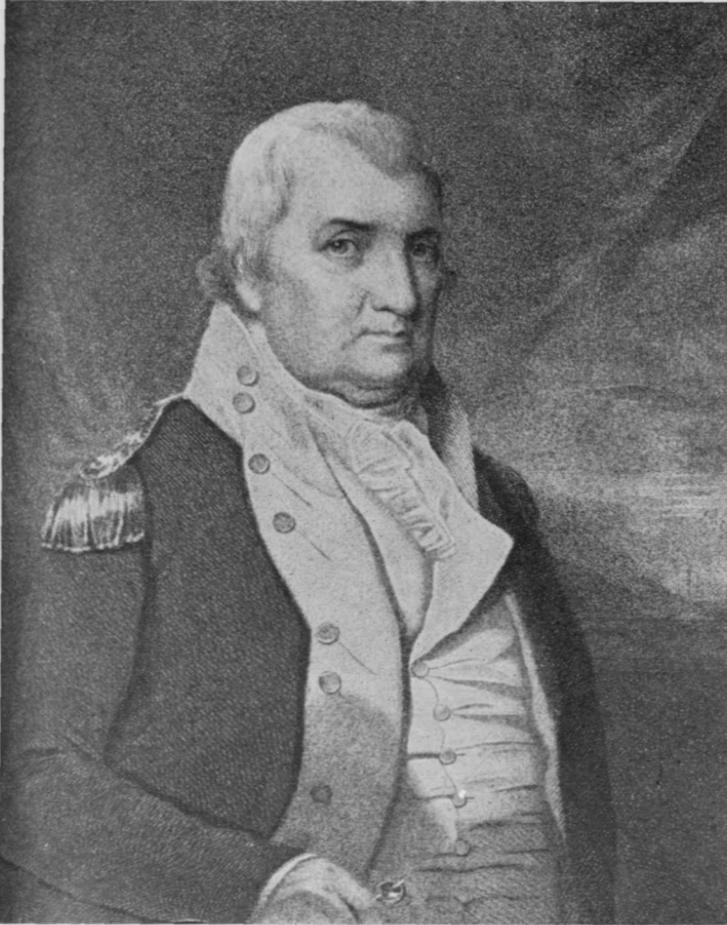
Messages and Papers of the Presidents, I, 208.

³⁸*Ibid.*, p. 213.

³⁹*N. A. Review*, Oct., 1826, pp. 265-67.

⁴⁰Upton, *Military Policy*, 91.

The Republicans still believed that the militia was the proper form of national defense as is shown by Madison's first message⁴¹ to Congress, in which he said: "For a people who are free and who mean to remain so, a well organized and armed militia is their best security." The war party was now so strong and sentiment against England so bitter that



MAJOR GENERAL CHARLES COTESWORTH PINCKNEY

Congress passed an act in 1812 increasing the military force by twenty-five thousand. In the early part of 1813 twenty-thousand more were authorized, and in 1814 three regiments of riflemen were added. This completed the regular force used during the war. The President was empowered to accept volunteers and to require the governors to hold in readiness their militia.⁴²

⁴¹*Messages and Papers of the Presidents*, I, 455, 476.

⁴²Upton, *Military Policy*.
N. A. Review, Oct., 1826, p. 250.

.It is interesting to note the change in attitude which the experience of the war brought to President Madison in regard to the militia. In his message to the Senate and House of Representatives in 1815 he said:⁴³

Experience has taught us that neither the pacific disposition of the American people, nor the pacific character of their political institution can altogether except them from that strife which appears beyond the ordinary lot of nations to be incident to the actual period of the world, and the same faithful mention demonstrates that a certain degree of preparation for war is not only indispensable to avert disasters in the onset, but affords the best security for the continuance of peace. The wisdom of Congress will therefore, I am confident, provide for the maintenance of an adequate regular force, for the general advancement of the naval establishment, for the improving all the means of harbor defense, for adding discipline to the distinguished bravery of the militia, and for cultivating the military art in the essential branches, under the liberal patronage of the Government.

Madison's change of heart was no doubt due to the trouble he had experienced during the war with England with the militia and the state governments, the most notable of which was the refusal of Massachusetts and Connecticut to furnish their quota of militia on the ground that the governors, as Commanders in Chief of the Militia, had the right to determine whether the troops were needed to enforce the laws of the Union, to suppress insurrections or to repel invasions, before placing them at the disposal of the President. These states held that there was no such need at this time and refused their quotas.⁴⁴

Other bodies of the militia refused to go into Canada⁴⁵ on the ground that they were not obliged to serve outside of the United States. In general, it may be said that the failures and disasters of this war were due largely to the policy of trusting the national defense to armies of militia supported by the states during the peace intervals. The militia consisted of untrained men and untrained officers and was therefore inefficient and insubordinate. It was this state of affairs which caused that ardent Republican, President Madison, and other leaders to change their views on the question of a standing army. The President, after peace was declared and the reorganization of the army became necessary, recommended a large peace establishment.⁴⁶ Congress did not go as far as the President recommended; but it fixed the peace establishment at not less than ten thousand men,⁴⁷ quite in contrast with its policy after the Revolution. From this we see that the American people had also modified their views in regard to a standing army; the minimum of ten thousand men was a comparatively large peace establishment and reasonably proportioned to the needs of the country and sufficient to maintain in the nation a

⁴³*Messages and Papers of the Presidents*, I, 553.

⁴⁴Upton, *Military Policy*, 96-98.

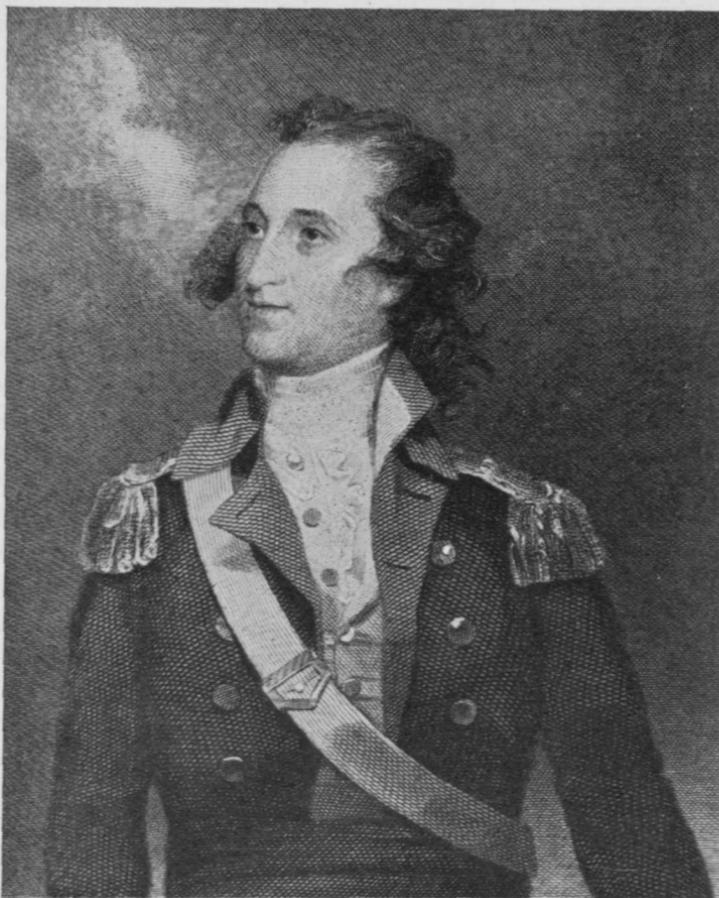
⁴⁵*Ibid.*, pp. 99, 100.

⁴⁶*Messages and Papers of the Presidents*, I, 476.

⁴⁷Ingersoll, *History of the W. D.*, 75.

Upton, *Military Policy*, 143.

knowledge of military art. In April, 1816, Congress provided for a general reorganization of the staff, by which the higher positions were required to be filled by experienced officers and the lower grades or positions by young men who had been "trained and taught all the duties of a private, noncommissioned officer, and officer."⁴⁸ By these two acts,



MAJOR GENERAL THOMAS PINCKNEY

Washington's recommendations of many years before were finally carried out; for we have at this time a peace establishment to preserve the military art, to form the standards of discipline for volunteers, and to furnish military commanders for these armies.

In 1820, with the United States at peace with the world and staggering under the effects of the large debt incurred in the War of 1812, there was a general demand for a reduction of the expenses of the government,

⁴⁸*Ibid.*, p. 144.

so one of the means adopted to meet this demand was a reduction of the regular army. The House of Representatives in 1819 directed the Secretary of War, John C. Calhoun, to report at the next session of Congress for a reduction to six thousand men.⁴⁹

In 1820 Calhoun presented his report and while it was not accepted by this Congress, it so logically sets out the principles on which the organization of a peace establishment should be based that it has been the guide for the future development of our national defense.

As we are seeking the experiences and the principles on which our present system is based, a study of this early period of the army would be incomplete without this report of Calhoun's which has been of such importance in its development and is an expression of the experiences and needs as shown in the first fifty years of the nation's life. In his report Calhoun assumed that the army, in organization and in numbers, should have reference to the objects for which it was maintained. He placed or classified the objects of a peace establishment as follows:⁵⁰

"(1) Those which, though they have reference to a state of war, yet are more immediately connected with its duties in peace, and (2) those which relate immediately and solely to war." In the first class he placed, as its leading objects, the garrisoning of forts, preserving of peace within the United States, commanding of posts on the frontiers for the protection of the new settlers; all of which he contended were important, but not so essential as the objects of the second class, which relate solely to a state of war. He stated:

The great and leading objects, then, of a military establishment in peace, ought to be to create and perpetuate military skill and experience, so that at all times the country may have at its command a body of officers sufficiently numerous and well instructed in every branch of duty, both of the line and of the staff; and the organization of the army ought to be such as to enable the Government, at the commencement of hostilities, to obtain a regular force adequate to the emergencies of the country, properly organized and prepared for actual service. * * *

To give such an organization, the leading principles in its formation ought to be, that at the commencement of hostilities there should be nothing either to new model or to create. The only difference, consequently, between the peace and the war formation of the Army, ought to be in the increased magnitude of the latter, and the only change in passing from the former to the latter should consist in giving to it the augmentation which will then be necessary.

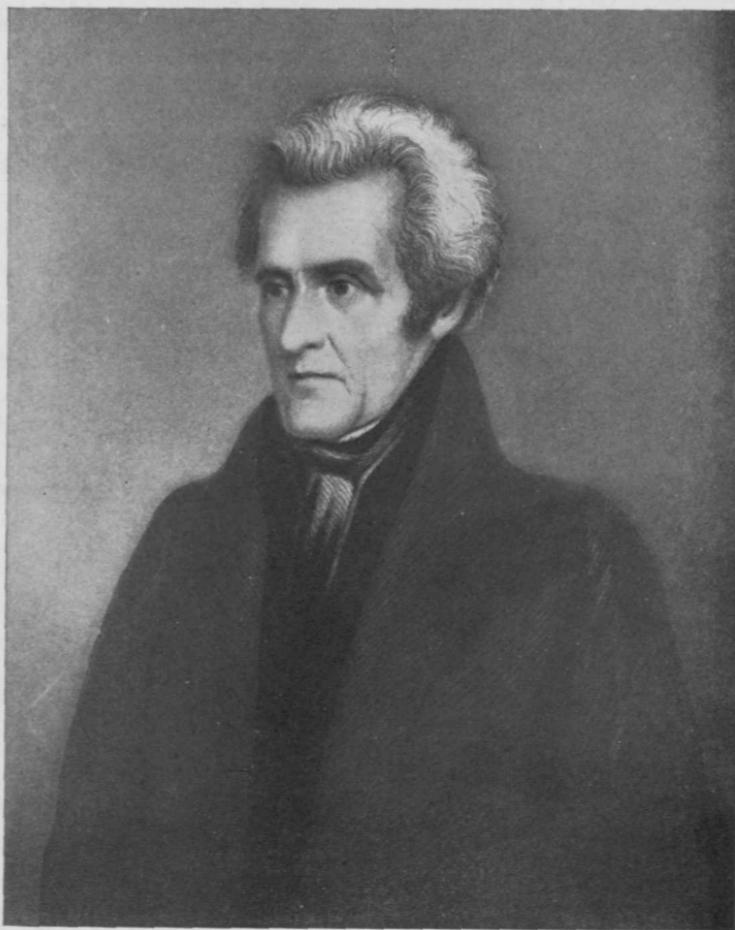
It is thus, and thus only, the dangerous transition from peace to war may be made without confusion or disorder and the weakness and danger which otherwise would be inevitable, be avoided. Two consequences result from this principle: First, the organization of the staff in a peace establishment ought to be such that every branch of it should be completely formed, with such ex-

⁴⁹Upton. *Military Policy*, p. 149.

⁵⁰*American State Papers*, II, 189.

N. A. Review, Jan.-Feb., 1878, p. 199.

tension as the number of troops and posts occupied may render necessary; and, secondly, that the organization of the line ought, as far as practicable, to be such that in passing from the peace to the war formation, the force may be sufficiently augmented without adding new regiments or battalions, thus raising the war, on the basis of the peace establishment, instead of creating a new army to be added to the old, as at the commencement of the late war (1812).⁵¹



MAJOR GENERAL ANDREW JACKSON

Calhoun so set forth the principles of an expansive organization and recommended the arrangement of officers and companies that, "without adding an additional officer or a single company," the army could in time of war be more than doubled.⁵² Congress, however, discarded all the vital points or principles of Calhoun's plans by the Act of March 2, 1821, when, without thought of the future, it reduced the army to 6183

⁵¹Upton, *Military Policy*, 149-50.

⁵²*Ibid.*, p. 50.

men, which insured the continuance of the old system. It was not until after the experience of the Florida War and the War with Mexico that Congress, by act, recognized Calhoun's principle of expansion. This principle has proved to be so fundamentally sound that it now prevails in every army in Europe, says General Upton.

Calhoun's report is a logical summary or rather deduction from the experiments and experiences of the first forty years, which we have studied, of the life of the nation along military lines.

I have discussed from time to time the value of military training to civilians, with business men who have large commercial organizations. Those employers, who have given the subject serious consideration, who have compared men with and without military training at the same tasks, and the work of certain other men before and after receiving military training, inform me that it increases the efficiency and capabilities of their employees as civilians. The number of organizations which permit their employees to attend our summer training camps at full pay increases each year. This policy is adopted by large corporations not only for patriotic reasons, but because it is proving to be a paying investment. Undoubtedly one of the important accomplishments of military training is its physical results upon the individual. Not only does it develop a boy physically at his most critical age, but also impresses upon him the necessity of keeping in condition throughout life. The advantages of starting any career with a sound body and keeping sound throughout the span of life cannot be over-stressed. I sometimes think that our educators as a whole do not appreciate the vital relation of the body to the mind. Not only does a sound body result in more working hours during a man's life and thus materially extend his effectiveness, but it also makes for clearness of thought and purpose and increased efficiency. At our Citizens' Military Training Camps it has been demonstrated that even a month as a soldier will produce noticeable and lasting physical benefits. Soldierly habits, once acquired, are not easily lost.—*John W. Weeks.*

Preparation for Mortar Fire

By

FIRST LIEUT. C. E. BRAND

11th Coast Artillery

SOME of the missions of the training of a mortar battery are common to all primary artillery; others are peculiar to mortars. The following ends to be attained are applicable to all artillery fire; but it will be noted, upon examination, that each of them has an especial application to mortar fire, so that especial methods of training of a mortar battery may conveniently be discussed under these heads.

a. Smart, precise drill of the pit sections, with the driving force of positive certainty in every action.

b. Quick, *accurate* drill of the range section.

c. A method of position finding and data computing which reduces the dead time to a minimum.

d. A method of fire adjustment suited to mortar fire (rapidly varying atmospheric retardation) and to permit continuous fire at maximum rate.

e. A system of spotting on the setforward point.

f. A system of drill and subcaliber firing which simulates service firing as exactly as possible in all respects.

The working out of each of these ends by Battery "X," 00th Coast Artillery, during the past season is discussed below in the order indicated above.

a. The mortar is sufficiently small and flexible in handling that every operation in the pits may be done with a maximum of force and smartness. As the truck comes to a stop at the breech, the projectile is rammed home instantly and with great energy, utilizing its momentum and not delaying to remove the truck before ramming as must be done in the case of gun batteries. The powder charge is light and is thrown into the breech quickly. The actual manipulations of the gun are as rapid as simple.

Absolute silence is maintained in the pits except for the calling out of firing data and necessary commands and the operations of loading. An intelligent private, with a stentorian voice, headphones, and a megaphone, stands upon the bridge between the pits and bellows out the commands from the B. C., which is several hundred yards removed. Commands are worded for staccato sharpness of delivery. After the battery has reported in order comes the command: "*Battery Attention! Prepare for fire with target practice (dummy, sub-caliber) ammunition! REST!!*"

This is real news for the pit sections. No previous warning is given for subcaliber firing. About ten minutes to put in the tubes and open a

few boxes of ammunition is all that is necessary. It is all that is expected. Of course the day set for service practice is known in advance; but the pits would not be surprised to get something else first even on that day. The essence of their training is that they must be ready to do *anything* they are called upon to do *at once*.

Presently the megaphone is directed to one pit: "*A Pit Attention!!*"—the telephone man holding one finger up above his head,—"*one pit salvo! Commence Firing!!!*" "*—LOAD!!*" from the pit commander almost simultaneously.

The mortar (only one per pit being manned) is loaded with the same snap that characterizes the commands.

"*Home — RAM!!*" ——— "*Elevate!*" ———

"*Take the data coming out!*"—from the pit commander as the new firing data are flashed on the display boards.

"*Set!*" ——— "*Set!*" ——— "*READY!*"

An intense silence holds the pits while the warning bell sounds, and then as the firing bell on the second stroke of the T. I. bell commands the crash of discharge that obliterates the third.

It must be obvious to anyone that such drills must be short and not too frequent. They are done under the emplacement officer's stop watch from "Commence Firing" to the pit commander's "Ready," and the pit with the low record during the first half of the drill period (the work being carefully checked for errors) is allowed to fall out during the last half. The pit commander may require certain individuals to do necessary police work in the pit during that period; or certain others may rehearse together for a few minutes the exact details of when and how to close the breech and insert the primer in a minimum of time. But this period is primarily "Rest" for the best drilled section. It may be added that this system becomes operative only after the winning time has been reduced below the maximum satisfactory limit (say, 25 seconds).

b. Quick range section drill requires, to begin with, *real* armsetters. A *real* armsetter can set his arm within from two to three seconds after the third stroke of the T. I. bell. It is not a matter of intelligence. In matter of fact an armsetter does not have time to think. He must work automatically. If he doesn't, after a reasonable amount of drill, there is but one thing to do:—try another. Also, it is well to remember, things done automatically are done with almost incredible accuracy. Of course the plotter must be both intelligent and quick. Nimbleness of mind and of fingers are essential. Anyone who is fairly intelligent can do anything else required in the plotting room. But everyone must be required to do *accurate* drill *every day*. And nothing new must be injected into the drill when firing—the report of the gun alone excepted. That can hardly be avoided, though it is simulated by having the B. C. telephone man in the

plotting room below "FIRE!!" as loudly as he can when he hears the firing bell ring.

The only known means of insuring *accurate* drill is to make an actual check of every piece of data derived, used, or transmitted by every individual in the range and pit sections. This is done by keeping records. The essential requirements of records are, first, that they shall cover *everything*; and, second, that they shall not impair the quickness of any of the operations leading to the display of proper firing data to the pits and laying the mortars upon them. The first requirement is easily checked through and requires no especial discussion. It is well, however, to pause over the second. It affects several matters. In the first place, it is conducive to accuracy to have every man keep his own records in so far as this can be done under the latter requirement. For example, the secondary armsetter can keep his record without difficulty, writing down his azimuth as repeated back to the reader immediately after he has cleared his arm. Plainly, this does not affect the speed of his work at all. It encourages accuracy because he realizes that in the analysis to follow the arm will be set carefully upon the azimuth which he has himself recorded, and that if he has not set it himself upon that azimuth the failure of the targeted point to check will reprove him for his error. The primary armsetter, however, like the plotter, must have a recorder. (The same, in fact, can serve both.) This fact at once, on its own account, hypothecates better trained, more experienced, more dependable men for these positions — so great a steadying influence it is for a man to record his data. Extra recorders are added, therefore, only where *necessary*. And it is noted, too, that records do *not* impair in any way the ability of a battery to deliver its most effective fire. They do increase the accuracy of fire tremendously, not only through their effect on training, but also through their steadying effect during the firing itself.

c. It was stated above that a *good* pit section works at high speed. It can, in fact, load and lay successive shots at 30-second intervals *for a short while*. This is too rapid a rate of fire to be maintained for any length of time, but at the same time a rate of one shot per minute is as much too slow for maximum efficiency. It is a matter of fact that the mortar is usually loaded, elevated, and ready to lay before the first 30 seconds after it has fired have elapsed. That 30 seconds is allowed to the range section to compute and post the firing data. The next 30 seconds is allowed to the pit sections to lay according to these data, the total dead time thus being one minute, corresponding to the interval between shots. Both of these allowances of time are greater than necessary. The range section can get its data to the pits within a maximum of 20 seconds after the bell upon which the last observations were taken, and the mortars can be laid within a maximum of 20 seconds after the data are posted in

the pits. The dead time can thus be reduced to 45 seconds without difficulty, and this is also a fair interval of time to be allowed between shots. One rather obvious way of accomplishing this end, so far as data computing is concerned, is to shorten the interval between T. I. bells to $22\frac{1}{2}$ seconds. This, however, requires certain alterations of the setforward ruler and a considerable quickening of the range section drill, which led to a consideration of the following scheme.

