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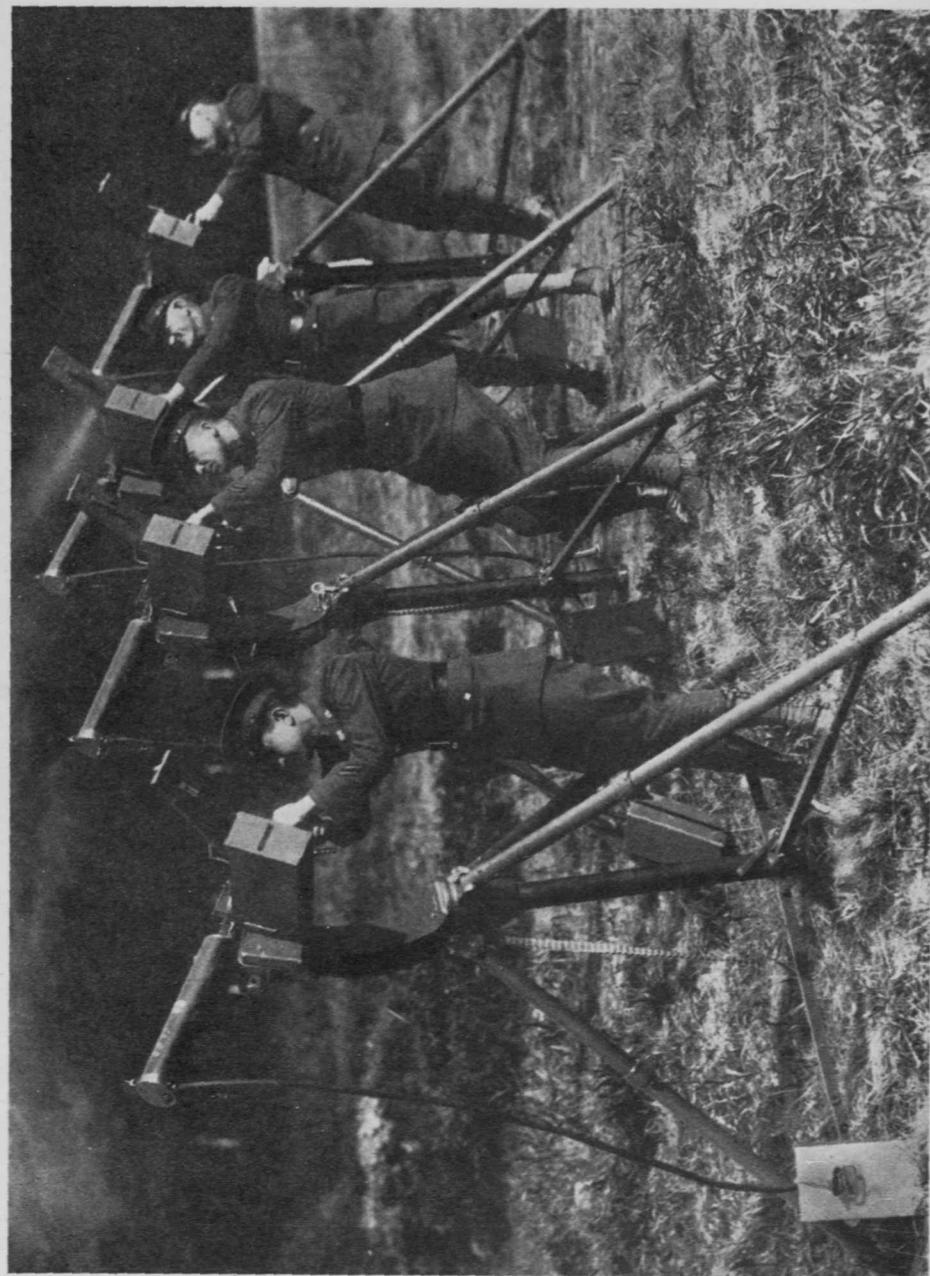
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THESE MEN HELPED BATTERY "E" 63D COAST ARTILLERY (AA) WIN THE KNOX TROPHY

From left to right: Pvt. 1st Cl. John Pico; Corporal Wm. C. Ross; Pvt. 1st Cl. Wm. H. Henderson;
Corporal Wm. S. Malone.

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Combat Arms, Their Relative Functions

By COL. SAMUEL G. SHARTLE, C. A. C.

WE all know in a general way the "Arms" of our Army, the kinds of weapons they use and the method of their employment. Why then discuss a problem so apparently simple? The simplest things, or those appearing so, recompense contemplation and study. Judging by statements one often hears or sees by officers of the different branches, even experienced officers, the problem is not so simple. It is desirable that officers of the military profession should have not only a broad view of the whole matter, but also a clear idea of the principles applicable to the use of the combined arms. This knowledge should go beyond dogmas, or the didactic statements of our regulations and school literature.

Both modern science and modern philosophy reject the fixed idea. Although we are ever seeking certitudes, we arrive either experimentally or by so-called pure reason at few, if any, unconditional conclusions, or ends that are not suggestive of further inquiry. That is a characteristic of life, which itself depends on change. By making ourselves the debtors of those who have gone before, that is, by availing ourselves of their experience, using it as a beginning for further inquiry, we may add our mite to the sum total of knowledge.

Even that basic dogma, set down without qualification in a General Service School publication, "The Infantry is the principal and most important branch. It represents the moral force of the nation and of the Army," may be made the subject of inquiry, but not in any partisan sense. Let us look at the whole problem.

The armed forces of the nation include the Navy, and the Navy, I have no doubt, would object emphatically to the dictum that even the Army as a whole represents the moral force of the nation vis-à-vis foreign powers. And the lay mind will in general agree. There are those, too, who look upon the Coast Guard as the "moral" force of the nation—those who would make us good by statute and intimidation. All of which means that unqualified generalizations stated as certitudes are not certitudes because they are invariably questioned and lead to argument and hence to further knowledge. We must remember that the writer of the above quoted dogma could have had in mind only the Army and the Army employed as a mobile fighting unit in land warfare. So understood and qualified, this starting point for the exposition of the relative functions of combined arms in the

field and premise for the development of the principles governing their use, are stable and sound.

