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MAJOR ROBERT ARTHUR, C. A. C. *Editor and Manager*

FIRST LIEUT. JAMES L. WHELCHER, C. A. C. *Assistant Editor*

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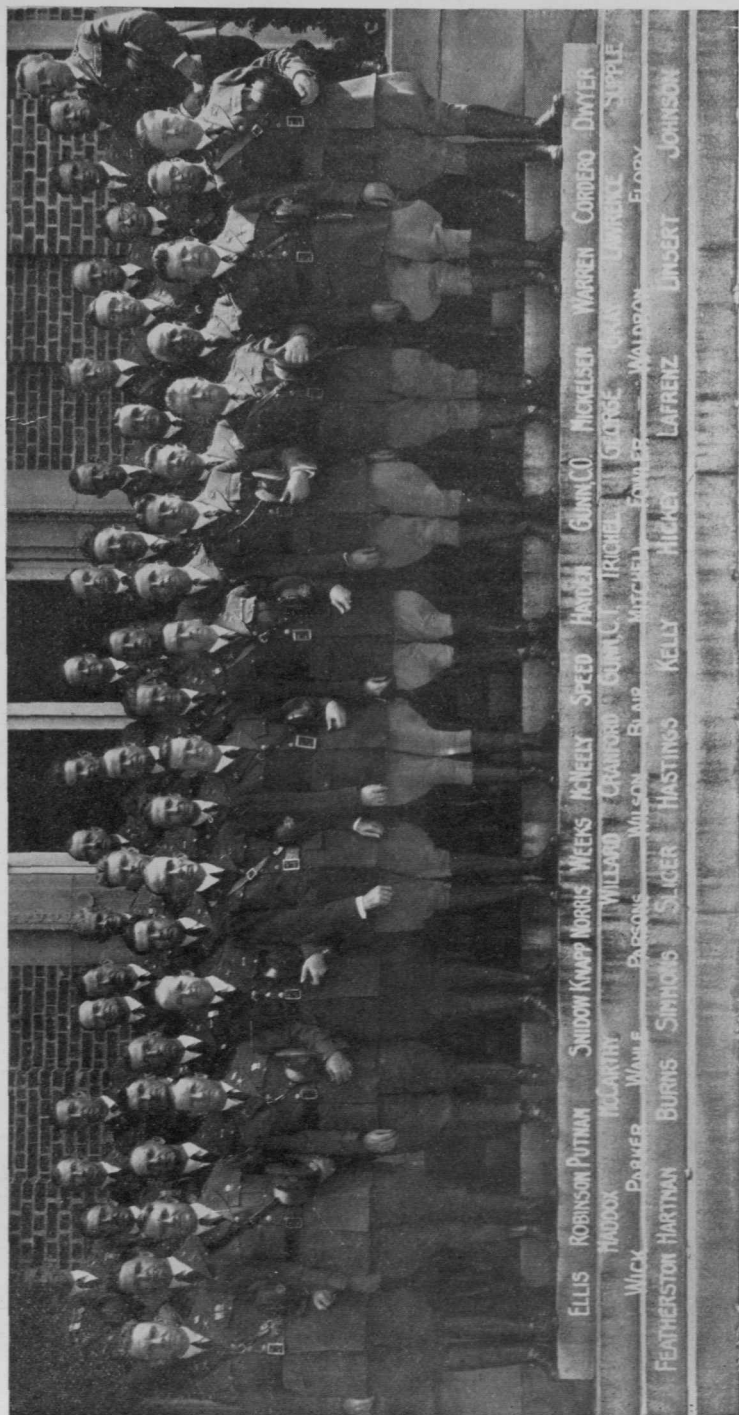
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BATTERY OFFICERS' CLASS, COAST ARTILLERY SCHOOL, 1927-1928

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The Landing at Gallipoli

By LIEUT. COL. NED B. REHKOPF, F. A.

A NUMBER of those who have tried it say that a forced landing on hostile shores is the most difficult and hazardous of all military operations. The following account is concerned primarily with the actual landing; only so much of the other features of the Dardanelles Campaign will be discussed as seems necessary to make a connected story.

EVENTS PRECEDING THE ARMY'S EFFORT

When Turkey entered the World War, at the end of October, 1914, the "race to the sea" had ended in a "dead heat" and the lines in western Europe had become stabilized from neutral Switzerland to the English Channel; there was no exposed flank there offering opportunity for maneuver. To a number of people in England, particularly to Mr. Winston Churchill, the First Lord of the Admiralty, in Turkey there seemed to be an opportunity for the Entente to assume the offensive, turn the enemy's flank, and win the war. If the Dardanelles could be forced and Constantinople captured, the sea route between Russia and western Europe would be opened up; wheat could be moved from Russia to western Europe and munitions could be moved from western Europe to Russia. Turkey would be cut in two and put out of the war; the advance of Germany to the east—her Mittel-Europa scheme—would be stopped and the Balkan States would be encouraged to come into the war on the side of the Entente.

On January 2, 1915, there came the additional incentive necessary to start the operation; Russia appealed to Great Britain to make some sort of demonstration against Turkey in order to relieve the pressure which the Turks were exerting on the Russian forces in the Caucasus. Lord Kitchener, the Secretary of State for War, was greatly moved by this appeal, but Kitchener's army was then in process of organization and no troops appeared to be available for such an operation at that time. Kitchener passed the appeal on to Churchill. The western allies had undisputed command of the Mediterranean, and additional naval

strength could be secured from the Grand Fleet, which was reduced to a comparatively inactive waiting policy by the refusal of the German Fleet to come out of the Baltic.

The question was—Could the Navy do it alone? Although history showed that ships had not been successful in attacks against land defenses, Churchill was encouraged by the effectiveness of modern artillery fire against fortifications as shown in the German advance through Belgium and was eager to try the fleet in this role. He telegraphed to Vice Admiral Carden, commanding the allied blockading fleets in the Eastern Mediterranean, asking if the fleet alone could force the Straits and attack Constantinople. Carden replied that the Straits could not be rushed, but that the object might be obtained by an attack by successive stages. Using Carden's plan for such an attack if it should be ordered, as an argument for such an operation, Churchill persuaded the War Council to decide on January 13 that "The Admiralty should prepare for a naval expedition in February to bombard and take the Gallipoli Peninsula with Constantinople as its objective."¹ Kitchener agreed to this, feeling that troops would not be required until the later stages were reached, *i. e.*, the taking of Constantinople, and that the operations (the demonstration) could be broken off at any time it seemed desirable to do so. On January 28 the War Council confirmed its decision, having overcome the objections of Lord Fisher, First Sea Lord, and Churchill began at once to order additional ships to the Mediterranean. A base was established in Mudros Bay on the Greek Island of Lemnos, sixty-two miles from the entrance to the Dardanelles.

As early as November, 1914, a combined British and French squadron had bombarded, for a few minutes, the batteries at the entrance to the Straits and the batteries made a feeble reply. In December a British submarine had gone up the Straits and sunk a Turkish battleship. On February 19, on order from the Admiralty, a combined squadron bombarded the forts at the entrance (Kum Kale, Orkanie, Sedd-el-Bahr, and Helles). Bad weather interfered with a continuance of this attack until February 25, when the forts were again bombarded and silenced. Small parties put ashore on March 1, however, reported that the forts and guns had not been destroyed. Two demolition parties, each supported by a company of marines, put ashore on March 5, were driven back with heavy losses and without having accomplished their mission of blowing up the forts. Between March 5 and 10, the fleet attempted to sweep the mine field inside the entrance to the Straits—the second stage of the attack—with little success.

1. Nevison, *The Dardanelles Campaign*, p. 36.

When the first naval attacks were imminent, steps were taken to provide the land force which would be required when the fleet had forced its passage through the Straits. It was decided to prepare a landing force of 50,000 men. Twenty thousand marines were already at Tenedos and the Royal Naval Division was due to arrive in the Mediterranean about March 13. The French Government had agreed to take part in the operations and had promised to provide a division of 18,000 men. The Australian and New Zealand Army Corps (the Anzacs) had been stopped in Egypt to complete its training for service in France, because shelter for it was not available in England as initially planned. There were also other British troops—Territorials and Indian troops—in Egypt that might be available when required to hold the Dardanelles after the Navy had taken them and to help in the capture of Constantinople. The command of all the troops was given to General Birdwood, commanding the Anzacs, and one brigade of the Australian division of that corps was sent to Lemnos to be ready to hold any gains the Navy might make. In February, Kitchener began to grow uneasy as to what use was to be made of the army and sent Birdwood to confer with Carden. At that time Kitchener impressed on Birdwood the point that the troops in Lemnos were "not so much for operations on the Gallipoli peninsula as for operations . . . in the neighborhood of Constantinople."² After this conference, Birdwood reported that in his opinion the Fleet alone could not succeed and that a landing of all troops would be necessary. Kitchener then definitely decided to send the 29th Division, the last regular division left in England, bringing the force up to a total strength of 80,000 men. In the meantime the French Government had appointed General d'Amade to command the French contingent designated for the Dardanelles. D'Amade was senior to Birdwood and the British Government then decided to appoint General Sir Ian Hamilton to the supreme command of the land forces.

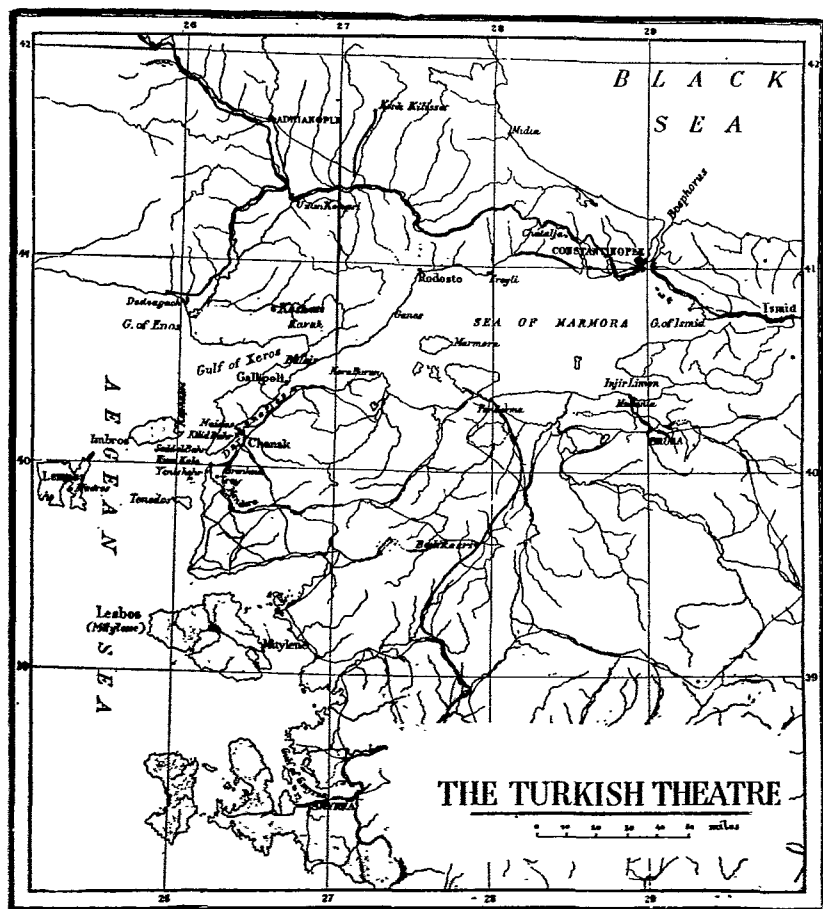
At the time of his appointment Hamilton was in command of the Central Force in England. He says that Kitchener had several times mentioned to him the possibility of a force being sent to Salonika under his (Hamilton's) command, but had never intimated anything about the Dardanelles until Kitchener sent for him on the morning of March 12. As an example of one kind of a directive for a large undertaking, Hamilton's account of this meeting is interesting:

"Opening the door I bade him good morning and walked up to his desk where he went on writing like a graven image. After a moment he looked up and said in a matter of fact tone, 'We are sending a

2. *Official History of Australia in the War of 1914-1918*, I, 196.

military force to support the Fleet now at the Dardanelles and you are to have command'.³

Hamilton had served as Kitchener's Chief of Staff in South Africa and knew that when Kitchener gave an order he expected the one who received that order to set about its execution without further ado or



questions, but Hamilton felt that he must have further information in this case. So in the next hour and a half Kitchener and Hamilton talked it over. During that time a number of others—General Wolfe Murray (Chief of the Imperial General Staff), General Archie Murray (Inspector of Home Forces), General Callwell (Chief of Operations of

3. *Gallipoli Diary*, I, 2.

the General Staff), and General Braithwaite (selected by Kitchener to be Hamilton's Chief of Staff) were brought in and took part in the discussion. Braithwaite also consulted various other officers around the War Office. From all these, the information obtained by Hamilton was about as follows:

G. H. Q. in France begrudged anything sent to the Dardanelles. The 29th Division, therefore, was to be considered merely as a loan to be returned as early as possible; Hamilton could not have his then Chief of Staff, but was to have Braithwaite; Braithwaite's request for a contingent of up-to-date airplanes, pilots, and observers was answered by an explosive "NO" from Kitchener. Hamilton was to understand that the whole enterprise was based on the success of the Navy attack—the Army to appear only in the later stages; if Carden wanted help from the Army it would be for Hamilton to decide whether or not that help should be given. The usual 10% of replacements would not be sent with the troops; if the Navy failed, then the Army would have to go in, and once the Army started to fight it was to burn its boats—no withdrawing (this was getting away from the original idea of a demonstration); no serious operations were to be undertaken until the entire force was concentrated on the spot; Asia was emphatically out of bounds, including Alexandretta and Besika Bay.

Hamilton called at the War Office the next morning and received written instructions along the lines given above and equally general. At Hamilton's request, the name Constantinople Expeditionary Force was changed to Mediterranean Expeditionary Force as being less optimistic.

During the conversation at the War Office on the twelfth, Callwell had gone over a plan with Kitchener and Hamilton. In 1906 Great Britain and Turkey had been at variance over a boundary question involving Turkey and Egypt and the Military Operations Directorate, of which Callwell was then the head, had begun a study of what Great Britain might do in case of armed conflict. When the dispute had been settled without war, the Committee of Imperial Defense had followed up the matter with a theoretical study and had reached the conclusion that "However brilliant as a combination of war and however fruitful were its consequences were it crowned with success, the General Staff, in view of the risks involved, are not prepared to recommend its being attempted."⁴ This was initialed by the Chief of Staff and accepted in principle by the Chief of Imperial Defense, the Navy agreeing. Again in 1914, at Churchill's suggestion, Callwell had prepared a memorandum on a proposed combined British and Greek operation against

4. *Final Report of the Dardanelles Commission*, II, 8.

the Turks, with a similar conclusion and it was the plan for this British-Greek expedition which Callwell discussed with Kitchener and Hamilton. This plan called for 150,000 men to land on the northwest coast of the southern part of the peninsula opposite Kilid Bahr. No war plan for the new undertaking was prepared. Kitchener had little confidence in the Imperial General Staff and made but little use of it; he was the War Office.

Hamilton sailed on the evening of March 13, taking with him a skeleton general staff (no supply or administrative staff officers), a text book on the Turkish Army, and two guide books. The maps available were not up to date and contained few details. Writing in his diary under date of March 17, while nearing the Aegean Sea, Hamilton said:

"Only two sorts of Commanders-in-Chief could possibly find time to scribble like this on their way to take up an enterprise in many ways unprecedented—a German and a Britisher. The first because every possible contingency would have been worked out for him beforehand; the second because he has nothing—literally nothing—in his portfolio except a blank check signed with those grand yet simple words—John Bull. The German general is the product of an organizing nation. The British general is the product of an improvising nation. Each army would be better commanded by the other army's general. Sounds fantastic, but is true."⁵

PREPARATIONS AND PLANS

Hamilton arrived at Tenedos on the afternoon of March 17 and went at once to call on Admiral de Robeck, who had relieved Carden (invalided home). De Robeck told of the situation and the difficulties of the Navy: the Turks' defenses were being strengthened, all landing places were now commanded by trenches and covered by field guns and howitzers, the Turk's gun positions had not been located because the naval sea planes could not rise high enough to get out of range of small arms. The Admiral preferred to force the passage on his own and was sure he could do it. Hamilton told de Robeck that he proposed to get the Army ready to land some place, wherever that might be, and that it was useless to think of landing at any distance from his objective as he had no transport of any kind which would enable him to support himself more than five or six miles from the Fleet.

The Gallipoli Peninsula from the Isthmus of Bulair to Cape Helles is about 56 miles long. At the isthmus it has a width of about three miles. From this neck it gradually widens out to a width of about 12 miles just north of Suvla Bay. It then narrows again to $4\frac{1}{2}$ miles at

the neck on the line Maidos-Gaba Tepe. Opposite the Narrows it has a width of about 8 miles and again narrows to $1\frac{1}{2}$ miles on the line Sedd-el-Bahr—Tekke Burnu. The Isthmus of Bulair between the Kavak River and the Sea of Marmora is formed by a chain of mountains which extends from the northeast. Gradually sloping down to the isthmus, this chain rises again toward the southwest, terminating near Ejelmer Bay. The maximum elevation south of the isthmus, about 1400 feet, occurs about three miles east of Koja Burnu. East of Suvla Bay a broken series of elevations extends toward the south. The coastal region between Cape Iridje and Yildiz Bay is not high nor steep at any place, while the section near the Kavak River is low and marshy. Between Yildiz Bay and Ejelmer Bay there are a few very small beaches at the foot of the precipitous northern range. Near Suvla Bay the terrain is flat. Farther south, many narrow and difficult valleys run up into the southern range of hills. The narrow neck just north of Maidos and the southern part of the peninsula are comparatively low and flat. On the Asiatic side of the Straits the region south of Kum Kale is flat. The Mendere River flows from south to north, generally parallel to the coast and enters the straits just north of Kum Kale. Between the river and the coast the country is low and marshy at all times of the year and passable at only a few well marked and bridged trails. East of the Mendere the country is overgrown with shrub and has but few roads.

Six months had elapsed between the outbreak of the war (August, 1914) and the first real attempt of the Fleet to force the Straits (February, 1915). During that time the Turks, with the help and advice of the Germans, had prepared a defense based on the mine fields just below the Narrows. A number of mobile batteries and searchlights had been installed to provide for the protection of these mine fields. Six battalions of infantry from the 7th and 9th Turkish Divisions were initially assigned for the security of the peninsula from the Gulf of Saros to Cape Helles. After the bombardment of the outer forts in February, this force was increased to four divisions.

On the day after his arrival, Hamilton made a reconnaissance of the shore line from the deck of the cruiser *Phaeton*. Starting from the mouth of the Dardanelles, he went up to the Gulf of Saros, keeping fairly well out, and then ran back on a course from one to two miles from shore, making a closer inspection. The impressions gained by him on this reconnaissance may be summarized as follows:

Gulf of Saros: a horrible swamp: no landing there. If the landing were made farther west, they would still have to march around the swamp or cross on a single road with many easily destructible bridges.

On either side of the Bulair lines the coast has been strongly intrenched and wired to a depth of a mile at least; beyond that he could not see. If this were the only available place, he would have to give it up and go home. Between Bulair and Suvla Bay: steep, no beaches, impracticable. Suvla: a fine harbor, but too far north to combine with an attack on the southern end of the peninsula, and too far from the objective—the Narrows—for the use of the whole force. From Suvla south to beyond Gaba Tepe: feasible, *i. e.*, they could get ashore on a calm day if there were no enemy. Gaba Tepe itself: ideal, but strongly fortified by the Turks and under fire from Kilid Bahr plateau. Between Gaba Tepe and Cape Helles: cliffs from 100 to 300 feet high, but a number of sandy strips at their base. The opinions of his officers differed, but Hamilton believed the cliffs not unclimbable. He adds, "I thoroughly believe in going for at least one spot that *seems* impracticable."⁶

At the conclusion of his reconnaissance Hamilton came to the mouth of the Dardanelles just in time to witness the climax of the naval attempt to force the Straits and the loss of a number of vessels. Three days later, at a conference of the Army and Navy Commanders and their staffs, de Robeck said he was now quite clear that the Navy could not get through without the help of Hamilton's troops. Hamilton says, "Before we went on board, Braithwaite and I agreed that whatever we landsmen might think, we must leave the seamen to settle their own job, saying nothing for or against land operations or amphibious operations until the sailors themselves turned to us and said they had abandoned the idea of forcing a passage by naval operations alone. They have done so. The fat (that is us) is fairly in the fire."⁷

Hamilton was tempted to go in at once with what troops he had, but the 29th Division would not be completely on hand for another three weeks and the transports bearing the 29th Division and the Royal Naval Division had been loaded with the idea that the troops were to land after the Navy had forced the Straits, *i. e.*, a landing without opposition. Units and equipment were badly scattered among the different transports and heavy stores had been loaded on top of arms and equipment necessary for the landing operations. Before a forced landing could be made the transports would have to be reloaded. Proper facilities for doing this quickly and for caring for the animals in the meantime did not exist at Mudros. So Hamilton decided to send the transports to Alexander, 650 miles away, for reloading and to wait the arrival of his entire force.