Minute predictions were made at 30-second intervals in the usual manner. The range-elevation and deflection boards, however, were provided with mechanical interpolators* so as to supply not only the minute prediction data, but also 45-second prediction data. This in effect supplies the pits with firing data every 15 seconds, the quarter-minute data being based upon 45 seconds dead time intervals, the half-minute data upon one minute dead time intervals. Thus, if the 45-second rate of fire is maintained, the advantage of 45-second dead time is realized every other shot. It has the advantage that a relay, if necessary, need be for only 15 seconds, and that if a 1-minute rate of fire be maintained, firing on the quarter-minutes, the 45-second dead time may be utilized every shot. This may be compared with reducing the time interval and modifying the setforward ruler, thus increasing the rate of fire and reducing the dead time to any selected time of 40, 45, or 50 seconds for every shot. The latter system also gives a uniform rate of fire when the pits alternate firing, whereas by the former system there are two shots at 15 seconds apart and then an interval of 30 seconds before the next shot. Both systems were given successful trials and the latter favored chiefly because of the uniformly shortened dead time.

d. Mortar fire adjustment differs from the average case of artillery fire adjustment in that mortar trajectories are so high and so variable in maximum ordinate, and accordingly atmospheric retardation is so variable from round to round, that adjustment data based upon the spots of previous shots very rapidly become obsolete. Anyone who has fired the rifle at from 600 to 1000 yards knows that in order to "dope" a variable wind from the spots it is necessary to correct on every shot and fire rapidly. This is still more necessary in mortar fire because, in the first place, there are so many strata of air affecting the flight of the projectile that some one of them will almost certainly vary during the shoot; and, in the second place, even if they all remained constantly, the trajectories themselves will certainly vary during fire at a moving target, both in maximum ordinate and in time of flight. If a firing interval of $22\frac{1}{2}$ seconds is maintained, however, the pits firing alternately, the correction can be made to lag by not more than two minutes, assuming a 1-minute time of flight, or thereabouts; and the continuous correction curve estab-

*In all essential respects identical with the mine predictor.

lished will very shortly disclose any pronounced acceleration in magnitude of deviations and thus permit a prediction to offset the lag of the correction.

Unlike the case of rifle fire, however, the probable error of the mortar is not negligible. In other words, it is not sufficiently accurate to consider that every impact represents the position of the varying C. I. at that instant. The true C. I. may be from one to three individual probable errors (P. E.'s) or more from the individual impact. In order to determine it more accurately, more shots must be fired—more impacts considered. These, however, cannot be materially separated in time because, as has been noted, it is the peculiarity of mortar fire that the C. I. will itself change materially in a short interval of time. It is therefore necessary to fire salvos of as many pieces as are available, thus reducing the P. E. of the determination of the C. I. at the instant to $^1\sqrt{n} \times 1$ P. E. of a single shot and apply the adjustment corrections in terms of this P. E. This we recognize as essentially the "salvo center of impact" method of fire adjustment.

The impact board as described in TR 435-221, modified to incorporate the essential features of the fire-adjustment pin-board of General Callan and to provide a mechanical calculation of the C. I. of two or more shots, provided the machinery to put this method of adjustment into operation while utilizing continuous fire.* This board is described in sufficient detail in the training regulation referred to. Due to shortage of personnel and ammunition only one mortar of each pit was manned, and a battery salvo was taken as two-pit salvos in succession fired alternately at the regular interval.

e. Upon a consideration that the point selected by the plotter to fire upon with mortars is, for a battle target, from one-half mile to one mile ahead of the observed target, the futility of basing the entire fire adjustment upon the assumption that the target actually arrived at that point at the predicted time becomes apparent. It would indeed be much more satisfactory to make no corrections whatever from observation of fire upon a battle target. To make such adjustment from measured deviations from the visible target during target practice is therefore an admitted non-service procedure, and is little if any more defensible than to use the towing tug as a spotting agency.

In any form of bilateral spotting the spotting is in fact simplified by measuring the deviations from the setforward point selected by the plotter. Using the observing stations as spotting stations, this is done by reading the azimuths on the B' and B'' arms to the setforward point back

*The modifications referred to will readily suggest themselves to anyone interested in this matter. The particular means employed in this case, while simple in operation, are somewhat too tedious in description to be taken up in detail here. A detailed description will be submitted to the Coast Artillery Board for consideration at an early date.

to the stations immediately after the firing data have been read and while the targ is still in place. The spotting observers have then but to read the splash which occurs in their instruments at a given time without reference to a target and without moving their instruments after they are set for the splash. The Cole spotting board, constructed with great care to insure accuracy, provides spotting data accurate within a probable error, which is fairly satisfactory. It is, at least, the best at present available, and was used with satisfactory results.

f. That the daily drill should, as closely as possible, simulate the firing of the battery is of capital importance. Something of this has already been mentioned. Some further details of how it is accomplished are now added.

After the drill season preparatory to the annual firings is well under way, it is commonly understood by the battery that subcaliber firing may be ordered within at most a half-hour's notice at any time. Also when the battery is reported "in order" every day it must be in order for service firing, if this were ordered, within at most an hour's time. Within that time powder cans can be opened and the projectiles prepared for firing. The emplacement officer can orient and clinometer the mortars, and the gun commander can dry them out, "dope up" the gas check pads, and put in the pressure plugs. Nothing else is necessary. The mortars are always in the best possible condition mechanically. The firing circuits are tested daily. The mechanic keeps on hand a supply of tested primers, sponging compound, graphite, grease, hydrolene, paint remover, pressure gauge outfit, etc., as a matter of course. These things are not gone over feverishly the afternoon before firing. They and everything else that affects the firing efficiency of the battery are gone over with minute care at least once each week (at the artillery inspection) during the entire season. The powder should not be opened until just before firing; and the mortars must be checked in orientation at that time whether this has been previously done or not. An hour is provided for this purpose, as mentioned above. That is sufficient. The drill and the routine of the day before firing — and the equanimity of the day of firing — are therefore not disturbed.

In addition to tracking such vessels as come into the field of fire of the battery, a large number of hypothetical courses are prepared of all types of vessels from monitors to battle cruisers and labeled as such: for example, *Battle Cruiser Division, Coming in — Main (speed 30, sinuous)*. These are used indiscriminately with the actual vessels, which are themselves assigned as "monitors," "supply ships," "battleships," etc. The B' station and the B. C. stations are the same so that no confusion to the observers results from this duplicity in assigning targets. For example the B. C. decides to track a commercial steamer coming in the main channel.

He calls to the B' observer, "Track that freighter with the yellow funnel, coming in." Thereupon B' assigns the target to B'' in the usual prescribed manner. At the same time the B. C. adds to his own observer, who is thoroughly familiar with the routine, "Assign it to the battery as a battleship division in line." This assignment is also made in the prescribed form by the B. C. observer.

After the second point is plotted the plotter calls off, and it is repeated to the B.C., "travel 130." This the B.C. recognizes as about 11 knots speed which appears reasonable for the steamer tracked, so that he calls back "travel O. K." The plotter realizes that 11 knots is quite low for a battleship and is therefore reassured by this check that nothing is amiss. The B. C. shares this reassurance upon receipt of the travel. Normally such slow targets are assigned as "old battleships," "crippled battleship," "lone monitor," etc. Even in this case, however, travel is called up to the B. C. after the first two readings as a matter of check—and later if it changes materially. It may be mentioned, also, that this check, as a matter of routine, as well as the check on the predicted point and the pushing of firing bells, is not done by the B. C. personally, but by his observer. The B. C. is thus free from any part in drill and may really command his battery.

The pits are ordered to stand by for firing with dummy ammunition as soon as the target has been assigned, and one pit is ordered to load when the travel has been checked (approximate data, including the zone, having been sent to the pits). The third point having been plotted a prediction is made and data posted in the pits for firing on the fifth bell. The pit which has loaded lays upon these data. When the fourth point has been plotted, the plotter is able to report "Course O. K." (unless some error has been made), whereupon the B. C. at once gives the command "Commence Firing!" The first shot is thus fired on the first possible prediction, and yet the course and travel have been checked by no less than four plotted points. This first shot is fired 4 observing intervals or $1\frac{1}{2}$ minutes after the first observation was made.

No definite number of salvos is ordered fired in the usual case, the fire being continuous until stopped. For certain drills, however, relays are ordered after the first salvo until the resulting fire adjustment corrections have been applied. This is for the purpose of familiarizing the battery personnel with the procedure in case of ordered relays which might become necessary, particularly for the purpose of conserving ammunition during target practice firings. In this case the range officer reports "Data correct" to the B. C. as soon as such corrections have been applied.

Two impact charts are kept in the plotting room,— one in range and the other in deflection,— by intelligent first class gunners. These men receive their deviations direct from the spotting section and call off the

proper fire adjustment corrections according to the rule used. The matter of operating these boards is as definite and as easily mastered a procedure as operating the deflection board, if drilled upon daily.

The angular deviations furnished the spotting section by the spotting observers had of course to be fictitious. A number of sets of them were compiled to give deviations which might reasonably be expected in the course of problems fired.

Unless the order "No records" is given, the B' observer commands "Next bell time 1" as soon as both observers are on target, whereupon all records begin simultaneously. Thereafter during the fixe seconds or thereabout of quiet preceding each tenth bell the B'' armsetter calls out "Next bell time 10," etc., which is repeated in all stations where records are kept.

Short "no records" practice drills may be held from time to time, but a regular drill simulating actual firing as nearly as possible is the main work for each day. It does not exceed 40 bells (15 minutes) and is followed immediately by a check-through by every individual of his work under the supervision of the range officer and plotter for the range section, and of the emplacement officer and pit commanders for the pit sections. If any errors are found the drill is repeated later during the period after special practice and instruction of the individuals making the errors. In case the analysis shows the drill to be free from errors and in all other respects satisfactory, the sections are allowed to fall out, polish up their instruments, or divert themselves as they see fit for the larger portion of the remainder of the period. It is a characteristic of these fall-out periods, however, that the battery may be called to attention at any time for an immediate drill. Failure of the sections to report in order promptly when such a call is sounded results in repetitions of such calls at frequent intervals until this defect is remedied.

The firing of this battery was simply a repetition of its daily drills plus the report of the guns. When the target was under way and assigned to the battery by the fire commander, the B. C. indicated to his observers by a nod of the head to repeat the assignment to the several sections and stations. Since no irregularity arose in the firing it was not again necessary for the B. C. to take any part in the conduct of the firing other than to keep a keen observation upon everything which took place in order to forsee and prevent or correct promptly any irregularity which might have arisen.

Effect of Aviation on Fixed Coast Defenses

By

MAJOR H. R. OLDFIELD

Coast Artillery Corps

PRIOR to the development of aviation, fixed coast defenses were limited in their means of determining the positions of naval targets and the results of fire thereon to visual and accoustic methods with all observers in terrestrial, floating, or subaqueous positions. Accoustic methods were not then developed, and in practice entire reliance was placed on visual observation from terrestrial stations. Mobile coast defense armament was developed coincidentally with aviation.

The development of aviation has increased the powers of fixed coast defenses by:

- a. Providing observation from the air of the movements of naval targets and of the results of fire thereon.
- b. Providing a source of information as to the entire local naval situation.

Reliable observation from the air of the movements of naval targets and of the results of fire thereon increases the powers of these defenses as follows:

a. The maximum range at which adjusted fire can be delivered has been increased from the maximum range of effective visibility from terrestrial stations to the maximum range of the armament. This increase in range varies with the locality and, in each locality, with the meteorological conditions and with the measures taken by the enemy to reduce the efficiency of observation from terrestrial stations. The maximum range of visibility from terrestrial stations varies from zero under conditions of dense fog or the most effective use of enemy smoke screens to about 25,000 yards under the most favorable conditions. The maximum effective range of the most powerful armament of fixed coast defenses must in general be held to be about 30,000 to 35,000 yards, although under certain exceptional tactical conditions it can be as great as 48,000 yards. The increase in effective range thus varies with conditions between 5000 and 35,000 yards. For less powerful armament, this increase is, of course, much less.

b. The efficiency of the fire of fixed coast defenses has been increased by the provision of aerial observation, because an aerial observer can report the fall of a high percentage of shots that are obscured from shore

observers due to a great number of causes, and fire thus can be much more accurately delivered.

Information as to the entire local naval situation allows a more accurate determination of the enemy targets most dangerous to the defense and thus permits the power of the coast defenses to be more effectively applied. This is equivalent to an increase in power.

It follows that the development of aviation has increased the powers of fixed coast defenses by increasing their effective ranges and the actual efficiency of their fire on the targets engaged and by permitting a more accurate determination of the targets that should be fired on.

The increase in powers outlined above is partially compensated for and the limitations of fixed coast defenses in a sense extended by:

a. A corresponding but in general smaller increase in the maximum ranges and efficiency of fire of naval vessels against shore targets due to the aid of aerial observation.

b. The ability of enemy aviation to decrease the range of terrestrial observation by laying smoke screens in front of naval forces and shore observing stations.

c. The ability of enemy bombardment aviation to conduct bombardment of fixed coast defenses.

While it is possible for certain British, and possibly for certain Japanese, battleships to fire at a maximum range of 44,000 yards, the ships must be listed 15 degrees to obtain this range, and present naval design and treaties limit this increase in range for most ships. In other words, it is impracticable for naval vessels to take as full an advantage of the possibilities afforded by the development of naval aviation in increasing maximum ranges as is possible with the shore batteries.

Fixed coast defenses are not particularly vulnerable to aerial bombing. It would require extended and efficient bombing operations to neutralize a fixed coast defense. A consideration of the possible effects of enemy bombing has influenced the design of modern fixed coast defenses. Modern design tends towards greater dispersion of all elements and this renders coordination and control more difficult. It is probable that a consideration of the increased efficiency of artillery fire possible with present day weapons and with aerial observation is principally responsible for such increased dispersion. In any case the development of aviation has resulted in limiting the powers of fixed coast defenses due to the unsuitability of restricted positions, such as small islands, for the emplacement of any great quantity of armament. This limitation has proven to be of little consequence however in the actual installation of fortifications.

The following quotation from the report of a board of officers convened in the Hawaiian Department (known as the McNair Board) is believed to be an accurate statement.

c. The antiaircraft artillery on land is a thoroughly effective means of defense against the bomber, provided it is available in sufficient quantity and that searchlights and listening apparatus are capable of detecting and illuminating the target.

It follows that the effect of aerial bombing on the operation of fixed coast defenses can be made very small by providing antiaircraft artillery protection and that the powers of these defenses are little affected by enemy bombers.

The development of aviation thus on the whole, has extended the actual powers of fixed coast defenses.

While the actual powers have been extended, the relative powers of fixed coast defenses have perhaps been somewhat decreased in importance.

Prior to the development of aviation, fixed coast defenses and naval vessels provided the only effective means of countering certain important phases of enemy naval action against our important harbors and vital seashore utilities. Mobile coast defense armament had not then been developed and, if developed, would have been of less utility than it is today with the aid aviation can give in intelligence of pending enemy attacks.

The development of aviation has decreased the relative importance of fixed coast defenses by providing intelligence agencies sufficiently far-reaching and dependable greatly to increase the probability of deriving material benefit from the mobility of mobile coast defense armament.

The relative efficiency of the bomber and of the shore gun is a question concerning which there is no universal agreement. The following quotation from the proceedings of a board of officers convened in the Hawaiian Department (known as the McNair Board) is believed to be as authoritative an opinion as to their relative efficiency as can be found. It is known that the Chief of Coast Artillery and then Commanding General of the Hawaiian Department agree with this opinion.

a. The major caliber coast gun is effective and essential against naval targets. Against large targets it is more accurate than the bomber, except beyond the range of about 25,000 to 30,000 yards. Its effectiveness is decreased if terrestrial visibility is impaired, but the Board is unable to evaluate this loss of effectiveness. When properly protected by antiaircraft artillery, it is thoroughly capable of resisting naval aerial attack.

b. The bomber is a powerful means of attacking naval targets at relatively great distances from the coast. Its methods are simple and direct. It is substantial and dependable from the standpoint of operation. Its effectiveness may be impaired by weather conditions and visibility. It is vulnerable to hostile aviation and antiaircraft agencies; hence it lacks the solidity and dependability of the seacoast gun.*

* EDITOR'S NOTE: It should always be borne in mind that adjusted fire by bombing is a difficult and rather a desultory operation and that when the bombs are dropped the planes must return to their base to receive more bombs. It would take a very large number of planes to maintain even approximately the rate of adjusted fire that can be obtained with a single fixed gun.

In the last analysis, it must be remembered that the seacoast gun is a dependable and efficient weapon—though its efficiency is reduced—even when the enemy has complete control of the air and our own bombing planes can not operate.

The development of aviation permits coast defense troops to keep better informed as to the movements and intentions of enemy forces operating against them. This information makes it possible to move heavy mobile armament from harbor defenses or central reserve positions to points near which major landing operations are being conducted and to give the defending troops support against naval targets that is more effective than any that can be given by lighter types. This has resulted in, or has at least made apparent, the desirability of providing heavy mobile armament for seacoast defense.

CONCLUSIONS

That the development of aviation has increased the maximum range and the efficiency of fire of fixed seacoast defenses. With the enemy in complete control of the air, these powers are decreased materially and the defenders can not operate bombardment aviation. Under such conditions, seacoast armament continues to be the only dependable means, other than naval, for the defense of important harbors against naval attack.

The limitations of fixed coast defenses are, in general, extended due to the fact that shore guns have become the second line instead of the first line of land troops in defense against naval attacks—the bomber has become the first line—and due to the fact that the development of aviation has emphasized the value of long-range mobile armament.

RECOMMENDATIONS

That primary reliance still be placed in harbor defenses consisting of shore guns and auxiliaries and that, where necessary, existing harbor defenses be modernized as rapidly as funds permit.

That bombardment aviation be provided in liberal amounts to form the first line of land troops in defense against naval attacks.

Annual Report of the Chief of Staff

* * * * *

TRAINING OF THE ARMY

8. *Regular Army.* Reports of the corps area and department commanders indicate that there has been considerable improvement in training during the past year. The training and combat efficiency of all units have improved in all branches of the service, and their state of preparation for active field service is in general satisfactory.

9. Owing to the fact that organizations are scattered and at reduced strength, training efforts have been concentrated on the small units and on combat communications. Much interesting and valuable information has been obtained in regard to the radio in the combat communication nets of these organizations. The state of training of these small units is excellent.

10. *National Guard.* There has been noted in all corps areas a marked improvement in the results accomplished in both the armory and the field training of the National Guard during the training year 1924-25. This improvement has been due, in a large measure, to the following:

a. Greater uniformity in preparation of programs and schedules.

b. Completion of basic instruction in the armories resulting in a minimum of duplication of such instruction in field camps.

c. A clearer understanding of training objectives. This has resulted in the announcement of limited objectives which have been successfully accomplished, rather than unlimited objectives which were beyond the possibility of accomplishment within the time available.

d. More attention to proper progression in training. The tendency to progress too rapidly from year to year is disappearing.

e. Improvement in methods of teaching leadership to commanders of all grades, particularly those of the smaller combat units. The instruction of field and staff officers in their proper functions, through the medium of terrain exercises, tactical walks, and map problems.

f. The segregation of recruits for instruction purposes during field training.

11. The training efficiency of the National Guard, as demonstrated during the period of field training this year, is on a higher plane than ever before in its history. Further improvement can be confidently expected as the National Guard becomes accustomed to the improved

methods of training noted above, which have for the most part been initiated during the past two years.

12. *Organized Reserves.* The training of the Organized Reserves, during the past summer, has been the most successful and the most practical that we have yet been able to give them. Unit training has met with a most cordial response, both from the Organized Reserves and from the Regular Army. By unit training, qualities of leadership and a sense of military obligation are being developed in all officers of the unit.

13. The most practical training plan that has yet been devised is the association of Reserve units with corresponding units of the Regular Army. Under this plan Reserve Officers understudy officers of corresponding grades in the Regular Army units and gradually take over drill and administrative duties under the supervision of the Regular officers. The Reserve units that have participated in associate training strongly favor this plan of instruction. Associate training is less expensive to the Government and affords the Reserve Officers practical experience which will go a long way toward preparing them for their mobilization mission.

14. During the past fiscal year, 405 regiments or similar organized Reserve units received training. One hundred thirty-five units were trained with installations of the Regular Army, fourteen units at Citizens' Military Training Camps, thirty-two units at local unit camps, and two hundred thirty-four at combined unit camps.