Before proceeding with the main theme of our subject, permit me to point out some *fallacies* with respect to the relative values or even obsolescence of certain arms—fallacies that like most errors of judgment may be ascribed to the over-weening enthusiasm of partisans or to the imagination of the unscientific mind quickened by the contemplation of actual and, by comparison with the old and familiar, marvelous accomplishments of the machine age.

Among these fallacies may be mentioned:

1. The oft-repeated assertion that *forts*, land and seacoast, are rendered well nigh obsolete by the increased effectiveness of mobile army weapons and the new air offensive power. I have seen it stated, blithely, that World War experience demonstrated the obsolescence of land forts; because forsooth the mobile armies carried artillery of such power that these forts could be demolished in short order, or failing this, besieged and forced to surrender large garrisons. One of the first principles of open warfare is, of course, not to take a field army into an isolated fort, but the regular garrisoning of a fort which is part of a defensive line is altogether a different matter. And even the isolated fort has held large forces of the enemy out of action elsewhere, for example, Maubeuge and Antwerp, where German forces sufficient to turn the scales on the Marne in favor of Germany were held. It would be interesting to discuss the influence of land forts on the course of the World War. In brief, the course of the war was largely determined by the land forts—from the initial German plan through the intermediate phases of *grand strategy* practically to the final collapse. The Germans chose a wide enveloping movement, the swing through Belgium, in preference to a frontal attack on the French fortresses on the line from the Swiss border to Verdun. And these fortresses proved to be impregnable throughout the war, notwithstanding the heavy mobile guns. They gave the law to the whole campaign on the Western Front. Similarly on the Eastern Front the forts decided the course, if not always the outcome, of the campaigns. For example, Przemysl held nine Russian divisions, a decisive force in the field, for several months. That a fort can be taken with the expenditure of sufficient means and lives is no argument as to its obsolescence. Rather the fact that it wastes the enemy's forces, disarranges his plans, and menaces his communications with, when modernly constructed and armed, a minimum force, is justification for its existence. All this is possible by a leisurely preparation in peace. I am speaking of permanent forts as distinguished from extemporaneous field fortifications.

2. These considerations apply also to *coast forts* with their fixed armament. They serve their purpose when they deter an enemy from attacking

the point defended. They give the law to the hostile fleet. The enemy may, of course, land elsewhere. But the important thing is, he has to, and thus the defending mobile force secures an advantage. As strong points in the coast line of defense, harbor defenses deny the enemy essential harbor facilities, assure protected assembly places for troops and supplies, and afford points of secure departure for the field forces, as well as for our own Navy.

3. But we are told forts can be destroyed from the *air*. So can any installation, ammunition factories, railroads, depots, all important war accessories, if not protected and actively defended when required. All of which merely opens up the question of offensive and defensive weapons. Conceivably a battleship could be sunk by a man in a row boat. The possibility of sinking a lifeless hulk by an air bombardment did not have to be demonstrated. The *possibility* of such performances should not, however, be taken as synonymous with the *probability* under service conditions, that is, a live defense. The fort and the battleship have two means of defense against the one of the enemy air forces, antiaircraft guns and friendly air forces. This advantage may, of course, be off-set by the attack through successful surprise, which is for any force, whatever its weapons, a fundamental principle of war, and is not peculiar to air forces.

4. Another fallacy we often meet is the assertion that *Chemical Warfare* developments have rendered certain arms obsolete. It is, of course, an additional menace, which must be met and was in the World War—defensive weapons again.

5. One other error may be mentioned, the somewhat frequent observation that motorization has rendered *Cavalry* obsolescent—notwithstanding its extensive and effective use by the Germans in the first months of the war on the Western Front and during the whole war on the Eastern Front. It could have been used effectively by the Allies at the end of the war against the Germans in retreat.

So much for the fallacies, which are due mainly to a confusion of *methods of warfare*, ever changing with the invention of new instruments, and the basic *principles of warfare*, ever applicable. It is questionable if the modern developments in instruments of war—aircraft, gas mechanization, have marked such a revolution as did the invention of gun powder. Naturally the methods of applying tactical and strategical principles, which basically have not changed, are more complex. But whether the infantryman is armed with the battle-ax, long-bow, needle gun or modern rifle; the artilleryman with the ballista, muzzle-loading, smooth-bore gun or modern high-power rifled cannon; the cavalryman with the sword, lance or fire-arms—they all must conform, if properly employed, to those principles of war so succinctly elucidated by Foch in his *Principe de la Guerre*, illustrated positively or negatively in the outstanding battles of

the world from Cannae to Tannenberg. In fact, the German initial plan in 1914 envisaged a gigantic Cannae—the double envelopment and annihilation.

Because of these immutable principles, and the fact that *defensive* weapons, or methods of using new inventions for defense, follow closely on the development of *offensive* weapons and methods, whatever the existing arm handling them, we find now practically the same classification of combat troops as in the days of the phalanx. It is true that today the multiplication and complexity of weapons along with the increased employment of machines both for combat and supply have necessitated the training of specialists, but they are sub-classes within the larger divisions of combat arms.

The time-honored combat arms of the Army are: Infantry, Artillery, Cavalry. To these have been added in comparatively recent times the Engineers and Signals, and within the lifetime of our youngest soldier, the Air Forces. In discussing their functions, the term "*function*" is used in its general meaning of peculiar business, assigned task, or duties. But it may be well also to give some weight to the mathematical definition—a quantity so related to another quantity that they have mutual and corresponding variable values.