During the delay the Navy was to keep hammering away at the forts; the troops continued their training in Egypt; Hamilton made himself acquainted with his troops by means of frequent inspections;

6. *Gallipoli Diary*, I, 28.

7. *Ibid.*, I, 41.

the Australian brigade at Lemnos practiced landing operations; and plans and preparations were carried on. Hamilton called on his corps commanders and on General Paris, commanding the Royal Naval Division, for "appreciations" or estimates of the situation. None of these were very optimistic as to the results to be expected. Birdwood favored a landing on the Asiatic side, but stated that his staff were keen for landing somewhere between Saros Bay and Enos. Hunter-Weston said that the only places worth considering were those near Suvla Bay and Cape Helles and of these two he favored Helles because there the fleet could work with the army. Paris favored Sedd-el-Bahr.

Hamilton's estimate of the enemy strength at this time was 40,000 in the Gallipoli Peninsula, with a reserve of 30,000 behind Bulair and at least one division on the Asiatic side. As the strength of a Turkish division at this time was about 11,000 men, this was an overestimate, but after the Naval attack on March 18, and the receipt of information that the allies were preparing for a land attack, the Turks formed the Fifth Army in the peninsula under Liman von Sanders, with a total strength of 84,000 men (62,000 fighting men). By this time the strength and organization of the Turkish Army was fairly well known to the allies.

On the other side, the Turks were kept well informed of the intentions and preparations of the allies. "Instead of being planned as a surprise—the essence of sea attack—the campaign had been heralded as few have ever been. No condition designed to proclaim it seems to have been omitted. As soon as Turkey entered the war, the Dardanelles were, for no sufficient reason, bombarded. Three and a half months later, in a glare of publicity the naval attack was launched. When the first bombardment missed fire, a handful of men were landed almost without opposition—as if to point out to the Turk the very moral which should have been kept from him. Then larger parties landed, which were opposed and failed. As a next step, in the hurry in which the army was organized, horseboats, lighters and tugs had to be bought by the score in the Piræus, the teeming port of that mart of Levantine gossip—Athens."⁸ The gathering of the French Expedition was announced in the newspapers while it was still at Bizerta. Hamilton protested to the British High Commissioner in Egypt on the frankness of the Egyptian press in publishing the arrival of British and French troops in Egypt and the open references to an expedition against Gallipoli, but without effect. "Finally the army began to arrive at Lemnos seven weeks before it was launched in attack; was moved thence to Alexandria: and was ultimately concentrated in Lemnos a week before the actual landing. Lemnos was a night's sail by fishing boat from the Bulgarian coast: Alexandria was in constant touch with

Athens. It was hoped, however, that the actual time and places of landing would be a surprise."⁹

Hamilton's decisions were made along the following lines: To land his force as close as possible to his objective—the Kilid Bahr Plateau; because of the cramped beach space his forces to be landed at a number of separated points. The 29th Division to land on the southern end of the peninsula with Achi Baba as its immediate objective; the Anzacs to land between Gaba Tepe and Fishermans Hut, seize Chunuk Bair and, later, take Mal Tepe, thus cutting off the retreat of the enemy from the Kilid Bahr Plateau; the naval Division to make a feint landing in the Gulf of Saros; a French Brigade to make a temporary landing at Kum Kale for the purpose of drawing the fire of the Turk's heavy guns away from Morto Bay and to prevent reinforcements from being sent from the Asiatic side to the peninsula.

On April 8, Hamilton returned from Egypt to Lemnos and on the tenth held a conference with de Robeck, Wemyss and Keyes, at which time Hamilton outlined his plans. Hamilton says that the Navy appeared to be afraid that the Army was going to land near Bulair, in which case they probably would not have agreed to the plan. During the next few days the Army and Navy staffs worked together on the technical details of the plan and preparations. Admiral Wemyss, commanding the base at Mudros, had been collecting, for some time, small boats and lighters for future use, but the number obtained was very limited. The Navy "Tipped the Army off" to the fact that the Admiralty had built some large bullet-proof lighters for use in the north and suggested that the Army ask that these be sent to Gallipoli. So Hamilton cabled Kitchener asking that a similar boat be sent to the Dardanelles. This request was refused.

Small boats were not the only thing which the expedition lacked. It was deficient in artillery and in high-explosive ammunition, trench mortars, and hand grenades; the only airplanes were the few seaplanes belonging to the Navy; no provisions had been made for supplying the troops with water after they had landed; the Supply and Administrative staffs did not reach Egypt until April 1, and when the expedition sailed from Egypt they were left behind it to finish up the work there, so that the general staff (which did not include a G-4) had to carry on the work of supply and evacuation, to a large extent, both while in Egypt and in the final preparations at Mudros Bay.

Finally, by April 20, the expedition was assembled on board the transports in Mudros Bay, the 29th Division on twenty transports, the Anzacs on forty, the Naval Division on twelve, and the French on

9. *Idem.*

twenty-three—a total of ninety-five. The British force totaled 70,000 men, of whom about 60,000 were available for combat, and the French had 18,000. The combined British and French fleet available for the operations included eighteen battleships, twelve cruisers, and twenty-nine destroyers, in addition to submarines, mine-sweepers, and auxiliaries. To carry out its functions, the fleet was divided into a number of squadrons. The largest of these, under Admiral Wemyss, was to support the landing at Helles. A squadron under Admiral Thursby was to support the landing at Gaba Tepe. Another under Captain Grant supported the feint in the Gulf of Saros, and a French squadron supported the landing at Kum Kale and demonstrated at points farther east. April 23 was fixed upon as the day for the attack, but on the twentieth and twenty-first a high wind held up the preparations and the attack was delayed until April 25.

DEMONSTRATION IN THE GULF OF SAROS

The Naval Division (less two battalions) on seven transports, escorted by the battleship *Canopus*, two cruisers and two destroyers, proceeded to the Gulf of Saros on the evening of the twenty-fourth. Early on the morning of the twenty-fifth the destroyers bombarded various points on the northern shore of the gulf. Later the *Canopus* bombarded the Bulair Lines, while the transports moved in and made preparations as if to land. That night a Navy officer (Lieutenant Commander Freyberg) swam ashore and lit flares along the beach and the destroyers again opened fire. News of the feint in the Gulf of Saros was the first information of an attack to reach Turkish Headquarters on the morning of the twenty-fifth and the 7th Turkish Division at Gallipoli was warned to hold itself ready to move. It was soon seen, however, that the landing was not being carried out and the affair was correctly diagnosed as a feint.

THE LANDING AT ANZAC COVE

The Anzacs designated the 1st Australian Division to land first and to be followed by the New Zealand-Australian Division. The 1st Division designated the 3d Brigade as the covering force. On the afternoon of the twenty-third, the 3d Brigade transports moved from Mudros to the eastern end of Imbros and on the twenty-fourth the 1st and 2d Brigades moved around to the Bay of Purnea on the north coast of Lemnos. At Imbros the 3d Brigade was transhipped to battleships and destroyers. A little before 11:00 P. M. on the twenty-fourth, the battleships *Queen*, *Prince of Wales*, and *London*, each carrying two companies taken from the 9th, 10th, and 11th Battalions, a total of

500 men, and the battleships *Triumph* and *Majestic* and the cruiser *Bacchante*, which were to cover the landing by their fire and which carried no troops, moved slowly out toward Gaba Tepe, fifteen miles from Imbros. The moon shone faintly through the clouds and at 1:00 A. M. the ships stopped, waiting for the moon to set. While lying here, all six men-of-war slung out and lowered their cutters (lifeboats). These were brought alongside the three battleships which carried troops and made up into twelve tows of three cutters each, to be towed by the battleships' small steamers or picket boats. The men climbed down rope ladders from the battleships into the boats and by 2:35 A. M. the boats were filled and dropped back in tow of the three battleships.

Closely following the battleships were seven destroyers carrying the remainder of the brigade—about 2500 men in all. Each destroyer towed empty small boats taken from the transports. The moon set about 3:00 A. M. and shortly before that time the battleships, followed by the destroyers, began to move slowly in. At 3:30 A. M., when about two miles out, the order was given for the tows to go ahead and land. The small steamers cast off from the battleships and attempted to form in line with all twelve tows abreast and with an interval between tows of about 150 feet. There was some difficulty in getting the tows in line and some tows got in the wrong place, so there was some mixing of units at this early stage. But there could be no waiting to straighten them out.

The small boats used were of varying sizes. The 30-foot cutter carried 32 men and the 34-foot cutter carried about 42 men, with their arms and equipment. Eight of the smaller boats would provide for a complete company. In addition to the soldiers, each boat had four or six sailors, depending on its size, as oarsmen. In each of the steamers (which carried no troops) was a naval officer, with a senior naval officer in charge of each four steamers. The naval officer in charge of the entire flotilla was in the left or northernmost steamer. Each small boat had a navy coxswain and in the last boat of each tow was a midshipman. The company commander generally sat beside one of these midshipmen.

The naval officer in charge of the right-hand tow was designated as the guide, but at times it was too dark to see even the next adjacent tow. The right-hand tow seems to have started in the right direction, but the second or third tow from the right soon began to veer off and close in to the left or north. When the officer in the right-hand tow saw that the others were veering away from him, he changed his course to the north and the 9th Battalion tows cut across the bows of the 10th Battalion.

As yet there was no sign of the enemy. The water was unusually smooth and the weather clear and cool. The 10th Battalion (on the right) was the first to cast off from the small steamers and begin the rowing in over the final fifty or sixty yards to shore. At about this time, although special instructions had been issued to guard against such a thing, a trail of flame flared out from the funnel of one of the northernmost steamers. Fully three feet of sparks and flame continued to trail for twenty or thirty seconds. Just then a high plateau of land, 200 feet high, towered out of the darkness above the boats. Some of the officers in the boats thought this was Gaba Tepe, but others realized that they were a mile and a half north of the intended landing places. A light soon appeared on Queensland point, the figure of a man appeared on the skyline above Ari Burnu, a voice called out, and a rifle shot soon followed from the same direction. By this time the 9th and 10th Battalions were reaching the shore; the 11th Battalion ran 200 or 300 yards north to the point and landed a few minutes later. The smaller lifeboats ran in until a depth of not more than two or three feet of water was reached; but the heavier "pinnaces" and "launches" grounded in deeper water and as the men tumbled over the sides, loaded down with their heavy equipment, they found themselves up to their chests in water and some, stepping into holes, were dragged down and drowned. With the increasing rifle fire coming from the shore it was impossible to say who had been hit and who had slipped.

It was 4:30 Sunday morning, half an hour before the bombardment at Helles was to begin and one hour since the tows had left the battleships. The men had been told that they were to run across ten or fifteen yards of sand, take cover behind a four or five foot bank, drop their packs and then rush across about 200 yards of open ground to the first hill. Now the men were ashore and most of them alive, which gave some feeling of relief, but instead of an open space of 200 yards, a high rugged slope came down to the beach. They had landed in the dark on an unexpected coast and were lying in small parties of boatloads and platoons out of sight of the other parties, their clothing heavy with sea water and their rifles choked with sand. During the actual landing the enemy's fire had increased rapidly. A machine gun in one of the folds north of the point and another one on the knoll itself were making themselves felt, in addition to the rifle fire. Occasionally some heavier missile, as from a small Hotchkiss gun, splashed heavily among the boats or on the beach. The 9th and 10th Battalions were fairly well protected from the enemy's fire, but the 11th Battalion was exposed to the fire of the machine gun on their left.

Although confronted by an entirely unexpected terrain and situation, the necessity of going ahead, once they had landed, had been impressed

on the officers and men, and soon small parties were climbing through the thick shrub up the slope. There was no coordination in this; some bolder spirit led his group up; others saw them and followed their example. In a few minutes after landing, men were climbing the steep sides of Plugges Plateau beyond Ari Burnu and the Turks were being driven off.

As soon as the destroyers received word to go in, they stood in close to land, towing the empty small boats behind them. The speed was too great in some cases and these boats, with only a seaman at the tiller of each, began to slew and whip around. Some got tangled up and had to be cut loose; others were crushed against the sides of the destroyers. The destroyers, like the battleship tows, came in farther north than intended, due in part at least to the strong current which was running from south to north along the coast. About 500 yards from shore the men climbed down from the destroyer into the small boats by means of a temporary wooden staging which had been rigged along the sides of the destroyers. The small steamers, coming back after landing the tows from the battleships, picked up the tows from the destroyers and took them in. There were not enough small boats to carry all the men on the destroyers and some had to wait until the boats could return for a second load. Meanwhile the destroyers were under fire and casualties were being inflicted among the men on board.

Although the tows from the destroyers had gone in farther north than planned and at points differing from those of the battleships, there was no mixing of units there. The first tows reached shore while it was still too dark to see a man fifty yards away and about twenty minutes after the first tows from the battleships had landed. From ship to shore these later tows were under fire and suffered losses. After reaching the shore, these units soon moved forward to join the leading units, in some cases without waiting for the remainder of the unit to arrive in the next trip of the small boats.

About the time the first tows from the destroyers landed, a Turkish battery opened fire from the direction of Gaba Tepe and shrapnel began to burst along the beach. The fire was answered a few minutes later by the two battleships and cruiser which had been detailed to cover the landing, but the Turk's battery was not silenced, even when the *Bacchante* stood in as close to shore as possible and fired broadside after broadside at the battery. The annoying battery would quiet down for a while; but whenever a destroyer ran in to discharge troops, which were now being taken off the transports of the 1st and 2d Brigades, the battery would open fire again. At times it shifted its fire to the destroyers and small boats as they were meeting the transports.

In at least one case, the transports carrying the 1st and 2d Brigades were not met by the expected tows and destroyers. The transport *Galeka* moved in as close to the shore as possible, 600 yards ahead of the others, and the men rowed their way in, in the small boats of the transports.

As soon as additional troops were landed, they were sent forward to join and extend the line of the 3d Brigade. One of the mountain batteries (Jacobs) was landed about 10:30 A. M., the first artillery ashore, and with much difficulty moved forward to take a position near the head of Whites Valley, in support of the left of the line. At this time, the greater part of the losses being inflicted were due to shrapnel fire from Turkish batteries. This one British mountain battery was effective for a while, but the Turks turned their fire on it and between 1:00 and 2:00 P. M. the battery was silenced and, with the infantry which it was supporting, was driven back. The other mountain battery, scheduled to land about 8:30 A. M., waited on board its transport until 3:00 P. M. for lighters to arrive and until 5:00 P. M. for a steam tug to take it in. Because of the difficulty of getting artillery into position in this area, a part of the divisional artillery was diverted and landed at Helles.

At 10:45 A. M. the Corps Commander signalled that he was sending in the New Zealand Division and it was decided to put them in on the left of the Australian Division. A part of this second division was already on shore at this time (those from one transport), but the others did not come in until much later, the transports having arrived at their designated anchorages much later than scheduled. Between 12:30 and 4:00 P. M. no infantry was landed and the small boats were used to clear the wounded from the beach to the transports.

General Bridges, commanding the Australian Division, went ashore about 7:20 A. M. and proceeded to get in touch with his front line and to direct the accumulation of a reserve and the disposition of reinforcements. The division staff was ashore at 10:00 A. M. and division headquarters were established in a gully just south of Ari Burnu. The Corps Commander observed the landing from the battleship *Queen*, with Admiral Thursby, and came ashore during the afternoon. Corps headquarters were established near the headquarters of the 1st Division. Hamilton watched the landing with de Robeck from the flagship *Queen Elizabeth* until about 5:30 A. M. when it was reported that 4000 fighting men had been landed. He then left to observe the landing at Helles.

The Variable Probable Error and The Adjustment Problem

By CAPTAIN HOMER CASE, C. A. C.

AN officer of the Ordnance Department has recently, in these pages, greatly disturbed the Coast Artillery with the specter of "The Variable Probable Error." It was represented that the value of the developed probable armament error varied so greatly from practice to practice that we are not justified in taking any constant value, either from the firing tables or from the records of previous firings, as the unit of adjustment. To assign a constant value for any range for any gun to the probable error is so likely to be incorrect that the value of adjustment is very often lost, if we follow the writer's logic. But somewhat inconsistently he then proposes that this will be cured by the use of *another* constant value, a percentage of the range, as the unit of adjustment. How this will keep the effects of the varying probable error from affecting the adjustment is not shown.

HOW VARIABLE IS THE PROBABLE ERROR?

In the article in question a number of examples were given of the great variations between the developed probable errors of practices fired by the same battery. It will be seen later that these must have been extreme cases; and it is special pleading to select as proof of an assertion only those examples which appear to prove it. So let us select a set of records open to all and analyse all the data.

For the target practice year of 1926 the 155-mm. batteries were the only ones that fired a sufficient number of practices to make a study of them really conclusive. During this year twelve batteries fired forty-five practices at moving targets with an average of about thirty shots a practice. No battery fired less than two practices and several fired five.

A glance at the developed probable errors of all batteries shows a wide variation, and this was shown by plotting the probable errors against range in the original article. But to plot against range is a rather unsatisfactory method since for every range there are too few cases. It is generally admitted, and was so stated in the original article, that the probable error varies as the range, certainly within reasonable limits. The probable errors can then all be referred to a

certain range and be better compared. The range of 10,000 yards was selected as average and convenient, and all probable errors were reduced to this range. Thus, if the actual range was 8000 yards and the developed probable error was 40 yards, the value of 50 yards was taken for 10,000 yards. This was done in the 45 practices and the results appear to be alarming. The lowest value was 17 yards and the highest 144 yards, or over eight times as great. But it is interesting to note that the mean value was 60.5 yards, as against the firing table value of 63 yards. The probable error of the probable error was then determined in the same manner that we ordinarily compute the probable error of a target practice. This amounted to 18.4 yards. In other words, in any practice at 10,000 yards with a battery with no previous history the probable error developed half the time will be not smaller than 42 yards nor greater than 79 yards. Over 80% of the time the value will be not smaller than 23 yards nor greater than 98 yards. These are large variations, and if there was not ordinarily better information than this a battery commander could well suspect the probable error of causing poor adjustment.

But in our service the probable error to be used in firing a target practice is always taken from the records of previous practices fired with the same battery. No battery commander would think of taking the mean probable error of all practices fired with the same type of battery in the Coast Artillery; nor would he use the firing table values except when there was no other information available. So that while the information as to the variations of the probable-error values of all practices is of some academic interest, it has small bearing on the practical problem. Experience makes us suspect that the probable error of one battery is no real indication of what may be expected of another. And this is reasonable. The muzzle velocity, which Ordnance experiments show to be the principle source of the probable error, varies from round to round with the powder used, with the amount of erosion of the bore, and with the weight of the projectiles. The jump of the gun varies with the adjustment of the carriage and with the care in emplacement. The ballistic coefficient of projectiles varies from round to round due to the location of the center of gravity, to the shape into which the rotating band is deformed, and to the difference in diameter between the lands and the bourrelet. When a battery is made up of more than one gun the developed battery probable error is the resultant of the probable errors of all the individual guns of the battery; and what is more important, the lack of calibration of the battery will cause the battery probable error to be greater than if calibrated.