15. During the fiscal year 1925, 2474 Air Service Reserve officers were under training in the air either on an active or inactive duty status. Air Service Reserve officers participated in over 80,000 flights lasting over 50,000 hours, and 1358 Air Service Reserve officers were in the air five hours or more during the year. A great deal of this flying was accomplished on an inactive duty status.

16. *Reserve Officers' Training Corps.* During the fiscal year 1924, three hundred twenty-nine units of the Reserve Officers' Training Corps were maintained in two hundred twenty-six institutions. The training in these units, based upon training programs prescribed by the War Department, has been very satisfactory.

17. On account of the prospective shortage of funds, and the rapidity with which the Reserve Officers' Training Corps has grown during the last year, it has been necessary to place a limit on the expansion of this activity. The Reserve Officers' Training Corps fall enrollment for the fiscal year 1925 was 125,504 students, approximately 10,000 more students than were enrolled during the previous year.

18. The primary object of the Reserve Officers' Training Corps is the production of Reserve Officers, and the results accomplished by this activity during the past year are indicated by the large increase in such

production. The War Department Mobilization Plan assigns an annual production of 5000 officers to the Reserve Officers' Training Corps. During the year 1925, there were 4897 Reserve Officers' Training Corps graduates eligible for appointment as Reserve officers. This is an increase of nine hundred forty-four over the previous year.

19. *Citizens' Military Training Camps.* These camps were established at twenty-nine stations in the nine corps areas, at which 33,975 candidates were successfully trained. The camps were found by inspectors to have been well administered and the instruction, in general, of a high order.

THE HAWAIIAN JOINT EXERCISE

20. The outstanding military event of the past fiscal year was the Hawaiian Joint Army and Navy Exercise, which proved to be the most extensive ever conducted by the combined armed forces of this Nation. This exercise served the double purpose of testing the defenses of our western outpost of Oahu and of training the Army and Navy in joint operations. * * * Modern weapons and means of warfare, recent developments in aircraft and communications systems, and the newer tactical dispositions made in the military units as a result of World War experiences, were given an extensive test under actual field conditions.

21. In addition to having the Regular Army troops and the permanent personnel of the Navy and Marine Corps in combined operations, this joint exercise served the purpose of giving active field training to the units of the Hawaiian National Guard and a considerable number of Reserve officers.

22. It is recognized by all countries of the world that strive to maintain armies on a modern basis that no type of garrison, school, or summer training camp instruction can equal that afforded to officers and enlisted men, whether of the Regular Army or the civilian forces, by extensive field maneuvers. This is evidenced by the many field exercises conducted by foreign armies during the past year.

23. It is my very earnest hope that funds may be made available from time to time which will permit of further joint exercises of the Army and Navy. It is also important that the First, Second, and Third Infantry Divisions and the First Cavalry Division be given the opportunity to conduct extensive field maneuvers, if possible, in conjunction with the National Guard and the Organized Reserves. To the officers of long service such exercises will be valuable, in that they will permit a study under field conditions of the capabilities and limitations of the means of warfare developed in recent years; to the officers who have entered the Army since the World War and whose training has been obtained solely at schools and in garrison, extensive field maneuvers are essential.

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MILITARY SUPPLY

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30. While other studies have been of great value, probably the most important progress made, so far as supply questions are involved, has been in the development of new types of arms and munitions by the Ordnance Department. While we must expect to begin any future war with the arms and equipment on hand at its outbreak, it is essential that we fully develop improved types so that we may begin the production of such types and minimize changes during war. This principle is important to all countries; it is of peculiar importance to the United States due to our methods of quantity production. Other things being equal there can be no doubt as to the enormous advantage given the nation which possesses a superiority in types of arms and equipment.

31. As to the Air Service, it is a matter of common knowledge that unlimited numbers of the types of aircraft of 1914 would be hopelessly outclassed by a mere handful of the latest types. It has not been fully appreciated that improvements in other lines have been, if less spectacular, equally important.

32. Considering the limited funds available, the progress made during recent years in the development of new and improved types of weapons of warfare has been remarkable. A few of the more important developments by the several services in weapons follow:

In Infantry Weapons:

a. Two types of semi-automatic shoulder rifles of a weight comparable to that of the present rifle have been developed. It is expected that either of these semi-automatics will enormously increase the fire power of the rifleman. Either may very well prove to be capable of replacing the present automatic.

b. There is now under development, with every prospect of ultimate success, a semi-automatic shoulder rifle which will have sufficient accuracy and stopping power up to 1000 yards and for which 33 $\frac{1}{3}$ per cent more rounds of ammunition, pound for pound, can be carried.

c. The 37-mm. has been developed to the point where we may be assured that it can be made an adequate antitank gun and vastly improved for use against machine gun nests.

d. In lieu of the Stokes Trench Mortar, the Ordnance Department has developed a 75-mm. Infantry Mortar. This development has progressed to a point where this weapon can be given a range of 1800 yards with enormous increase in accuracy and with probably at least as great a shell efficiency as the Stokes now has.

e. Great improvements have been made in the design of tanks. It is believed, however, that much more experimentation must be carried out before it can be said that the tank has reached a satisfactory development. Few weapons combine material and moral effect

to the same extent as do tanks. Their development should be pushed.

In Artillery Weapons.

a. A type of pack howitzer has been developed which fires the same projectile as the new 75-mm. field piece and which, in addition to other improvements, double the range of the present mountain gun.

b. A 75-mm. field piece has been developed which has an increased range over the World War type of nearly forty per cent. There are also other improvements embodied in this type, but the fact that an Infantry advance can be supported for an additional 4000 yards is sufficient to indicate the folly of neglecting this type.

c. The American Army has never been furnished with 105-mm. howitzer materiel. This piece is essential for mobile war. The Ordnance Department has progressed far enough to be certain that this type of weapon, now under development, will have a range of about 12,000 yards with a 33-pound projectile.

d. In any great war the Corps Artillery must be depended upon for the greater portion of the counter-battery work. This artillery is of both direct and indirect importance to our Infantry and, therefore, to success. Without adequate counter-battery gun and howitzer fire the enemy's light guns are free to hammer our Infantry, and without adequate counter-battery our own light guns are helpless in supporting our Infantry. Although the World War reaffirmed the importance of these types, beyond question the counter-battery types in use during that war left more to be desired, especially for mobile warfare, than did most other pieces of artillery. In its experimental work the Ordnance Department has fully met this deficiency. A model of an improved 4.7-inch gun has been constructed which has a range of 20,000 yards, with a lateral field of fire of 60 degrees while still keeping within a weight limit which can be handled with a five-ton tractor. Comparison of the range of 20,000 yards of this new type with the war type range of 9000 yards gives a slight, though totally inadequate idea of the improvement. The 155-mm. howitzer is the companion piece to the 4.7-inch gun. Everyone is familiar with the excellent work done by the 155-mm. howitzer during the World War. But the Ordnance Department has increased the range of the World War type by nearly 4000 yards and has increased the field of fire to 60 degrees.

e. In Army artillery the development has been no less striking than in the calibers already considered.

In Antiaircraft Weapons.

a. During the World War a .30-caliber antiaircraft machine gun was used. By the end of the war these guns were becoming appreciably effective against low-flying airplanes. But since the war the Ordnance Department has developed a .50-caliber antiaircraft machine gun which, as compared with the war type, has the following advantages:

An increase in range of over 100%.

An increase in striking energy of about 500%.

An increase in visibility range of tracer ammunition of about 100%.

An increase in ability to pierce armor of about 100%.

These advantages have been obtained without appreciably decreasing the rate of fire.

b. An entirely new weapon, the 37-mm. Antiaircraft Automatic Cannon, is now under development. The first tests have been successfully passed. This gun promises a velocity of 3000 f/s, a possible vertical range of 15,000 feet with a visible tracer range of 10,000 feet. This piece should assist materially in solving the problem of defense against aircraft. However, the Ordnance Department is undertaking the development or improvement of still heavier pieces. Ground defense against aircraft can be further improved and brought to reasonable efficiency. Mobility is the greatest single asset of the Air Service, and in the interest of developing the full power of this service, it is vital that we develop ground defense so as to avoid tying our own Air Service down to the defense of localities against hostile planes.

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SELECTIVE SERVICE LAW

34. One of the principal personnel studies which the War Department had under consideration during the past fiscal year was that of providing the framework for a selective service system which could be placed in operation immediately upon the outbreak of any future major war. This study included consideration of the following subjects:

- (1) War-time demands upon available manpower.
- (2) Selective Service as affected by local mobilization.
- (3) Relation of the peace-time allocation of units of the Organized Reserves to the draft of personnel for such units in war.
- (4) Extent of operation and administration by states. Necessity for encouragement of peace-time study and cooperation of states in the development of plans for the system.
- (5) Revision of tentative Selective Service Law, and the Regulations to put it into effect, as result of opinions and recommendations obtained through contact with state and ex-selective service authorities.

35. It is incomprehensible that this country will depend upon voluntary enlistments for its future armed defense. At the same time, lack of legislation for selective service on the statute books may result in delay in action on the outbreak of war with serious injury to the national defense. The perfection of a plan for selective service in time of peace will permit of rapidity in the formation of our war armies, should we ever be called upon to organize them, with a resultant saving in time and, in all probability, in lives and treasure. The value of having the machinery of an approved selective service law ready to operate prior to the date of mobilization cannot be over-estimated.

ANTI-AIRCRAFT DEFENSE

36. It is regarded as of the greatest importance that the subject of the employment of means of anti-aircraft defense be fully investigated and the result brought to a definite conclusion. To this end the War Department initiated, during the past year, a general study designed to determine the general principles and policies that should govern anti-aircraft defense, and the application of these principles to problems involving the determination of the kind, quantity, distribution, organization, and employment of means for anti-aircraft defense. All Corps Area Commanders, the Department Commanders in Panama and Hawaii, the Commandants of the Army War College and the General Service Schools, and the nine Chiefs of Branches have been called upon for reports and recommendations. It is expected that these reports and recommendations on the important subject of anti-aircraft defense will have been fully studied and analyzed as the basis for a complete major project for the anti-aircraft defense of the United States during the coming fiscal year.

ARMY AND NAVY COOPERATION

37. The securing of the fullest cooperation between the Army and Navy in the preparation of defense plans is another very vital matter which has received most earnest attention. The past year has been characterized by a more complete and a better understanding between the two services in the solution of the many problems which have been referred to the Joint Planning Committee, which operates as an agency for the Joint Board. This Committee is composed of an Army section and a Navy Section, each of four officers, designated from the personnel on duty in the respective War Plans Divisions.

38. This Committee has operated effectively during the past year and has handled with dispatch a large number of problems of varied character involving matters of joint action, policies, or interests. This Committee has also afforded a useful contact between the War and Navy Departments.

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G. P. F.'s IN ACTION



RAILWAY GUN IN ACTION

EDITORIALS

Enlisted Specialists

IT is a well-recognized fact that many activities of the Coast Artillery Corps, meritorious and deserving and oftentimes of utmost importance to the entire Corps, silently do their part from day to day—modestly leaving the singing of their praises to be done by others. Hence these activities frequently fail to receive the recognition or to gain the appreciation that their merit deserves and, as a result, remain practically unknown to a great many officers whose aid and cooperation are essential for their complete success. It is the pleasure of the JOURNAL, from time to time, to speak a few words in recognition of these silent partners. Accordingly, on another page of this issue the JOURNAL offers to its readers a concise summary of the work of the Enlisted Specialists' Division of the Coast Artillery School.

Every day in every command we see the Coast Artillery Corps Non-commissioned Staff Officer displaying marked skill and efficiency in performing duties of the most technical character. We appreciate his value and we recognize his ability; but do we ever think of the source from which he came—the Enlisted Specialists' Division of the Coast Artillery School? Do we fully appreciate the fact that every year a certain number of our best Coast Artillery soldiers must be trained to fill the vacancies that will occur in the Noncommissioned Staff? It is from the commanders of batteries and of the higher units that this school must obtain its students, and upon the quality of the students so obtained must depend the quality of its graduates. It is to these commanders that the school must look in order that its graduates, upon return to their organizations while awaiting appointment to the Noncommissioned Staff, will be given the opportunity to obtain the practical experience essential for the highest development of their training as specialists.

The Enlisted Specialists' Division of the Coast Artillery School is one of the most constructive activities placed at the disposal of the Coast Artillery officer for the accomplishment of the technical training of enlisted personnel. The extent to which the facilities of this school are used is dependent upon a clear understanding of the scope and character of its various courses of instruction and a full appreciation of the value of this training. To all Coast Artillerymen the JOURNAL recommends a careful consideration of the facts set forth in the article on the subject in this issue.

Army Costs

[Reprinted from the *New York Tribune*]

Some confusion seems to exist as to the actual increase in army appropriations between 1914-15 and 1923-24. It arises chiefly from the fact that the War Department has always had charge of certain non-military expenditures and that the appropriation acts have been altered in form since the Federal budget system was adopted.

Fairly accurate comparisons are possible, however. The War Department act for 1922-23 appropriated \$355,723,000. Of this total only \$284,113,000 was for military purposes. The bill passed by the House of Representatives last year, for 1924-25, carried \$331,000,000, but of this only about \$258,000,000 was for military purposes. The non-military allowances were for rivers and harbors, national cemeteries, soldiers' homes, hospitals, and operation of the Panama Canal.

For 1914-15, under a different classification, Congress voted \$101,019,000 for the army, \$5,627,000 for fortifications and \$997,000 for the support of the Military Academy. This makes a total of \$107,643,000. Owing to the change in the classification this does not offer an accurate basis of comparison; fair estimate of the 1914-15 army cost might be above this figure, but it can be taken as approximate.

Powerful pressure exists for a reduction of army expenditure, and the department is said to have conceded a cut of \$7,000,000 to \$8,000,000, bringing next year's total down to about \$250,000,000. General Lord hopes to save more. The question is whether that can be done without crippling the army.

Since 1914 the strength of the regular establishment has been increased. It stands now at less than 125,000 men. Ten years ago it was below 100,000. The officers' corps has been enlarged, pay and allowances have been raised all along the line, the cost of supplies and operation has nearly doubled, the air service has been added, the chemical service is new, the artillery arm has been expanded and modernized, and state guards have been absorbed into a national defense organization.

An increase of maintenance charges from the neighborhood of \$107,000,000 ten years ago to \$250,000,000 now is not remarkable or excessive, under the circumstances. In the reorganization act of 1920 a new standard was set for the American army. The cost of that much needed reform has been extremely moderate. Our army is very small and inexpensive compared with the armies of other first-class powers. Charts published in the October issue of "Foreign Affairs" shows that in proportion to national wealth we spend in our army less even than disarmed Germany does. Our percentage is less than 8, Germany's is 10, France's 23.5, Japan's 32, the British Empire's 35, Italy's 39 and Russia's 62.

Army accounting and purchasing costs may be reduced by intensive budget methods. Some army activities, like those of the coast artillery, are becoming less important, and many of the forts in the United States are only military relics. But the present enlisted force is hardly sufficient both for overseas garrison and home police duty and for the maintenance of the skeleton national defense organization, which is indispensable.

The army is not an extravagance or a luxury. Money may be saved on it wisely in the bureau administration and civilian annexes. But the fighting force is well worth holding on to and paying for.

The Lost Rules of War

[Reprinted from the *Louisville Courier-Journal*]

"I have no faith in conventions which attempt to prevent the use of the most deadly weapons when nations are fighting for their existence," says Major General Sir Frederick Maurice, of the British Army, in an article recently printed in the *London Spectator* on "the lost rules of war"—a subject that has been alluded to in these columns of late by reason of the apparently inhumane methods employed by French and Spanish in their war against the Riffians, by France in its fight with the Druses in Syria and even by Britain on the Afghanistan frontier.

"It was Lincoln, whom few would dare to charge with inhumanity," General Maurice points out, "who urged McClellan that he should bombard Richmond; it was the German public at home which pressed Moltke to begin what he considered to be a premature bombardment of Paris. This pressure, to use every means to bring war to an end, has always come from behind the armies, and its tendency is to increase."

The reason why this tendency is increasing is that civilized nations realize that war has ceased to be a chivalrous thing and has become a brutal business enterprise. Kitchener deplored the fact that in the South African War the bulk of the British Army regarded the struggle as "an exciting adventure" rather than a business, that the officers treated the Boer War "like a game of polo, with intervals of afternoon tea." It is the people and not the professional soldiers, the argument runs, who have stripped war of its chivalry and made of it a calculating ruthless business.

The Army Probe

[Reprinted from the *New York Tribune*]

The recommendations in Secretary Davis' annual report all go to the question of maintaining at real efficiency the peace army as it was constituted by the reorganization act of 1920. If we are to live up to the 1920 standards it is unwise to indulge in economies which will mean only dangerous weakness and greater expense in the future.

The regular army is living for the greater part in temporary war barracks, which are hardly worth keeping in repair. They ought to be replaced by permanent barracks. Similarly, the army has been drawing for some years past on surplus war supplies from the war period. These are near exhaustion. It is better to face the fact that the army must be housed properly and that from now on military supplies will have to be accumulated.

Hawaii is not sufficiently protected for use as an advance naval base. It is the key to our position in the Pacific and ought to be made secure. Appropriations for the purpose will have to be increased. The Panama Canal Zone also requires better protection. It is now undergarrisoned and not sufficiently defended. The army air service will undoubtedly have to be expanded.

These things all fall in line with sound national policy—with reasonable national insurance. They are incontestably desirable in spite of the fact that they will cost money. The problem in Congress in dealing with the army is one of far-sighted adjustment of expenditure to purposes of genuine national defense, not of merely carrying along a depleted and crippled army organization.

The Army in Peace

[Reprinted from the *Manchester Union*]

Secretary of War Davis is doing an almost unprecedented work in popularizing the army with the people. While it is not now the custom of politicians to attack the army, it is not too often that anyone in print or on the platform says a good word for it. There used to be several things which the politician desirous of impressing his constituents could attack with entire safety. The Army was one, and many a thwack it received.

That day has passed. But the public does not yet understand that the army performs many functions besides making war or preparing for it. Mr. Davis asks the American people to bear in mind that the army built the bridge across the Mississippi, built the first wagon roads across the plains, that it even built railroads, including the New York, New Haven and Hartford and the Baltimore and Ohio. It has constructed our harbors, made our rivers navigable, even runs a barge line on the Mississippi which last year cleared two hundred and thirty thousand dollars. It dug the Panama Canal, freed Cuba and Panama of yellow fever, thereby showing how it could be banished from the world. It has made other medical and chemical discoveries of capital importance.

At this moment it is helping agriculture in spraying, using its chemical and air service in the work. It is always ready, in case of great dis-

aster, floods, conflagrations, earthquakes, tornadoes, bearing food, clothing, shelter, protection, medical services to the stricken community.

The army and navy perform services in the affairs of peace that justify their existence if they never had to strike a blow in war. It is fortunate that Secretary Davis has set himself the task of correcting ancient misconceptions of the army, has begun to instruct the people in what their army does in construction at home in peace as well as in destruction abroad in war.

Lessons of War

[Reprinted from the *Washington Post*]

"Previous to the passage of the National Defense act in the spring of 1916 we never had an adequate skeleton organization on which to build an army in case of war," says the *World's Work*. Since the world war this statute has been subjected to amendments incorporating the lessons evolved from our experiences in the great war and sponsored by General Pershing. The appropriations now barely meet the cost of putting this plan into operation. If they are cut we shall be in danger of mutilating the whole conception. When we consider the number of objects which are neither fundamental nor vital on which the Federal government spends money it would seem that our economy need not be used as an excuse to destroy the organization which was evolved by the best brains we created out of the expensive knowledge gained in the last war. The maintenance of the organization created by the National Defense act is not unduly expensive. Its re-creation, once it is allowed to lapse, will be infinitely expensive, especially if the re-creation is done in haste and stress.

In the history of the United States there has not been a man who has lived to be 40 years old who escaped living through a war.

<i>Name of War</i>	<i>Duration</i>	<i>Period of Peace to next war</i>
Revolution.....	1775-1781	31 years
War of 1812.....	1812-1814	32 years
Mexican.....	1846-1848	13 years
Civil War.....	1861-1865	33 years
Spanish War.....	1898	19 years
World War.....	1917-1918	

We entered each war with the minimum preparedness and the maximum expense. Every one was unnecessarily costly in men and money because of this. After every one the country has piously hoped that there would never be another war and promptly forgot everything possible. After the world war the National Defense act was passed and it seemed at last as if we were about to use our experience to create a skeleton

organization which could function effectively if history should be so unkind as to repeat itself. The repeated suggestion for cutting the army appropriations indicate that we are beginning to forget. If we destroy the present plan of defense by economy, and if we should have another war in 30 years, the men who learned about war in 1917-18 would be either dead or superannuated and what they learned would have been destroyed by savings—to the country's immense cost.