It will be seen that the arms in combat are so related in their action that the efficiency of one not only affects the combined result, but also the individual efficiency, or value, of the others. Thus Infantry with proper Artillery support may succeed in a difficult attack, but utterly fail when not properly supported.

In land warfare no machine makes it possible to dispense with the man on foot with a weapon in his hand. Artillery and aircraft may demolish things and places and destroy their defenders, but the battle is not won until the *Infantry* "mops up" and takes control. The infantryman or other soldier in the roll of an infantryman only can assert and maintain authority where personal contact of the military is essential. Thus the Infantry does domestically represent the moral force of the nation. And in mobile warfare on land, Infantry is the most important and basic arm. Because upon the success of Infantry in reaching its goal depends decisive victory and its fruits, armies are organized with the view of utilizing all other arms to assist and support it. Thus tactically it is the function of Infantry to close with the enemy—it is organized and equipped for this purpose. Its main weapons have been adapted since time immemorial to hand-to-hand fighting. Its auxiliary weapons—the machine guns, light mortars, one-pounders and tanks are modern additions so proportioned as to insure most effectively the success of the rifleman.

From the foregoing it follows that the chief functions of the *Artillery* with mobile forces is support of the Infantry and Cavalry. This support is given in various ways:

1. Directly by *Supporting Fire*—neutralization of hostile guns, reduction of enemy infantry and MG. fire, concentrations, rolling barrages, counter offensive preparation, defensive barrages.

2. *Destruction Fire* against material targets—batteries, trenches, depots, etc.

3. *Neutralizing Fire* against enemy areas to restrict his activities.

4. *Interdiction Fire* upon a particular point or area to prevent full movement.

5. *Bombardment* of fortified places. Support of siege operations.

The functions of that part of Coast Artillery not a part of a field army will be discussed later. To the above list, which includes the heavy field artillery manned by Coast Artillery troops, may be added,

6. Protection of Infantry against air attacks by antiaircraft gun fire and machine gun fire.

A further function of antiaircraft Artillery is, of course, to protect places—forts, depots, rail centers, important installations (as the Panama Canal locks, ammunition factories, etc.).

Cavalry by reason of its mobility and ability to fight mounted or dismounted has a dual rôle, *1st*—Support of the Infantry by reconnaissance, getting information, providing security, veiling movements, delivering surprise attacks on small groups of the enemy, foiling of enemy cavalry, securing critical points (positions, fords, etc.) in advance, and exploiting victories; *2nd*—Independent action as a fighting force against distant infantry or cavalry, raids and specific expeditions. This list further disposes of the fallacy that cavalry is obsolescent.

The effective use of technical aids, such as maps, maintenance or construction of means of communication (roads, railroads), planning and organizing defensive positions (field works), demolition of things useful to an enemy, construction of obstacles, supply of water—these and others have necessitated the inclusion of specialist organizations in combat units.

The duties outlined above are those of the *Engineers*. In addition the Engineers add to the actual fighting force, being armed with the rifle. Thus the term *Combat Engineers*. Of course the Engineer Corps has a variety of other functions not directly connected with combat forces—peace (as well as war) construction and maintenance of navigational channels and accessories, canals, forts, and certain public works.

Included among the combat technical arms are *Signal Corps* units, the functions of which pertain to the construction, maintenance and part operation of signal communication lines—radio, telegraph, telephone, etc.

The less technical duties of the Engineers and Signals are shared by the personnel of the subordinate line troops—digging trenches, laying wire, operation of telephones. These arms are also supply departments.

The newest of the combat arms is the *Air Force*. Because of its phenomenal development within a score of years, the possibilities of its utiliza-

tion in war, as already demonstrated, and its appeal to the imagination, its status and administration as an arm of the services are often in controversy. Notwithstanding, its functions in relation to the other arms have gradually been evolved and reasonably fixed.

As in other arms, their relative functions depend upon their weapons, and the use that can be made of them, so in defining the functions of the Air Force their practical capabilities are considered. In the beginning, the increased facilities for observation by moving aircraft—balloons had been used before (in our Civil War), were evident. Our own Army was interested early in aircraft—one of the first victims being an Army officer, Lieutenant Selfridge. Orville Wright came to Berlin, Germany, in 1909 and flew the first plane seen there. It was my privilege to see those flights and to observe the development of the German Air Forces during the next three years. The German Army authorities from the first made the Air Force a part of their information and communication service—corresponding to our Signal Corps. At that time our own authorities were discussing the best means of developing this new arm, that is, the most promising branch with which to charge its development and its possible uses. My own recommendations in reports from Berlin were to place it in the Signal Corps—for at that time its use as a weapon carrier and air fighter had not been demonstrated. I recall a discussion of this question with General Squiers, then Chief Signal officer, on a visit to Berlin. Later our authorities in Washington took the same view and the Air Force thus became a part of the Signal Corps, remaining under its administration until after our entry into the World War. The World War demonstrated the fighting possibilities of the Air Force and it became too big a factor in warfare to remain an appendage to Signals. This is due to its weapon-carrying characteristics and mobility as a fighting unit. Upon these, as well as upon the special tactical, technical and administrative problems to be solved, its most enthusiastic supporters base their arguments for a separate and independent governmental department—just as the Navy Department became independent of the War Department in our early history. But the problem is different. The Air Forces have not the distinct field of action that the Naval Forces have. It must not only cooperate with both Army and Navy but its activities must be coordinated by tactical superior authority. While the Army and Navy themselves must on certain occasions cooperate, their operations within their own units are self-sufficient; not so with the Air Forces. The Army with its infantry can assert its authority over places and persons. Similarly the Navy, after defeat of the enemy's naval forces or a defended place, can, with its naval infantry, the Marines, assert its authority. Aircraft may defeat enemy aircraft, may destroy places and persons, but then its mission is ended. There can be no exploitation by independent action. The nature of its tasks in conjunction with the land or sea forces is such that aircraft must

be under the command of the headquarters of the force with which it operates.