So the problem really resolves itself into this: does the probable error of each battery vary so greatly from practice to practice that the adjustment is materially affected? The following tabulation shows the developed probable armament errors for all practices for the year 1926 of batteries manning 155-mm. guns, reduced to 10,000 yards:

	A-51	B-51	A-92	B-92	C-92	D-92
	80	54	70	51	144*	79
	82	53	43	61	79	66
			55	98*	49	62
			101*	40	63	64
	—	—	—	—	—	—
Mean value probable error	81	54	67	62	84	68
Probable error of probable error:						
All practices	1	0	15	14	26	5
Excluding "wild" practices	1	0	8	6	7	5
	A-55	B-55	C-55	D-55	E-55	F-55
	28	47	31	45	65	66
	18	35	25	55	80	54
	24	36	29	66	89	85
	21	23	34	66	132*	46
		25	104*		92	
	—	—	—	—	—	—
Mean value probable error	23	33	45	58	92	63
Probable error of probable error:						
All practices	3	8	25	7	17	11
Excluding "wild" practices	3	8	3	7	8	11

A glance at the tabulations shows that there is a remarkable regularity in the value of the probable errors of the different batteries. The only disturbing element is the fact that five of the twelve batteries each have one practice, marked with an asterisk (*), in which the value of the probable error varies greatly from those of other practices fired that year. In every case the probable error was *greater* than those of other practices, varying from one and one half to almost four times the mean of the remaining values. Each of these five values should be rejected as "wild", since in each case the value is more than four probable errors of the probable error from the mean of all others. The test is made in the same manner as for "wild shots." The number of "wild" practices is larger than would be expected, but a consideration of the fact that in each case the values were too large gives some clue to the reasons. In determining the armament errors, personnel errors must first be stripped, but this is often very difficult and sometimes impossible. Thus, in a 155-mm. battery one or more guns might be

fired with an error in the angle-of-site setting. This might never be detected and the personnel error be included in the armament error. Then again a change in the direction of fire or of the wind or a change in the maximum ordinate during the practice may have so changed the effect of the atmosphere on the trajectory that the center of impact shifted. Any of these, and other, causes would increase the probable error, and that is what happened in each case.

The only yardstick with which these variations can be measured is the probable error of the probable error. These are tabulated and show a mean value of 11 yards for all practices; while if the "wild" practices are excluded this is reduced to 6 yards. This is extremely small. Thus in any 155-mm. battery the probable error of a future practice at 10,000 yards half the time will not vary more than 6 yards from the mean of all past practices, excluding "wild" practices from the determination of the mean; and 82% of the practices will have a variation of less than 12 yards from the mean, while 96% will have a variation less than 18 yards. Certainly a battery commander is not in a difficult position if he can determine his future probable errors as closely as this.

The foregoing results are checked with reasonable closeness by the set of probable errors, tabulated in the original article, of 14 proving ground firings with 155-mm. guns at a range of 16,000 yards. The mean probable error was 75 yards against the firing table probable error of 104 yards, and the probable error of the probable error amounted to 14 yards. The highest was 100 yards and the lowest 52 yards, a maximum range of 33% from the mean. It is interesting that these firings under proving ground conditions gave none of the "wild" practices found in the field. This is what would be expected from the probable causes.

Unfortunately, most of the batteries of other calibers fired only two practices during 1926, so that it is not possible to draw such definite conclusions from an analysis of the results. The following tabulation shows that on the average their probable errors varied about the same as those of the 155-mm. batteries. The first column gives in percentage the mean variation of the probable error from the mean of each battery, the probable error first being reduced to 10,000 yards. For example, a battery fired two practices, the probable errors reduced to 10,000 yards being 104 and 72 yards, respectively. The mean is 88 yards, and the percentage variation from the mean is $16/88$, or 18%. The first column gives the mean of these percentages. The second gives the maximum for each caliber, this being the battery with the most variable probable error.

<i>Type battery</i>	<i>Mean variation from mean per cent</i>	<i>Maximum variation from mean per cent</i>
3-inch seacoast	27	49
6-inch barbette	33	61
6-inch disappearing	15	26
8-inch railway	11	22
10-inch disappearing	22	29
12-inch disappearing	41	52
12-inch barbette	14	34
Means	23	39

The number of zones precludes the computation of these values for mortar batteries. The foregoing results indicate that the variation from practice to practice in the probable error averages 23 per cent. If previous practices indicate that the probable error of a certain battery at a certain range should be 100 yards, on the average it will not actually develop to be smaller than 77 yards nor larger than 123 yards, while practically never will it be smaller than 61 yards nor larger than 139 yards. The probable errors for 155-mm. practices computed in the same manner give an average variation from the mean of 22 per cent, which checks extremely closely.

EFFECT ON ADJUSTMENT BY THE BRACKETING METHOD

It is obvious that if the probable error varies between wide limits this variation will be most serious when fire is adjusted by the bracketing method, for in this method the probable error is the yardstick with which all corrections are made. If the probable error used is too small the target will not be bracketed soon enough, resulting in wasted shots in trial fire, while if the unit used is too large corrections will be excessive and the target will be crossed each time. While this is evident, no method of mathematical analysis seems to meet the problem. It might be tested by firing a large number of practices, using in turn the correct probable error, one too large, and one too small. If this were done, over two thousand rounds of ammunition would be required, and even then there is no method of knowing what value would be correct for the probable error until after each practice. So the method is impracticable. But with the dispersion, or hit, bag the problem may be tested at no cost and with an accurate knowledge at all times of the true probable error.

This problem was set up: A battery has a constant probable error of 50 yards. What is the relative effectiveness of the fire adjusted by the bracketing method if the corrections are made on the basis of a

probable error (a) of twice the proper value, 100 yards, (b) of the proper value of 50 yards, or (c) of half the proper value, 25 yards?

It was solved by firing 20 practices with each assumed probable error, or a total of 60 practices, with the dispersion bag. Three practices, one with each value, were fired simultaneously, using the same chips for each practice. All practices were fired by the bracketing method for moving targets as laid down in paragraph 123, TR 435-280, as changed provisionally. Trial fire was conducted by two gun salvos until a hit or bracket was obtained. Fire for effect consisted of 32 shots, adjustment being made after each 8 shots, fire being held until corrections had been applied. The assumed distance of the center of impact from the target on opening fire varied uniformly from zero to nine probable errors. The distance of the center of impact of each group of eight record shots was recorded and the effectiveness of the fire compared to fire when the center of impact was on the target was computed from the Table of Probability Factors. The mean effectiveness of the four groups of eight shots gave the effectiveness of the practice. The following three practices show the method. The center of impact was started 7 probable errors from the target:

PROBABLE ERROR USED IN ADJUSTMENT.							
		Twice correct value, 100 Yards		Correct value, 50 Yards		Half correct value, 25 Yards	
		Distance C. I. from Target	Effective- ness	Distance C. I. from Target	Effective- ness	Distance C. I. from Target	Effective- ness
<i>Trial Fire</i>							
1st salvo	SS	Bracket	SS	Bracket	SS	OO	Bracket
2d salvo	OO		SS		SS		
3d salvo			OO		SS		
4th salvo			SS		SS		
5th salvo							
<i>Fire for Effect</i>							
1st group	-100	50%	0	100%	50	80%	
2d group	50	80	10	98	15	97	
3d group	-50	80	20	96	10	98	
4th group	20	96	-35	89	-10	98	
Mean effectiveness		77%		96%		93%	

The following is a tabulation of the results of the 60 practices fired with the dispersion bag:

PROBABLE ERROR USED IN ADJUSTMENT			
	100 yards	50 yards	25 yards
Average number of trail fire salvos	2.1	2.5	3.3
Mean effectiveness of fire compared to fire with the center of impact on center of target	72.7%	89.0%	88.7%

From these firings the following observations are made:

1. When using too large a probable error a bracket or hit can be obtained with fewer shots of trial fire, but the center of impact will not usually be as close to the target when fire for effect begins. In fire for effect the adjustment corrections are too large, throwing the center of impact alternately over and short of the target. At times the entire group of eight shots would be over, and the correction of one half fork would throw the next group all short. A battery commander finding that his groups are falling alternately preponderately over and short as a result of corrections should recognize that he is using an assumed probable error greater than the probable error being developed. When using too large a probable error the fire is about 20 per cent less effective than when the correct value is used.

2. When using the correct probable error the fire is less than 90 per cent as effective as fire with the center of impact always on the target. This is usually not considered but is always true to a greater or less extent in any method of adjustment of fire. Normal dispersion of shots and the fact that in making any correction a rather small number are considered make it impossible to keep the true center of impact, which in actual firing is never known, exactly on the target; and in the firings held with the dispersion bag this loss in effectiveness amounted to over ten per cent. It probably is seldom less than this in actual practice. The average number of trial salvos necessary was not much greater than when the probable error was too large.

3. When a probable error too small was used two things are very noticeable:

a. The average number of trial salvos necessary was one third greater than when the correct value was used. When the center of impact at the first salvo was from seven to nine probable errors away from the target two or three times as many salvos were needed. But with large-caliber guns this would be an extreme case, for any sort of preparation of fire would bring the center of impact nearer than this to the target. So that the results shown here really would not be true in actual service as far as using too small a value is concerned.

b. The fire for effect was just as effective as when the proper value was used. The center of impact was near the target when fire for effect began, gradually crept closer, and then stayed there. If the center of impact should shift during the shoot, the use of this small probable error would have prevented as rapid a response as the use of a larger value; but this shift is an exception rather than a rule.

From these observations the following could well be added to the rules for adjustment of fire by the bracketing method:

1. If there is any doubt as to the accuracy of the preparation of fire the first bracket for trial fire should be so large that the target certainly will be crossed by the second salvo. Two, and sometimes four forks, should be used. Halve the bracket each time until a bracket of one fork is obtained. This will shorten trial fire and still place the center of impact near the target for the first salvo of fire for effect. This is the system used in the Field Artillery.

2. For fire for effect select a probable error which is too small rather than too large. Fire will be just as effective and fewer corrections will be called for, making fewer chances for errors.

3. If corrections cause adjustment groups to be alternately preponderately over and short the probable error being used in adjustment is too large. Reduce it by half at least.

EFFECT ON ADJUSTMENT BY METHODS USING MEASURED DEVIATIONS

The writer in the original article went to some trouble to prove that adjustment of fire using measured deviations was seriously hampered by the variable probable error. As a matter of fact, the probable error has little practical use in these methods. In firing at moving targets the trial fire is not completed in the method of successive approximations until the correction called for is less than one probable error; but it is rare that the fourth or fifth correction is not much smaller than the firing table probable error. This method is so ill suited to firing at naval targets that it will be used in service only under very unusual conditions. In all other methods of firing at naval targets the adjustment corrections are based on the center of impact of certain groups of shots and the probable error is not used. In firing at fixed targets in two methods of adjustment, the improvement phase is not completed until the deviation of the center of impact of an adjustment group is within one probable error of the target. In this fire time is usually not important, and there is no harm in adjusting as carefully as possible. A hit in the improvement fire is as effective as in fire for effect.

PERCENTAGE OF RANGE AS THE UNIT OF ADJUSTMENT

In the original article it was proposed that one-half of one per cent of the range be used as the unit of adjustment. The reasons given were that the probable error varied so greatly that it was of small value and that proving ground probable errors averaged about this percentage. A plot of firing table probable errors against range does not bear out the last reason. For a number of different guns the curves indicate that even at the proving ground the probable error rarely is lower than

one-half of one per cent, and often larger than three-quarters. The values in the field should be larger. As a matter of fact, there is no great objection to the use of a percentage of the range, but the reason is that adjustment is not materially hampered by the use of a unit other than the proper probable error. Especially is this true if too small a unit is taken, as would be the case with one-half of one per cent of the range. With the fire adjustment board, and probably with other systems, it is convenient to use percentage instead of fixed values, but it must not be forgotten that the correct value of the probable error is the best possible unit of adjustment and the best method of determining this is from the record of past firings.

THE STUDY OF PROBABILITY

The author in the original article criticized very caustically the study of probability by artillery officers. To him it is "a maze of mathematical trickery" and he feels that "there should be no more reason for artillerymen going into problems involving probability and least squares than there is now for his going into trajectory computation studies."

Probability and the Theory of Errors are the bricks of which adjustment of fire are constructed. Artillery officers devise the rules of adjustment and are called upon to test and judge those already in use to determine under what conditions they may be best used. Each method of adjustment must conform to the basic laws of probability or it is unsound, and is it too much to ask that those who must use these methods in their daily work be familiar with the theory and principles on which they are based. Calculus and geometries infinitely more complicated and more laboriously acquired may fade unused into the past without great loss, but the artilleryman who has not a fair mental picture of the vagaries of the fall of shots is ill-equipped for adjustment of fire.

Nor is adjustment of fire to be compared to the picking of a range from a firing table. If it were sufficient to adjust fire by rigid rules of thumb there would be no gain in studying probability, but the very complexity of the problem is such that there are many times that only the sound judgment of the person making the adjustment will cause the correct decision to be made. This sound judgment can only be based on the knowledge of dispersion, of probability, and of the law of errors. If officers of our branch know so little of probability and find the study so distasteful it is more to the discredit of the officers and their instructors than a proof of the lack of value of such study, and if we

had left the pursuit of all similar knowledge and the practical development solely to the other departments where would the Whistler-Hearn and Cloke Plotting Boards, the Range Boards, the Deflection Boards, and the other equipment used in our fire control have come from? And in "trajectory computation" it is not unfair to say that our army has never seen finer ballisticians than our own fellow artillerymen, Colonel Ingalls and General Hamilton.

CONCLUSIONS

From a consideration of the foregoing discussions the following conclusions may logically be drawn:

1. The probable error for any battery will rarely vary more than 35 per cent from the mean of the probable errors developed in previous practices and half the time it will not vary more than about 20 per cent.

2. In the bracketing method of adjustment:

- a. The use of too large a probable error shortens trial fire, but renders fire for effect less effective than if the correct value had been used. This loss in effectiveness rarely exceeds 20 per cent.

- b. The use of too small a probable error lengthens trial fire, but renders fire for effect as accurate as when the correct value is used.

- c. The correct probable error gives the shortest trial fire combined with the most accurate fire for effect, but this value can never be known until after a practice. It can best be taken as the mean of previous firings with the same battery. In case of a doubt as to the value to be used, err on the small side.

3. In adjustment of fire using measured deviations the use of an improper value for the probable error is of no practical consequence.

4. The use of a percentage of the range, as one-half of one per cent, as the unit of adjustment instead of the probable error is not unsound and may be more convenient when adjustment boards or similar devices are used. There will be no appreciable loss in effectiveness of the fire, but it is rarely the best unit of adjustment.

5. A working knowledge of the laws of probability is essential in the adjustment of fire and should be possessed by every artillery officer.

Organization and Equipment of the 52nd Coast Artillery (Ry)

By MAJOR P. H. OTTOSEN, C. A. C.

THE 52nd Coast Artillery (Ry), the only railway artillery regiment functioning as a regiment in our Army, is organized and equipped to perform two missions: to fire on naval targets and to fire on land targets.

A fleet made up of battleships, cruisers, destroyers, and submarines demands a unit of long-range guns capable of endangering the biggest fighting ships at the longest naval ranges, a unit of mortars capable of continuing the battle from behind vertical shelter when the fleet has closed to 15,000 yards, and a unit of rifles capable of overmatching the modern light cruisers, destroyers, and submarines. For long-range missions four guns are deemed the minimum required; for destructive fire at 15,000 yards eight guns or mortars are deemed the minimum required. Multiples of any or all of these units may be necessary to match the size of the fleet expected. For flexibility each half unit has its separate fire-control equipment for firing on naval targets. The units constitute our battalions, the half units our batteries. The 1st Battalion has two batteries each equipped with two long-range guns, the 2nd Battalion has two batteries each with four 12-inch mortars, and the 3rd Battalion has two batteries each with four 8-inch guns. For reasons of economy not all units are active.

For land warfare missions, as in France, a variety of calibers and characteristics is demanded. The firing missions may be divided into two classes; long-range gunfire and howitzer fire beyond the power of corps artillery. The first is met by the long-range battalion, the second by the 12-inch mortar battalion and by giving the 8-inch gun battalion two powder charges so it can be used as a howitzer. Regimental operations are seldom employed, but the firing unit may be as small as a single gun in the case of 14-inch rifles. The regimental staff easily provides two provisional battalion staffs for the 1st and 2nd Battalions, so that each battalion of long-range guns will operate two 12-inch or 14-inch guns or four 12-inch mortars. The regimental commander, with his staff, may be assigned to command a groupment. The 8-inch guns, where the ammunition can be man-handled, remains as before in a two-battery battalion, with each battery serving four guns. Fire-control apparatus for stationary targets is so simple that platoons

of two guns can be assigned a single target. The 52nd Coast Artillery (Ry) has sights, azimuth instruments, scissors instruments, range tables, and firing boards, all in mil graduations for land warfare. Actual firing at land targets in time of peace is restricted to 3-inch field pieces, of which each battery has one, and to an occasional demonstration for the Coast Artillery School, with 8-inch guns firing as howitzers with H. E. shell.

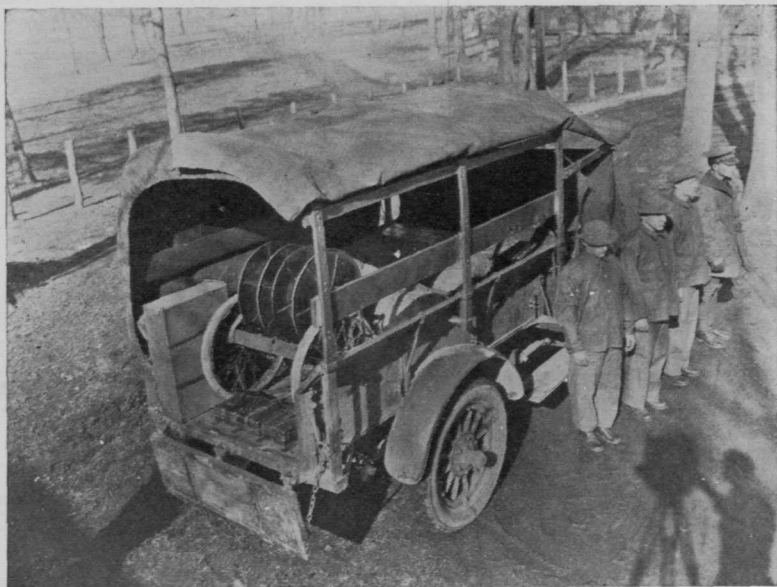


FIG. 1

After laying wire the G. M. C. truck is available to carry observing instruments and men to outlying stations

The Tables of Organization for war strength provide:

- a. Headquarters and Headquarters Battery with Colonel, Commanding; Lieutenant Colonel, Executive; Captain, Adjutant; Lieutenant, Intelligence Officer; Captain, Plans and Training Officer, with a Lieutenant Assistant; Captain, Communications Officer, with a Lieutenant Assistant; a Lieutenant, Reconnaissance Officer; and 89 enlisted men.
- b. Band.
- c. Service Battery commanded by a Captain, Regimental Supply Officer, with a Lieutenant Personnel Adjutant, three Lieutenants, each in charge of a battalion section, and 126 enlisted men.

- d. Three battalions each commanded by a Major, with a staff of Lieutenants, one for each staff activity listed under Headquarters Battery above.
- e. Battalion Headquarters Battery of 115 enlisted men organized into Headquarters, Maintenance, Observation and Orientation, Communications, and Railway and Munitions sections. The latter section is the largest and has a locomotive and all the ammunition cars, forming a sort of combat train.
- f. Two firing batteries each of 6 officers and 190 enlisted men.