The R. O. T. C. Builds Straight Backs

[Reprinted from the *Chicago Tribune*]

Washington officials have issued denials that the administration's economy program would curtail next year's R. O. T. C. work in the high schools. The instruction will receive the same federal support that it has received this year, it is promised.

This is reassuring news, contradicting what we had been led to fear through reports that have come to us.

To lose the course of disciplinary training embodied in the program of the R. O. T. C. work, would be to lose something mutually valuable to the boy and to his country. We do not think that too much emphasis can be placed on the benefits to be derived from military training received during high school years.

As a military measure its value is unquestionable. Should a national emergency arise young men would be forced to take up arms anyway. The better for them and for the nation's safety if they have learned how to use those arms. As for the theory that military training breeds militarism and so causes wars, that is bosh. It was not militarism and standing armies that caused wars in Europe but economic necessity and imperialistic greed that caused militarism, standing armies, and wars.

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As for the boy himself, R. O. T. C. work strikes him where he is most receptive. Its mass activity appeals to him. Its uniform pleases his adolescent sense of grandeur. His habits are plastic and he learns the value of discipline and the force with which it endows groups of individuals. At the same time, he learns the importance of the individual in that group and so achieves a sense of responsibility.

His body is plastic and military training moulds it in the ways of health and strength. He learns to hold his head and chin up, square his shoulders, throw out his chest, and take a reef in his stomach. He learns how to hold his hands and how to walk.

The R. O. T. C. builds a race of straight backed men. Straight backs can carry heavier loads and travel farther. America needs straight backs.

PROFESSIONAL NOTES

The Department of Enlisted Specialists, Coast Artillery School

In reaching its present status as a self-contained technical school of recognized high rating, the Department of Enlisted Specialists of the Coast Artillery School has passed through numerous processes of formation.

Intermittent efforts to provide adequate systematic technical training for the specialist Noncommissioned Officers of the Artillery have frequently appeared in the history of that arm, but the genuine nucleus of the present system in the Coast Artillery Corps appears in the school for Electrician Sergeants established at Fort Totten, New York, in 1899. This was followed by the establishment of a school for Gunnery Specialists (Master Gunners) at Fort Monroe in 1903, and which was incorporated into the Artillery School at Fort Monroe in 1904 as the School for Master Gunners.

Upon this foundation, the Department of Enlisted Specialists of the Coast Artillery School was built in 1907, and in it was provided a course for Electrical specialists, one for Mechanical specialists, and one for Artillery specialists. The original course for Electrician Sergeants at Fort Totten, which had in the meantime suffered some of the usual growing pains, was consolidated with the Department of Enlisted Specialists in 1908.

From these early beginnings, the department has progressed to its present organization. Today it comprises an excellently equipped technical school in which three distinct and separate courses, (Artillery, Engineering, and Radio) are conducted. These courses are open to all enlisted men of the Coast Artillery Corps, who possess the qualifications necessary successfully to pursue the course of instruction. Candidates for admission to the various courses are required to pass an entrance examination in the following subjects:

- a.* Arithmetic.
- b.* Algebra, to include exercises and problems involving the solution of equations of the first degree containing two unknown quantities.
- c.* Composition and penmanship.
- d.* Spelling.

Entrance examinations are held at all Coast Artillery posts and stations in the United States beginning the first Monday in May.

SCOPE OF COURSES

The regular school terms begin September 15, of each year. Each course covers a period of thirty-eight school weeks. Thorough theoretical and practical instruction is given in the various courses as follows:

ARTILLERY COURSE.—Mathematics, to include algebra; plane, solid, descriptive, and coordinate geometry; plane and spherical trigonometry; logarithms; elementary mechanics and the mechanics of machines; orientation and seacoast engineering; plane and topographical surveying; ballistics and gunnery; photography and photo printing; artillery and position-finding materiel; mechanical and architectural drawing; map making; panoramic sketching; machine shop practice; and a study of shop methods.

ENGINEERING COURSE.—Fundamental principles of electricity and their practical application; use of electrical measuring instruments and devices; generators and motors, alternating and direct current; cable testing and general line work; construction, operation, and upkeep of fire-control systems, and the making of all ordinary repairs to electrical equipment in seacoast fortifications; installation and maintenance of fire-control cables; telephones and storage batteries; internal combustion engines and searchlights; interior and exterior wiring; cable splicing; machine shop practice; steam and gas power plant operation; the fundamental theoretical principles of radio communication and radio apparatus; instruction in driving and making minor repairs to motor vehicles.

RADIO COURSE.—Mathematics, to include simple equations in algebra, solution of right angles in trigonometry, and the use of logarithms; use of electrical measuring instruments and devices; alternating and direct current generators and motors; storage batteries; internal combustion engines; theoretical and practical radio telegraphy and telephony, including installation, maintenance, and operation of radio apparatus in fixed stations and in the field; visual signaling; communication with airplanes; radio laws and regulations; instruction in driving and making minor repairs to motor vehicles.

THE COAST ARTILLERY NONCOMMISSIONED STAFF

Graduates of the Artillery, Engineering, and Radio Courses are placed on an eligible list for appointment to the grade of staff sergeant, Coast Artillery Corps.

Graduates of the Artillery Course—Staff Sergeants (Artillery), (Master Gunners).

Graduates of the Engineering Course—Staff Sergeants (Electrical), (Electrician Sergeants).

Graduates of the Radio Course—Staff Sergeants (Radio), (Radio Sergeants).

As vacancies occur in the higher grades, staff sergeants are promoted by seniority, subject to examination, to the grade of technical sergeant, and technical sergeants are similarly promoted to the grade of master sergeant.

The following tabulation shows the present (June 10, 1922) monthly rates of pay received by Noncommissioned Staff Officers of the various grades, depending upon their years of previous service in the Army, Navy, or Marine Corps:

	<i>Staff Sgt.</i>	<i>Technical Sgt.</i>	<i>Master Sgt.</i>
Less than 4 years service.....	\$72.00	\$84.00	\$126.00
4 to 8 years service.....	75.60	88.20	132.20
8 to 12 years service.....	79.20	92.40	138.60
12 to 16 years service.....	82.80	96.60	144.90
16 to 20 years service.....	86.40	100.80	151.20
Over 20 years service.....	90.00	105.00	157.50

In addition to the rates of pay stated above, Noncommissioned Staff Officers are entitled to the usual allowances for clothing, subsistence, and quarters.

Noncommissioned Staff Officers are assigned to duty as follows:

STAFF SERGEANTS (Artillery).—In harbor defenses staff sergeants (Master Gunners) are assigned to duty under direction of the Artillery Engineer. These duties consist of photographic work; triangulation; drafting; preparation of tables, charts, and maps; computation of orientation data for seacoast guns; and such other technical artillery duties as may be assigned to them by harbor defense commanders. If assigned to regiments, their duties consist in assisting the orientation officer in making field surveys, locating positions for heavy batteries and their observation stations, computing ranges to assigned targets, laying out sidings and spurs for railway artillery, and other similar duties which may be assigned by regimental commanders.

STAFF SERGEANTS (*Electrical*).—Staff sergeants (Electrical) in harbor defenses or regiments are charged with the care, repair, and maintenance of the electrical installations, including telephone systems, searchlights, internal combustion engines, power plants, and such other duties of like nature as may be assigned them by harbor defense or regimental commanders.

STAFF SERGEANTS (*Radio*).—Staff Sergeants (Radio) are charged with the care, operation, and maintenance of harbor defense radio stations, or those aboard harbor boats, mine planters, and cable ships. When assigned to regiments, their chief duty consists in maintaining radio communication with other headquarters equipped with radio apparatus or with observation airplanes assigned to work with batteries firing at target practice or in action.

The contribution of the Department of Enlisted Specialists to the trained personnel of the Coast Artillery Corps may be indicated in part by the fact that from 1919 to 1924, inclusive, 493 students have been enrolled in its regular courses. Of this number 330 have graduated. Of those who failed to graduate, many have been returned to their organizations at least with some additional information and training of value.

Detailed information concerning the Department of Enlisted Specialists may be obtained from the Secretary, Coast Artillery School, Fort Monroe, Virginia.

Why I Like My Job

By CAPTAIN G. A. MOORE, *Cav.*

My job I like because it has no limitations, either in service to country, development of self, understanding of men. Than that of Army officer no profession is more ancient nor honorable. American officers must go ahead—or go out: that is the law. Beginning with entrance into service and running through school of branch, General Service Schools, and Army War College, where problems one step in advance of the most advanced university work are studied with the best civilian brains to polish off the courses, officers are continually under instruction.

Officers are teachers. Military art is for the purpose of conserving national life until it can live its ideal and give it to the race. In this crucible are fused the acmes of all arts, sciences and miscellaneous knowledge: when a nation's life is at stake, its all is offered; supreme coordination of potentialities is necessary. These things officers must at least learn to appreciate and, if possible, to use.

I like my job because I like peace. Preparedness means safety. I have a part in practical means to peace.

My job is democratic. I associate with all kinds of men, for in some component of the Army of the United States are found all kinds of Americans, either in Regular Army, National Guard or Reserves. We all obey the same laws.

From earliest service officers are in executive positions: this means necessity for initiative. My work is never monotonous; there is ever a new assignment to master. My duties take me to the ends of the earth.

Esteem for my profession gives me even in strange localities entrée to every activity, otherwise gained only by long residence. I must be healthy in mind, soul and body, to do my work. Outdoor sports, which demand wealth for others, are part of my life. I must take a month of vacation each year.

My boss is such by law, not because he possesses more than I: economic war does not disturb my mind. If I play squarely, old age is provided for.

I am proud of the Woods, Harbords, Butlers, Goethals, Hines', developed in and by military life, and now sought by their fellows for great tasks; there is no circumscription to what I might attain, in or out of the military.

Reserve Officers' 1925 Camp at Fort Terry, N. Y.



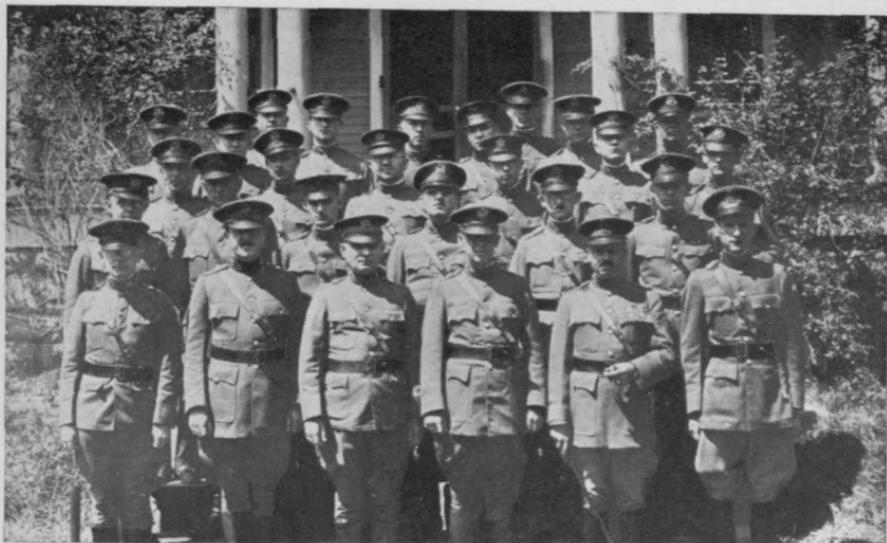
OFFICERS OF THE 544TH COAST ARTILLERY (A. A.)



FIRING THE ANTI-AIRCRAFT GUNS



TRACKING A BURST



OFFICERS OF THE 489TH F. A.

Citizens' Military Training Camp, Fort Adams, R. I.

JULY 1-30, 1925

The Fort Adams, Rhode Island, Coast Artillery Citizens' Military Training Camp started with the following students:

Basic	265
Red	110
White	36
Blue	17

Total 428

and ended with:

Basic	262
Red	110
White	33
Blue	18

Total 423

The reduction is accounted for as follows:

Dismissals:

Insubordination 1

Separations:

Illness in family 1

At request of parents 1

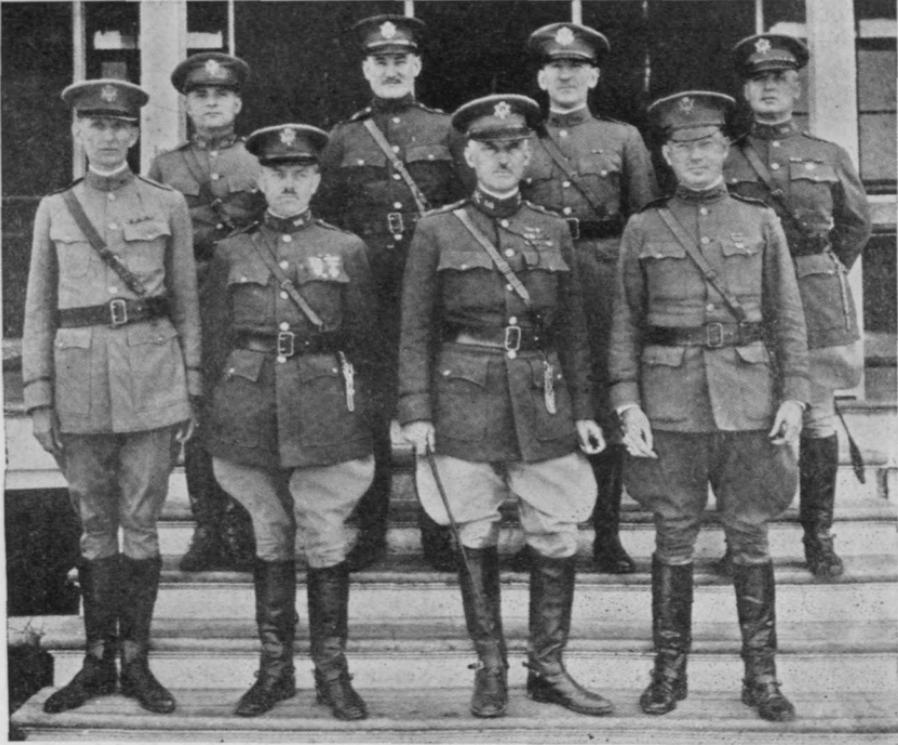
Physical disability 1

To join National Guard 1

Total 5

NOTE: One (1) White student was advanced to Blue student during camp.

The camp originally was intended to include some five hundred students but the quota was reduced in order to fill the other camps to be held during August.



Top Row (left to right): *Supply and Mess Officer*, Captain Berthold Vogel, 10th C. A.; *Camp Adjutant*, First Lieut. Chas. S. Denny, 10th C. A.; *Chaplain*, First Lieut. L. C. Harris, Chap.-Res.; *Plans and Training and Publicity Officer*, Captain R. J. Imparatoria, 10th C. A. Bottom Row (left to right): *Camp Surgeon*, Major R. K. Cole, Medical Corps; *Executive*, Major Roy S. Atwood, C. A. C.; *Camp Commander*, Lieut. Colonel S. G. Shartle, 10th C. A.; *Camp Inspector*, Major Francis J. Toohy, C. A. C.



ON THE MARCH

OBTAINING THE STUDENTS

The Commanding Officer of the Harbor Defenses of Narragansett Bay, Lieutenant Colonel Samuel G. Shartle, 10th Coast Artillery, made a vigorous recruiting campaign in Rhode Island for the purpose of stimulating interest. By addresses delivered by him and other officers of the 10th Coast Artillery, supplementary of course to the work of the Corps Area Citizens' Military Training Camp Officer and the Civilian Military Training Camps Association, the Fort Adams quota was the first to be filled and soon exceeded the necessary number by about twenty per cent. The Chamber of Commerce of Newport, Rhode Island, was drafted into this service and, by sending out letters to parents, advertising in the papers, and by direct personal



A 155-MM. G. P. F. IN POSITION

solicitation by a committee of prominent men, aroused the interest of the people. The Camp at Fort Adams has become an institution.

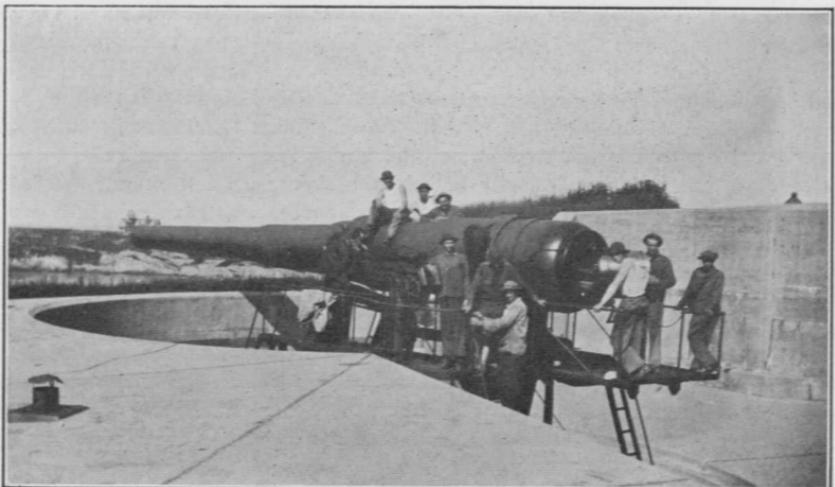
Typical of the general interest was the celebration on July 22, 1925, which has become known as "Army and Navy Day." In 1924 a similar celebration was held with great success and this year it was decided to continue. The publicity work leading up to this affair was entrusted to the Plans and Training Officer, who also acted as Publicity Officer for this special occasion. The Newport Chamber of Commerce, the Naval Training Station, and the Marine Corps Detachment at the Naval Torpedo Depot joined in the celebration. The results were beyond expectations. The weather was threatening and finally ended in a downpour, but nevertheless some seven thousand people attended and over twelve hundred cars parked in the parking spaces. If it had been a typical Newport day we would have been hard pressed to care for the crowd. Special busses were run from Providence, Fall River, and Newport, each bus displaying a large sign "Fort Adams." The Lieutenant Governor of Rhode Island and his Staff, United States Senators Gerry and Metcalf, Admirals Sims and Howard, General Parker, and many other notables attended. The Mayor of Newport, Hon. Mortimer Sullivan, and Congressman Clark Burdick also were present. The Navy Department was represented by Captains O. P. Jackson and E. B. Larimer. All the above constituted the Reviewing Party.



IN FULL RECOIL

THE CAMP ORGANIZATION

The student body on arrival were divided into four batteries,—“A,” “B,” “C,” and “D,” each in separate barracks, each in numbers proportionate to each course. Attached to these batteries were the cadres of the inactive batteries of the 10th Coast Artillery (members of Headquarters Battery, 10th C. A.). These cadres consisted of an acting First Sergeant, Supply Sergeant, Mess Sergeant, three Cooks, and approximately six men of other ranks. These four batteries were organized into a battalion, under the command of Major Earl H. Metzger, C. A. C. The Harbor Defense Staff operated as a Camp Staff—Major Roy S. Atwood, C. A. C., Executive; Major Francis J. Toohey, C. A. C., Inspector; and Chaplain Leonard C. Harris, Captain, Reserve Corps, being added.



WAITING FOR A CLEAR FIELD OF FIRE

TRAINING

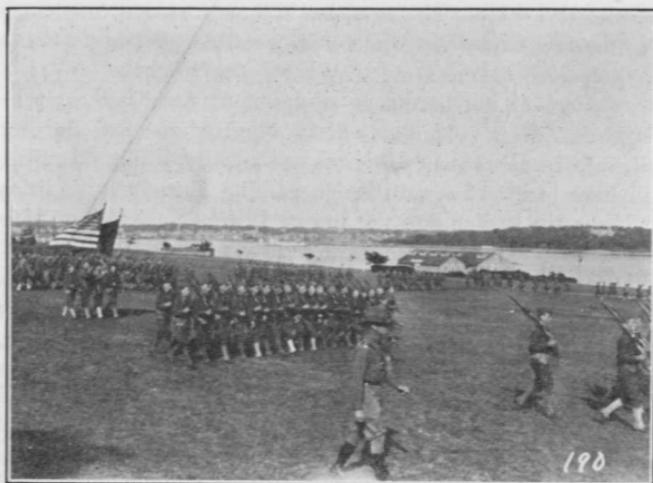
ARTILLERY

The work of students in artillery was very creditable. Batteries "A" and "B" combined to hold practice with 12-inch mortars. All positions at the guns and in the stations and plotting room were filled by students, supervised by the officers.



RECREATION

Battery "C" trained on 12-inch guns but, due to lack of ammunition allowance, did not fire them. This battery also trained on and fired 3-inch guns. The student personnel manned these guns completely. Battery "D" fired the 155-mm. guns with student personnel except the gun pointer.



PASSING IN REVIEW

INFANTRY

The training in Infantry was very broad and included quite a number of subjects. Special attention was given to precision in all movements. The first period each day was devoted to "Close Order Infantry Drill by Battery for Precision."

Conducive to this and to a homogeneous camp were the daily setting up exercises, ceremonies and drills, both by battery and battalion, rifle exercises, parades, and guard mounting—all with the band. A feature of this training was the student guard, strictly in accordance with the manual.