The functions of the Air Forces are:

1. Aerial reconnaissance, visual and by photography.
2. Protection of the command to which assigned against aerial attack.
3. To assist the operations of the command by attacking enemy land troops, depots, lines of communication, installations, forts.
4. To observe artillery fire.

The reconnaissance functions are supplementary to those of Cavalry; and like Cavalry the Air Force can carry out independent missions, which also like those of Cavalry, should have a bearing on the operations of the command—army or corps. The Air Force also supplements Artillery in their bombing operations. All their activities must be coordinated by higher command. If there were a separate Department of Air, it could have to detail its personnel, as in England, to the Army or Navy. Its activities would be technical and administrative. They could not be tactical.

In the above review of the functions of the combat arms or, as the War Department now designates them, "arms" as distinguished from the "services," the inter-relational functions of Infantry, Artillery, Cavalry, Engineers, Signals, and Air were emphasized, and the quasi-independent missions of the Engineers noted.

The subject is one of both tactics and technology since these functions and missions are conditioned by the weapons with which the several "arms" are equipped. Or put it in another way, the several "arms" are equipped with the kinds of weapons most effective in enabling them to carry out their respective missions as members of a fighting team.

The situation with respect to Artillery is somewhat anomalous, since there are two branches, which have over-lapping functions in the mobile army. There is, technologically, no reason for the division of the Artillery into two branches, certainly so far as the mobile army is concerned.

It remains to discuss the functions of that part of the *Coast Artillery* assigned to Harbor Defense. Here we have an arm whose chief functions are not primarily concerned with the support, in its immediate tactical operations, of another arm. In fact, except locally, that is, in the vicinity of its batteries, the status of the Artillery and Infantry is here reversed from that in field operations. It becomes the function of the Infantry and other arms accompanying it to assist the Coast Artillery in fulfilling its mission by protecting the flanks and rear of the forts. This is because an attack from the sea by naval gun fire makes, for the time being at least, Coast Artillery the most important arm, which in a very real sense represents the moral force of the nation, as anyone who recalls the panic caused by the as yet undefeated Spanish fleet on the high seas in 1898 knows.

Thus the *primary function* of Coast Artillery in Harbor Defense in resistance to naval attack, in fulfilling which it:

1. Denies the harbor defended to the enemy Navy.
2. Protects the harbor installations, depots, shipping and contiguous city itself from bombardment.
3. Clears the exit water so that our own naval forces can debouch without being subjected to fire while in an unfavorable formation.

The *secondary functions* of Coast Artillery manning Harbor Defenses is to assist mobile forces by:

1. Driving off landing parties by gun fire, or
2. Supporting land operations by gun fire.
3. Operating as Infantry.

The weapons of the Coast Artillery are: High power cannon (fixed and mobile), antiaircraft guns, machine guns, shoulder rifle. Thus Coast Artillery can function in a triple rôle—as Coast Artillery proper, Field Artillery and as Infantry.

The Harbor Defense works are strong points in the line of Coast Defense, in which all arms of the Army are concerned. Hence coordination by a common superior commander is essential. But in a naval attack on the forts themselves, the Harbor Defense Commander acts in a measure independently within his own command. He is responsible for direct cooperation with the friendly naval forces.

In conclusion, we may sum up the functions, characteristics and armament of the "arms," as follows:

1. Infantry is the *close-combat* arm with the rifle and bayonet as its chief weapons. Its combat tactics and organization are based on the most effective methods of realizing to the full the fighting powers of the individual.

2. Artillery is the arm of *long-range* combat. It depends solely upon fire effect. The chief mission of Field Artillery is support of Infantry, of Coast Artillery (HD) combat with floating forces.

3. Cavalry is characterized mainly by its mobility, enabling it rapidly to change positions from which to deliver fire or cold steel, reconnoiter, cover, or seize places. Its mission is to cooperate with the other elements of the larger commands and contribute to the success of their operations. Its weapons are based on its close-combat functions.

4. Engineers are technical troops, organized skilled laborers and specialists with the mission of facilitating the movements, elaborating defensive positions and water supply of the other arms. On necessity they act as infantry with the rifle and bayonet.

5. Signals are technical troops, responsible for signal lines of communication and their technical operation.

6. The Air Forces constitute the new arm of extreme mobility with the

missions of combat, observation and transmission of information. Its weapons are the machine gun, small guns, bombs.

This brief outline of the functions of the "arms" and their auxiliaries is intended to present a general view of the modern combat force. It is suggestive of the wide field of study required of the officer who would master his profession, such as:

1. Technology of materiel.
2. Technique—handling instruments of war.
3. Tactics—handling individuals and units in combat.
4. Strategy—evaluation of situations and of the bearing of projected campaigns on the war aims, forcing our will by maneuver.
5. Logistics—the science of supply.
6. Organization.
7. Administration.
8. Law—military and martial. Discipline, and the employment of the Army in peace and war from a legalistic point of view.
9. Sanitation and medical service.

To these we may add national and international *policies* as they may affect the armed forces.

The *Art of War*, utilizing so many sciences, cannot be applied by intuition and its progressive expansion has necessitated the development of specialists, for, as in the Law and Medicine of Civil Life, no one person can thoroughly master all the details of all these subjects and practice them with efficiency. But every officer can and should be familiar with their outstanding characteristics and inter-related principles as they affect his particular sphere of action, and thus justify his membership in the *military profession*.

Air Defense

A TRAVELER from Mars or anywhere beyond the limits of this terrestrial sphere would undoubtedly identify the English and Americans as being of the same nationality. Not, as one might think, because they speak the same language—because they don't—but from certain points of similarity in their national characteristics and particularly the manner in which they prepare for their National Defense.