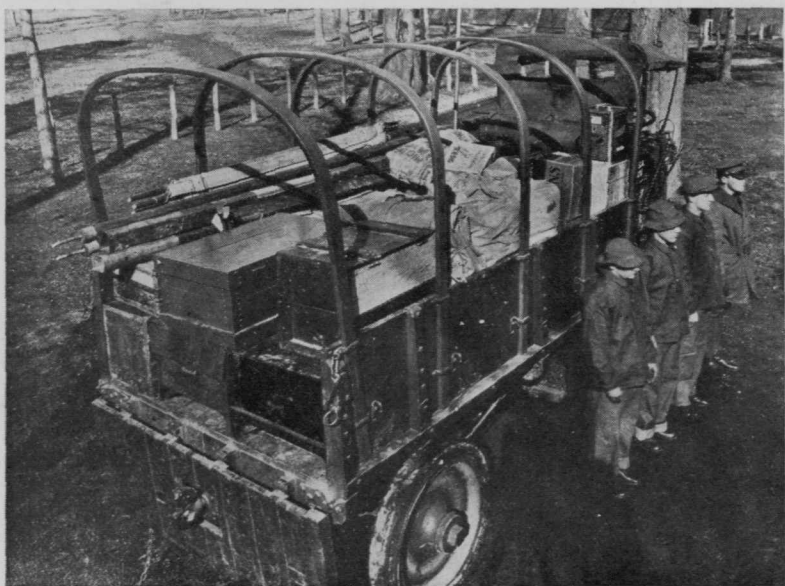


FIG. 2

The rations, baggage, and camp equipment are moved in F. W. D. trucks

- g. Attached Ordnance Maintenance Company, Searchlight Battery, Medical Personnel, and Chaplain.

Under the present conditions of reduced strength, several of the staff positions are held by one officer. In the absence of active battalion headquarters batteries, men are detailed from regimental headquarters battery to fill essential positions, and lieutenants from the firing batteries serve as battalion staff in addition to their other duties. Each staff activity actually functions, although on a reduced scale.

Regimental Headquarters Battery has three railway cars; a fire control car; a power car; and a kitchen car. The fire control car is a portable command post and message center. The power car contains

a SCR 132 (Divisional) radio set. The kitchen car, a battalion headquarters function, has a water tank and sink, tables, ice box, store room, and field range No. 1 mounted in a sand box. When a war strength battalion moves, the personnel and their motor equipment travel in a standard type "B" railway train (19 box cars and 10 flat cars), and their guns, ammunition, and other cars in a special armament train. The standard train arrives at the destination a day or two ahead of the special armament train, so that all reconnaissance, orientation, and part of the communications are installed before the armament train arrives. On the armament train are the gun commanders, mechanics,

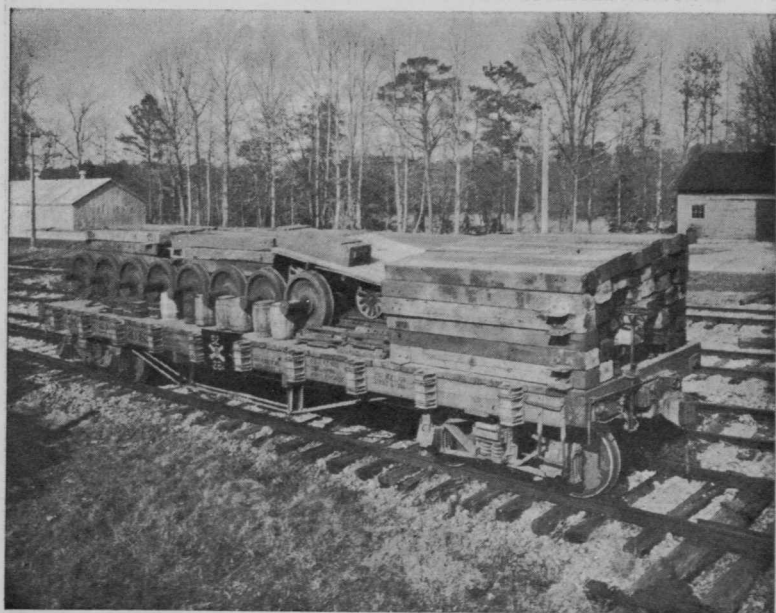


FIG. 3

The battalion flat car carries some track tools and materials and wheel assemblies for ammunition cars and guns

etc., a total of about 25 men. The kitchen car is provided to feed them en route, so they can be free to inspect guns, wheels, and journals at every stop.

The headquarters motor equipment of the regiment at present consists of a Dodge touring car, a White reconnaissance car, three motorcycles, and eight G. M. C. trucks. These vehicles are all used for reconnaissance and communications service. After laying the wire which each G. M. C. truck carries, and after the special armament train arrives, the G. M. C. trucks are available to carry the instruments and

details to the outlying observation stations, and to lay additional wire. Due to a shortage in personnel, the regiment has been compelled to concentrate all motor vehicles in one garage under the Service Battery.

The Service Battery is organized to supply the regiment with everything except ammunition. Ammunition service is a function of the battalion headquarters battery, which in time of war has a locomotive to switch the ammunition cars about and spot and shift guns on artillery tracks. Having no battalion headquarters battery, the 52nd Coast Artillery (Ry) has no locomotive but arranges locally for the

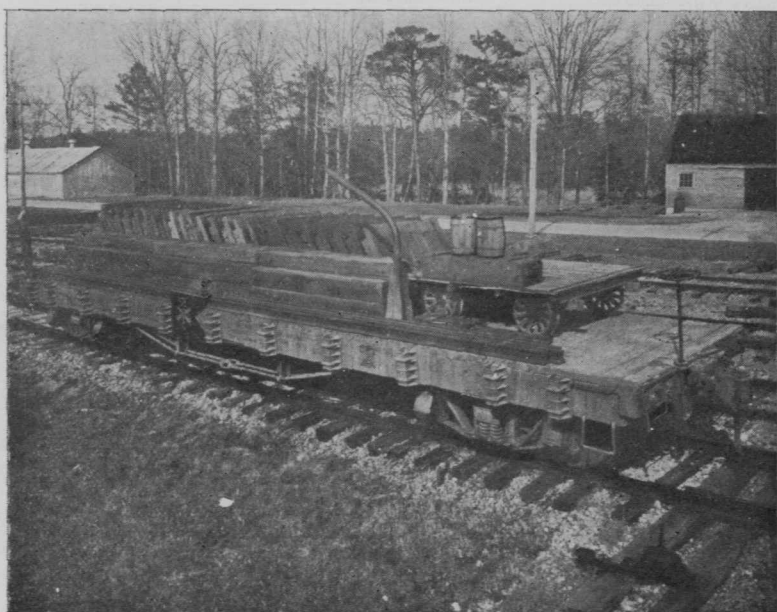


FIG. 4

The battery flat car carries some track tools and materials and enough platforms for an alternate battery position

switching of guns and ammunition. The service battery is practically a battalion section since it supplies about 500 men, the war strength of a battalion. The rations and baggage for 500 men, including organizational baggage (field desks, field ranges, etc.), requires five F. W. D. trucks. That is the number of F. W. D. trucks actually used by the 52nd Coast Artillery (Ry). The Service Battery maintains a garage with motor mechanics and operates all the motorized equipment in the regiment. A Dodge light repair truck is provided for road service by the mechanics.

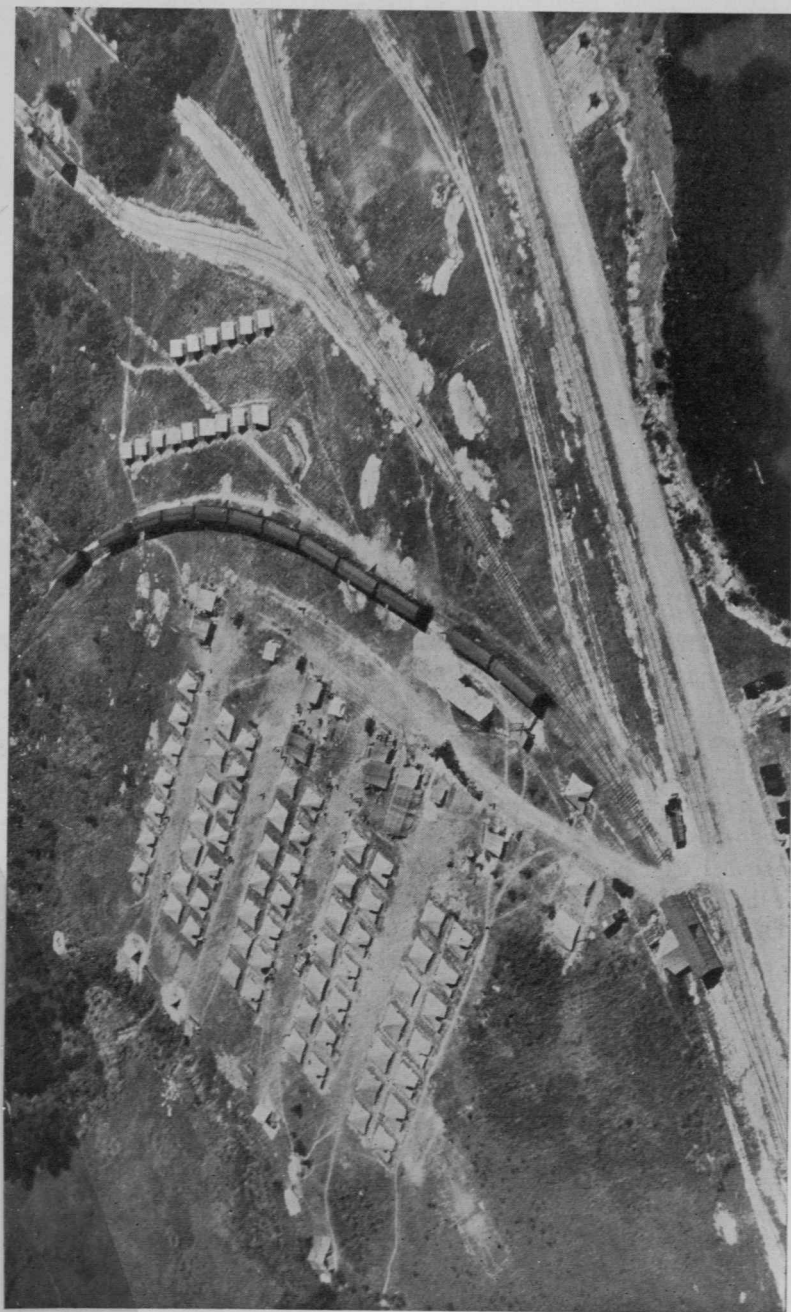


FIG. 5

A comfortable camp may be set up in training, but in war each battery bivouacs separately under cover of woods

Each battalion headquarters in the 52nd Coast Artillery (Ry) is provisionally organized with personnel detailed as previously described, and with motor equipment from the regimental pool under the supply officer. Its railway equipment should be 1 gas-electric locomotive, 2 tank cars, 12 ammunition cars, 1 store car, 1 power car, 1 fire-control car, 1 kitchen car, and 1 flat car with drop sides and ends. These are all drawn for use at Fort Eustis when desired, except the gas-electric locomotive, the power car, and the fire-control car. The latter two are used constantly and have been improvised from available ammunition cars. A steam locomotive is always available from the Quartermaster. The flat car carries wheel assemblies for ammunition and gun cars, track materials, track tools, etc.

An 8-inch gun battery should have four guns, one fire-control car (see the COAST ARTILLERY JOURNAL, December, 1927), one box car for cleaning and preserving materials, one spare parts car, and one flat car with drop sides and ends. The flat car carries enough floats (platforms to support the ends of the outrigger braces) to establish an alternate battery position, with a crane to set the floats in place, and a small amount of track materials and track tools for the maintenance of battery trackage. These are all available at Fort Eustis and drawn for training purposes when desired. With limited personnel it has been found better to draw equipment when desired for training rather than to attempt excessive upkeep.

From the above two paragraphs, it is apparent that an 8-inch gun battalion special armament train consists of a gas-electric locomotive, 2 tank cars, 8 guns, 12 ammunition cars, 3 fire control cars, 6 box cars, 3 drop-side flat cars, and 1 kitchen car. No extra cars are required for personnel on the armament train for there are good accommodations for the men in the fire-control and other box cars.

The best test of organization and equipment is derived from successful operation in war. In the absence of war, terrain exercises and innumerable map maneuvers are the only criterion to depend upon. Besides routine training and successful target practices, the development of equipment and of organization has been a continuous problem for the 52nd Coast Artillery (Ry).

Antiaircraft Defense in Mobile Warfare*

(With special reference to Eastern Theaters of War)

By MAJOR E. J. ROSS, O. B. E., M. C.

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IT is a strong characteristic of Britons that we are apt to be over-optimistic—to take the view that, because we *hope* things will be all right, they will be so. When our brains tell us that the future is likely to be uncomfortable, our optimism allows us to stifle all powers of reason, and so we go on in a false and pleasant paradise. This optimism has its good points, it prevents us from panicking and keeps up our morale, but it is one of the basic reasons why we have never yet been truly prepared at the beginning of a great war.

The first point in training for war must surely be to think out clearly what weapons the enemy will bring against us and how he will use them, to realize what the results of his action will be, and, facing these facts honestly and unswervingly, to decide what our counter-measures will be. Only by such honesty of thought can true efficiency in modern war be attained.

I cannot help thinking that we in the army have not so far, as a whole, adopted this honesty of thought towards our preparations for meeting aerial attack. We refuse to allow ourselves to admit how unpleasant and far reaching the effect of such attacks will be, and consequently very few of us have really thought out what steps are necessary to combat them. The result has been a general failure to appreciate the importance of training in antiaircraft defense.

You may think that, from the point of view of ground troops, I draw too gloomy a picture. Possibly I do. At present no one can tell. But the views I put forward are the result of watching two big maneuvers closely, and after discussion with a number of officers, both in the army and the R. A. F. who have thought these things out.

I am discussing this question today from the point of view of a force engaged in a major war in the east. I assume that in such a case we would be contemplating an offensive against an army whose air force, though perhaps not the equal of our own, would at least be somewhere in the same class as it. For one has to remember that such a war would probably not be local, and a great part of our air force would be required simultaneously in other theaters.

* Lecture delivered at the Senior Officers' School, Belgium.

Now what are the salient features of an eastern theater of war viewed from the point of view of air attack? It seems to me that the following are the most important.

The first and most striking characteristic of all seems to me to be the immense length of the L. of C. compared with that of the actual fighting front. Look at the attached diagrams (Fig. 1).

The first is a rough representation of the front in a western theater, compared with the L. of C.

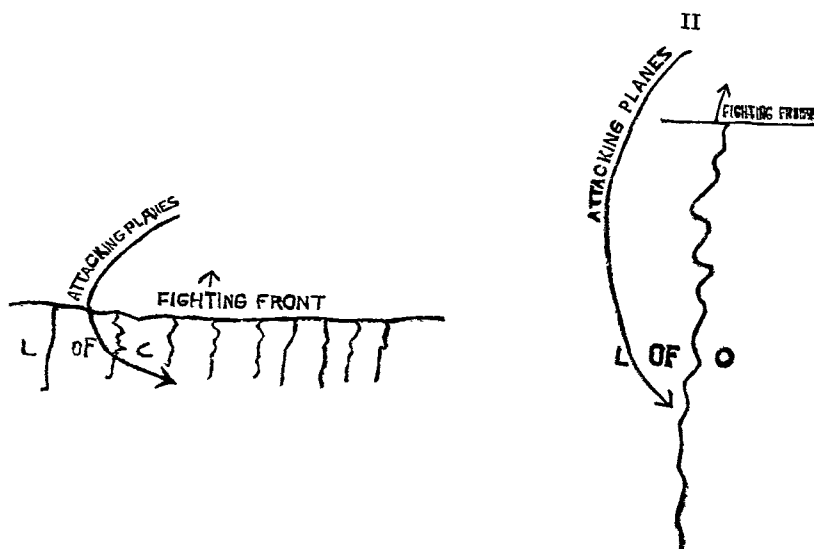


FIG. 1

The second shows the same sort of thing with regard to a force fighting in Iraq round about Baghdad.

You will notice at once that an airplane in a western theater which wishes to attack a central point on the L. of C. will normally have to cross some part of the fighting line, and more important still, the area just in rear of it, where will normally be situated both observation and the front line of anti-aircraft defenses.

In the east, however, an airplane can easily pass outside the whole fighting front, and cut in from a flank unobserved wherever it pleases.

Narrowness is another important feature of an eastern L. of C. Generally speaking there is one narrow line and no other. It is therefore peculiarly vulnerable, while there is no alternative route should the one be damaged.

The whole force, supplies and all, has to move through what is practically a continuous defile—divisions, trains and intermediate depots all on one and the same road. I wonder how much any of you would give to be in command of a divisional train in one of these defiles when attacked from the air.

Again, concealment—the most effective and the best passive form of defense against any air action—is almost invariably difficult to obtain. There are no great stretches of forest, etc., to hide troops, trains and depots.

There is a lamentable lack of fast moving and heavy weight carrying transport, and consequently an enormously increased quantity of slow moving animal transport, with all which that entails—masses of A. T. carts and camels, filling roads to their utmost capacity.

Remember, too, the difference between animals with their powers of thinking and feeling, and machines which can only run away when the driver starts them up and pushes in the accelerator. Think of the moral effect of bomb and gas attack on a divisional train of mule carts. Think of the mules stampeding in all directions, and the general confusion which follows. If you blow up one or two lorries out of a column it does not worry the others very much.

Finally, there is an absence of effective civil objectives to attack, for normally in the east attacks on civil centers will not help much to get a decision.

Now I want you to think of these characteristics and consider whether they do not give a lot of cause for reflection. Think of an army of three or four divisions practically confined to the one road. Look behind the fighting troops and watch the thousands of mules and camels on the march closely packed on a single road—remember each one of these is a living and thinking animal subject to real mental worries, and particularly liable to panic.

Then think of the refilling points—the M. T. companies handing over their rations to the trains, and the masses of transport which are likely to collect there, probably, of necessity, in an open plain devoid of all cover.

Cast your eye further back still over the L. of C., that long single line, with all its intermediate depots, away back to a railhead, where all your supplies lie unconcealed and open to air attack, and remember that there is no alternative line should that one slender thread be broken. Can you, for instance, imagine that we could ever again advance the hundred miles or so from Kut to Baghdad as we did in 1917, with our daily supplies carried on the good old paddle steamers

moving three or four miles an hour, an ideal mark for air attack, if even two or three flights of enemy machines could take the air against us.

An army marches on its belly more truly now than it did 100 years ago. In the east, tactical considerations—the plans of “G” staff—have always had to be rigorously circumscribed by the difficulties of “Q”—the provider. That was in the days when Q had only lack of roads and long distances to contend against. What is going to happen to the unfortunate fellow when he has air attacks to worry him as well?

I do not know whether any of you ever suffer from nightmares. A very common one is to find yourself in the middle of a particular job, and then to discover that you cannot move hand or foot. You wake up in a cold sweat. When I think too much of this particular problem, I have a very similar nightmare. I see myself, again a “Q” officer, as I was during the war, running the administrative arrangements for an offensive operation. The show has started, the troops have moved, I have a reasonable reserve of supplies and feel quite happy. Suddenly we begin to get wires that our reserve dumps have been attacked from the air. That our refilling points have been scattered, and that our trains have been stampeded all about the country. Forage burnt and spoilt by gas, ammunition blown up, animals blistered with mustard gas. I wake up then, but I must say I come out in a cold sweat when I think of the troops all about the country without their rations and ammunition, and I sweat a bit more when I think of the interview I am likely to have shortly with my general. It is not at all a pleasant dream.

So far I have said nothing about attacks on the actual troops themselves. In my opinion these will be considerably less effective than those on administrative units, but still they can and will be very effective at times, especially if they are carried out, as they should be, at critical moments during the operations, while their effect will increase out of all proportion, if troops have not been properly trained to look after themselves. Even where the actual damage is not great, their moral effect will be high. They will slow up recuperation after actions and, above all things they will lessen mobility.

Now I am not one of these enthusiasts who believe that air operations can, by themselves, achieve decisive results. They can no more do this than can any other branch—navy—artillery—cavalry—or infantry unaided and acting on its own. Of one thing, however, I am quite certain, it will be found utterly impossible for any force to undertake sustained offensive operations against an enemy who has, and is free to use, a properly equipped modern air force, until it has taken steps

effectively to protect both its mobile units and its L. of C. from serious attack from the air, or to render such attacks ineffective.

This brings us to the main problem for discussion. How are we either to prevent these attacks or to render them ineffective?