DISCIPLINE

The conduct of the students was uniformly good. Only one student was dismissed for misconduct. A high state of discipline was attained without apparent difficulty. This is attributed to the student guard, the pass system, battery competition and consequent *esprit*, and the general high class of the students.

RECOMMENDATIONS

1. Preparation well in advance in plans and supplies.
2. Camp set up with personnel on the ground at least two weeks before the opening of camp.
3. Instruction of camp personnel in preparation for their duties, especially the cooks and drill masters.
4. The continuous striving for a higher class of students,—keeping in mind the end sought to be attained—efficient officers.

Aerial Bombardment

The following remarks have been extracted from *Bombardment*, a text book in use at the Air Service Tactical School at Langley Field, Va. They are believed to be of particular interest to Artillerymen assigned to antiaircraft units:

During the World War the maximum ceiling of any type of bombing plane was not over 15,000 feet. It appears probable, however, that *in the future, daylight missions will be executed at a minimum altitude of 15,000 feet*. The increased efficiency of antiaircraft artillery and machine gun fire will have some tendency to force bombardment planes to seek higher altitudes, but the main reason for doing so will be to make attack by hostile aircraft as difficult as possible. Night missions will require a ceiling of at least 9000 feet to avoid the enemy searchlights.

The rate of climb of bombardment planes must be given careful consideration in their employment. As a rule they will be required to cross the lines at or near their ceiling. Since bombardment airdomes are usually within 35 miles of the front, the planes will have to spend some time in gaining altitude in addition to the time required to fly from the airdome to the lines. Light bombardment planes should be able to cross the lines at 15,000 feet within fifty minutes after take-off, and heavy bombardment at 9000 feet within 75 minutes after take-off. *If the planes cannot do this with a full load, commanders may be justified in reducing the weight of bombs carried in order to speed them up.*

Parachute flares are carried on bombing planes engaged in night missions. They are intended as an aid to flight, but they also offer possibilities in the illumination of targets in order to assist in accurate night bombing. It is also hoped that they may be used to blind the personnel of ground defenses, but so far the experiments conducted are not encouraging as to their efficacy along that line.

Smoke-laying devices are in an experimental stage. It is believed that they can be developed for successful use in screening bombardment and attack planes from ground observation prior to and during their attack. They may also be used to lay a curtain of smoke to assist in the operations of ground troops. This latter is an

auxiliary use and should be resorted to only under especially favorable circumstances and when other means fail.

THE WILL TO REACH AND DESTROY THE OBJECTIVE.— Most important of all in the training of the bombing crew is the inculcation of the will to reach and destroy the objective. Regardless of opposition by the enemy, it must find a way to reach its objective. Once there, it must hit that objective despite antiaircraft artillery or machine-gun fire or hostile aircraft. It must surmount every obstacle to accomplish its mission. *This, in fact, is the basic doctrine of bombardment aviation.* The defenses against aviation are numerous; their powers are real. *But no matter how numerous or how powerful they may be, they will not prevent bombardment from accomplishing its assigned missions.* The oldest fighting arm is the infantry. From the beginning of history, man's ingenuity has been busy creating defenses against its participation in personal combat. Modern weapons have set up what would appear to be insurmountable obstacles to such combat, yet an assault will often succeed, no matter how intense the machine gun fire which seeks to halt it, or how destructive the artillery barrage through which the infantry must advance. No greater determination, no higher morale, no more heroic personnel is required to bomb an objective despite all opposition than is displayed by infantry closing with the enemy in hand to hand combat. Bombardment will reach and destroy its objective.

Bombardment planes executing daylight missions fly in formation. The primary reason for this lies in the necessity of providing for tactical control, by means of which the actions of the individual teams may be coordinated and directed by a qualified leader and the offensive power of the planes may be utilized in a concentrated attack.

The use of formations complies with the Principles of War known as the Principle of Mass and the Principle of Security. The concentration of effort which a formation insures illustrates an application of the Principle of Mass, while the inherent defensive power of a formation illustrates the Principle of Security.

When a bombardment formation reaches its objective it must launch its attack with vigor and determination and complete it in the shortest time possible. It should take advantage of every opportunity to employ the element of surprise, such as by screening its approach behind clouds or by deceiving the enemy as to the intended target by feinting an approach on some other likely target in the same general locality or direction. The technique of the attack of any formation will vary with the nature and size of the target, with weather conditions, with the amount of resistance encountered during the attack from hostile ground and aerial antiaircraft defenses, and with the probable enemy aerial reaction after the attack. Ordinarily the nature and size of the target will have been considered in determining the size of formation to send against it, so that the size of the formation will generally suit the size of the target. It is the duty of group commanders to see to that, otherwise the total time of attack might be excessive. The effect of weather conditions and poor visibility is obvious, for full advantage will always be taken of clouds at favorable altitudes, just as allowance must be made for unfavorable conditions of visibility. The amount and accuracy of antiaircraft artillery fire will influence freedom of movement during the attack, and may determine whether the attack should be launched up or down wind. Obviously it will affect the altitude. If there is reason to expect that hostile pursuit aviation will be on the alert ready to take off as soon as the bombardment appears, it will be necessary to complete the attack and reassemble the formation before such pursuit can make its attack. If the enemy has his pursuit waiting over the target, bombardment's attack must be made in such a manner that the defensive

strength of the formations is not lessened. This may necessitate changing the intended method of attack; but it must not prevent the successful bombing of the target. Under all conditions the essence of attack is speed, so that, normally, a given plane or formation will make but a single trip over the target.

Ordinarily daylight attacks are made at the altitude which the formation has when it arrives at the target. When the altitude enroute is extremely great, and most daylight formations fly at or near their service ceiling, some of it may be lost just before the attack starts if greater accuracy in bombing can be gained thereby without at the same time causing too great an increase in danger of losses from hostile antiaircraft defenses. But during the attack the planes fly as nearly horizontal as possible, each element passing over the target at an altitude slightly higher than that of the element next in front in order to avoid disturbance in aiming due to propeller or bomb wash. Bombardment never makes a diving attack.

In night operations, missions are normally assigned to individual teams which are sent out alone at suitable intervals until the total number of bombs which it is desired to drop on the designated objective have been provided for. The planes must be routed carefully so that there will be no danger of collisions. Routes to and from the objective must not intersect. Direction of approach to the target and altitude, direction and duration of attack must be specified in the order for the mission and understood clearly by each team. Night bombing planes should cross the lines at as high an altitude as practicable, or as possible, in order to avoid being picked up by enemy searchlights. This will enable them to glide down onto their targets and at times actually release their bombs before the ground defense personnel is aware of their presence.

The employment of bombardment in formation at night is possible under certain favorable conditions, but it is not to be considered as the normal method. Practice and cross-country night formations have been flown successfully for several years, so there is no question but what night formations in peace time are possible. Their absolute value in time of war, however, has by no means been established and probably will not be determined until tried out against an enemy. The planes in the night formation are not able to support one another against pursuit attacks, which is one of the main reasons for a bombardment formation. They cannot avoid or escape from searchlights as well as a single plane and cannot deceive the sound ranging device by varying the sounds of their motors. They will probably scatter when they are caught in lights or attacked by pursuit or when they encounter bad weather, which will result in great confusion, loss of time and a lessened probability of successful completion of the mission by the individual planes.

During recent months there has been considerable discussion relative to the rôle of bombardment in seacoast defense. Boards of officers were appointed in Hawaii and Panama to investigate and report upon this matter. Their findings and conclusions were at variance and, as a result, inconclusive. The Hawaiian Board, known as the McNair Board, made extensive tests and forwarded voluminous data apparently showing that the accuracy and general effectiveness of a unit of coast artillery is materially greater than that of a comparable bombardment unit, from which it arrived at conclusions which may easily be interpreted as meaning that bombardment is of little or no value as a weapon for coast defense. This appears to be one of those absurdities sometimes arrived at even in mathematical calculations, for there can be no doubt that any weapon which possesses the power displayed by bombardment to sink and destroy naval craft with ease and despatch is, *ipso facto*, a potential weapon of seacoast defense.

The Panama Board, holding itself to the broader perspective, arrived at the conclusion that cooperation and mutual support between coast artillery and bom-

hardment is now essential to secure adequate coast defense, and that each arm has a definite function to perform in such defense. This, likewise, is the opinion of the Air Service.

The rôle of bombardment in the defense of our coast then is:

- a. To extend the danger zone for enemy naval craft to 150 or 200 miles from the coast.
- b. To make this danger zone a continuous band along the entire coast.
- c. To be directly responsible to the country for the defense of such coast line and adjacent waters as cannot be covered by the fire of the coast artillery.
- d. To render all possible assistance to the coast artillery in its defense missions.

Fire Adjustment for Antiaircraft Guns

By 2D LIEUT. JOHN E. REIERSON, C. A. C.

In nearly all the practices during these exercises the Trial Shot Problem has not placed the center of impact on the target and kept it there for any length of time due to the erroneous correctors obtained thereby. It is impossible to determine whether or not the bursts are short or over unless there is observation near the horizontal projection of the line of flight.

The writer is of the opinion that if three centers of impact differing by 65 yards and at the same altitude were used, a larger number of hits would be obtained; for 50 per cent of the bursts would fall in a vertical parallelogram whose sides are about 200 yards and 125 yards, respectively, and an average altitude of 100 yards; whereas with all guns shooting with the same corrector the bursts would fall on a curved line. (See Fig. 1.)

To fulfill the conditions of Par. 2, the procedure is as follows: fire the Trial Shot Problem and with the corrector obtained, use it on two guns and correctors differing by 2 therefrom for the other two guns. If the Trial Shot Problem Corrector is 36, two guns will use it; while the other two guns will use 34 and 38, respectively. Using differences of 2 on the correctors the differences in slant range would be about 65 yards between the centers of impact except the two using the Trial Shot Problem Correctors. The bursts are brought to the same altitude by using the "method of eliminating errors in elevation"; that is, we add algebraically to the arbitrary corrections tabulated on each 0.5-second fuse range curve an angle which will bring the "34 corrector burst" to the same altitude as the "36 corrector burst"; the same is done with the "38 corrector burst."

For example the fuse sent to the guns is 10 and the quadrant elevation is 500 mils. The arbitrary correction (decreasing fuses) for this range curve is -70 on No. 1 gun, which is using corrector 38. The angle to be added to the quadrant elevation of the 36 corrector burst (No. 1 gun) is found as follows:

- a. Get the angle of site and altitude for $i = 500$, $B = 10$, from the Tables of Fuse Setting.
- b. Enter the chart with this altitude and angle of site and locate the burst for the Trial Shot Corrector (36); also get the slant range.
- c. Draw a horizontal line 125 yards long through this point on the trajectory with its mid-point on the point determined.
- d. From either end of this line draw a perpendicular BV to GO (the slant range) and this perpendicular will subtend the angle, at the slant range determined in Par. b., which must be added and subtracted to the arbitrary corrections on the fuse range curves of No. 1 and No. 4 guns respectively.

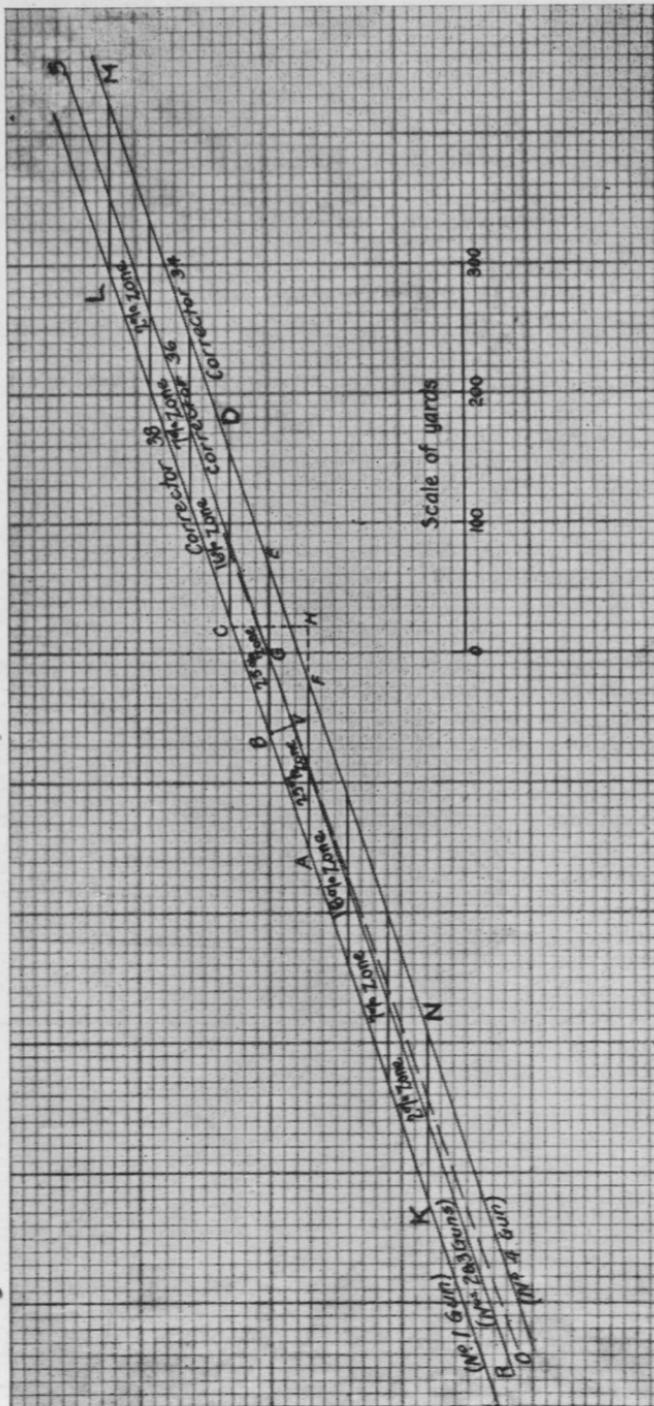


FIG. 1

RS, KL = Vertical projections of all trajectories in the "Vertical" plane of No. 1 trajectory. The vertical plane of these trajectories practically coincide for the entire 50% zone ACDF, thus actually giving a vertical parallelogram of dispersion.

- G = CI of "Corrector 36" bursts and the data i = 500 (S = 438,
- B = 10, VD = 300)
- B = CI of "Corrector 38" bursts and data i = 505 (S = 440,
- B = 10, VD = 300),
- E = CI of "Corrector 34" bursts and data i = 495 (S = 436,
- B = 10, VD = 300),

- RS = Vertical projection of "Corrector 36" trajectory.
- KL = Vertical projection of "Corrector 38" trajectory.
- MN = Vertical projection of "Corrector 34" trajectory.
- 0.3 = Probable Error of Fuze.
- 0.2 = Difference in Correctors.
- AB = BC = 96 yards,
- BC = GE = 65 yards,
- CH = Altitude = 75 yards,
- BV = Perpendicular to line GO.

GO = Line from G to guns	$i = 500$
B = 10	Y = 1692 yards = altitude
BV = 30 yards	Slant Range = 4100 yards
Angle of Site = 438 mils	

Angle BOV (for these data) = $30/4.1 = 7$ mils
+ 70 = Arbitrary correction on ten-second curve (D. F.) gun No. 1
- 80 = Arbitrary correction on ten-second curve (D. F.) gun No. 4
∴ + 70 + 7 = + 77 = corrected arbitrary correction, gun No. 1
- 80 - 7 = - 87 = corrected arbitrary correction, gun No. 4
500 + 7 = 507 = elevation for gun No. 1 in mils
500 - 7 = 493 = elevation for gun No. 4 in mils

This angle should be determined for every 0.5 second of fuse range for every 100 mil trajectory. The angles for any 100 mil trajectory are used only for elevations \pm fifty mils therefrom; for example: angles would be determined for say 500 mil trajectory for every 0.5 second fuse, and these angles would be good for all trajectories of $i = 450 - 550$.

An altitude and corrector correction can be made during the firing by putting an arbitrary correction for altitude on the R. A. corrector and by sending "Corrector up (or down) X" to the fuse setters; however with the above method it is believed that these corrections will not be necessary.

The centers of impact of the trajectories can be placed in any position in the vertical plane desired with the above method; for example, on the corners of a parallelogram of any size or shape.

Defenses of Key West, Florida

Key West Barracks and Fort Taylor are located on the island of Key West, at the extreme southern tip of the State of Florida, 60 miles southwest of Cape Sable. The island itself is four and one-half miles long and one mile wide, and its formation is primarily coral. Its highest point lies but ten feet above sea level.

From the time of the first visit of Ponce de Leon until the cession of the Floridas to the United States the many small islands were resorted to only by aborigines. Of the occasional presence of these we have evidence in the works of ancient fortifications or mounds of stone formed in various localities, in one of which, opened some years since, human bones of a large size were discovered; and tradition has in addition brought down to us notices of them which deserve all the credit conferred upon the same authority in other parts of the country.

Previous to 1820 Key West was, because of its peculiar position, a rendezvous of pirates and other lawless characters. The first permanent settlers were a few emigrants from New York and several fishermen of the Bahamas. A legend of the extermination of several Indian tribes at Key West is current in Florida, when, a feud arising about the beginning of the 18th Century, they were driven from island to island until they could go no farther. What few survived escaped in canoes to Cuba. The bones of the dead, having been left unburied, led to the designation "Cayo Hueso," or Bone Island, later to be corrupted into the name Key West.

Key West was granted to Juan P. Salas on the 26th of August, 1815, for military services he had rendered to Spain. In December, 1821, he sold the property to John W. Simonton of Mobile, Alabama, for \$2000.

Following the cession of Florida to the United States, Lieutenant M. C. Perry, U. S. Navy, commanding the schooner *Shark*, received orders to visit and examine the island and harbor with a view to determining its military qualifications, as well as

formally taking possession of the territory in the name of the United States. The ceremony proclaiming American sovereignty and the raising of the Stars and Stripes was witnessed by the few residents on March 25, 1822. The island was named Thompson's Island, and the harbor Port Rogers, in honor of the Secretary of the Navy and the President of the Navy Board.

The first troops arrived in February, 1831, consisting of two companies of Infantry under Major James M. Glossell. The erection of buildings for the accommodation of the troops, on two acres of land which were purchased in the north-eastern section of the city of Key West, was quickly accomplished. Subsequent garrisons consisted at different times of Infantry and Artillery. A permanent Artillery garrison was established January 25, 1893.

The construction of Fort Taylor was begun in 1845, but so much of the work that had been completed by October, 1846, was washed away as a result of the disastrous



OLD FORT TAYLOR

hurricane of that year. Although interrupted, the construction was not suspended, and was so far completed as to be available for occupation of troops from 1861 to 1865. During this period it was strongly garrisoned by Union soldiers and, although at the beginning of the Civil War the Confederates attempted to seize the post, they were successfully resisted by General William H. French. Some military distinction and importance was gained by the fort during the Seminole and Mexican Wars, although no engagements took place there. Originally an enclosed work, the old fort has since been partially demolished due to the erection of new batteries.

The post was named in honor of Major General Zachary Taylor, in compliance with G. O. No. 38, Army Headquarters, November 4, 1850.

Situated on the southwestern edge of the island and entirely surrounded by water, Fort Taylor is connected with the land only by a wooden bridge about 300 feet long. Key West Barracks are located one mile from the fort, on the northwest side.

An interesting extract from the report of Assistant Surgeon William F. Cornick, in 1870, gives an idea of the complete isolation of Key West at that time.

Medical supplies are obtained once a year. About a year's supply is now on hand. Communication with the nearest city is by water or telegraph; the former is very irregular, being liable to interruption from heavy winds. The mails are, therefore, sent once a week, sometimes once a month. In winter time we always get one mail a week, but in summer we have to wait sometimes a month or six weeks, which delay also regulates the length of time required to transmit communications to department headquarters and to Washington.

The general sanitary condition of the post is good, and this is as healthy a station as there is on this coast. The quarters and barracks are well furnished with good and substantial furniture, which can be procured on the island. The average price of milk is \$1 per gallon; butter 60 cents per pound; eggs from 75 cents to \$1 per dozen; chickens from \$5 to \$10 per dozen; potatoes from \$3 to \$10 per barrel. The commissary department is supplied from New Orleans, Louisiana, and the length of time it takes to get the stores from there makes it impossible to have the necessary fresh vegetables. Very many of the stores are always spoiled before they are received at the post.

Good water for drinking purposes was extremely hard to get. Although a few wells were dug in the rock, the water proved brackish and unfit for other uses than washing. There were a few ponds on the northeast side of the island, but as they dried up in early summer, the rains had to be relied upon, the water being conducted from the roofs into cisterns and stored for use during the dry seasons.

Fortunately, such conditions have long since been changed, and Key West is an ideal spot for the soldier. All year 'round bathing and fishing facilities are available, and trips can be made by boat to Havana, ninety miles away, or by rail to cities in Florida.

While Fort Taylor is not garrisoned at present, it is completely fortified with modern guns and equipment. Key West Barracks is garrisoned by Battery E, 13th Coast Artillery, and detachments of the Medical, Ordnance and Quartermaster Corps.