Maybe it was Napoleon who said, being somewhat disgusted with the manner in which the British were cramping his style, after about fifteen years getting the combination, "The damned British lose every battle except the last one." We Americans are no better. We milled around about three years in the Civil War finding out what it was all about but we hung up a record in the War of 1812 when we didn't even win a single battle (The battle of New Orleans? We were off-side when the battle was fought although Andy Jackson probably would have ignored the whistle, anyway. He liked the British so much). But, so far, like the British, we have been able to win in the end. Maybe some of it has been luck—but not all. It takes something really serious to stir us up—such as this subject of Air Defense.

During the past ten years and more we have been devoting a great part of our effort towards the development of antiaircraft materiel and technique. The problem of antiaircraft fire control and methods was never solved during the World War but much research was carried on and the beginnings of our present system were made. Until rather recently we had done very little in developing the tactics of air defense in its broader aspects although we have spent considerable time on the firing of antiaircraft guns and the operation of searchlights and sound locating devices.

If one were looking for information as to the best methods to accomplish any purpose it is only common sense to assume that he would investigate the means used by those who have had practical experience. This applies to bricklaying, painting (pictures or barns), and to any phase of military operations. In looking about for some one who has had experience in air defense we naturally think of the British and the defense of London against air raids during the war.

It is now time to call your attention to a recent book, "Air Defence," published by Longmans, Green and Company, which describes the development of the London air defense system and is written by one who had first hand information concerning this subject. The author, Maj. Gen. E. B. Ashmore, of the British Army, was connected with the development of the air defense of London from July, 1917, when the German air raids were at their height, up until comparatively recently (1928). The information in this article was obtained largely from his book, which should be on the reading list of all Coast Artillery officers.

General Ashmore describes the gradual development of the London air defenses from the beginning of the war up to the present. He has deduced a number of principles of air defense which are the result of this development and, although some of them are so well known as to be axiomatic, a few of them will probably be new to many officers. It is believed to be worth while to state them.

PRINCIPLES OF AIR DEFENSE

Antiaircraft guns should be distributed and emplaced in their firing positions before and not during the raid.

An efficient system of air defense includes the combined and coordinated use of air forces and ground forces, including antiaircraft artillery, and its observation, warning, and control systems.

No hostile aircraft should be permitted to move over any part of the country unless its movements and course is known.

Airplane patrol and gun lines should be kept separate.

Continuous air patrolling in anticipation of a raid is out of the question.

There is no tactical advantage in scattering airplane locations on the ground.

A gun line should be used to break the hostile bombing formation before pursuit planes gain contact.

Airplanes are impotent in defense unless assisted by an elaborate and far-reaching system of observation and control from the ground.

No defense can be effective against surprise attacks on the coast line.

No scale of defense can secure complete immunity from bombing.

The foundation of air defense lies in a smoothly working system of warning, good observation, quick telephone communication, and a thorough cooperation between the observation system and the defense forces.

The peace and war establishments of air defense troops should be the same.

One would have thought that the British would have been prepared against air raids at the outbreak of the war or would have had at least some tentative defense plans to be put in operation. Such was not the case, although the Germans had been developing the airship since 1884. There may have been some excuse for failure to consider the airplane a serious menace but very little preparation had been made against the Zeppelins for which the Germans had been claiming wonderful accomplishments long before the war.

So it was that as late as May, 1915, when the first raid on London took place, the entire antiaircraft artillery located there consisted of four 6-pdr. Hotchkiss guns, six 1-pdr. pompoms, and two 3-inch guns. As a matter of

fact only the two 3-inch guns could, even by courtesy, be called anti-aircraft guns. These guns were mostly manned by part-time volunteers.

If some of our readers are puzzled by the apparent childishness of the first principle mentioned above (guns should be emplaced before and not during the raid) it is only given notice to indicate the embryo state of development of air defense tactics at the beginning of the air raids on England. Those responsible for the defense believed that anti-aircraft guns should be mounted on fast motor trucks, garaged at some central point, and should turn out when the alarm was given—just like fire apparatus. As a matter of fact the anti-aircraft artillery and the fire-fighting equipment turned out about the same time. Generally there was some need for the fire-fighting equipment but the anti-aircraft artillery never arrived in time to be of any use.

The first German air raids over England were delivered by airships early in January, 1915. The first airship raid on London was made by the LZ 38 on May 31, 1915. This raid was opposed by the anti-aircraft guns mentioned above and a few poorly suited planes which were stationed in the vicinity of London for the principal purpose of training pilots. The era of the airship as a raider extended over a period of about one year—the last airship raid on England being made on March 31, 1916. All raids were conducted at night.

At the very beginning the British were confronted with numerous difficulties. It was found that a system for obtaining information of airship movements was very necessary. The defense must have information of the approaching raiders as far in advance as possible so that it may be prepared to meet the attack. This required an elaborate communication net and observer system. Volunteer observers (civilians) were tried, at first. This system didn't work. At the time of a raid the telephone system became congested, due to the number of reports turned in, and the information furnished was exceedingly unreliable. The flight of a single Zep was exaggerated by the untrained observers into an air armada scattered over the entire southeastern area of England. Nor was the system fast enough even if the information had been accurate.

When the warning of the approaching raiders was received it was necessary to promptly inform the air forces so that they could take off and climb to the altitude necessary to gain contact. This required time. It was early found impracticable to keep planes constantly in the air for several reasons: There were not enough planes and pilots to patrol the air. It was not found practicable to communicate with them so that targets could be pointed out with the necessary information concerning their course and altitude. The searchlight and sound locator system had not been developed to its present efficiency and naturally was of no assistance, except in a few instances, to the air forces.

It is not generally appreciated that the pilot of an airplane is an unusually blind creature while in the air. The design of modern planes has changed greatly but the original difficulty in locating a hostile aircraft while in the air still exists. It can be done much better from the ground. Although airships can be sighted much easier than planes and had a speed of only fifty or sixty miles per hour the British records show that out of eighty-one flights by defense planes the hostile airships were seen on only three occasions after taking off and on one occasion only was an airship brought to action.