Before we go on to this, I would like to enunciate what I take to be an absolute and unchanging truth. The principles of war hold good equally in every form of war, whether it be waged on the ground, on the surface of the sea, under the sea, or in the air. Offensive action and surprise are as important to the submarine and to the airplane as they are to the cavalry or to the infantry.

This gives us at once a line on which to design the most important point of our antiaircraft defense. Are we going to sit still and let the other side drop bombs on us and machine gun us at his own selected time and under his own selected conditions. Surely not. Those of you who have been in a proper rough house will know the correct defense against gouging. When you see a fellow who looks like gouging, you kick him, very hard, and very quickly in the stomach. That is to say you get your attack in first, and with all your strength. The only way to attack airplanes is by airplanes. In other words our proper defense against any form of air attack lies in a sustained and concentrated air attack on the enemy air force, both in the air and on his airdromes.

The first point which a commander must ensure before he can embark on any offensive campaign is to secure real superiority in the air. To obtain this he will have to concentrate every machine he has got in a continuous and sustained attack on enemy aircraft, wherever and whenever they can be met, and especially on their own airdromes. An offensive campaign on the ground must, therefore, begin with a fight for air supremacy, and during this phase it will normally be impossible for the commander to set free any of his airplanes for the normal duties of mobile warfare.

Now it is the business of the Royal Air Force to guarantee superiority in the air, and I have no doubt whatever that they will be quite capable of carrying out their role. There is one point, however, on which we soldiers must be quite clear, for to us it is of the utmost importance.

Although the R. A. F. guarantee superiority in the air, they never can and never will guarantee command of the air to the extent which the navy guarantees command of the sea. In other words, however successful we may have been in the fight for air superiority, we have still got to reckon on numbers of enemy machines being able to take the air for reconnaissance and for attack, and it is to meet this remainder that our ground defenses must be designed.

It is often argued that, because offensive air action is the best defense against air action, a nation is therefore justified in spending all its available money on more airplanes, and none on antiaircraft artillery or similar defensive weapons. This is of course pure fallacy. A boxer's truest defense is a vigorous offensive. The more he can lead, and the more effective his leads are, the less will he be called upon to ward off hostile blows. But he cannot hope that his offensive will invariably be successful against a well trained antagonist. He must pause at times to draw breath and to recuperate. His opponent must at one time or another have an opportunity of attacking in his turn, and in the absence of any attempt at guarding important points, may well seize the opportunity to strike a knock-out blow.

Similarly, a force which seeks to carry out successful offensive action on the ground must have, ready and available, the necessary material to guard vital points on its lines of communication when the enemy air force has succeeded in side-slipping the air offensive.

Now let us turn to the question of these ground defenses. First and foremost comes the question of early information—an observation chain and linked inter-communication system. This I have no time to discuss here; so I will go on to the question of fire defense. I have no intention, even had I the necessary technical knowledge, to discuss problems of antiaircraft gunnery. I must, however, put before you the following points. The improvements in antiaircraft gunnery during the war were considerably greater than the improvements in aircraft themselves. For instance, according to records compiled by the Americans, during the first few months of the war, 24,000 A. A. shells were fired for every effective hit which was obtained. In the closing stages of the war this percentage fell to 1400 rounds per hit. A vast improvement. Since the war, I believe, very great strides have been made. History, moreover, is very clear on one point. In a direct combat the weapon firing from a fixed platform eventually beats that on a moving one. The man lying down with his rifle defeats the man advancing on him, while fixed land defenses overcome the moving battleship.

The same thing will eventually apply to the contest between the airplane and the A. A. gun. The airplane has a fixed roof above which it cannot fly. The gunner trying to hit it is faced with a problem in pure mathematics, chiefly one of instrument making which, sooner or later, he will solve. Every year brings him nearer to this solution and it is safe to predict that in time it will be impossible for an airplane to fly over a properly defended area. What chiefly concerns us at present, however, is that antiaircraft gunnery, instead of being a jest,

as it was at the beginning of the war, is now definitely effective between certain height limits, the top limit being above that at which bombing is normally effective against small targets, while the lower limit approximates to three thousand feet—at which range controlled rifle and automatic fire becomes effective.

One often hears people say, that it is useless trying to take on airplanes with rifle and automatic fire. Let us take comfort from the R. A. F. however; most of their pilots will tell you a different story. I think most of them will tell you that there is nothing they dislike so much as coming under heavy rifle or machine gun fire, and the damage inflicted by this, both on machines and personnel, is very great. The reason why we people on the ground have so poor an opinion of the results is that we practically never see them. One cannot expect to bring airplanes crashing down like pheasants out of the sky with small arms fire; but what pilots, who did counterattack and contact patrol during the war, could tell you of the result of rifle fire on their machines will surprise and encourage you.

It follows then that fire defense against airplanes will take two forms, firstly an upper defense layer of shell fire, and secondly, a lower belt of small arms rifle fire, while any sound system of defense requires the coordinated use of these two.

I do not intend to say much about the defense of railheads, depots and fixed posts. This is really outside the scope of a lecture on mobile warfare. I must, however, call your attention to the fact that if these points are not adequately defended there can be no such thing as mobile warfare on our side. It is essential then that they should be defended, and their defense will have to take the form of the coordinated use of antiaircraft artillery, search lights and machine guns, possibly with the addition of flame projectors and nets.

Now, to turn to the defense of mobile units. This takes three forms:

- a. Concealment from view.
- b. The use of formations which are not vulnerable to attack.
- c. Defense by fire when concealment has failed.

Concealment is, of course, far the most effective, but it is extremely difficult to carry out in most countries across the border. It normally implies movement by night and halting by day, for hardly anywhere can troops on the move avoid being seen by day.

Now this movement by night and concealment by day sounds all very nice in theory, but it is desperately difficult to carry out in practice. Remember you have not to think only of the fighting troops, but of your trains as well. If your troops move by night, can your trains get up to them before dawn? If they do, how are they to get back to their

refilling points? Can you refill in the dark, and can your M. T. lorries run at working speed along eastern roads in clouds of dust in the dark? All these points require an answer, and, whatever that answer be, it will certainly demand a very greatly improved standard of training and discipline on all sides.

Remember, too, that animals must be watered, groomed and fed by daylight. Personnel cannot sleep all day. So think of the strain on them. Think too of the difficulty of finding covered bivouacs for all your transport. They can move at night, but they cannot disappear down rabbit holes at dawn.

Then again take the case of the fighting troops. You can march them at night, and in many places you can find them covered bivouacs by day, but it seems to me that if you do this continually you will kill your troops from sheer fatigue. It is not difficult, with training, to get troops to do their 14 or 15 miles across country by night, but what is your morale going to be like, and where will be the fire in their attack, if you expect them to do it night after night and then to attack all day on top of it? I saw a very fine brigade on Northern Command maneuvers which had marched three nights in succession and on the last night had done 14 miles, mostly across country. They were then pushed into a long attack. By 4 o'clock in the evening they were literally reeling with fatigue—fatigue alone, remember, without the strain of real war. Do not let us forget that the soldier in the ranks has any amount of work which he must do by day, although it can be reduced by careful training. But he has his rifle to clean, his rations to draw, his digging, his sanitary work and all the rest of it, while it is one of the characteristics of the east that you cannot get a refreshing sleep by day—the glare—the dust—the flies prevent it.

Taking all these matters into consideration it seems to me that if you are to get the full fighting value out of your men, you must reserve these night movements for a crisis, and not make them the ordinary routine. We must, of course, be prepared to move at night much more than we have done in the past, and to move much further and more quickly. But it seems to me that movement by day will still be the rule, and hence we must be prepared to protect ourselves by daylight, and often without cover.

I should like here to emphasize the effect which the use of mustard and similar gases is likely to have in this respect. Let us think again of Northern Command maneuvers, and the little thick patches of garden used so successfully for concealment by the troops. Would the troops still have concealed themselves so well in these had the enemy sprayed them with liquid gas? Surely one or two hostile airplanes

with properly arranged tanks would have made the whole of these uninhabitable in a few hours. I think this problem of liquid gas is about the most difficult thing we have to face in modern war, and I have yet to hear of any solution to it.

Although matters will be very unpleasant at times for the fighting troops, it seems to me that the most vulnerable and effective targets for actual attack will be the refilling points. The latter must be carefully concealed whenever possible, and they must never be allowed to become congested. It seems probable that, instead of having large refilling points serving a number of units, it will be necessary to have a number of small ones. Again the demand will be for improved staff work, better training and discipline.

Trains, instead of being unwieldy and ill-disciplined masses, must be highly trained, able to shake out quickly into suitable formations and to maneuver almost as effectively and rapidly as the fighting units. They must be able to move and find their way across country in the dark. They must, in short, be as well trained and disciplined as the fighting troops, and their junior commanders must possess sound tactical knowledge.

Again, the trains and refilling points, being the most vulnerable portions of your formations, must be the first to be properly protected by antiaircraft artillery and machine guns. I suggest that the next war will see them protected by their own Lewis guns, mounted on limbers, which will work on a properly coordinated plan with the antiaircraft artillery. But remember it is no use to stick a machine gun on a cart and put a driver in charge of it and pretend you are protected from air attack. If you do this you are merely wasting a machine gun, and a perfectly good driver as well.

Many of the points I have referred to above, apply equally to the protection of the fighting troops. The latter have, however, several advantages. They are, for the present at least, better disciplined. They are more elastic, they are able to leave the roads almost anywhere and shake out across country into suitable formations. They have, moreover, their own weapons. But to take advantage of these characteristics a great all round improvement is necessary in march discipline, while battle drill for getting under cover and into suitable formations must be carefully worked out and regularly practiced.

Remember that every commander is responsible for protection of his own unit against air attack from less than 3000 feet, and that properly coordinated rifle and Lewis gun fire is effective up to that height. Remember, too, that antiaircraft artillery only undertake the

defense of units who are compelled to march on the roads. Once troops leave the roads and deploy they must look after themselves.

It may interest you if I sketch with a view to experiment, a suggested antiaircraft organization of a battalion.

It is based on the fact that hostile airplanes when they come near troops are doing one of two things, reconnoitering or attacking. If they are doing the former the best way to scare them off is to get out of sight at once. We have therefore one signal on which each platoon commander is responsible for taking his platoon under cover as quickly as possible and for keeping it there. It is extraordinary how little practice in this gets rid of the initial confusion and quickens it up.

Should it be fairly obvious that the battalion has been observed and there is a likelihood of the planes acting offensively, the first thing to do is to get the battalion into a formation which is as little vulnerable as possible, and at the same time to get fire defense into action. On the signal for this each company and the transport gets into a square formation, alternate companies and platoons moving out on either side of the road. The advance can then be continued in this formation, platoons moving at varying distances from the road, and so keeping separate. It is very important to avoid lagging to the rear, for this will cause the battalion to occupy more than its proper road space when it closes on the road.

Fire defense is entrusted, in the first instance, to the Lewis guns of the two rear companies in the order of march, and is organized as follows. The four Lewis guns of the last company but one march at the head of the battalion, and those of the rear company at the extreme rear. The leading pair of each of these groups of four guns is ready for immediate action, the guns are not in their covers, and antiaircraft mountings are carried by hand.

Should hostile aircraft be sighted, whether or not immediate attack appears imminent, the immediate action guns come into action one of each pair on either side of the road, while the next pair of guns prepares for action. Each pair of guns remains in action until the battalion has passed, and then comes up to the head of the battalion at the double, when the process is repeated. You thus get a step system of defense, giving you always four guns in action, while four more are always ready to supplement them should actual attack develop.

Whenever the battalion is halted, either in bivouac or in brigade reserve, all these guns are in action on their antiaircraft mountings, and two men with each gun are on the look out ready to open fire.

The guns of the third company in order of march being grouped in pairs at the front corners of the battalion, and those of the rear

company at the rear corners. This gives the maximum raking effect from whichever direction airplanes appear, a most important point, both when halted or on the march.

You will notice that the L. G.'s of the two leading companies are not normally used for anti-aircraft defense, and remain with their platoons, so that they are ready for immediate use on the ground.

No orders are necessary for the allotment of guns for anti-aircraft defense. The third and fourth companies in the order of march take this on automatically as a matter of battle drill. When the battalion deploys for tactical work on the ground, the reserve company automatically takes over A. A. defense, and the guns of other companies which have been performing this duty rejoin their platoons.

In addition to this automatic fire, company commanders may, when ordered or attacked, open controlled rifle fire with two platoons, but only when it is certain that the battalion has been spotted.

While talking of this matter of battalion defense I would like to emphasize the importance of troops in reserve always taking full precautions against air attack. This is a point which is often neglected, yet this is the time when a battalion is most likely to be attacked. A reserve battalion or company should always be extended under cover, and should have its automatics ready for action and to open fire should the position be discovered and attack developed.

In conclusion, I will try to paint a picture of what a well trained division will look like when doing an approach march against an enemy possessing a properly organized air force. First will come the fighting troops, but not in dense columns on the roads. They will be compelled to move on wide fronts, making use of all available cover, and moving across the open in artillery formation. Each battalion of the force will move with its anti-aircraft scouts scanning the sky, and with automatic guns ready for instant action. The whole force will be, as it were, on tip toe, ready to extend more widely or halt under cover at a moment's notice on the alarm being given.

Behind the troops will move the trains, no long strings of carts and drivers jammed together on the road, but elastic and highly disciplined bodies, ready at any moment to leave the road and adopt similar formation to the infantry, or to take cover as the situation may demand. They will be covered by anti-aircraft weapons specially allotted for their defense.

Refilling points will no longer be great congested transport centers. They will be split up into smaller centers, and each site will be carefully selected for defense from air attack. They will be covered by a carefully coordinated system of anti-aircraft artillery and machine guns.

The concentrated portion of the force, but not the leading and deployed units, will be covered by mobile antiaircraft artillery moving in long, rapid bounds, and keeping watch over the columns as they pass.

All this will, of course, complicate enormously problems of staff work, of supply, and of time and space. It will throw an immense strain on the endurance of the troops and on the training of officers. It will, of course, slow up movement to a very great extent, and will therefore make tactical decisions slow and difficult to obtain. The difficulties of the offensive on a large scale will be vastly increased. But highly trained, elastic and well disciplined forces will still be able to retain their mobility, and will be at an immense advantage over those who have never considered and practiced in peace, the conditions which will be imposed upon them in war.

MAXIM LXXII

A general-in-chief has no right to shelter his mistakes in war under cover of his sovereign, or of a minister, when these are both distant from the scene of operation, and must consequently be either ill informed or wholly ignorant of the actual state of things.

Hence it follows, that every general is culpable who undertakes the execution of a plan which he considers faulty. It is his duty to represent his reasons, to insist upon a change of plan—in short, to give in his resignation rather than allow himself to be made the instrument of his army's ruin. Every general-in-chief who fights a battle in consequence of superior orders, with the certainty of losing it, is equally blamable.

In this last-mentioned case, the general ought to refuse obedience; because a blind obedience is due only to a military command given by a superior present on the spot at the moment of action. Being in possession of the real state of things, the superior has it then in his power to afford the necessary explanations to the person who executes his orders.

But supposing a general-in-chief to receive a positive order from his sovereign, directing him to fight a battle, with the further injunction, to yield to his adversary, and allow himself to be defeated—ought he to obey it? No. If the general should be able to comprehend the meaning or utility of such an order, he should execute it; otherwise, he should refuse to obey it.—Napoleon's Maxims of War.

The Officers' Reserve Corps As It Affects Our Military Policy

By MAJOR S. T. STEWART, C. A. C.

THE surgeon at a C. M. T. Camp in 1926 was called upon to dress a swollen face. "What happened, son," he asked. "A bee lit on my face at parade," was the reply. "Why didn't you brush him off?" "How could I? I was carrying the colors." That is the sort of stuff of which the younger Reserve Officers are made.

The *Saturday Evening Post* carried a story of a colonel of the old school, in France with a tractor outfit of the new army. He received orders to move by rail the next day at noon. He could not find a copy of Combat Orders—his adjutant was "Raw", and he fumed and fussed all night because he could not get his entraining order written. He was very much upset in the early morning when his adjutant showed up after having been told to clear out at midnight. How was he going to load with this crowd of half-baked soldiers? The adjutant was smiling. "Sir, will the colonel come with me?" They walked to the siding and behold—there was the entire train—loaded—guns and tractors clamped and secure. "How did this happen?" the colonel asked. "Oh, Major X was superintendent of the Keystone Truck Co. and when I told him of the move he had the bunch up all night." That may be only a story but it helps to picture the resources of the Reserves.

Two men come to mind, one a colonel C. A. Reserve, who is well known in the office of the Chief of Coast Artillery for his knowledge of certain phases of coast artillery work. The other is now a lieutenant colonel who has passed every correspondence course offered by the branch and one or two school terms. Both of these men are engineers high in their profession with salaries or incomes which a Major General might envy. In Baltimore there is a colonel of a reserve regiment of engineers who is a high official of the B. & O. railroad. He is frequently seen at Corps Area Headquarters. His officers are all employees of the road. In an emergency the regiment would be made up of railroad men and ready over night. Have we any Railroad Engineers in the Regular Army to compare with this unit?

I overheard a young officer ask, "What do these men get out of it? Why are they buzzing around?" Well, I guess they have the "Bug"—it is their avocation. In some it may be a liking for the uniform and

the title which goes with it; in some it is a genuine patriotism; in many other cases it is an honest belief that it is the duty of every citizen to prepare to fulfill his duty as laid down in the law, to serve his country when needed.

Upon returning from foreign service in 1925 it was my privilege to be one of the speakers at a meeting of Reserve Officers on the occasion of a monthly conference. At the dinner early in the evening there were three distinct regimental groups of from twenty to forty officers each. Many of these men I knew had performed creditably the duties of post commanders, fire commanders, artillery engineers on this side, and had taken troops into the zone of action. Others were youngsters just out of college with four years theoretical training—but they were organized, cohesive groups of the Organized Reserves, ready for instruction. It struck me forcibly that there had been a great change since 1917 and that certainly, as the saying goes, "Much water had passed over the dam."

It is these men and one hundred thousand like them with whom we are concerned today. Of this body of men it may be said: "They were officers yesterday and civilians today—they are the officers of tomorrow." Though civilians today, they stand, as do the regular, as citizens and soldiers with a heavier accent on the "Citizens." However, they do hold commissions and they are a part of the "One Big Army." We must work with them in peace time, serve with them in war, both giving and taking orders. It is wise therefore that we understand them.

The following figures, as of January, 1928, will be informative:

Strength of Officers' Reserve Corps	110,014
Organized Reserves	84,052
(Of whom the unassigned are	18,472)
Other classifications	25,962
Number with World War experience—approximate	60%
Number from R. O. T. C.	17,623
Number from C. M. T. C.	1766
Number of National Guard Officers holding reserve commissions —	8451
Regular Army Officers on duty with Organized Reserves	463

If my memory is correct, there were but a few hundred reserve officers in 1916 and their status was uncertain. Today we have this splendid group of men, a component part of the Army of the United States.

Let us see where this Officers Reserve Corps fits into the army scheme. "The organized peace establishment, including the Regular Army, the National Guard, and the Organized Reserves, shall include all of these divisions and other military organizations necessary to

form the basis for a complete and immediate mobilization for the national defense in the event of a national emergency declared by Congress."

Let us turn back again to 1916 and 1917. There comes to mind the "Business Men's Plattsburg." Men of affairs for the most part, inspired by the genius and foresight of Major General Leonard Wood, laid aside their business, paid their own transportation and subsistence to go to Plattsburg in order to receive a few weeks training in military matters. Incidentally, they laid the foundation of the Officers' Training Camps which did so much to make possible the American Army which astounded the world. Bacon-Roosevelt-Poe, the names were true to history. They were also the beginning of the Officers' Reserve Corps today.

Then, too, there were the scenes on Governor's Island and in Central Park where, after business hours on Saturdays and Sundays, Boyce's Tigers were drilling with broom sticks for guns in their eagerness to learn the Art of War. Of some 25,000 who drilled in this manner nearly every one became an officer or noncommissioned officer in the war which followed.