65th C. A. Antiaircraft Record

Battery B of the 65th Coast Artillery, stationed at Fort Amador, Canal Zone, established a record on November 27, 1925, by bringing down a towed sleeve target with the first round fired by the battery for the day. The target was being towed by a Martin bomber at a distance of 4500 yards above the canal at the Culebra Island battery when No. 4 gun, a 3-inch A. A. gun, model 1917, on a railroad mount, was given the command to fire one round. The gun responded, and coincident with the burst the sleeve was seen to be falling into the canal, the observing plane reporting the burst as target. The next firing took place on December 1, 1925. This time the target was shot down after the fourth burst from all guns, which, although not as good as getting the target on the first shot, is considered also good shooting for this type of artillery.

This is the first time on record that a sleeve target has been brought down with the first shot and, although remarkable in itself, shows the accuracy and effectiveness of which antiaircraft fire can be delivered by a well-trained section. Battery B is the holder of the department commander's trophy for antiaircraft fire on the Canal Zone and has averaged twenty-five per cent hits on all its firings to date. Sergeant Belk was gun commander of the record gun. The battery officers are First Lieutenant John M. Moore, commanding, and Second Lieutenant Harold J. Conway, 65th C. A. The 65th Coast Artillery is commanded by Major H. R. Oldfield, 65th C. A.—*Army and Navy Register*.

George Washington at Valley Forge

Twenty miles to the northwest of Philadelphia is a tract of land that has been converted into a spacious park. Thousands of persons visit it each year, but beginning June 1, 1926, when the Sesquicentennial International Exposition opens in Philadelphia, it is expected to prove a mecca for visitors from all parts of the country.

The tract is Valley Forge, where during the winter of 1777-78 Washington and the Continental Army encamped and endured hardships and intense cold in the cause of liberty.

Valley Forge has become one of the greatest shrines of American patriotism. Its roads and lawns are well kept now, and monuments to the brave men who suffered there dot the landscape, but in spite of this the ground is much the same as it was when Washington and his troops were encamped there.

The Schuylkill River still flows by in imperturbable serenity, and Valley Creek still ripples past the grey stone building that was Washington's headquarters.

Midway up the valley of the creek, a half-mile from the river into which the creek flows, is a small building which, before Revolutionary days, was occupied by a blacksmith and an iron founder. Valley Forge gets its name from this old building.

The forge is reputed to have been the first built in the province of Pennsylvania. Further up the stream is a grist and saw mill. The British, prior to their occupation of Philadelphia in 1777, burned the saw mill, but permitted the forge to remain unharmed, believing that they might be able to put it into use for the casting of cannon and other war-time metal working pursuits.

The story of the winter of 1777-78 at Valley Forge is one of dreadful hardships borne with unconquerable spirit. There was a desperate shortage of clothing and food, and many of the Continental soldiers were forced to go without shoes.

Somehow, by bravery, self-sacrifice, endurance and fortitude the dreadful winter months were passed. Spring approached and the men became cheerful. Then came the news that the British had evacuated Philadelphia. On June 21, 1778, the little army crossed the Delaware in pursuit of the invaders, who were hurrying to New York. They fell upon them in upper New Jersey and the Battle of Monmouth followed.

Thus ended the occupation of Valley Forge, but the park which now marks the spot of the historic encampment will remain as a perpetual reminder of the heroic sacrifices of Washington and his men.

A PERFECT OFFICER

He who combines the genius of the general with the patient endurance, both mental and physical, of the private; who inspires confidence in himself and in all under him; who is at all times the gentleman, courteous alike to inferior, equal and superior; who is strong and firm in discipline, without arrogance or harshness, and never too familiar towards subordinates, but to all is the soul of courtesy, kind, considerate and just.—*Alexander Hamilton.*

MILITARY NOTES

furnished by

THE MILITARY INTELLIGENCE DIVISION, G. S.

France

ORGANIZATION OF FRENCH CAVALRY.—The French Army has five divisions of Cavalry numbered 1, 3, 4, 5, and 6. These five divisions have the following composition:

- 1 group of motorized machine guns,
- 3 brigades of cavalry of 2 regiments and 1 troop of motorized machine guns,
- 2 groups of horse artillery of 3 batteries each,
- 1 group of chasseur cyclists.

In addition to the organized cavalry divisions, there are five groups of non-divisional cavalry of four regiments each, excepting the third group which has only three regiments of cavalry.

Argentina

ARMY MANEUVERS.—The General Staff of the Army, under the direction of the Inspector General, Major General Jose F. Uriburu, is preparing plans for maneuvers on a large scale to take place in October in the Province of Cordoba as a final course of training for the present class of conscripts now under training prior to their demobilization in November.

Since 1914 the Army has had no opportunity to have large maneuvers on account of lack of appropriations donated by Congress, and it is especially desired to have maneuvers this year to try out the new army organization, and the new system of tactics utilized during the World War.

It is intended that troops of the 1st, 2d, and parts of the 3d and 4th Divisions will concentrate in the hilly and wooded country, which contains many rivers, in the Department of Colamuchita in Cordoba. The maneuvers will take place between October 15 and November 15, the first ten days being devoted to the concentration of troops, and the remaining twenty days will be tactical maneuvers in which certain divisions will be lined up against others.

It is also planned to complete a provisional division on a war footing in order that the chiefs of the units may practice their particular parts in combat. For this purpose it will be necessary to create new units such as Sanitary Units, Divisional Communication units, field hospital units, remount the regiments on a war footing, organize air units, repair shops, ammunition and fuel dumps. All this organization has been thoroughly planned out by the Inspector General, General Staff, the Director of Arsenals, Administration Department (Q.M.), Director of Remounts, and the Surgeon General to provide the necessary personnel at as low a cost as possible. The necessary arrangements are being made with the railroads in order to furnish the transportation needed and determine the train schedules.

It is calculated that between 10,000 and 12,000 men will be present at the maneuvers with all the different services complete and on a war footing, and to have as large a number of senior officers of the army present as possible in order to gain the greatest amount of experience with troops in campaign.

A general survey has been made of the proposed maneuver grounds to determine the character of the drinking water, and all-round conditions as far as the health of the troops is concerned.

It is expected that these maneuvers will put the finishing touches on the courses which have been taught at the various service schools during the present year.

The plans are contingent on whether or not Congress appropriates the necessary funds to cover the cost, but it is practically assured that the money will be forthcoming and that the maneuvers as planned will be held this year.

Ireland

THE IRISH FREE STATE ARMY.—Though few in number, the Irish Free State Army is a well organized and efficient force.

The present force dates back to December, 1921, when the Anglo-Irish Treaty was signed. It consists at present of some seventeen thousand of all ranks headed by a General Staff and two departments, the Adjutant General's and the Quartermaster General's.

The combatant arms and auxiliary branches consist of infantry, artillery, cavalry, an Engineer Corps, Air Force, a Signal Corps, Medical Service, an Armored Car Corps, a force of Military Police, and an Army Supply and Transport Service.

The infantry uniform is a dark olive green in color, accouterments are black web, and both rank and file wear leather puttee leggings.

Italy

DISCHARGE OF THE 1904 CLASS.—The Ministry of War, on September 4, 1925, ordered the discharge of the 1904 class which began its term of service with the colors on April 23, 1924.

The entire class must be discharged not later than October 20, 1925, except those individuals who entered the service later than May 20, 1924. The latter will be discharged upon completion of seventeen months' service.

The strength of an army, like the power in mechanics, is estimated by multiplying the mass by the rapidity; a rapid march augments the *morale* of an army, and increases its means of victory. Press on!—*Napoleon.*

COAST ARTILLERY BOARD NOTES

Communications relating to the development or improvement in methods or materiel for the Coast Artillery will be welcome from any member of the Corps or of the Service at large. These communications, with models or drawings of devices proposed, may be sent direct to the Coast Artillery Board, Fort Monroe, Virginia, and will receive careful consideration. R. S. ABERNETHY, Colonel, Coast Artillery Corps, President Coast Artillery Board.

Projects Initiated During the Month of December, 1925

Project No. 419, The Stephens Predictor.—Technical Sergeant Thomas J. Stephens, Coast Artillery Corps, has designed a predicting device which is believed by the Coast Artillery Board to be superior to any one of the numerous devices at present in use. The Coast Artillery Board has recommended that a small number be constructed by the Ordnance Department and subjected to service test.

Project No. 420, Use of Repeating Coils with Mobile Heavy Artillery.—Four modified repeating coils were sent to the Coast Artillery Board by the Chief Signal Officer for tests to determine whether or not repeating coils will be practical for simplifying mobile artillery field wire telephone lines.

Project No. 421, Horvath Mechanical Data Computer for Sound Ranging.—A mechanical plotting board, the description of which was sent to the Coast Artillery Board by Mr. Horvath through the American Military Attaché in Hungary. This device is now being considered by the 1st Sound Ranging Battery at Fort Eustis.

Project No. 422, Locomotives for Railway Artillery.—The Commanding Officer, 602d Coast Artillery, has suggested that the matter of the study of internal combustion locomotives, and especially oil-electric locomotives, be presented to the Chief of Coast Artillery with a view to its being made a Coast Artillery Board project. In the opinion of the Coast Artillery Board it does not seem desirable to equip railway artillery with locomotives of an experimental, semi-experimental, or special type, and that, in general, railway artillery motive power should follow standard commercial practice.

Project No. 423, Revision of Bulletins on Antiaircraft Sound Ranging (Single-Station System).—The Chief of Coast Artillery has directed the Coast Artillery Board to prepare the text of a bulletin which will be a revision of the Bulletins of November 1, 1924, and April 10, 1925, on Aerial Sound Ranging, and which will contain a description of the single-station angular travel method.

Project No. 424, Aerial Spotting and Communication from Spotting Plane to Ground.—The Coast Artillery Board has been directed by the Chief of Coast Artillery to investigate and recommend a method of aerial spotting and a simple code for transmitting spotting data from plane to ground.

Project No. 425, Modified Range Correction Board, Model 1923.—The Coast Artillery Board has designed a modification of the Range Correction Board, Model 1923, which it believes possesses many advantages over the unmodified Range Correction Board, Model 1923, and the Pratt Range Board, especially in that it is very much more compact. The Coast Artillery Board has recommended that a limited number be manufactured and submitted to service test.

Project No. 426, A Study of Results of Service Test of Fire-Control Materiel for 155-mm. Batteries.—Coast Artillery Board Project No. 75 (See COAST ARTILLERY JOURNAL for August, 1924) contained an outline of the recommendations of the Coast Artillery Board for the fire-control materiel to be supplied to 155-mm. batteries of Coast Artillery. During the year 1925 service tests of the materiel were conducted in the 51st, 55th, and 59th Regiments of Coast Artillery, and reports and recommendations submitted to the War Department. These reports were referred to the Coast Artillery Board for study and further recommendation.

Project No. 427, Effect of Horizontal Distance on Antiaircraft Ballistic Wind.—The Chief of Coast Artillery has directed the Coast Artillery Board to carry out a program of ballistic wind tests to obtain a comparison of ballistic winds at Fort Monroe and Fort Eustis. The purpose of the tests is to determine whether it is necessary for each separate Antiaircraft Battalion to be equipped with meteorological equipment or if satisfactory ballistic wind data can be obtained from the nearest meteorological station.

Project No. 428, Traversing Mechanism of 240-mm. Howitzer Replaced for All-Round Fire.—In order to permit quick large changes in azimuth, the Coast Artillery Board recommended that, for the fixed 240-mm. howitzers, a quick release mechanism be designed by the Ordnance Department and submitted to test.

Project No. 429, Firing Tables for 6-inch Gun, Models 1897 MI, 1908, 1908 MI, and 1908 MII.—These tables, with minor changes, were found satisfactory for publication by the Coast Artillery Board.

Completed Projects

Project No. 393, Proposed Fire-Control Equipment for 14-inch Railway Guns, Model 1920 MII

I—HISTORY OF THE PROJECT.

1. The following is quoted:

1. It is desired that you submit a proposed list of the fire-control equipment for the 14-inch Railway Gun, which is to be shipped to the Coast Defenses of Los Angeles in the near future. Your attention is invited to the fact that a training regulation for the 14-inch Railway Gun is now being prepared under the direction of the Commandant, Coast Artillery School.

2. Your recommendations of the above subject should be in concurrence with the text of that training regulation which may pertain to fire control equipment.

2. The Coast Artillery Board made a study of the fire-control equipment required for the 14-inch Railway Gun, and conferred with the officers preparing the training regulations for this gun.

II—DISCUSSION.

3. The training regulation for the 14-inch Railway Gun has not as yet been developed to such an extent as to influence the choice of fire-control equipment.

4. The Coast Artillery Board believes that the fire-control equipment provided should permit of firing the gun from a concrete platform against either fixed or mov-

ing targets by either Case II or Case III, and from railway track against fixed targets by Case III. It is understood that this gun is provided with:

Azimuth Scale,
 Quadrant and Range Scale,
 Telescopic Sight, Model of 1923,
 Panoramic Sight, Model 1922-E.

The Coast Artillery Board believes it desirable that an aiming rule and sight be provided for use in firing from railway track against land targets.

5. The Coast Artillery Board believes that this 14-inch Railway battery must be prepared to act independently and should be provided with all instruments necessary for establishment of base lines and orientation.

6. The Coast Artillery Board considers that the apparatus here listed should be provided for the fire-control and position-finding system for the 14-inch Railway Gun, Model 1920 MII.

A. Fire Control

- 1 Cloke Plotting and Relocating Board, complete,*
- 1 Pratt Range Board,*
- 1 Wind Component Indicator,*
- 1 Prediction Device (either a pantograph, a device to be constructed locally, or predicting scales. Predicting scales can be furnished by the Coast Artillery Board),
- 1 Range Percentage Corrector, Δ
- 1 Interpolator, range or elevation (described in COAST ARTILLERY JOURNAL, August, 1925), Δ
- 1 Coast Artillery Board Universal Deflection Board, Δ
- 1 Angular Travel device,
- 1 Impact Board,* Δ
- 1 Spotting device (to be constructed locally),*
- 1 Special data display board at each gun (to be constructed locally),
- 1 Aiming rule with sight, per gun.
- 5 Azimuth instruments, Model 1910, complete with tripods,
- 2 Megaphones,
- 1 Field Glass, Type EE,
- 2 Thermometers, mercurial, Fahrenheit.

Articles marked "*" are described in TR 435-221.

Articles marked " Δ " should be of Arsenal construction if funds are available. They can be constructed locally if necessary.

The Coast Artillery Board believes that ultimately there should be provided, for emergency use, one self-contained horizontal-base range finder, of type yet to be determined.

The following can be supplied by the Coast Artillery Board, upon receipt of information as to weight of projectile; muzzle velocity; unit of elevation (yards, degrees, or mils); unit of azimuth setting (degrees or mils):

- (a) Range correction chart.
- (b) Deflection correction chart.
- (c) C. A. B., Universal Deflection Board, description and drawing.
- (d) Angular travel device, drawing.
- (e) Range elevation scale.
- (f) Range percentage corrector, drawing.
- (g) Impact Board, drawing.
- (h) Wind Component Indicator, modified scale.
- (i) Range Board ruler percentage scale.
- (k) Interpolator, range or elevation, drawing.
- (l) Interpolator, blue print scale.
- (m) Deflection Board, azimuth scales.
- (n) Data display board, sketch.

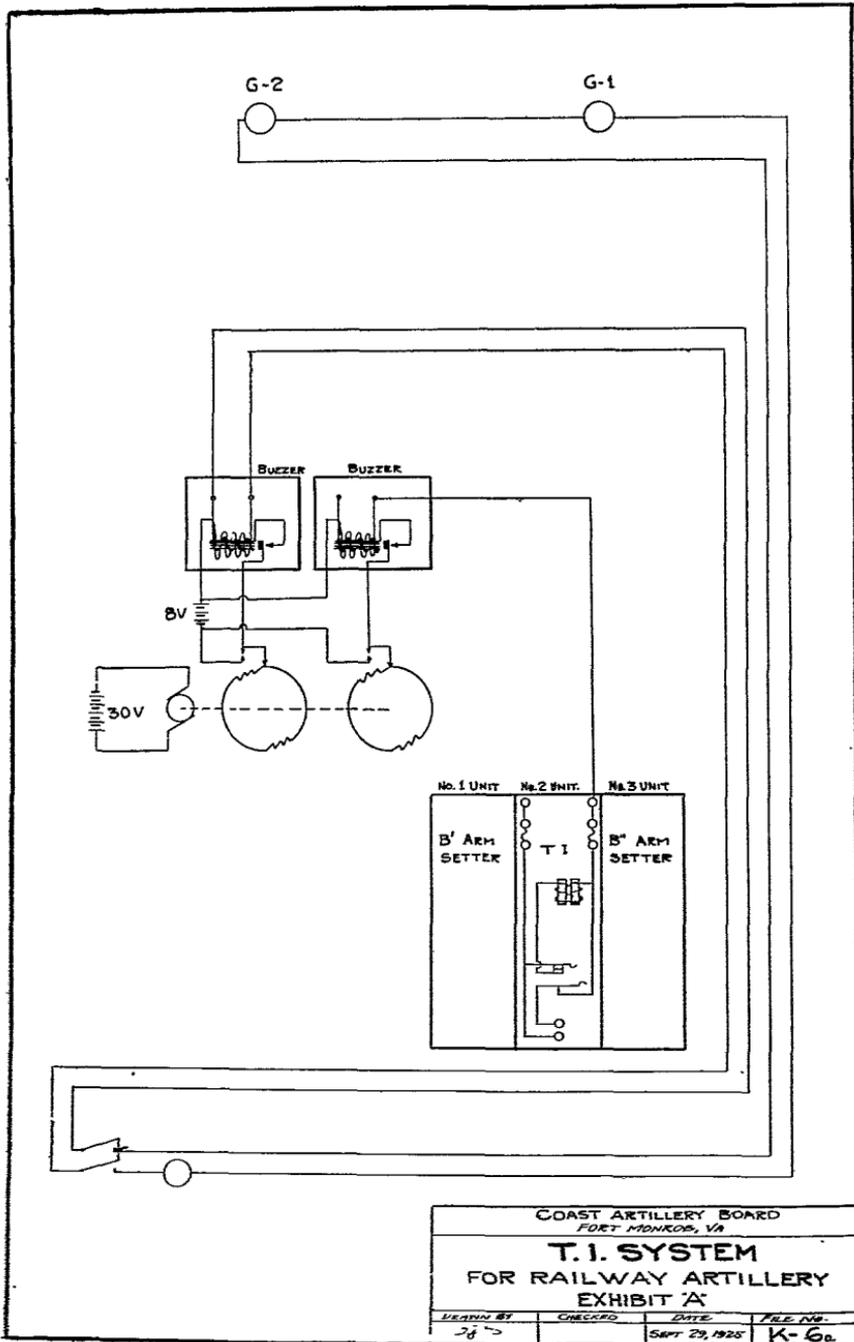


FIG. 1

B. T. I. System

(1) If the regular Harbor Defense T. I. system is available for use with this battery it is recommended that it be used until such time as a suitable T. I. system for mobile artillery shall have been developed.

(2) The following improvised T. I. system, using the motor-driven chronograph, is recommended for use in case it is impracticable to use the present installed system:

(a) Use two service buzzers, the primary of each being in series with two discs of the T. I. apparatus; one buzzer to be used for observing signals and the other for firing signals.

(b) The observing signals are impressed on the arm setters lines by running one side of the secondary winding of the buzzer to the second unit of the monocard switchboard. Units No's. 1 and 3 are used for the arm setter's telephones. By means of the cords on the arm-setter units of the switchboard, connection can be made to any two of the various observing stations that may be connected to the switchboard.

(c) The firing signal is produced by using watchcase telephone receivers in series at each gun and B. C. Station, with the secondary of the firing-signal buzzer of the T. I. apparatus. A D. P. S. T. switch is provided in the B. C. Station, which when closed will send the firing signal to all guns. Diagram illustrating the method of connecting up the T. I. apparatus is attached hereto and marked Figure I.

(3) The following equipment is required for the T. I. system described above:

- 1 T. I. apparatus, type EE-56.
- 2 Service buzzers, type EE-63.
- 1 30-volt storage battery for operating T. I. motor.
- 1 8-volt dry cell battery for energizing primaries of buzzers.
- 1 D. P. S. T. switch in B. C. Station for firing-signal control.
- 3 Telephone receivers, watchcase, for use as firing signals.

(4) One set, battery charging, type SCR-120, is required for charging storage batteries and providing power for lights.

C. Telephone and Radio Equipment

(1) The following telephone communications are required for a battery of railway artillery:

- (a) One data line from plotting car direct to display boards at guns.
- (b) One tactical line from plotting car direct to guns.
- (c) A line from each of the plotting board and spotting board arm setters to the battery monocard switchboard.
- (d) A data line from each observing and spotting station to the battery monocard switchboard.
- (e) A tactical line from plotting car to observing stations.
- (f) A line direct from plotting car to battalion switchboard.
- (g) A line direct from plotting car to the battery radio station.