But the raiders had their difficulties, too. One of the most serious was their inability to accurately locate themselves when over England. At first they did this by sending out radio signals calling for bearings. This was a great assistance to the British because they also located them—much more accurately than they could locate themselves.

In the year 1915, in fact, during the entire period of airship raids, the antiaircraft artillery and searchlights, poor as they were, rendered very good service. In fairness to the air forces it should be stated that in the early part of the war the planes did not carry machine guns with incendiary bullets and numerous experiments with darts, rockets, etc., were carried on before their adoption. The Zepps furnished a fairly large target for the antiaircraft artillery and since their speed was not great they were easily picked up by the searchlights and could be fired on effectively while within range. The searchlights were particularly useful to the defense planes in pointing out the hostile airship by a concentration of beams.

Then the British began a feverish period of developing defensive measures. These efforts were further intensified by the popular clamor which arose. More efficient antiaircraft guns were designed and investigation of suitable position-finding equipment for them began. The searchlights were also improved or at least efforts to improve them began. The strength of the air forces was increased and the initial cordon of guns and air patrols began to assume form.

But the greatest need of all was an observer and communication system which would furnish instant and accurate information of approaching raiders. A cordon of observers was established about thirty miles from London with additional observers near the coast in a generally southeasterly direction. The observers were mostly policemen, although some of the posts were manned by soldiers. The country was divided into seven warning districts, each one containing a center for the collection of information which, when collected, was sent in to defense headquarters in London. The system was more tightly drawn together and functioned with much greater celerity and efficiency.

It is well to mention that any air defense system should include not only such elements as are necessary to properly inform the defense forces

as to the situation with respect to raiders but, the civilian population should also be warned in order that unnecessary loss of life may be avoided by taking refuge in positions of safety. Panics will result if the populace does not have this information. It is interesting to observe that during one of the raids on London the greatest loss of life occurred not from hostile bombs but in the subway stations in the East End where the populace, mostly alien, was thrown into a panic by the proximity of the bombers and jammed the subway entrances. The people will demand some warning system. It is necessary not only to save life but to prevent the cessation of work in these industries upon which the prosecution of the war may depend.

Airship raids on London ceased in March, 1916. They still continued in the north of England and Scotland, however, but their effects were not so great as in the metropolitan district of London. The British believed they had solved the airship problem and possibly they had. It is more probable that the Germans had only discovered a more efficient means of bombing London and that the operations of airships were transferred to the north due to their greater radius of action.

When the bombing airplane appeared on the scene the British were up against a real problem. Fortunately the Germans began by daylight raids which simplified it somewhat. Airplanes had been used in raids on the channel ports since early in 1915 but it was not until May 25, 1917, that the first serious raid was made on London. It was closely followed by other attacks on June 5, 13, July 4, and 7. These bombing planes came over in formations about sixteen strong and split up as they approached their objective. They cruised at an altitude of about thirteen thousand feet and at a speed of about seventy miles per hour.

In the raid of June 13, 1917, the 3rd Bombing Squadron (German) crossed the North Sea in formation and as it entered the mouth of the Thames detached one machine to attack Margate (on the south shore, sixty miles about east of London) and three others to attack Shoeburyness (on the north shore, forty miles east of London). General Ashmore in his frank account of the raid says, "If, as seemed likely, these detachments were sent out with the object of upsetting the defense organization, they were hardly necessary." The remaining fourteen continued on to London, arriving about noon. They delivered the main blow of the attack within an area whose center was Liverpool Street Station and with a radius of about one mile. One hundred and sixty-two persons were killed and four hundred and thirty-two were wounded. Ninety-four defense planes took the air, out of which five found the hostile formation. Twelve gun stations in London were in action. Casualties to the raiders—none; to the defense—one observer (air), killed. The antiaircraft fire was said to be far too low.

On this date, June 13, General Pershing and his staff left England and landed at Boulogne the same day. He was crossing the channel when the raid took place. Whether it was organized to "get" him or impress him, he missed the show entirely.

This series of raids, the most serious being described above, brought a storm of public protest and disapproval of the existing defense system. The entire system was reorganized. Maj. Gen. E. B. Ashmore, an artilleryman, was brought from France and placed in charge of all means of air defense in the newly established London Air Defense Area (Lada). A gun barrier line was established about twenty miles out and to the east of London. The airplane sphere of action extended from the center of London outward and was separated from the gun areas by a so-called green line which was the division line of the respective priority. This division was to secure coordination which had heretofore been lacking. The guns were to break the hostile formations and, when disorganized, the air forces could attack with better chance of success. Some guns were retained at the central point of the area but due to the fact that only shrapnel ammunition was available they were dangerous to friend and foe alike and were afterwards removed. A system of white arrows was established on the ground, visible at a height of twenty thousand feet, which during the raid were always pointed towards the hostile planes. Air patrol lines were established separate from the gun lines and nearer London. The observer and warning systems and their communications were brought to a higher state of efficiency. Tracker planes were designated and equipped with wireless.

Some of our readers will not know what a tracker plane is (or was). It was a plane equipped with wireless which, when a hostile formation appeared, attempted to get on its tail and send down data to the guns which included the altitude, the course of the bomber and the effects of the gunfire. It should be remembered that no position-finding equipment was developed at this time, although in August, 1917, Colonel Thompson began to use a system of height observation and control which he practiced with some success.

About August, 1917, day raiding ceased. Then it was learned that the Germans were busy practicing night flying and it required no special intelligence to anticipate what was coming next. How to meet this situation? Searchlights were still unable to locate a plane and hold it in its beam. Fighting planes had not been trained in night flying and many believed night flying impossible for them due to their higher landing speed. The slow type of machine was unsuited for pursuit.