It was the story of America's military history repeating itself, raw untrained men grouping together without coordinated direction, reminiscent of Civil War days when music teachers drilled but could not keep step, when a man who raised a company was a captain, or if a regiment, he was a colonel.

Then came the entry into the war. The National Guard was drafted—it was officered and was grouped into brigades—but where were the millions of men and the trained officers to lead them, necessary for a modern army?

You know the story of the Officers' Training Camps, of the Draft of the National Army, of the enormous costs, and of the many mistakes, yet culminating in that wonderful army of which we are all proud to have been a part.

But once before there had been in this country a victorious army which had marched down Pennsylvania Avenue and made the rest of the world think twice before antagonizing us. At the end of the Civil War the Union Forces were disciplined and seasoned, trained in the sternest of schools, the battlefield. What became of them all? Scattered, disintegrated, merged into civil life, living only in memory. A small regular establishment survived, made up of companies and battalions. Was the same thing to happen again after the demobilization of the great fighting machine? Were we to face the necessity, in case of future war, of creating our military organization

after war had begun? Would there be no effort to perpetuate any part of the plan which had been used?

Men from every walk in life, from every town and village had been in the ranks and seen the waste of life and treasure due to unpreparedness. There was talk of universal service, but this was against all American tradition: there was talk of universal training, but this too was rejected by the people. However, they did demand action and action was given in the National Defense Act. It added to the one of 1916, which made the Organized Militia of the states available as a national force in an emergency, two important items, the Organized Reserves and the perpetuation of the National Army, not as a huge machine but as a framework to which can be fastened the man power of the nation and an army trained in a smooth, orderly and efficient manner. Preserved are the numbers and traditions of famous regiments and divisions, assigned to the same country and same states which gave them their beginning.

Think what this would have meant in 1917 if such action had been taken in 1865. Think what it will mean in the future. It means that the World War with its tremendous cost has been funded as a permanent investment for all time. The units which fought at Château Thierry, at Soissons, at the Marne have been retained and the experience and pride of achievement can be handed down from year to year and added to as new knowledge is acquired. Not a large regular army has been created but a permanent peace-time organization which provides for a system of National Defense.

The military policy of the United States is a subject upon which one might write volumes. There was a time when there were grounds for saying that the United States had no military policy. That was hardly true. We had a policy but no way of enforcing or carrying out that policy. The basic theory is that every citizen owes military service to the country which protects him. It was a policy of voluntary service. It was held that in times of emergency a million men would spring to arms over night.

Every male citizen between the ages of 18 and 45 was and is a member of the militia. In pioneer days every house had its rifle and men knew how to use them, but the student of our military history knows what happened when there was no organization and no trained leaders and enlistments were short.

That policy is due to the mental attitude of the Anglo-Saxon founders of our government. They dreaded a large army because they had seen its misuse by tyrants. Such a dread is unfounded when the army is at all times subject to the will of a free people.

Today we have a policy and a means of carrying it out, and the Draft Law puts teeth into the old militia laws of the states.

The *Military Organization of The United States*, a Leavenworth pamphlet, gives this definition: "A sound military policy comprises the adoption and application of measures necessary for national defense and for the protection and the promotion of national policies.

"The essential of a military policy is a correct scheme of national defense, supported by governmental provisions for its execution.

"The military policy of the United States contemplates the maintenance of a small and highly trained peace establishment consisting of the Regular Army, National Guard and the Organized Reserves, all so organized and trained as to provide the framework on which the required man power of the nation is mobilized, trained, armed, equipped and supplied; and the necessary resources of the nation are organized."

It is to be kept in mind that the Regular Army and National Guard are both expandable bodies with peace-time tables of organization and inactive units to be filled to war strength by voluntary enlistment. The Organized Reserves—at present made up of active units—are composed largely of officers with a small body of enlisted specialists and key men—training cadres to be filled largely by the draft.

We have seen that the Organized Reserves comprise 50% of our first-line troops, furnishing 27 out of 54 divisions. Apparently, therefore, the Officers' Reserve Corps is to furnish 50% of the trained or partly trained officer personnel in an emergency calling for the mobilization of this National military organization. Actually, it will furnish more because reserve officers are also assigned to both active and inactive organizations of the Regular Army. When deferred National Guard organizations are formed by the Federal Government at such a time, they also will be largely officered by the reserves.

There is the mass of GHQ Reserve, Harbor Defense, Communication Zone, and Zone of the Interior Troops to consider. Therefore 75% to 80% is nearer the figure.

This view of the subject makes all the more justifiable the present division of the Officers' Reserve Corps into two lists, the assigned and the unassigned (really the inactive, as the latter are those who do not have the time to devote to obtaining the necessary credits for promotion or retention on the assigned list). It is believed that this list should be as large as possible, that is, taking in all qualified candidates. The more it contains the more will the army be a part of the people. It is also believed that more attention should be paid to qualifying enlisted men of the Regular Army for reserve commissions. The present regulations make it very hard for an enlisted man to make the grade,

but if the Regular Army can't train them who can?

It may be well at this time to see just who is the Reserve Officer, what is required of him, and what he can do.

ELIGIBLE

- a. Former officers of the army at any time between April 6, 1917, and June 30, 1919, and retired regular officers in the grade of a general officer.
- b. Approved graduates of R. O. T. C.
- c. Approved graduate flying cadets.
- d. Graduates of the C. M. T. C. upon passing required courses.
- e. Former Federally recognized National Guard officers.
- f. Warrant officers and enlisted men of the Regular Army, ERC and NG. Warrant officers and enlisted men who served between April 6, 1917, and November 11, 1918.

All the above under special regulation or approval of examining board.

- g. Specially qualified persons, by direction of the Secretary of War or his assistant and not above the grade of major in Specialist Section Reserve.

For promotion he must hold a certificate of capacity or pass an examination and have served from 3 to 8 years in grade. No officer will be promoted or appointed in any grade higher than major unless he first shall have completed the full course of instruction at the Special Service School of his section and the full course as required of Regular Army officers at Fort Leavenworth, except that this does not apply to those who have had World War experience as an officer.

He may not, in general, remain on the assigned list for more than 5 years if he has not completed 200 hours of correspondence course work or other credit, or holds a certificate of capacity for a higher grade. He may not stay on the unassigned list for more than 5 years unless he obtain credits or has some special qualification.

Based upon 60% of World War veterans at this time, 10 years after the war, 15 years will see all but a few of them gone from the list.

Do these reserve officers take themselves seriously? They do. The Reserve Officers' Association, Department of Oklahoma, in 1917 resolved in convention assembled, that any officer of the National Guard or Organized Reserves who had had 30 years service, enlisted or commissioned, should be put upon the retired list of the Army with all of its privileges but without pay.

The *Reserve Officer Magazine* for October, 1917, suggests that the War Department seek a plan of issuing emergency commissions to

Regular Officers or in some other way fix their status in time of peace to make sure that they may be of greatest worth in time of war. They *are* thinking.

Suggestion has been made that Reserve divisions take over the training of CMTC in their own districts. It is the question of property and not of training which has so far proven the greatest obstacle.

Correspondence course enrollments have grown from 6091 in 1922 to 33,646 at the end of the quarter closing October 31, 1927. These figures are not total enrollments but survivors at the end of periods.

Appropriation has been made to send 16,000 of them to camp in 1928 for 14 days training. This number is all too small, and only goes to show the interest taken.

Are they efficient? Compared to the War-time emergency officer—Yes. They do not claim to know tactics and strategy as do the Regular officers who make such study a profession, but they do have a knowledge of things military and they have attained the "Officers point of view" as no 90-day wonder did in 1917. Many of them have had extensive combat experience. Reserve regiments have processed and trained CMTC for ten-day periods and proven that they fulfill their mission of fitting themselves to receive, organize, supply, equip, and train the selective service men necessary to bring the unit to war strength during mobilization for a major emergency.

There are new regulations in the War Department not yet issued, which have been put into being largely by demands from the reserve officers themselves, for better training and more efficiency—efficiency both in the administration of that training and in the individual officer himself. Many of them are asking for obligatory training.

It has been a difficult problem ever since the start in 1921 to know what time the reserve officer could give and what to demand of him. Many questions have arisen as to training, promotion, and recruitment. There have been mistakes and misunderstandings.

Today the Organized Reserves have a separate department of their own in the War Department. A better understanding of the place filled by the Reserve Officer and of his needs is being achieved by the Regular and the Reserve Officer himself.

They have learned through contact and through correspondence courses how much there is to learn. The failure to understand this has always been one of the handicaps of the partially trained officer. It must be recognized, however, that those men have a knowledge of things and ways and means of doing things in commercial life with which the Regular officer is not acquainted. Lt. Col. Thompson Short, C. A. Res., of Kansas City, took 30 minutes to design a "Short Winch"

for Portée Artillery by which one man can load a 75 into a truck, with floor $4\frac{1}{2}$ feet from the ground, in one minute. The Antiaircraft Reserve Artillery Group at Camp Knox, Kentucky, in August, 1927, with an attendance of 135, concluded four record practices with the words "Target shot down," and with 15% of hits for each practice. Small things, perhaps, but they show which way the wind blows.

It is not always easy to be a Reserve Officer, to make a living and to have your spare time filled up with correspondence courses, CMTC, and other official mail, to have your vacations taken by summer training camps, but they do it and like it and hate to give it up. Some of them ask for more.

The quality of men in the Reserve Corps is high and the replacements from below are typical of young American manhood. A lady who saw the demobilized officers pass through the Pershing Club in New York said they were the finest body of men she had ever seen. They are the men who make up 60% of the Reserve Corps today and the rest are their younger brothers.

The Reserve Officer looks with respect upon the Regular, but he expects high standards. He wants to like him and wants to look up to him both as an officer and a gentleman. The following extracts from a letter may be illuminating. The writer is a prominent business man who is not too busy to devote a great deal of time to Reserve affairs.

I would like to emphasize this thought to you, that the greatest effect on military policy in the United States that the Organized Reserve can possibly have is that of FAVORABLE ADVERTISING of the army and its accomplishments.

If we may take the recent visits of the officers to this city as an illustration. These visits, through their personal contact, did more to make the people think that the army is a respectable lot than anything else, because it emphasized the better class of officers, and enlisted personnel.

It must be borne in mind that army characteristics have changed since the war due to two reasons; partly to the resultant glamour of the war and a better knowledge of the army, but more particularly in the retention in the Regular establishment of some of the men who have come up either from the ranks or from civilian life, as officers, which has softened the hardboiled, absolute 220-proof autocratic attitude of the old timer. The contact which the officers and men have had with Reserve officers and with CMTC men has broadened them in a way that, I think, has been of incalculable benefit to the army. [Personally I think it has been the contact with the Reserves and general public. STS].

I think the practice, which seems to be the case, of pushing the Organized Reserve off on to some officer who is practically unfitted for anything else, is all wrong. I think the handling of the Organized Reserve should be done by one of the best type of Regular Army Officers, because he would be

a sort of half-way between the close Army regulation type of officer and the broad-guaged—almost slipshod—average Reserve Officer.

Let us take Colonel A as an illustration. His reputation, of course, was that of a very strict disciplinarian and a typical old-time, hard-boiled Army man that would only appeal to the "Roughnecks" because if they opened their mouths he would just figuratively, if not literally, knock their teeth down their throats. He was the boss and, damn it, he was going to see that everybody knew it. That type of Army Officer is no longer "the style" in spite of the fact that I think he may be necessary in war time. But you yourself have seen how they change the regulations and training material to "Feed 'em raw meat" during the war period and that the training schedules are entirely different in peace time.

There are a number of darn nice chaps in the Army, enlisted personnel and commissioned, just as there are nice chaps in civilian life, and just as there are a H of a lot of "Prunes" in both. When the Organized Reserve gets the nicer ones and gets the rough edges worn off the "Prunes," the Organized Reserve returns from their military contact realizing (1) that we must have an Army; (2) that the Army has its problems; (3) that there must be money spent to accomplish the Army's aims; (4) that public opinion needs to be guided; and (5) that the Army will get just as much appropriation as public opinion wants it to get.

The Reserve Officer is a power to be reckoned with in the land. The Reserve Officer's Association has between 20,000 and 27,000 members with a department in every state. There are the Association of the Army of the U. S., the Military Order of the World War, and M. O. F. W. There are the American Legion and the Veterans of Foreign Wars. They give time, money, and effort to C. M. T. C., they stand behind the R. O. T. C., they stand shoulder to shoulder with the National Guard; they are a bulwark against the radical. They will have much to do with the future of America.

They permeate all ranks of American life from the Vice-President to the boy just out of college. They are in Congress, editors of our newspapers, professional men, and merchants. Their membership in the Army makes them its friends, their knowledge makes them critical, their being gives America a consciousness that the military policy is based on sound principles and will stand the test in time of need.

Royal Military School Music

Kneller Hall, Twickenham, England

By MAJOR E. L. DYER, C. A. C.

IT is said that, after the Crimean war, the British Commander in Chief, the Duke of Cambridge, ordered a military ceremony at Varna, where all the bands of his regiments were required to play the national anthem as a unit. However, as standard pitch was not known in army music of those days, and as there were doubtless other irregularities in the bandman's art, His Royal Highness was horrified instead of thrilled by the resultant efforts of his massed musicians. He decided then and there that a school was necessary for army bands. On his return to England, Kneller Hall was secured for this purpose, in 1857, the year of the Indian mutiny.

Kneller Hall had been built in 1709 by Sir Godfrey Kneller, court painter of Charles II, as his country house. It may be that Kneller was not a very good painter, but he was rich and spared no expense in laying out and beautifying this famous estate. The ground plan of his original house and park is hanging on the walls of the present edifice and a hasty glance suggests a miniature Versailles, with its little lake, promenades and park land.

In 1848, the original house was burned, but the stables now standing are the ones built 200 years ago. The corner stone of Godfrey Kneller's house is still preserved as a relic in the hallway of the rebuilt mansion.

The present hall is a fine large structure of brick and stone, three stories high, with ornamental veranda of stone arches and double towers above the central door giving entrance to the chapel. Ivy or creepers cover part of the walls. The rooms on either side of the chapel comprise the Commandant's office and school rooms.

The Commandant's quarters consist of a suite of rooms on the rear of the building facing the gardens and small lake 150 yards away. This lake runs parallel to the building and a pair of swans as well as a flock of ducks, perhaps attracted as much by the music of students as the natural beauty of the place, make their home there. A small island in the pond has been laid out with gardens and walks, and is reached by a gracefully arching bridge. About the pond and Hall, the well kept lawn is shaded by many large trees. The lane from the street to the main entrance winds through a miniature forest.

A few yards in front of the Hall stands a tree that is quite new to me. It reminds one of an armored fir. The Commandant said it is

called a monkey puzzle. Its branches are sheathed with heavy projecting scales, and a monkey cannot climb it without injuring its paws.

There is a magnificent plane tree, an acacia, and beech, oaks, elms and chestnuts furnishing shady bowers where the students place their music stands and practice scales and tunes. A few captured German guns seem out of place here.

As I entered the grounds, the spell of Arcadia and the melodies of flute and horn brought me visions of Pan and his pipes, of Orpheus and his lyre. As the Commandant remarked, one would hardly believe such a delightfully rustic place existed within eight miles of Hyde Park Corner, London.

The small town of Twickenham may be reached in about one hour from London by bus, bus and trolley, or by suburban train, and is not far from the famous Hampton Court, built by Cardinal Wolsey and presented to Henry VIII.

Getting off at Twickenham Railroad station, one crosses a stone bridge over the tracks, then strolls (unless he prefers the bus) along a fine macadamized road, passing typical cottages on the right and larger homes and gardens on the left. A few minutes walk, and the cottages cease. On either side are broad fields. The famous Twickenham rugby field or stadium is passed on the right, then a large field devoted to sports, opposite a florist's multi-colored gardens. This athletic field is part of the 50 acres of land pertaining to Kneller Hall and gives the music students opportunity for football, cricket, golf, tennis and other sports. Boats on the little lake give a realistic setting for those who may wish to sing the Venetian Boatman's Song.

Continuing along the road just beyond the athletic field the Park woods begin, and, through an ornamental gateway, a pretty lane winds among the trees, the main entrance to Kneller Hall. Two hundred yards further along the road is the students' entrance. Just opposite is a large brick public house named in honor of the Duke of Cambridge and offering the thirsty a cool drink of ale or beer. Not far from the "Pub" is a new brick two story building, quarters for married students and their families.

A building separate from the main Hall is called the Band Practice Room. Besides being used for band work, it has a stage for theatricals and a musical library. It is in this building that the Kneller Hall Amateur Dramatic Society, a students' organization, gives its performances.

The mission of the School is to furnish conductors (the American Army designation is band leader) for the 180 bands and 10 staff bands in His Majesty's military service, and, in addition, to give musical instruction to selected bandmen. Those in the conductor course, which

lasts about three years, are designated students and number 42. They wear the blue uniform. The other class, numbering 128, are called pupils. They wear the khaki colored uniform and their course lasts one year. Those who show marked talent in their work may expect to return to the School in the conductor course, after they have served a few years more in their organization. Each band in the British Army has the right to send a pupil to the School. The pupil, during his school year, perfects himself in his special instrument and gets a good rudimentary training in his profession, but the conductor student, in the course of his training, must become proficient on every instrument played in the band, must master the theory of music, compose a musical number of his own, writing parts for all instruments, rewrite an opera for military band, write a complete orchestration from simply the piano score, and lead a band or orchestra in the most difficult classical music. A conductor who can say he has graduated from Kneller Hall needs no other recommendation.

With nearly 200 musicians at the School, bands and orchestras are organized and weekly concerts given. These enjoy the highest repute, and the King and Queen have been enthusiastic listeners. A special band of 25 picked students is in great demand and often goes on concert tours, during week ends. Thus the School as well as the students derive considerable income from this practice.

The staff of the School consists of the Commandant, the Director of Music, civilian instructors for the various instruments, and subjects, a few noncommissioned officers for administration work, and 17 civilians who are cooks, table attendants and laborers. No non-musical work is required of the students, except keeping their rooms policed. Thus their entire energy may be devoted to their professional studies.

The present Commandant is Colonel Sir F. N. Elphinstone Dalrymple, Bart., C. B. E., D. S. O., who very courteously conducted me through the School and explained its organization. On the walls of his office are the pictures of all his predecessors. The detail is for four years. The Director of Music is Lieutenant H. E. Atkins, Mus. Bac., L. R. A. M., A. R. C. M.; the letters following his name stand for Bachelor of Music and for degrees from the Royal Academy of Music and the Royal College of Music. His important duties as head of the musical instruction carries with it commissioned rank. The conductors of the 10 staff bands in the British Army also hold commissioned rank—they may rise as high as Lieutenant Colonel—but those of the line are not commissioned. Q. M. Sergeant F. C. Waller is an assistant to the Commandant in administration work. Colonel Elphin-

stone-Dalrymple estimated that the School costs the British Government \$75,000 a year, which, I believe, does not include the rations and army pay of the students.

Separate from Kneller Hall, there is also a Piping School, at Edinburgh, for the pipers of the Scottish Regiments.

It is said that the sun never sets on the British flag. It might be added that melodies never cease from horn or reed that know the technique of Kneller Hall, for the graduates of the School are scattered over the far flung empire. Some also have shown their skill under foreign flags. I believe W. O. Francis Leigh, who directed the American Headquarters band at Chaumont during the world war, and W. O. Wm. Cain, of the American Army Music School, got their early training at Kneller Hall. It certainly seems no mistake that the American "Army Music School" at Washington, D. C., is copied after Kneller Hall as a model.

It is hoped that the two Schools may enjoy intimate and helpful relations and it would seem a splendid idea to encourage American bandmen travelling abroad to visit the mother institution. Perhaps, it could be arranged to have occasionally an American band leader take a short course at Kneller Hall to learn its methods, feel its inspiration, and carry a worthy message back to America.

MAXIM XXVIII

No force should be detached on the eve of a battle, because affairs may change during the night, either by the retreat of the enemy, or by the arrival of large reinforcements to enable him to resume the offensive, and counteract your previous arrangements.—Napoleon's Maxims of War.