(2) The following telephone and radio equipment is required for these communications:

- (a) 1 Monocard switchboard, type BD-11.
- 1 Monocard switchboard operator's set, type EE-64.
- 2 21-pair terminal strips.
- 1 21-pair terminal box to be installed on the outside of plotting car.
- (b) Telephones:
 - 3 for each gun.
 - 2 for each observing station.
 - 1 for each spotting station.
 - 9 in plotting car.
 - 1 for radio station.

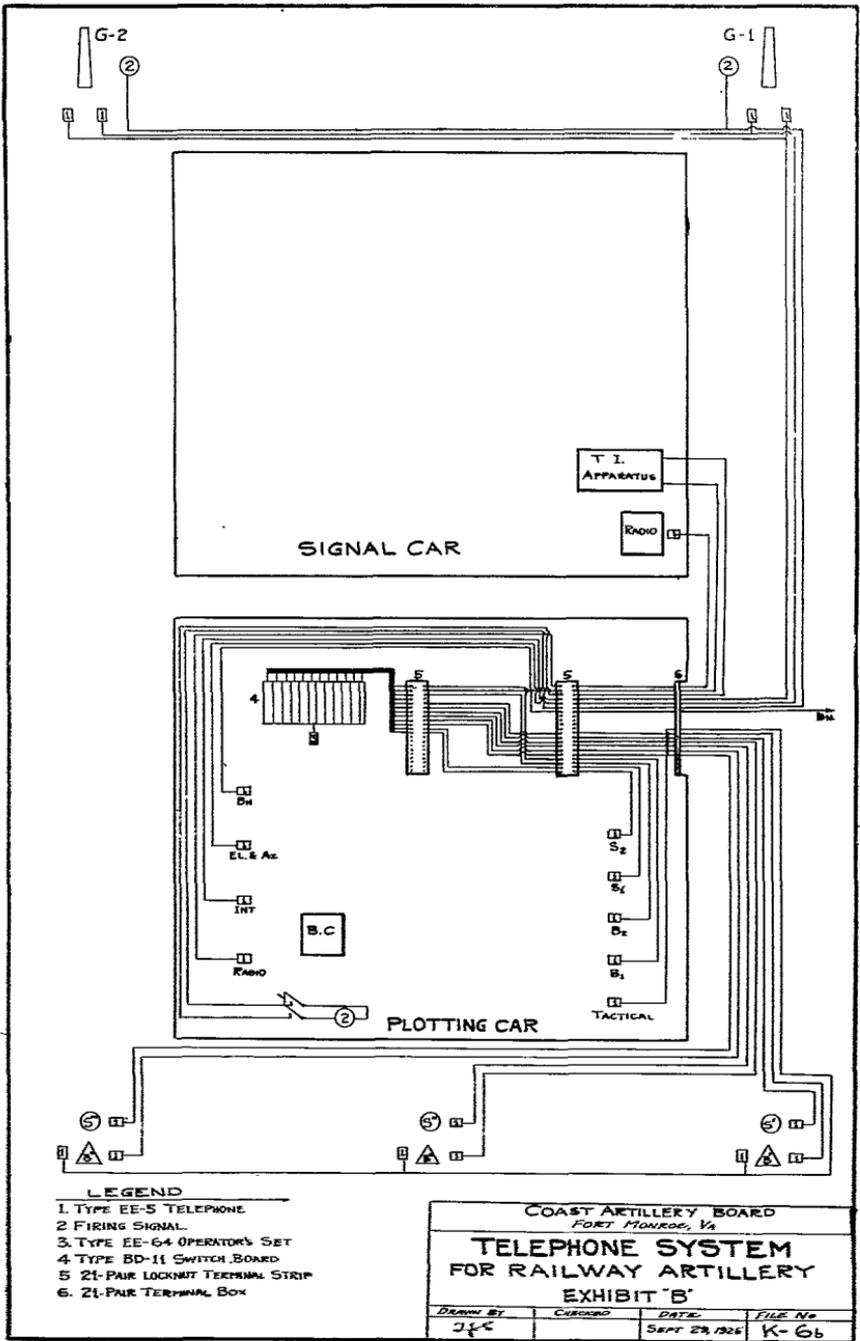


FIG. 2

The telephone should be the type EE-5 field telephone; each equipped with Western Electric 234 B-W Breast Transmitter and a Western Electric D-30469 head receiver with soft rubber ear caps.

(c) Wire: The wire used in the car should be type W-38 outside distributing wire.

(d) Each telephone in the plotting car, observing and plotting stations should be equipped with a type TM-70 terminal block with a three-conductor cord from the telephone to the block and a six-foot cord from the block to the head and breast sets.

(e) The type BA-9 dry cells used with the type EE-5 telephone have insufficient capacity for use with telephones in constant use. For each telephone having the transmitter in operation for long periods at a time, the use of three No. 6 dry cells or a 4-volt storage battery, such as the type BB-2 Edison battery, is recommended.

(f) One radio set SCR-136 should be provided ultimately. One radio set SCR 109-A should be provided until such time as SCR-136 is ready for issue.

(g) Diagram illustrating the proposed telephone system is attached hereto and marked Figure 2.

(h) Panels, signalling, Army Artillery, type AP-7, set.

D. Orientation Equipment

- 1 Transit, complete, with tripod and prismatic eyepiece.
- 1 Level (Explorer's type).
- 1 Tape, steel, 100-feet.
- 2 Rods stadia, feet and tenths.
- 1 Rod, level, feet, Philadelphia.
- 11 Pins, marking, steel.
- 3 Rods, range.
- 1 Plane table and tripod.
- 1 Alidade, telescopic, with Beaman attachment.
- 12 Baldwin Solar Charts.
- 1 Compass, large, for plane table.
- 1 Alidade, open sight.
- 1 Aiming circle.
- 1 Scale, 10-inch, plane-table, yards, 1:20,000 and 1:62,500.
- 1 Clinometer.
- 1 Borerest Clinometer.
- 1 Boresight, set.

III—RECOMMENDATIONS.

7. The Coast Artillery Board recommends that fire-control equipment as listed in paragraph 6 be furnished the 14-inch Railway Guns, Model 1920 MII.

IV—ACTION BY THE CHIEF OF COAST ARTILLERY.

1st Ind.

War Department, O. C. C. A., October 5, 1925—To Chief of Ordnance.

1. In this connection attention is invited to letter, Ordnance Officer, Harbor Defenses of Los Angeles, 472.17/2, August 28, 1925. It is requested that the necessary steps be taken to issue to the Ordnance Officer, Harbor Defenses of Los Angeles, the fire-control equipment listed in paragraph 6-A, Proceedings of the Coast Artillery Board, inclosed herewith.

2. The following items which are now undergoing test at Fort Eustis, Virginia, will be available for transfer to Los Angeles about October 15:

- 1 Range Percentage Corrector with interpolator.
- 1 Impact Board (Range Adjustment Board).

Project No. 394, Requirements for Short-Range Radio Telegraph Sets

I—HISTORY OF THE PROJECT.

1. On September 10, 1925, the Coast Artillery Board received a letter from the Chief of Coast Artillery, from which the following is quoted:

It is desired that the Coast Artillery Board investigate and report on the specific requirements to be met in an easily transportable, short-range radio telegraph set for use with distant subposts of the antiaircraft information service that cannot conveniently be included in the telephone net. It is considered desirable to utilize Signal Corps apparatus now available insofar as practicable, and requirements that will necessitate extensive development projects should not be included if they can be avoided.

2. The requirements as set forth in this letter were not clear to the Coast Artillery Board and in order to learn more about the requirements of the radio set a letter was sent to the Chief of Coast Artillery, from which the following is quoted:

1. With reference to letter from the Chief of Coast Artillery, on the above subject, file No. OCCA 665.41/AW, after consultation with the Coast Artillery School Faculty, the Coast Artillery Board is of the opinion that a short-range set will not meet the requirements for use with distant subposts. It is believed that the stations will be distant listening stations on the avenue of approach to frontier and rear area defended positions, and that the warning from the subposts should reach the antiaircraft defense commander in sufficient time for all elements of the antiaircraft defense to meet an attack.

2. It is the opinion of the Coast Artillery Board that the range of the radio sets for these subposts should be about 100 miles.

3. Further instructions as to the function of the distant subposts mentioned and the range of the radio set for these subposts is requested.

to which the Chief of Coast Artillery replied as follows:

The term "Distant" used to determine the subpost of the Antiaircraft Information Service may have been misleading. These subposts are the outlying detached posts consisting of two or three men located on probable lines of approach of aircraft at such places as lightships, lighthouses, and other points which favor observations. Although these stations are at considerable distance from the central antiaircraft command they probably would not be at a greater distance than five to ten miles from an intermediate command which could relay information. Long-range radio equipment for these stations would probably cause interference and the cost would be prohibitive. In the original study of this subject it was considered that all that would be necessary for the personnel in these outlying posts to send in preliminary warnings to the next intermediate station would be a simple, short or medium-range instrument, probably a spark set. In certain localities a set of higher power might be required, but these would be extremely rare.

II—DISCUSSION.

3. The following are believed to be the characteristics of the radio set required:

- a. Short range—5 to 10 miles.
- b. Light and portable—one that can be transported, installed, and operated by two or three men.
- c. A set that will not necessitate extensive development by the Signal Corps, and which will utilize insofar as possible, Signal Corps apparatus now available.

4. The Coast Artillery Board has considered the following Signal Corps Radio sets for their suitability:

- a. The SCR-74-A.
- b. The SCR-77-B.
- c. The SCR-105.
- d. The SCR-131.

5. All of the above sets have approximately the desired range. The SCR-74-A and the SCR-105 are obsolete spark sets, the SCR-77-B is an obsolescent vacuum tube set, and the SCR-131 is the latest short-range tube set which is of a type designed eventually to replace all short-range sets for use with the field army. Furthermore, all of these sets also meet the requirements for portability and will not require special development.

6. It is understood that the desired set will be required to send simple code signals from advanced substations on light-ships, lighthouses, and similar advanced stations along our sea coasts frontier. The function of these advanced substations would be to send back warnings of the approach of hostile air forces. For these warnings simple prearranged code signals could be used, requiring a minimum of time.

7. The two spark sets, the SCR-74-A and SCR-105, would probably meet the requirements for the desired set, but it should be noted that both sets are now obsolete, that both sets require antenna equipment which may be difficult to install satisfactorily, especially on a lighthouse.

8. The SCR-77-B and the SCR-131 are vacuum tube sets using small loop antennas. Both sets work on short wave lengths, about 75 meters, and would require special receiving equipment at relaying station.

9. The four sets are equally portable and require the same amount of personnel for installation and operation, i. e., two or three men.

10. Whichever set is adopted would require the relay station to be constantly on the alert and listening in continuously in order that any advanced warning could be received. It is quite probable that the majority of these stations would operate for long periods of time without sending a single warning of the approach of hostile planes, under which conditions it is believed it will be extremely difficult, if not impossible, to acquire such discipline as to insure small details at these relay stations being constantly on the alert and listening in. If the configuration of the front line or shore line permitted two or more relay stations to be in range of the outlying station, the situation would improve.

11. The maximum distance of ten miles would give an advanced warning of hostile approach of not over six minutes. It is believed that at least three minutes of this time would be required to transmit the warning and relay it so that the net gain in time would be about three minutes. It is believed that this short advanced warning would be of value only when the firing batteries were in the immediate vicinity of the relay station; in other words, when the battery itself was receiving the warning direct from the relay station.

12. Of the four sets under consideration, all but the SCR-131 are known to one or more members of the Coast Artillery Board. The SCR-131 is considered from a knowledge gained from its written description and the uses for which it is proposed for the other components of the Army.

III—CONCLUSIONS.

13. The Coast Artillery Board believes that:

a. Any one of the four sets mentioned, i. e., the SCR-74-A, 77-B, 105, and 131 would be satisfactory from the viewpoint of operation.

b. In view of the lack of certain information as to which of these sets is most suitable, competitive tests are desirable.

c. Visual signals might offer a better solution of this specific problem than radio.

IV—RECOMMENDATIONS.

14. The Coast Artillery Board recommends that:

a. Competitive tests be conducted to determine the most suitable set.

b. Consideration be given the use of visual signals and that they be tested in competition with radio.

V—ACTION BY THE CHIEF OF COAST ARTILLERY.

665.41/AW-2

1st Ind.

War Department, O. C. C. A., December 10, 1925—To Chief Signal Officer.

1. Attention is invited to the attached report of the proceedings of the Coast Artillery Board on Project No. 394, *Requirements for short-range Telegraph Sets*. The conclusions and recommendations contained therein are concurred in.

2. Remark and recommendation is requested as to the relative suitability for the purpose intended of the four types of radio equipment mentioned in Par. 3 of the report, and as to the availability for issue to the Coast Artillery Board of the sets with which it is considered advisable to conduct the comparative tests referred to in Par. 14 of the report.

The Law of 1920 was practically the first successful effort to benefit by experience. * * * There has never been greater interest in time of peace in the subject of national defense. The Army, the Guard, the Reserves are all anxious to be found ready, and the spirit is abroad among the people. But we are prone to be careless, and under our very eyes there have already been serious reductions made by Congress in our military establishment. More unfortunate still, further cuts seem imminent and for political reasons, unless the people through the press and through their representatives step in and call a halt. Otherwise the result will be a repetition of the past with its loss of life and treasure, and with the added possibility that defeat may come some day instead of victory. This has been the fate of all nations that have neglected security.—*General John J. Pershing.*

COAST ARTILLERY SCHOOL LIBRARY

BOOKS CATALOGUED

Unless marked thus "*" these books may be obtained by any Regular Coast Artillery Officer; Warrant Officer, A. M. P. S.; or Non-Commissioned Officer (Grades 1-3), C. A. C., upon request to the Librarian, C. A. S. Library.

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Our National Government is not doing as much as it legitimately can do to promote the welfare of the people. Our enormous material wealth, our institutions, our whole form of society, cannot be considered fully successful until their benefits reach the merit of every individual. This is not a suggestion that the Government should, or could, assume for the people the inevitable burdens of existence.

There is no method by which we can either be relieved of the results of our own folly or be guaranteed a successful life. There is an inescapable personal responsibility for the development of character, of industry, of thrift, and of self-control. These do not come from the Government, but from the people themselves.—*President Coolidge in a Message to Congress*.

BOOK REVIEWS

History of the Great War: Military Operations—France and Belgium, 1914. (Vols. I and II). By Brigadier General, Jr. Edmonds, R. E., Ret. MacMillan & Co., Ltd., London. 9"x 5 $\frac{3}{4}$ ". Vol. I: 1922. 543 pp. 21s. Vol. II: 1925. 548 pp. 12s. 6d.

The official history of the military operations of the British Army on the Western Front during the World War is to appear in approximately ten volumes, viz.: for 1914, two; for 1915, one; for 1916, two; for 1917, two; for 1918, three. Of the other campaigns, two volumes on Mesopotamia have already appeared; and volumes on Gallipoli and Egypt and Palestine are in preparation. These volumes are all based on the British official records.

Volume I of the Military Operations in France and Belgium covers Mons, the retreat to the Seine, the Marne, and the Aisne, from the mobilization in August to the middle of October, a period of but two and a half months. During this momentous period the British Expeditionary force formed only a small part of the Allied Armies engaged and it did not form an independent command; but its operations were of great importance, not only insofar as concerned the events then occurring, but also in that they indicated what might be expected of British troops yet to be raised. In consequence, this first volume is written in considerable detail, with the smaller organizations forming the unit of narrative. Battalions, squadrons, and batteries are closely followed throughout the period covered by the volume.

Volume II continues the narrative to the close of the Battle of Ypres in the latter part of November, 1914. After discussing the loss of Antwerp, the narrative takes up the great battle of October and November in Flanders: La Bassée, Armentières, Messines, and Ypres. The scale on which this volume was written has necessarily been reduced, so that the twenty days of critical fighting which took place during the period could be presented in the same space required for the seven days of fighting covered in Volume I. The smaller organizations begin to disappear as the unit of narrative, and the larger ones begin to appear. As the series continue, this compression will increase, and for the later volumes the division will become the principal unit of narrative.

Great care has been exercised in the preparation of these two volumes. Of Belgian, French, and German operations, sufficient detail has been given to orient the reader and to make quite clear the relation which the British operations bore to the whole. Whenever reference has been necessary to the operations of Allied or enemy forces, official sources have been used that these volumes might be authoritative throughout. To avoid the confusion incident to reading of operations wherein the same numerical designation of organizations appear in both opposing forces and also in the armies allied with that of the narrative, General Edmonds is very careful and very uniform in his designations. In distinguishing between Armies, Corps, Divisions, etc., he follows the usual convention; in distinguishing between British and German units, he prints the designation of the former in Roman and of the latter in italic characters.

The two volumes contain maps, or "sketches," as General Edmonds calls them, which will enable the general reader to follow the operations in sufficient detail. They are, however, insufficient for the military student who desires to make a careful and detailed study of these operations. For such, a set of maps has been prepared for each volume, and these can be purchased separately.

The text is clear and the language simple; the books are less dry than is usually the case with a complicated narrative such as this; and the numerous threads of the narrative are so skillfully woven together that there is at no time a distinct sense of a break in continuity. These books should be in every military library.

Lincoln and His Generals. (Illustrated with official photographs from the War Department). By Clarence Edward Macartney. Dorrance & Co. 1925. 5½"x 8". 226 pp. \$2.50.

Gideon Welles records that on September 21, 1863, he asked the President what the immense army of Meade was doing. Lincoln, much depressed at Meade's inaction, which allowed Lee to collect his defeated army at Gettysburg and return safely and unmolested over Blue Ridge and across the Potomac, exclaimed: "It is the same old story of the Army of the Potomac. Imbecility, inefficiency—don't want to do—is defending the capital. Oh, it is terrible, terrible, this weakness, this indifference of our Potomac generals, with such armies of good and brave men." There, in few words, is the story of the war in the east until Grant arrived. It was a story that perplexed and depressed the entire Union. Nor was it entirely a one-sided story.

If the errors of his generals were of the first magnitude, it is hardly necessary to add that the President's blunders were almost equally palpable. History will agree with the author that "The campaigns with which Lincoln had the most to do were the most unsuccessful, and those with which he had the least to do were the most successful." But as the war progressed, Lincoln studied—and learned. And the important lesson learned was the necessity for centralized authority and responsibility and absence of interference in military matters. So, when Grant came east there was a distinct change. With his former commanders we have the record of fatherly letters from the President, with queries and suggestions. No so with Grant. The fatherly attitude is gone: free rein is given. Maurice, in *Robert E. Lee, The Soldier*, says: "But in all Lincoln's remarkable career, nothing is more remarkable than the way in which he learned by experience, and his conduct of the latter part of the war seems to be a model of what the action of a statesman of a democratic country in war should be."

This book furnishes a close and scholarly study of the relations between the President and those military leaders with whom he came in direct contact. Scott, Fremont, Butler, McClellan, Sherman, Burnside, Hooker, Meade, Halleck, and Grant complete the list. New light is thrown upon the character and traits of the leaders studied, but the main effort is directed toward the study of the great President from this side of his life. It contains exactly 226 pages of fascinating reading matter.—C. S. H.

Personalities and Reminiscences of the War. By Major General Robert Lee Bullard, U. S. Army, Ret. Doubleday, Page & Company. 1925. 9½"x 6½". 347 pp.

Robert Lee Bullard, one of the outstanding figures of the American Army during the World War, a Colonel of Infantry at the time the United States joined the Allies, was promptly assigned to command of the 2d Infantry Brigade at the outbreak of war and was early promoted to command of the 1st Division, whence he went to command the III Corps and finally the Second Army.

A natural leader of men—a soldier first, last and all the time, he devoted his entire time and attention to his command and brought it to a high state of efficiency which received its reward in many decorations and citations, both American and foreign. So intent was he upon the training, discipline, and battle efficiency of his organizations that he was largely unaware of events occurring without his command, nor did he keep any records of events within his command, other than brief notes in his dairy, from which he quotes throughout his book.

Personalities and Reminiscences of the War is, therefore just what the title indicates. General Bullard gives out his story, not as history, but as his impressions and beliefs at the time. He is frank, but not overly critical; he spares no one's feelings, but he is not hostile. One is impressed with his impersonal impartiality. He praises many organizations; he condemns but one. The 92d Division he finds "hopelessly inferior." He passes lightly over his experience with the 26th Division when we might have expected, or at least excused a trace of bitterness.

With his keen insight, his highly-developed powers of observation, and his analytical mind, General Bullard has prepared an intensely interesting book. To those of us who were in France during the trying winter of 1917-1918 and in close touch with the French, General Bullard's analysis of French feeling at the time will appear extremely accurate. His pen pictures of the officers, both French and American, with whom he came in contact, are delightfully descriptive. His periods of depression were ours; his periods of bouyancy were also ours. In all, whether we are revisiting old scenes with General Bullard or whether the scenes are new to us we shall find enjoyment and profit in reading the General's very readable story.

The Naval Side of British History. By Geoffrey Callendar. Little, Brown & Co. 1924. 5½" x 8¾". 305 pp. Illustrated. \$3.50.