It is at a time like this that the "nuts" of the world rush to the assistance of the professional soldier, who, as is well-known, is stupid, lacks imagination, and does not possess the necessary mental dexterity to solve

a problem over which he has worried long before these amateur experts ever heard of it. If there is a submarine to be raised they leave their filling station in Kokomo, Indiana, in charge of their oil changer and hurry to the seacoast (which they are seeing for the first time) to tell our naval experts how it should be done. They mean well but generally their intense desire to be of assistance greatly exceeds their professional qualifications and results only in a waste of time. So it was with the British. Some of the "solutions" proposed by these amateurs should be amusing.

One scheme was to illuminate the entire south of England by a gigantic system of flood lighting so that the approaching bombers would be silhouetted against this background of light and could be easily seen by the defense pilots. Since the British did not have time to move the falls of the Zambezi (Victoria) to England this idea was not tested. Another advocated blowing emery powder into the air ahead of the bombers. In spite of its resemblance to Jeff's plan to obtain revenge by throwing a moth in Mutt's coat, this brain-storm was actually tested whereupon the motor seemed to improve. Another plan was to spray sulphuric acid on the pilot of the bomber hoping he hadn't brought his slicker or to catch him without his gas mask and fill the entire upper atmosphere with poison gas.

What really was adopted as the approved solution was the night use of pursuit aviation, a more highly developed observer and control system, the improvement of the searchlight and the introduction of the sound locator, the improvement of position-finding equipment for antiaircraft artillery, the adoption of barrage fire and the introduction of the balloon barrage. General Ashmore is a strong believer in barrage fire and in the use of searchlights to indicate targets to pursuit aviation. He admits that barrage fire is expensive in ammunition but, at that time (1917), at least, no more effective fire could be delivered.

The balloon barrage deserves some special mention. It was first suggested in 1917 to be placed to the east of London and by the middle of 1918 ten aprons, of three balloons each, were completed. The balloons could be raised to a height of about ten thousand feet and were connected by a horizontal cable from which were suspended vertical wires at fairly close intervals. Their effect is mostly moral. Night, of course, is the time when they are most effective. It can be argued that their height is limited and that the bombers can fly above them. Even so it creates a zone up to a vertical distance of ten thousand feet which need not be patrolled and the increased height of the bombing flight makes accurate bombing more difficult. General von Hoepfner is quoted as stating in a report that "the aprons added greatly to the difficulty of the attack and if increased much more would make a raid on London impossible."

The reorganized defense system was completed just in time to meet the series of night raids on London which began early in September and con-

tinued, with frequency, up until March, 1918, when the last great German offensive on the western front was launched. The Germans continued their usual practice, arriving over England in formations of from ten to twenty-four bombers, which split up into smaller detachments with separate objectives.

A word concerning these bombers lest it be imagined that the war-time vintage of bomber did not compare favorably with the bomber of today. They had a speed of about seventy miles per hour and a ceiling of only eleven thousand feet or just barely above the balloon apron. The most numerous were of the Gotha type, which in 1918 were being gradually displaced by the Giants. The Giants had a wing span of from one hundred and fifty to one hundred and eighty feet and carried three times the load of the Gothas. They had four motors. They were armed with machine guns, had a good steady platform for firing and an ample field of fire. In formation they could put up an effective defense. Let it not be assumed for an instant that the single seater pursuit ship is a specific for the bomber in formation, or even alone, especially when the bomber is armed with several machine guns capable of all-round fire. These planes carried bombs of various sizes. The one hundred-pound bomb was most frequently used but some up to six hundred pounds were used. On March 7, 1918, a two thousand-pound bomb was dropped in London on Warrington Crescent, killing only twelve people.

The defense met these raids with indifferent success. The main difficulty was in obtaining the cooperation between the air and ground forces which is so necessary in air defense. Antiaircraft artillery continued to fire on friendly planes, due to lack of proper identification signals. Out of an average of eighteen pilots taking the air during this period only one succeeded in locating the enemy. In five raids during the first quarter of 1918 only one bomber was brought down. Progress was being made by the defense but slowly—too slowly to quiet the public dissatisfaction. Civilian casualties were fewer because they had learned to take cover. Radio communication with planes had been found practicable. The number of guns and planes were increased, searchlights were being improved, and a new control system was being constructed.

After March 7 the raids ceased for a time giving the defense a breathing spell. General Ashmore was discouraged over the results and lamented the fact that so few planes were brought down, destroyed. While the damaging results of the bombers were not so great as at first they continued the raids, apparently without end. It was then that he became convinced that to stop air raids, absolutely, *planes must be destroyed*.

In May the newly reconstructed control system was partially completed (it was not entirely completed until after the end of the war). In celebration of the event the Germans decided to put on a raid on a

grand scale on the night of May 19. Thirty-three planes took part. Instead of attacking in small numbers they attacked en masse which made it easy for the defense because they were less difficult to locate. This raid was very costly to the Germans. Three Gothas were brought down by the air forces, three by the antiaircraft guns, one was forced to land in Essex, and three were crashed on their return to Belgium, a total of ten bombers lost out of the thirty-three which came over. Not even the air forces can stand a casualty percentage of one-third and keep up their morale.

The cooperation between the ground and air forces during this raid was much better than ever before. One out of six pilots located the enemy and there were no casualties from friendly (?) antiaircraft fire. Thirty thousand rounds of antiaircraft ammunition were fired from one hundred and twenty-six gun stations. The total casualties suffered were forty-nine killed and one hundred and seventy-seven injured. The materiel damage was assessed at about six hundred and fifty thousand dollars.

This raid was the last air attack made on England during the war. It will be recalled that from this time on the net around Germany was drawing tighter. Americans were arriving in great numbers adding a punch to the efforts of the Allies which required the Germans to devote all their attention to the Western Front and begin the fight for their existence which ended with the Armistice.