BRIGADIER GENERAL WILLIAM R. SMITH
Commandant Coast Artillery School, January 11, 1923, to December 20, 1924

EDITORIAL

Machine Guns

IN an interesting article in a recent number of *The American Mercury*, "An Army Officer" discusses the development of the machine gun in our service. The author is a proponent of this weapon and feels that, despite present agitation and recent changes, our present practice fails to take full advantage of the possibilities of this powerful adjunct to modern warfare. He argues that the requirements of the machine guns should control the location of the riflemen, rather than the reverse, but he is sufficiently pessimistic to believe that it will be a long time before our regulations will contemplate machine-gun priority in locating battle lines.

" . . . In the 1923 Field Service Regulations of the United States Army it is suggested that machine-guns are 'the most powerful weapons of the holding elements which make possible the counter attack.' That is clear sense: use your best and most rapid fire weapon to shoot into the enemy and stop him dead, and use your rifleman with musket and flashing bayonet to rush at him and drive him back, to counter attack, to sweep him away from your positions and over beyond his original starting point. To do this, you must pick a position that will be suitable for machine-gun fire, and have the riflemen support and protect the machine-guns, instead of having the machine-guns protect and support the riflemen. Nevertheless, the books all go the wrong way. They all say that in the defensive the machine-guns should be disposed so as to cooperate with the riflemen.

"Here is a problem posed at Army men. It comes from the Infantry School, teaching the best American principles to our troop leaders. . . . It tells of the situation of an imaginary combat in an imaginary war. It has the major putting rifle company A on the left, and rifle company B on the right, and rifle company C in reserve, and tells the officers of machine-gun company D to look over the spots that the other units have not occupied and see if they can find places to put their own gun crews.

"This sequence of thought . . . is the reverse of correct. . . . But the tragedy of the matter is that it is in exact conformity with the Training Regulations of the Infantry, which state:

The rifle units constitute the framework around which the plan of defense is built. (T. R. 420-115, Par. 12.)

The primary weapons [of the infantry] are the rifle and the bayonet, and ultimate success depends upon their skilled use. Its other weapons are auxiliary. (T. R. 10-5, Par. 12.)

"In other words, according to the regulations, the poor machine-gunners might just as well have remained at home. . . ."

Undoubtedly, many of the younger officers, particularly those who have served with machine guns, will find themselves in full accord with the ideas advanced by the author; but is it not possible that their gaze is fixed so steadily upon the machine gun that they fail to see the threat to the supremacy they claim for it. Tom Jenkins, teaching wrestling at West Point, used to—and probably still does—pronounce an axiom which holds good for military science. "There is a block for every hold," he would say, and the course of military science demonstrates that this is so. The arrow superseded the sling and gave way to the rifle. Guns are dominated by bigger guns. Armor was invented to defeat the projectile. Gas brought forth the mask. The anti-aircraft gun is the reply to the airplane. And so it goes.

The machine gun was fifty years in arriving, and until it arrived it was not considered worthy of counter measures. The World War demonstrated the possibilities of the machine gun, and brought forth the tank. Neither approached their possibilities during the war, but mechanization of armies is going on apace and the tank is receiving much attention. Both Great Britain and the United States are experimenting with tankettes and baby tanks. In them probably lies the answer to the machine gun. Tanks, however, are offensive weapons, rather than defensive. If the tanks replace the riflemen, wholly or in large part, the machine gun will be left alone on the field and, if not mounted in a tank, its lot will be a hard one. A more important question than the precedence of riflemen or machine gun would seem to be the development of a "block" for the tank.

MAXIM XXIX

When you have resolved to fight a battle, collect your whole force. Dispense with nothing. A single battalion sometimes decides the day.—Napoleon's Maxims of War.

PROFESSIONAL NOTES

Coat of Arms of the Harbor Defenses of Portsmouth

Shield: Gyronny of eight *azure* and *gules*, a three-bastioned fort voided *argent*.

Crest: On a wreath of the colors a ship *gules* flagged proper in stocks *argent*, from the seal of the State of New Hampshire.

Motto: We Are One.

The field is taken from one of the two earliest New Hampshire flags known to exist, that of the Second New Hampshire Regiment of the Continental Army in the Revolutionary War. (This flag bears in the upper corner next to the staff, eight triangles, alternately red and blue, so arranged as to form two crosses, one upright and the other diagonal.) The field commemorates the capture, on December 14-15, 1774, of Fort William and Mary (now Fort Constitution) by the Colonial Americans of New Hampshire, the first American victory of the Revolutionary War. The three bastions of the fort is used as a charge, represent the three forts of the harbor defenses, Fort Constitution New Hampshire, at chief, Fort Foster, Maine, dexter base, Fort Stark, New Hampshire, sinister base. The fact that the three forts are represented as bastions joined together by curtain walls so as to form a single fort signifies their union in the Harbor Defenses of Portsmouth and the close cooperation of the three in the common defense of Portsmouth. The motto, "We are One," taken from the old flag mentioned in connection with the field, also alludes to this union and cooperation. The ship on the stocks, used as a crest, is taken from the seal of the State of New Hampshire, of which seal it is the most prominent feature. Its significance lies in the fact that the Harbor Defenses of Portsmouth defend the only port in the state. Its tincture, red, is that of the Coast Artillery Corps, the combatant arm manning the defenses.

One-Man Tanks

Great Britain, it is reported, has given up the one-man tank as impractical. The United States war department is keeping on with its experiments. It should. The nation that evolved the small car ought to be able to build a small tank, and the goal is important enough to warrant the expenditure of a great deal of time and money. Ask any doughboy who ran up against German pill boxes in the Argonne what he would have given to have been inside a one-man tank. Ask any officer how much faster the advance could have pushed over the German resistance. Had the Americans had an ample supply of tanks to make up for the artillery which could not be dragged ahead fast enough, the battle might have gone through on schedule instead of taking the more than a month that it did.—*Chicago Tribune*.

Test of Motorized Equipment

The 80th Division. Organized Reserves. will be ordered to active duty at Camp Leonard Wood, Md. from July 8 to 21 for the organization of the first "mechanized unit" of the United States Army.

The "mechanized unit," according to the War Department, is a new departure in military tactics and is being studied by European governments. The "mechanized unit" is neither infantry nor cavalry, but a new division of forces providing a unit of great striking power and high degree of mobility.

According to the plans of the department, a "mechanized unit" would consist of 2000 or 3000 men, made up of a battalion of light tanks, a company of medium tanks, two battalions of artillery, a company of engineers, a special infantry battalion and a service detachment. All would be motorized.

The unit would operate independently as a new modern element for an army. The War Department, in this initial study, hopes to be able to apply to the benefit of our military forces the preeminence of the United States in automotive industries.

The work at Camp Wood will consist of problems of organization, administration and supply, as well as tests of new principles in motor equipment for armed forces. The training period will conclude with an extended practice march of four or five days under conditions of active field service.

The 80th Division has been selected to participate in the experiment because it has had several previous successful periods of active training as a divisional staff. Thirty-three of the 60 officers of the division have been receiving training here during the past year under the direction of Lieut. Col. Robert P. Parrott. The division headquarters are at Richmond. Col Fred V. S. Chamberlain will be in charge of the camp training.—*Washington Star*.

Participation of Present General Officers of the Regular Army In the Spanish-American War 1898

Fifty-one of the ninety-five major generals and brigadier generals, line and staff, of the present Regular Army participated in campaigns during the Spanish-American War. This fact was disclosed by a review of individual records on file in the War Department, occasioned by the approach of the thirtieth anniversary of the declaration of war with Spain, April 21, 1898. Thirty-seven were in the campaign which culminated in the capture of Santiago de Cuba, nine were in action against Spanish forces in the Philippines when the city of Manila was surrendered to United States troops, and five took part in the campaign in Porto Rico. Six of the present general officers were cadets at the United States Military Academy during the War with Spain or were not in the military service.

Of the general officers who were in the Regular Army during the Spanish-American War two, Major General Merritte W. Ireland and Brigadier General Frank R. Keefer, both of the Medical Department, held the grade of captain. Seventy-six were first or second lieutenants, five of whom temporarily held higher grades in the volunteer forces. Seven of the Regular Army's general officers were in the Volunteer service and four were enlisted men during the War with Spain. Major General James E. Fechet, Chief of Air Corps, was a private in the Sixth United States Cavalry with which he participated in the Santiago de Cuba campaign. Major General George S. Gibbs, Chief Signal Officer, was a sergeant in the Signal Corps in the Battle of Manila. Brigadier General Campbell King, Assistant Chief of Staff, Personnel Division, War Department General Staff, was a corporal in the Fifth United States Cavalry at the outbreak of the War with Spain and in July, 1898, was commissioned a second lieutenant of Infantry in the Regular Army. Brigadier General Benjamin D. Foulois, Assistant Chief of Air Corps, was a sergeant in the First United States Volunteer Engineers and participated in the expedition to Porto Rico.

Four of the present general officers were wounded in action in engagements during the Spanish-American War. Major General James E. Fechet, Chief of Air Corps, then a private in the Sixth United States Cavalry, was wounded at San Juan Hill in the Santiago de Cuba campaign. Major General Briant H. Wells, Deputy Chief of Staff, then a first lieutenant of the Eighteenth United States Infantry, and Brigadier General Frank R. McCoy, Director of Elections in Nicaragua, then a second lieutenant in the Tenth United States Cavalry, were also wounded in the same action. Brigadier General Walter C. Short, now commanding the Second Brigade at Madison Barracks, New York, as a second lieutenant in the Sixth United States Cavalry was wounded twice in the charge on San Juan Hill.

A total of sixty of the present general officers served in the Philippine Islands during the Insurrection which followed almost immediately after the surrender of Manila. Among this number were four of the present generals who had been cadets at West Point during the campaigns of the Spanish-American War. Brigadier General Frank C. Bolles, now commanding the Fourth Brigade at Fort D. A. Russell, Wyoming, was wounded twice in action during the Philippine Insurrection while a first lieutenant in the Sixth United States Infantry. Brigadier General LeRoy Eltinge, now commanding the First Cavalry Brigade at Fort Clark, Texas, was also wounded in action during the Philippine Insurrection when he was a first lieutenant in the sixth United States Cavalry.

Outlawing War Isn't Simple

The details of the general treaty outlawing aggressive war, which has been urged by President Coolidge, have not been made public. It is assumed, however, that the principle of the outlawry of aggressive war would be made a fundamental principle of international law and that it be enforced "by the compelling power of world opinion."

As every nation that took part in the World War held it was fighting a defensive war, some arbitrary definition of aggressive war is necessary. The definition that has been most often suggested is that an aggressive war is one made by a power that has refused to arbitrate a dispute of a sort that it previously had agreed to submit to arbitration.

It is always difficult to make hard and fast rules for such a complicated problem as that of international disputes. Consider how the proposed test would have worked in the World War between Germany and Russia. Russia was willing to negotiate with Germany—while she mobilized. Russian mobilization was a matter of weeks while German was a matter of days. The German general staff held that if Russia were given time to gather overwhelming forces on the frontier, the czar might break off negotiations and begin war. Then Germany would be at a fatal disadvantage. If there was a likelihood of war Germany's chance was to strike swiftly before Russian mobilization was well under way. In such a situation it would not necessarily follow that Germany's refusal to wait for arbitration meant that its war was aggressive and not defensive.

As to the "compelling power of world opinion," world opinion, unsupported by arms, had no compelling power in 1914. Is there reason to suppose it would have more "compelling power" some time in the future? Would the United State translate its opinion into action in a European struggle because one nation had agreed to arbitration and another had refused?

Cannot this country be of most service to the world by adhering to its traditional policy; by maintaining an adequate defense while dealing justly and generously; by using its influence on behalf of peaceful settlements of disputes, and by taking an active hand only when its vital interests are threatened?—*Kansas City Star*.

Fort Leonard Wood

A general glow of approval ought to go through the country as the news becomes general that the War Department has renamed Camp Meade in Maryland in honor of the late General Leonard Wood, simultaneously with the transformation of the establishment into a permanent Army post. No more appropriate and graceful tribute could be paid the memory of the man who was the father of the Plattsburg plan, and by inaugurating the training camp system gave the United States its only real preparation for combat before the plunge into the World War.

The recognition is of a sort General Wood would certainly appreciate highly were he here. Maintenance of a trained force to be used in time of national emergency was a subject near to his heart. He urged it continually and emphatically upon the nation as he had opportunity, and worked for it in a practical way through the development of camps, even when his activities brought upon him the frown of a dictatorial administration which a man less eminent could scarcely have defied with any success. Indeed the general's devotion to his country along the line he chose brought its penalty even in his case, and necessitated the forfeiture of the chief natural ambition of every soldier, to lead the forces of his country in defensive action against an enemy. General Wood passed through his great travail as a military man in order to see that fellow soldiers should not be forced to go into action unprepared and unable to combat on equal terms with those they must meet. While the nation and the Government subsequently saw to it that he received the recognition and compensation he deserved, unquestionably something of the sting of regret must have remained to the end, in spite of the honor and distinction which crowded the final years of his great and, as far as America is concerned, unique career. It is easy to believe that were he still present, General Wood might find something resembling a final compensation in the commemorative action of the War Department.—*Detroit Free Press*.

Are Automobiles Polluting the Air?

Surgeon General H. S. Cumming of the U. S. Public Health Service, has recently announced the results of a survey undertaken to ascertain whether or not a health hazard from carbon monoxide existed in the streets of our large cities, inside of auto busses and in repair shops. Fourteen of the largest cities in the country were visited, having a combined population of over 19,000,000, and 250 samples of air were obtained for carbon monoxide analysis. These samples were analyzed by the iodine pentoxide method, using a liquid air cooling tube which was shown to be necessary in order to eliminate gasoline vapor, a substance which tends to vitiate the results of the analysis. The street samples were taken in such a manner as to approach the most congested conditions that may exist at a busy traffic intersection. Hence it is felt that these results indicate the maximum hazard that may exist today in the metropolitan thoroughfares from automobile:

exhaust gas. The average of 141 tests made in city streets at peak hours of traffic showed a contamination of 0.8 part of carbon monoxide per 10,000 parts of air. Only 24% of all the street samples had more than one part of carbon monoxide in 10,000 of air and in only one location, a covered passageway, were there as much as 2 parts per 10,000. Samples taken inside auto busses yielded even lower concentrations of carbon monoxide gas. The figures for street air, when viewed in the light of present day standards of exposure to carbon monoxide, do not reveal the existence of a health hazard from this source in our city streets. The only individual who may possibly be exposed to a health hazard from inhaling street air containing automobile exhaust gas is the traffic officer. This potential hazard may be minimized by diminishing the duration of exposure at the most congested traffic stations.

On the other hand, of the 102 tests made in 27 garages in the 14 cities visited, the average carbon monoxide content was found to be 2.1 parts in 10,000. More than half of the samples (59%) contained over 1 part of carbon monoxide and 18% of all the samples contained over 4 parts of this gas in 10,000 parts of air. These results for repair shops show a dangerous condition that demands the serious consideration of those concerned. This hazard in repair shops may be reduced to a minimum by not allowing the motors of automobiles to run longer than 30 seconds unless the car is in necessary motion or the exhaust is connected to the outside air by a direct, airtight outlet of ample caliber. Without such outlet no automobile engine should be allowed to run indoors, except to reach its berth or to leave, by the shortest route. All of these samples were taken in garages of considerable size. The great danger to life is unquestionably in the small private garage containing one or two cars. Under any circumstances the discharge of an automobile exhaust into a roofed enclosure should be regarded as a hazardous act.

A Piece of Zinc

Many of the junior officers feel that Army correspondence is bound up in red tape and find the preparation of official papers an onerous burden. This has always been an Army cry, but to show that that correspondence is not what it used to be, the following letter has been resurrected. Perhaps some of the JOURNAL readers can find other and better examples of "getting nowhere fast."

808 D. E. 1895.

Dauids Island, N. Y. H.,
January 23, 1895.

To the
Chief Commissary of Subsistence,
39 Whitehall Street, New York City.
(Through Post Adjutant)

Sir:

I have the honor to request that authority may be granted for the purchase of 8 sheets zinc at \$1.10 per sheet—\$8.80, and 4 pounds 1 inch galvanized nails at 4 cents per pound to line a bin which is under construction for the purpose of securing the bacon, which is kept on hand for issue to troops at this station. The cellar is so damp that it is an impossibility to keep the meat from moulding if not kept in salt.

Very respectfully,
Your obedient servant,
J. W. SUMMERHAYES,
A. Q. M. and A. C. S.

1st Endt.

Davids Island, N. Y.,
 January 24, 1895.

Respectfully forwarded to the Assistant Adjutant General, Department of the East.

W. L. HASKIN,
*Major 1st Artillery,
 Commanding Post.*

2nd Endt.

January 25th, 1895. C. C. S.

3d Endt.

Headquarters Department of the East,
 Office of the Chief Commissary of Sub.

New York, January 26, 1895.

Respectfully returned to the Assistant Adjutant General, recommending return to the A. C. S., with attention invited to A. R. 1347.

J. W. BARRIGER,
*Col. & A. C. G. S.
 C. C. S.*

4th Endt.

Headquarters Department of the East,
 Governor's Island, N. Y., Jan. 28, 1895.

Respectfully returned to the Commanding Officer of Davids Island, inviting attention to the 3d endorsement.

By command of MAJOR GENERAL MILES:

SAM'L. BRECK,
Assistant Adjutant General.

5th Endt.

Davids Island, N. Y.
 January 29th, 1895.

Respectfully returned to the Post A. C. S.,

By order of MAJOR HASKIN:

GEO. W. VANDEUSEN,
*1st Lieut. 1st Artillery,
 Acting Post Adjutant.*

6th Endt.

Davids Island, N. Y.,
 January 29, 1895.

Respectfully returned to the Post Adjutant with the request that the Post Quartermaster be directed to make a requisition for the necessary material required and to complete the bin as desired.

J. W. SUMMERHAYES,
A. Q. M. and A. C. S.

7th Endt.

Davids Island, N. Y.,
 January 31st, 1895.

Respectfully returned to the Post Quartermaster who will make the necessary requisition for the material required.

By order of MAJOR HASKIN:

GEO. W. VANDEUSEN,
*1st Lieut. 1st Artillery,
 Acting Post Adjutant.*

8th Endl.

Davids Island, N. Y.
 February 1st, 1895.

Respectfully returned to the Post Adjutant with special requisition, in duplicate, prepared in compliance with the preceding endorsements.

J. W. SUMMERHAYES,
Capt. & Asst. Quartermaster.

FORM No. 48.—(VOUCHER TO ABSTRACT K.)

(COPY)

SPECIAL REQUISITION

[illegible]

I CERTIFY that the above requisition is correct, and that the articles specified are absolutely requisite for the public service, rendered so by the following circumstances: To line a bin made to store the bacon in the Subsistence Storehouse at Davids Island, N. Y. H.

APPROVED:

(sgd) J. W. SUMMERHAYES,

(sgd) WM. L. HASKIN,
Major 1st Artillery, Commanding.

Capt. & Asst. Q. M., U. S. A.

9th Endt.

Davids Island, N. Y.
 February 2nd, 1895.

Respectfully returned to the Assistant Adjutant General, D. E.

W. L. HASKIN,
Major 1st Artillery,
Commanding Post.

10th Endt.

Feb. 4th, 1895 C. Q. M.

11th Endt.

Headquarters Department of the East,
Office of the Chief Quartermaster,
Governor's Island, N. Y., Feb. 4, 1895.

Respectfully returned to the Assistant Adjutant General, D. E., recommending that the requisition be forwarded with recommendation that purchase of the zinc and nails called for be authorized, cost not to exceed \$8.96 Barracks and Quarters.

C. G. SAWTELLE,
Assistant Quartermaster General U. S. A.
Chief Quartermaster.

12th Endt.

Headquarters Department of the East,
Governor's Island, N. Y., February 5, 1895.

Respectfully forwarded to the Adjutant General of the Army, approved as recommended by the Chief Quartermaster of the Department in the 11th endorsement.

NELSON A. MILES,
Major General, Commanding.

13th Endt.

A. G. O., Feb. 7th, 1895 For the Quartermaster General.

14th Endt.

WAR DEPARTMENT
Quartermaster General's Office,
Washington, February 11, 1895.