One must recognize the authority of the author to treat of his subject matter. He occupies the Chair of Natural History at the Royal Naval College and has produced other books of the general subject of Naval History that recall him to those who delight in Naval reading. He attempts the same work that Mr. Wells did in his *Outline of History*, when he imprisons the Naval history of Great Britain within the pages of a single volume. *The Naval Side of British History* is not a tactical study, but such a chronological account as will be of interest alike to the Navy man and to the average reader. The naval side of British history is, more or less, the naval side of the history of the world. Mr. Callender's book is a distinct contribution to the world's library of naval history.—B. F. H.

The First World Flight. By Lowell Thomas. Houghton Mifflin Co. 1925. 5½" x 8¾". 328 pp. \$5.00.

On September 28, 1924, three Douglass Cruisers, flown by Lieutenant Lowell Smith and five other officers of the U. S. Air Service, landed in Seattle. Two of the three planes were completing the first flight around the world. The third, a replacement, bore two officers who had lost their original cruiser on the hop from Orkney Isles to Iceland, but who, with the aid of the U. S. Navy and good fortune, had succeeded in overtaking the flight and securing their replacement cruiser in Nova Scotia. A fourth cruiser, piloted by Major Frederick L. Martin, the original Flight Commander, had crashed into an Alaskan mountain in a blinding snow storm. Exactly five months and twenty-two days had been required to circumnavigate the globe.

This book is a personal narrative of the fliers, related hurriedly by themselves and written and compiled into book form less hurriedly by the author. It records

chronologically the events of the flight as the fliers journeyed through Alaskan fogs, Bering Sea snow storms, along the Kuriles, through Japan, China, India, Persia, Turkey, Europe, to Orkney Isles, thence to Iceland, Greenland, and, finally back to the North American mainland. As will be remembered, the journeys from Seattle to Japan and from Orkney Islands to Labrador were the most difficult. The 835-mile hop from Reykjavik to Fredericksdahl was, without doubt, the most dangerous single flight. On the last lap of this trip, Smith and Nelson piloted their planes through wind, rain, and a blinding fog. They were forced to fly just above the water's surface in order to see as far as fifty yards ahead. Then for two hundred miles they flew over this sea, dotted with arctic icebergs. It was only with rare good fortune that they reached Fredericksdahl. The brilliant idea of jumping from one continent to another by following the meridians receives small encouragement from the experiences of the world flight.

No attempt is made in this book to make a searching study of the experiences of the world fliers, but the events of the flight are recorded faithfully and in detail. Perhaps too great an effort has been made to adapt the book to the popular demand. However, it is presented in readable form, is handsomely illustrated, and will undoubtedly receive approval.—C. S. H.

George Washington. By Eugene E. Prussing. Pascal Covici, Chicago. 1925. 9½" x 6½". 183 pp. Illustrated. \$5.00

It is quite customary, in writing of Washington, to look upon him as a great soldier and a great statesman. From these two angles, his life has been deeply investigated; and, since both show him in positions of command and responsibility, we are given the impression that Washington was cold, austere, commanding, and hard to approach. Less has been written of his business affairs, his early training and environment, his natural predilections, and the influence of all these upon his military and political career. Mr. Prussing has searched diligently for a number of years among original sources and has brought to light considerable new material concerning Washington's more intimate affairs. This material he has gathered together and published under the title, *George Washington in Love and Otherwise*.

The book is published in a *de luxe* edition, consisting of eleven hundred copies, numbered and autographed, of which a thousand are offered for sale. The first chapter, "In Love," is the author's adaptation of the facts as written by Washington, himself, and is, according to the author, "the finest love story in the world." It shows how Washington's affections, once centered, remained unvarying to the end. Two chapters are devoted to Washington, "The Engineer," showing his remarkable aptitude toward civil engineering and the habits of command and leadership which his early responsibilities developed. These habits served Washington in good stead when he perforce became a soldier, but the author does not take up this phase. The next shows us Washington as a "Captain of Industry," leading us through his tremendous range of activities, first as a business man and legislator during the fifteen years preceding the Revolutionary War, and second as the business man at the head of the Nation. The last chapter, "George Washington, Personally," pictures the Father of his country socially, in his hours of ease, and is intended to show "that Washington was indeed very human."

Fully to appreciate Washington, we must know somewhat of the vast range of his interests and activities: county surveyor of Culpepper County at seventeen years of age, Major of militia in control of a large area at nineteen, manager of the estate of 15,000 acres and \$100,000 inherited by his wife and her children, manager of the company organized to drain the Dismal Swamp, builder of roads and canals, exporter

planter, realtor and property owner, proprietor of a mill, a ferry, and river fisheries, and director or stockholder in numerous enterprises. Mr. Prussing succeeds admirably in impressing us with Washington's ability in all these lines and informs us that, despite the many years devoted to war and to the Presidency and despite his many generousities, Washington so increased his patrimony that, when he died, he left an estate of more than 63,000 acres, worth in excess of one million dollars. The book is most interesting, is typographically excellent, and is written in a very easy style.

Memoirs of a Napoleonic Officer. By Jean-Baptiste Barrés, with an introduction by his grandson, Maurice Barrés. Translated by Lincoln MacVeagh. The Dial Press. 1925. 6"x 9". 316 pp. \$4.00.

We learn from the jacket that:

Recently Maurice Barrés, the famous French novelist, unearthed some remarkable manuscripts of his grandfather, who was in the Guard under the Consulate, fought at Eylau, Austerlitz, and Leipsic, and in the terrible retreat after that last disastrous battle * * *.

M. Barrés prepared the manuscript for the press and contributed a preface * * *.

The diary is distinctly a non-technical one. It recounts the experiences and impressions of an infantryman who served as an enlisted man for three years and six months and in the campaigns of Ulm, Austerlitz, Jena and Auerstadt, Eylau, Friedland, and Tilsit; as an officer in Spain and Portugal in 1810-11, in the campaigns of 1813-14, during the first "Restoration," "The Hundred Days," the second "Restoration," the revolution of 1830, and under the "Citizen King." The style, in marked contrast with that of the editor-grandson, is direct, simple—almost naive—and distinctly readable.

The army officer will be interested in the reaction of the diarist and his associates to the changes of government and the corresponding changes of allegiance necessary, in the matter of selections for promotion, in the incidents connected with the disbandment of the Army in 1815, and its subsequent reorganization, and in many of the incidents of army service in peace.

One receives an impression of the high morale of the Grand Army before, and its low morale after, the Russian campaign, of the rather haphazard method of subsistence, of the tremendous demands on the tact of any army officer during a successful revolution, of arduous marches with hunger and cold as companions, of the effect on his army of Napoleon's personality, and of the mixed feelings with which Napoleon's veterans viewed later governments of France.

In closing, the diarist writes, "Thus ended a career which, if it was not very brilliant, was at least useful to France and honourable to myself." The reader will find himself in sympathetic accord.—R.S.A.

Released for Publication. By Oscar King Davis. Houghton Mifflin Co. 1925. 5¾"x 9". 468 pp. \$5.00

Early in 1898 Oscar King Davis, as an embryo war correspondent for the *New York Sun*, came in slight contact with Theodore Roosevelt, then Assistant Secretary of the Navy. After experiences with Schley's Flying Squadron, Dewey's expedition in Manila, the Filipino insurrection, the Boxer rebellion, and the Russo-Japanese war, he returned to the States to become the Washington correspondent of the *New York Times*. There his energy and ability as a correspondent, together with his direct manner, brought him into intimate relations with President Roosevelt. This period also brought him in contact with a number of other prominent national figures,

including Mr. Taft. Thereafter until 1914 he kept in intimate association with the political campaigns of the period. He was with Mr. Taft in the 1908 campaign, and with "T. R." in 1910. In 1912 it fell to him to take a leading part in the conduct of Mr. Roosevelt's pre-convention and election campaigns for the Presidency.

Released for Publication is a book of the author's personal recollections covering the period outlined. It is devoted largely to Theodore Roosevelt. The author's activity, however, brought him behind the curtain with other political figures; and so we find in the book a number of interesting and illuminating side lights on such figures as Borah, Hughes, Beveridge, Root, Hiram Johnson, and others. Mr. Taft, naturally, receives quite a bit of attention. No attempt is made to record the political history of the period. Rather the author records and interprets a chain of political incidents of the period, with which he was personally connected, and which, too, tend to furnish an insight into the motives of certain political figures.

Naturally we expect to find Mr. Roosevelt characterized as a man of decision and action, and so we do. We also find particular attention given to another characteristic,—that of a man who paid his debts. In the campaign of 1910, 1912, and 1914, according to the author, he was busy paying his debts, campaigning at times for his friends, at times for himself, but ever in payment of his debt to his followers. At the close of the campaign in 1914, we hear the Colonel exclaim with some satisfaction that he has paid up. The theory is advanced that Roosevelt had little personal desire to become President in 1912. When the war clouds appeared in 1914 he did have a great desire to take again his position as the leader of his country, but not so in 1912. The author makes out a fairly strong case for Mr. Roosevelt along this line; but he does not dwell long upon such niceties, nor is he extravagant in the praise of his hero. The book is largely filled with action. His story is one of a period of stirring events and his style is what we would expect from an able journalist.
—C. S. H.

The American States During and After the Revolution. By Allan Nevins. The MacMillan Co. 1924. 6"x 8¾". 728 pp. \$400.

This book is one of a historical series published in a program of the Knights of Columbus. It furnishes a "conspectus of State history," as differentiated from national history. In general, our histories treat the colonies separately up to the beginning of the Revolution, and collectively as a nation thereafter. Of course there are histories of individual states with little reference to other states or to the nation. But in this volume an effort is made to synthesize state history from the time when the colonists first began to think of independence and liberty until the consummation of the Union in 1789.

The author begins by making a study of the forms of early colonial governments and compares one with another. In similar manner a study is made of the causes of discontent in the various colonies and the spread of the germ which culminated in the separation from the mother country. Then we advance to the emergence of popular government and the writing of the state constitutions. This is followed by a study of the constitutions in operation, their revision, and the political development in the various sections. The final chapters are devoted to "Progress in Liberalism and Humanity," "The States and Their Money Affairs," the states in their relations to each other and to Congress, and to the migration westward. Throughout, we study the development in one state, or section, and watch its reaction in others. The author brings out the variety among the states in the forms of their government and in the habits and characteristics of their people. In all of the colonies we witness the bitter struggle between the conservative groups and the radical frontiers-

man. The status of the various state governments is presented—fairly strong in some states; in others, woefully weak and unfit to meet the military crisis.

The influence of such Revolutionary leaders as Jefferson, Adams, Franklin, Madison, Hancock, and others is presented in its true light.

The history furnishes a scholarly study of the formation of a democratic government. It is a subject in which American students should be intensely interested, and this volume covers a field which has been neglected. The author has devoted long study to his subject, made exhaustive research in this field, and has presented his work in an authoritative manner, carefully annotated.—C. S. H.

Sea Life in Nelson's Time. By John Masefield. The MacMillan Company. 1925. 5¼" x 7½". 218 pp. Illustrated. \$2.50.

Seafaring ways are no novelty to John Masefield, and in *Sea Life in Nelson's Time*, he presents his subject with charm and confidence. In turn, he describes minutely the ships of Nelson's time; their armament; the duties, privileges, status, uniform and customs of the commissioned, warrant, and petty officers, the seamen and marines; the disciplinary system; the steps taken in preparing a ship for action, the conduct of the crew during the action, and the dispositions necessary after action. The later chapters describe the daily routine of a ship in time of peace, both at sea and in port. All these are covered with just such an abundance of homely detail as might be expected from a shrewd observer who had recently returned from a long cruise in one of Nelson's vessels.

Many points, which seem trifling in themselves, are taken up in great detail: the painting and police of the ships, the handling of her guns, the preparation and stowage of ammunition, the duties on deck and aloft, the berthing arrangements, the supply system and the operation of the several messes, the procurement of replacements, the system of classifying and training personnel, the daily drills, the sailors' customs, songs and amusements. Not the least interesting are the means taken to enforce order while at sea, compared with the drunken and licentious orgies which were tolerated on board while in port. All these are portrayed with such a wealth of detail as to call up in the reader's mind a most vivid picture of the strange existence led by these men.

The dominant note is that of a hideous and degrading brutality. It is not impossible that Masefield exaggerates some of the hardships, and it is probable that bitterness may color his account of the unquestionable oppression of the crew. However, making all possible allowance for bias either on Masefield's part or on the part of the narrators from whom he draws his material, the reader cannot doubt that the vile food, the uncomfortable and unsanitary surroundings, and the senseless and wanton savagery with which the crews of many ships were treated, combined to render their existence nothing short of appalling. The grog issue, and the relaxation of discipline which accompanied a stay in port or which marked the first day or so after an action, were the only things for which the sailor could hope.

Sheep, pigs, cattle and fowl were carried on board on long cruises. Berthing space being inadequate, and little ventilation being possible, the ships were fumigated by burning gunpowder in vinegar. Wooden casks—sometimes old oil casks—held the drinking water, which putrified and became thick and slimy after a few week's storage. "Small beer" was served for the first month at sea—"not at all the sort of stuff to put the souls of three butchers into one weaver"; thereafter wine; after the wine was exhausted, spirits were issued at noon and night. The food was of low quality to begin with, normally spoiled and vermin-infested from prolonged storage and wholly lacking in variety. Shore-leave was almost unknown, due to the

certainly that most of the crew (criminals, men who had succumbed to the temptation of a bounty," and victims of the "press-gang") would desert at the first opportunity; "there was no going ashore till the ship was paid off, or till a peace was declared," on entering port, the women of the town were examined by the boatmen who rowed them out, and often by an officer at the gangway, who would "refuse to admit any ugly woman, or any woman not smartly attired or freshly painted." A woman then chosen by one of the crew would remain aboard with her "fancy-man" (ostensibly her husband) until the ship sailed. Sometimes they remained on board, and are reported as carrying water or powdercharges while the ship was in action.

The book is full of little touches of quaintness and interest. In port, the cook was required to keep a poker heating in the galley stove, so that salutes might be returned promptly. Although most of the men chewed tobacco, its use for smoking was rare; the men were cleanshaven, but wore their hair long, braided into a pigtail. Men fatally wounded in action were at once thrown overboard; those killed were thrown over with equal lack of ceremony as soon as the action was ended. The interior of gun-decks was usually painted red that blood stains might not be evident; after battle, the ship was cleaned with vinegar "and disinfected with brimstone" to rid it of smells. Midshipmen were accepted at the age of eleven years and upward, without prior instruction, but were entitled to the respect due an officer. Sailors coming aboard in serviceable clothing were generally not required to draw a uniform, but the crew of the captain's gig were sometimes given a fanciful dress, such as "kilts, with Scottish bonnets," or "scarlet frocks, white hats, blue trousers, and black handkerchiefs"; "the gig's crew of H. M. S. "Harlequin" were dressed up as harlequins, in parti-colored clothes, to the great delight of the rest of the ship's company." Flogging was common; "flogging through the fleet," which was the penalty for attempted desertion, was usually fatal, in which case the body was buried on the beach below low-water mark, without other formality. The men were habitually robbed, both by the "purser," (a creature of the captain's, who provided clothing, bedding and rations, but profited at their expense on each such transaction), and by "the Jews," (peddlers who swarmed aboard ship as soon as it entered port). "Dr. Johnson was right in wondering why folk came to sea while there were gaols ashore."

The compilation of information in this book reflects great credit upon the writer. It is to be regretted that equally illuminating accounts of our army in past years do not exist.—F. M. G.

The Great Pacific War. By Hector Bywater. Houghton Mifflin Co.. 1925. 5¼" x 8". 317 pp. \$2.50.

This history of the imaginary Japanese-American campaigns of 1931-33 is primarily a study of strategic problems that would confront the United States in the event of hostilities with Japan. The author has merely turned to the field of fiction to continue the strategic studies so well developed in his "Sea Power in the Pacific." He does not argue that such a war is probable, nor can the book be criticised as being provocative. He merely suggests that such an event is not impossible, and is, therefore, a possible field for study.

Throughout the story, Mr. Bywater has kept pretty well within the limits of probable possibility, ever attempting to avoid the sacrifice of realism for dramatic effect. That the story is an entirely plausible one depends upon the viewpoint of the reader. Every movement here, just as in actual war, is open to endless debate. Certainly there are weak points in the story, but they are not such as to cause the loss of interest,—even among authorities on naval strategy. There are major and minor

naval engagements, as well as landing engagements between armies and navies. Air raids and aerial engagements are also recorded, but they hardly reach the importance which Colonel Mitchell would have them given. The strength and composition of opposing forces are based on reliable information as to the present status of both navies concerned and logical indications for future development.

As fiction the book is fascinating from cover to cover. This feature can not fail to enhance the value of the work.

In brief, Japan starts the war, destroys the American fleet in western Pacific waters, occupies the Philippines and then Guam. For a long period then the struggle becomes a stalemate with the Japanese naval forces supreme in the western Pacific, American forces supreme in Eastern Pacific. Minor raids only take place, Japan holding the better end of the struggle thus far. America takes the offensive with an unsuccessful attempt at gaining a foothold in the Bonin Islands. This failure results in a housecleaning in the Naval Bureau in Washington and a change in the command of the Pacific Fleet. Again the offensive is assumed and by feinting an expedition via Alaska, the navy slips into Truk Islands and establishes a base unopposed. Thence to a further base in the Pelew Islands. Finally the Japanese fleet is drawn out to defend the Island of Yap. With a superiority in battleship and cruiser strength, the American fleet wins a decisive engagement. Japan sues for peace and a satisfactory peace treaty is concluded, both countries standing all the worse for the struggle.—C. S. H.

Days of the Leaders. By L. Lamprey. Frederick A. Stokes Company. 1925. 5¼" x 8". 357 pp. \$2.50.

This book consists of a series of thirty-one stories, the first nineteen of which deal with the Civil War period. The stories are unusually interesting, especially those dealing with the Civil War, and contain a wealth of local color and interesting episode which carry the reader back to those stirring days, and make events of long-ago surprisingly realistic. The stories are written particularly for young readers but this does not detract at all from their interest for the general reader; in fact, the picturesque manner in which historical happenings, sometimes considered dry reading, are brought out adds greatly to the worth of the book.

There are many quaint illustrations, some in color, by Wallis Sturtevant, and also campaign and battle maps. Interesting and apropos, little poems are inserted between the stories. Historical events described since Civil War days are: *The Trail of the Sea-Serpent*, a description of the laying of the Atlantic cable; *The Totem Pole*, a story of the acquisition of Alaska; *Men Who Bridged the Desert*, a tale of laying the rails of the Union Pacific and Southern Pacific; *Prairie Gold*, the story of the reaping machine; *Ears to Hear*, Bell's work in bringing out the telephone; *I Knew Him When*, the story of Edison; *Chips of the Old Block*, adventures in the Northwest with a little about Roosevelt; and a series of interesting stories on Spanish War leaders and battles.

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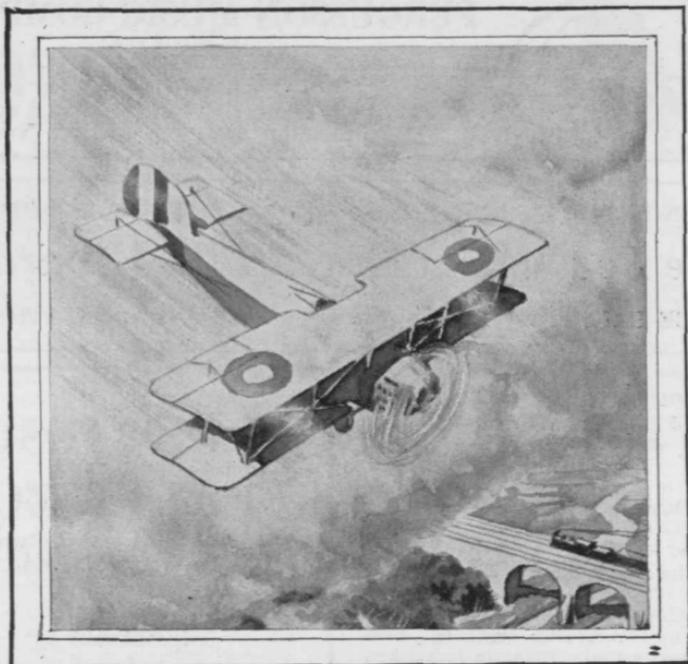
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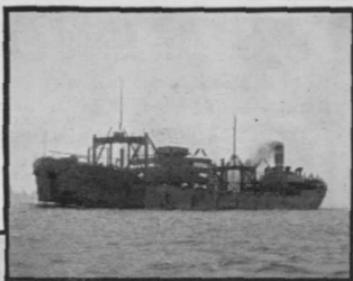
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(d) Articles must not exceed 3000 words in length (approximately eight typewritten, double spaced pages of legal cap paper). Photographs, drawings, etc., may however, be submitted in addition if desired.

(e) All articles entered in the competition become the property of the JOURNAL.

(f) No competitor may submit more than one article.

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