Respectfully returned, by direction of the Quartermaster General, to the Chief Quartermaster, Department of the East, Governor's Island, N. Y. H., through Department Commander, disapproved.

The sheet zinc would quickly rust out when covered with salt brine, and the oxide of zinc that would form would poison the brine.

C. P. MILLER,
Capt. & Asst. Quartermaster,
U. S. Army.

15th Endt.

Feb. 11, 1895 C. Q. M.

16th Endt.

Headquarters Department of the East,
Office of the Chief Quartermaster,
Governor's Island, N. Y., February 14th, 1895.

Respectfully returned to the Post Quartermaster, through the Commanding Officer, Davids Island, N. Y., inviting attention to the endorsement of the Quartermaster General hereon of the 11th inst.

C. G. SAWTELLE,
Assistant Quartermaster General,
U. S. A., C. Q. M.

17th Endt.

Davids Island, N. Y.,
February 15, 1895.

Respectfully transmitted to the Post Quartermaster.

By order of MAJOR HASKIN,
1st Lieut. 1st Artillery,
Post Adjutant.

18th Endt.

Davids Island, N. Y.,
February 16, 1895.

Respectfully returned to the Post Adjutant.

The zinc called for is not intended to line the inside of the bin for the bacon, but to line its outside to prevent rats entering it.

J. W. SUMMERHAYES,
Capt. & Asst. Quartermaster,
U. S. A.

19th Endt.

DAVIDS ISLAND, N. Y.
February 18th, 1895

Respectfully returned to the Chief Quartermaster, Department of the East, inviting attention to the 18th endorsement.

W. L. HASKIN,
Major 1st Artillery,
Commanding Post.

20th Endt.

Headquarters Department of the East,
Office of the Chief Quartermaster,
Governor's Island, N. Y., Feb. 19th, 1895.

Respectfully returned to the Assistant Adjutant General, Department of the East, inviting attention to endorsement hereon of the Post Quartermaster, Davids Island, dated the 16th instant, in which it is recommended that this requisition be again forwarded for further consideration by the Quartermaster General.

C. G. SAWTELLE,
Assistant Quartermaster General,
U. S. A., C. Q. M.

21st Endt.

Headquarters Department of the East,
Governor's Island, N. Y., Feb. 20, 1895.

Respectfully forwarded to the Adjutant General of the Army, recommending re-consideration.

NELSON A. MILES,
Major General, Commanding.

22nd Endt.

WAR DEPARTMENT,
Quartermaster General's Office,
Washington, D. C., Feb. 26, '95.

Respectfully returned, by direction of the Quartermaster General, to the Chief Quartermaster, Department of the East, Governor's Island, N. Y. H., through Department Commander, with information that the previous action of this office disapproving this expenditure is adhered to.

C. P. MILLER,
Capt. & Asst. Quartermaster,
U. S. Army.

23d Endt.

Feby: 27, '95. Chief Quartermaster.

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. W. E. COLE, Colonel, Coast Artillery Corps, President, Coast Artillery Board.

New Projects Received and Initiated

Project No. 617, Service Test of Transmitting Antenna for SCR-132 Radio Set.—Devised by the Signal Corps for field use, this transmitting antenna is in the hands of the 61st Coast Artillery (AA) for service test.

Project No. 618, Confidential.

Project No. 619, Confidential.

Project No. 620, Test of Binaural Training Instrument, T-1.—In accordance with instructions from the Chief of Ordnance the Binaural Training instrument recently developed in the Acoustic Laboratory at Frankford Arsenal has been shipped to the Coast Artillery Board for test. This instrument is designed to assist in the training of listeners in the sound ranging section. It is now in the hands of the 61st Coast Artillery (AA) for a service test.

Project No. 621, Depression Position Finders, M1, Long Range (Maximum and Minimum Ranges for Each Class).—This study has to do with the graduation at the Arsenal of Depression Position Finders, M1, with particular reference to the maximum and minimum ranges for each class. The Board made a study of the subject and recommended that the minimum and maximum ranges for each class of Depression Position Finders, M1, be determined only after consideration of the special conditions that may apply for each instrument.

Project No. 622, Coincidence Trainers, Types "A" and "B", Makaroff.—The Ordnance Department recommended the withdrawal of all coincidence trainers, types "A" and "B", in excess of those required for training purposes, for storage at Frankford Arsenal, there to be held subject to requisition by the using services. The Coast Artillery type coincidence trainer is the type "B", of which there are 32. The Coast Artillery Board recommended that one type "B" coincidence trainer be made available for each regiment in which there is for use a coincidence type self-contained range finder. In this connection, attention is invited to a Bulletin on the subject, "Training of Coincidence Range Finder Observers," issued by the Chief of Coast Artillery, May 26, 1927.

Project No. 623, Location of Fire Control Instruments, 3-inch Antiaircraft Gun Battery.—Quoted from a letter from the Chief of Coast Artillery: "Another problem that has to be solved in reference to the employment of antiaircraft artillery is the one of minimum displacement between the guns and the fire control instruments such as to permit of (1) accurate work on the part of the instrument

crews due to interference by overhead fire, and (2) accurate position finding due to possibility of too great dispersion of the elements of the battery (guns—height finder—director).” The Board made a study of this problem, suggested a program for test, and recommended that the Ordnance Department be requested to prepare forty rounds of inert ammunition; that the 61st Coast Artillery (AA) be directed to conduct, under the supervision of the Coast Artillery Board, the test as suggested in the report; and that authority of the War Department be obtained to conduct a service practice, with shrapnel, with suitable safety precautions for the protection of personnel.

Project No. 624, Installation of Continuous Fuze Setter on M 1918, 3-inch Antiaircraft Gun Mount.—The Chief of Coast Artillery referred to the Coast Artillery Board a sketch, prepared in the office of the Chief of Ordnance, showing a preliminary outline of a method of installing the continuous fuze setter on the M 1918, 3-inch antiaircraft mount. The Coast Artillery Board studied this sketch, in conference with officers of the 61st Coast Artillery.

MAXIM LXII

Tents are unfavorable to health. The soldier is best when he bivouacs, because he sleeps with his feet to the fire, which speedily dries the ground on which he lies. A few planks, or a little straw, shelter him from the wind.

On the other hand, tents are necessary for the superior officers, who have to write and to consult their maps. Tents should therefore be issued to these, with directions to them never to sleep in a house. Tents are always objects of observation to the enemy's staff. They afford information in regard to your numbers and the ground you occupy, while an army bivouacking in two or three lines is only distinguishable from afar by the smoke which mingles with the clouds. It is impossible to count the number of the fires.—Napoleon's Maxims of War.

BOOK REVIEWS

A. E. F.—Ten Years Ago in France. By Major General Hunter Liggett. Dodd, Mead and Company, New York. 1928. 5½"x 8". 335 pp. Ill. \$3.00.

The author is an exception to the rule that military studies alone are insufficient to prepare an officer for the responsibilities of high command. The American Army has never afforded an opportunity in time of peace for training in command of large bodies of men. Study is the only alternative, albeit a poor one, to experience, and General Liggett made the most of this alternative. Without a background of practical training, except with small bodies of troops, he rose to the command of an army and became one of the outstanding generals of the World War.

General Liggett's rank in France gave him a comprehensive view of the situations on the Allied side and enabled him to give us this very vivid picture of the A. E. F. in France. The story is essentially that of his own experiences and those of the troops he commanded, but the whole A. E. F. and the events on the Western Front are sketched in with sufficient detail to present a complete picture of the continually changing situation in France. The greater part of the book is historical in character, with such anecdotes as Sergeant York's feat, the Lost Battalion "that was not lost," and Parker's march on Sedan through the First Army Corps. Of this last exploit General Liggett says that "This was the only occasion in the war when I lost my temper completely."

Of greater value to us of the present generation are the comments of the author, particularly in the latter part of the book. Here we find his kindly judgment of individuals (especially of his staff) and here we find his conclusions and observations on many matters.

"France itself was a sorry disillusionment to the American soldier. That the fault was more the American soldier's than France's does not alter the fact."

"Only youth and physical prime can meet the full impact of modern war."

"High executive ability is rare in any walk in life; it is a gift rather than an acquirement."

"War grows progressively more graceless and mechanical, but there is such a thing as an army too drab for its own good, . . ."

"Putting a uniform on a man does not dim his ardor for souvenirs."

"In this war we made an incomparably better military showing than in any previous war; not so much that we were so good this time as that we were so bad in the past."

"The tank has a great future in war."

"The Army deserves well of the country."

The book will give us a better understanding of the A. E. F., though we may have been a part of it, but, more important, it also gives us an insight to the character of one of the great military leaders of recent times.

De La Resistance De L'Air Au Movement Des Projectiles (On the Resistance of the Air to the Movement of Projectiles). By Colonel A. Grouard. Berger-Levrault, Paris. 1928. 5¾"x 9". 87 pp. Ill. 6 francs.

The title of this book by Colonel Grouard unfortunately does not indicate truly the subject matter discussed. The resistance of the air to the movement of projectiles, as an entire subject, is of primary importance both to the ballistician and to the artilleryman. Its effects have been seriously studied ever since the ranges of artillery fire began to increase beyond that which could be readily estimated by the gunner's trained eye. The various phenomena have, however, almost without exception, continually resisted successful reduction to simple mathematical analysis, although certain phases of the problems presented have received a great deal of attention from numerous students of artillery. Notable among the contributions of American ballisticians is the paper of General Ingalls, then Captain Ingalls, on the Resistance of the Air to the Motion of Oblong Projectiles as Influenced by the Shape of the Head, published in the *Journal of the United States Artillery* in 1895.

The particular phase of the subject discussed here by Colonel Grouard pertains to that deviation of projectiles from the plane of fire known as drift. Beginning with the experiments of the German physician, Magnus, whose results, by the way, formed the basis for the comparatively well known Flettner Rotor-Ship, Colonel Grouard develops a theory of the composition of forces acting on a solid of revolution in motion in a resisting medium, not only of translation, but also of rotation about the axis of figure. The application of this theory is, in general, more qualitative than quantitative in that it seeks rather to delineate the physical bases for the effects observed than to evaluate their numerical values. It is applied to practically every form of projectile, spherical and oblong, concentric and eccentric, and by its means many observed phenomena, formerly considered as anomalies, are explained. From the development of the theory, it is stated that not only does the direction and amount of the drift depend on the sense or direction and pitch of the rifling, but also on the shape and homogeneity of the projectile, the initial velocity, the quadrant elevation, etc. Supported by experiments in which the author assisted as a Second Lieutenant of Artillery in 1869, this theory is caused to explain the drift of a spherical projectile to the left, whereas an oblong projectile fired from the same gun will ordinarily drift to the right.

In discussing the physical bases for the principal causes of drift in modern oblong projectiles, Colonel Grouard does not depart from the generally accepted theories of other writers and experimenters on this subject, attributing the observed effects to the gyroscopic precession of the point due to the center of air pressure being in front of the center of gravity. The different results which may ensue from this precession are indicated and discussed in turn. These results may be caused by differences in the length of the projectile, the pitch of the rifling, the initial velocity, the quadrant elevation, and to a lesser extent by other more or less negligible causes, such as the presentation of the projectile as it leaves the muzzle.

The book as a whole is a collection of seven essays by the same author which appeared in the *Revue d'Artillerie* from July to December, 1926, and which themselves are a resume of the previous work of the author published in the *Journal des Sciences Militaires* from 1874 to 1878. There are two notable defects in this

work from the standpoint of the student of artillery. The first pertains to a dearth of suitable and simple diagrams to explain and supplement the text. The second is the fact, regretted alike by the author as by the reader, that no very modern experimental verifications of the theories propounded was available. It is to be hoped that when such experimental evidence does become available, Colonel Grouard's more than a half century's devotion to this phase of artillery fire will as successfully explain the drift of modern projectiles as it did of those in the infancy of rifled cannon.—G. B. W.

Napoleon the Man. By R. McNair Wilson. The Century Co., New York. 1928. 5¾"x 8½". 621 pp. Ill. \$5.00.

The many-sided and tremendously vigorous Napoleon has offered such a varied field for the biographer that the man himself has been neglected. To the military man he is the greatest of all soldiers; the lawyer remembers him for the code of laws which bears his name; the statesman considers him remarkable for his statesmanship; and the administrator finds his administrative ability unique. All are prone to forget that he was a human being, and it is as such that Dr. Wilson presents him to us.

The book, brilliant though it is in places, has not the dramatic brilliancy of Herr Ludwig's recent book, nor is the Napoleon of Dr. Wilson the Napoleon of Herr Ludwig or of Dr. Rose. The treatment is wholly sympathetic and probably unduly kindly. From beginning to end we find that Napoleon was a patriot, a son of the Revolution, in whom the welfare of France was the dominating thought. Most writers find that at some stage of his life, usually at or shortly after his elevation to the consulship, personal ambition began to replace patriotism. Dr. Wilson does not permit us to see that personal ambition ever entered Napoleon's mind.

To be thus partial to Napoleon reflects discredit upon his counselors. Undoubtedly, many of those who surrounded Napoleon were more worthy of suspicion than of trust, but some of them must have acted in good faith. Talleyrand, in particular, seems to bear the brunt of Dr. Wilson's attack, yet Talleyrand gave Napoleon much good advice at one time or another only to have it rejected. It is, however, of Napoleon himself rather than of his actions or of his surroundings that the book treats. Of the women who entered his life other than his wives or his relatives only Pauline Fourès (a gesture by a man heart-sick because of his wife's infidelity) and the Countess Walewska (an affair of true love) receive mention.

"The price of Napoleon's fall was the World War, . . ."

"In 1914, 'England and France united' were compelled . . . to return to the wise and generous plan of Napoleon and to put an end . . . to the power of kings.

"Italy is a nation today; Napoleon tried to make Italy a nation. The Pope, today, is compelled to content himself with his Heavenly power, Napoleon tried to make him so content. Germany, today, lives while Prussia, with her horrible militarism has been curbed; Napoleon tried to curb Prussia and to raise up Germany. Austria has been quelled and reduced; Napoleon tried to quell and reduce Austria. Poland has regained her freedom and her soul; Napoleon tried to secure them for her. Belgium is independent of Holland and is the friend of France; Napoleon tried to bring about this state of matters. The Holy Inquisition reigns no longer

in Spain; Napoleon suppressed it. England and France are friends; that was the dream of all Napoleon's life. . . ."

Dr. Wilson's book is an important contribution to Napoleonic literature, and the Napoleon he describes is best summed up by Sir Frederick Maitland who carried Napoleon to France on the *Bellerophon* prior to his transfer to St. Helena. "Damn the fellow," he said, "if he had obtained an interview with His Royal Highness in half an hour they would have been the best friends in England."

Soldier of the South. General Pickett's War Letters to his Wife. Houghton Mifflin Co. 1928. 5¼"x 8". 158 pp. Ill. \$2.50.

These letters cover the period from 1861, just after General Pickett's return from California to join the Confederacy, to the late Seventies, when he was trying to sell insurance after having turned down an offer of command by the Khedive of Egypt. The side-lights they throw upon the men and women of the South are both tragic and glorious. The letters well repay reading by any American proud of his heritage. It is almost incredible that any man, under those circumstances, could have written letters of such beauty.

Quotations from them gives little idea of the letters on the whole, and those which follow are selected for other reasons—they speak for themselves—

September 17, 1861.—I, of course, have always strenuously opposed disunion, not as doubting the rights of secession, which was taught in our text-book at West Point, but as gravely questioning its expediency.

October 11, 1862.—Old Jack [Stonewall Jackson] holds himself as the God of War, giving short, sharp commands, distinctly, rapidly and decisively, without consultation or explanation, and disregarding suggestions and remonstrances. Being himself absolutely fearless, and having unusual mental and moral, as well as physical courage, he goes ahead on his own hook, asking no advice and resenting interference. He places no value on human life, caring for nothing so much as fighting, unless it be praying. Illness, wounds and all disabilities he defines as inefficiency and indications of a lack of patriotism. Suffering from insomnia, he often uses his men as a sedative, and when he can't sleep calls them up, marches them out a few miles; then marches them back again. He never praises his men for gallantry, because it is their duty to be gallant and they do not deserve credit for doing their duty.

After Fredericksburg, December 14, 1862.—I can't help feeling sorry for Old Burnside—proud, plucky, hard-headed old dog. I always liked him; but I loved little Mac [McClellan], and it was a God-send to the Confederacy when he was relieved.

February, 1863.—Old Peter [Longstreet], our far-seeing, slow but sure, indefatigable, plodding war-horse . . .

July 3rd and 4th, 1863.—(the order to charge at Gettysburg)—Old Peter laid his hand over mine and said:—"I know, George, I know—but I can't do it, boy. Alexander has my instructions. He will give you the order. . . . I am being crucified at the thought of the sacrifice of life which this attack will make." . . . I will never forget the look in his face nor the clasp of his hand when I said: "Then, General, I shall lead my Division on." . . . I obeyed the silent assent of his bowed head, an assent given against his own convictions—given in anguish and with reluctance.

After Gettysburg, July 6, 1863.—The sacrifice of life on the blood-soaked field on the fatal 3d was too awful for the heralding of victory, even for our victorious foe, who, I think, believe as we do, that it decided the fate of our cause.

After Cold Harbor, June 3, 1864.—Oh, this is all a weary, long mistake. May the merciful and true God wield power to end it ere another day passes.

Message passed through the hostile lines after the birth of General Pickett's son, July 18, 1864.—"To George Pickett: We are sending congratulations to you, to the young mother and the young recruit. 'Grant, Ingalls, Buckley.'"

January 28, 1865.—My knowledge of Mr. Lincoln, his humanity, his broad nature, his warm heart . . .

Appomattox, 8-9 April, 1865.—We have poured out our blood and suffered untold hardships and privations, all in vain. And now, well—I must not forget, either, that God reigns.

After the war—Trying to sell insurance.—Our company's agent . . . then profanely informed me that I'd "have to unbuckle a few holes and throw out, if I wanted to paint the monkey's tail sky-blue." Alas, little one. I am afraid your soldier isn't much of an artist. . . . He can't throw out and he can't paint the monkey's tail sky-blue; and it makes him crawl and creep to be associated with artists who can!—S. M.

American Presidents. By Thomas Francis Moran. Thomas Y. Crowell Company, New York. 1928. 5¼"x 7½". 318 pp. Ill. \$2.50.

In the *American Commonwealth*, Lord Bryce devotes a chapter to a discussion of why "great men are not chosen Presidents." In his concise study of American Presidents, Dr. Moran finds that great men are chosen Presidents on occasion and that they are most likely to be chosen when most needed, for each of the three truly critical periods in American history has found a really great President in the Executive chair. Nevertheless, the peculiarities of our political system have too often brought mediocre men to the head of the nation when great men have been available.

Dr. Moran divides presidential history into three periods. From Washington to Jackson, the nation selected men of greatest ability; from Jackson to Lincoln (the "lowest point" in the presidential curve), from men of least ability; and since Lincoln, from men of intermediate ability. In each period the author discusses the Presidents individually and points out the comparative value of their services to the nation. His descriptions are concise and to the point, and each President stands forth in sharp relief, save that the author is chary of judgment in discussing recent Presidents.

Washington is "the personification of dignity, poise, and sound judgment." John Adams possessed "statesmanship of the highest order," but Jefferson was "a far abler man." John Quincy Adams was "one of the lofty peaks in the presidential range." Jackson was "a strong leader of tremendous motive power and bold initiative." Van Buren had no superior "as a political leader and organizer." Between Van Buren and Lincoln came seven men "of mediocre talents and modest attainments." Lincoln was "the ablest of the Presidents with the possible exception of the first." Grant was "remarkably successful . . . considering his lack of preparation." Arthur was a "machine politician" who "rose splendidly to meet the responsibilities of his office." McKinley "did not have the attributes of a real leader." Coolidge is "an enigma to the politicians and a delight to the people."

Summing up, the author finds that "The twenty-nine American Presidents will compare very favorably with the Prime Ministers of England since 1789 or with the constitutional executives of any other European country for a corresponding length of time," and of the twenty-nine he believes that history will record five—Washington, Lincoln, Cleveland, Roosevelt, and Wilson—as great.

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