And what came of it all at last? There is no doubt that the raids were very annoying and caused much dissatisfaction among the civilian population—a poor place to have dissatisfaction when a great war is in progress. But the people acquired raid discipline and after a while accepted the raids as a matter of course. The government issued air raid insurance for which it charged one-sixth per cent and made a profit of over fifty million dollars. The total raid damage in London was about ten million dollars. In three years the total killed in London was five hundred and forty-one, which compares favorably with the Chicago murder rate. The manning of the ground elements of the defense (about twenty thousand men) did not reduce the number available for overseas service because these duties could be performed by men physically unfit for the front line.

But the indirect and psychological effects were very great. Modern war is possible only when the entire nation supports the efforts of its government wholeheartedly and willingly. Any method of warfare which a nation can use to cause dissatisfaction and discontent in the minds of the people of the opposing nation has a far-reaching psychological effect difficult to estimate. When night raids occurred the work at munition plants ceased for the entire night even if the raid lasted only a couple of hours. But most important of all, the raids compelled the retention in England of an air force of two hundred planes which was sorely needed

in France and which would probably have given that air superiority to the Allies which they could not maintain.

In justice to the Germans it should be stated that after twelve years of calm contemplation the air raids against England do not appear to be examples of pure Hunnishness but were proper military measures initiated with a definite military objective which was successfully attained. Wars fought hereafter will be brought to the front doors of the civilian population and the attending sufferings will not be the experience alone of the soldiers in the front line trenches. This should have a dampening effect far greater than any number of treaties.

But it is not the business of the professional soldier to enter the realms of statesmanship. He is only the surgeon who is called in after the infection has become general and something drastic must be done to stop it. So we plan for the future and perfect our means of again obtaining peace after it has been lost by some one else.

The British, after the war, permitted their air defenses to slide. In 1920 not a single gun or searchlight for the defense of London was emplaced. In 1925 the government again became interested in establishing its air defenses and much has been done recently in bringing the system to a high state of efficiency. A beginning has been made in reestablishing the observer system over southeastern England. Considerable progress has been made. The Observer Corps has been organized on the principle that "no hostile aircraft must be allowed to move over any part of the country without its movements being known constantly and instantly at the Headquarters of the Air Defences from which the necessary orders and intelligence would issue to the subordinates concerned." With this in mind an observer system covering the entire country has been laid out. The observers' posts are to be evenly distributed about six to eight miles apart. The observers themselves are volunteers—special constables, serving without pay and receiving the doubtful emolument of the Special Constabulary Long Service Medal, when earned. The telephone construction, while considerable, can be managed with much less expenditure of funds than in this country. It should be recalled that the telephone system in England is government-owned and operates under the G. P. O. (Post Office Department). Apparently the constables are very enthusiastic and show great aptitude for the work. Each group of about twenty-five posts communicates with a center where a map (plotting board) is located on which plane locations are plotted. From the map it is possible to determine the location of a plane at any given time. A teller telephones to Air Defence Headquarters the speed and direction of the plane as it appears.

In Air Defence Headquarters this information is received, the situation posted on a map divided into districts, orders issued to air and ground troops. The map in Air Defence Headquarters is reminiscent of the Coast

Artillery War Game Board. It was provided with a system of colored lights in which certain districts could be made green (air raid is threatened), red (air raid is imminent), white (all clear), etc. The flashing of the color on the map automatically communicated the information it represented to the district concerned.

This system of flash information, in General Ashmore's opinion, is of the highest importance. No time can be lost if an air raid is to be met successfully. Defending air forces require time to climb to the altitude at which the hostile formation is flying. 'It is very desirable that the attack be met by our air force at as great a distance from the objective as possible. The problem of the antiaircraft artillery is simplified by an alert warning. Civilians in danger areas must be informed of the impending raid so that they may take cover. Civilians in other areas not in danger must be reassured so that they may proceed with their occupations which may be highly important to the prosecution of the war. In other words, the whole system must click and click fast.

It should be obvious to anyone that an efficient system of air defense requires unity of control. Unity of tactical control now exists in the British defenses. The tactical command is held by the Royal Flying Corps but the ground defenses still remain under the War Office for supply and administration. This does not work well, in peace time, due to financial complications. "The ground troops have two masters pulling in opposite directions, the R. A. F. only want them efficient, the War Office only want them cheap." It is not within the scope of this article to discuss who, in our service, should command and direct the troops, both ground and air, which make up the air defense forces. That will come later, and how!

The British have greatly improved and perfected their tactical methods since the war. Air defense exercises have been held each year, beginning in 1927 on a considerable scale. Nor are they so far behind us on technique and equipment as some may imagine. Their percentage of hits has risen from three in 1924 to fourteen in 1927. They have perfected a sound locator system almost identical with ours so that the searchlights are turned on only to illuminate a target and do not serve to indicate one for the hostile bomber. They are experimenting with distant control of searchlights. "Recent experiments with infra-red rays and other methods give some hope that we may be able to locate aircraft more accurately than with sound locators in fog or misty weather when searchlights are useless." The Vickers Predictor is, of course, a British product which "the authority responsible for manufacture allowed to be sold abroad at a time when its value was hardly appreciated." (We are almost ready to turn it back to them.)

In our tactical exercises we are decidedly behind the British. They have certain advantages which we do not have—particularly the govern-

ment-owned telephone system, so important in air defense. Then, too, their troops can be easily assembled for exercises due to the comparatively short distances of movement.

The geographical situation of Great Britain differs greatly from our own. The heart of the Great British Empire is located in a few small islands just off the coast of Europe within easy striking distance of a number of other nations. Napoleon found this short distance too great to negotiate with the means then available. Is it too great now?

The answer to this question has caused the British some serious moments and has spurred on the development of their air defense. Perhaps it has detracted somewhat from the importance of the fact that "Britannia rules the waves." Do they hear some one sneer, "What of it?"

This may account for General Ashmore's statement, "Air Defence units, if they are ever wanted, will be wanted at full strength and fully trained at a few hours' notice. For air defences, even the Regular Army system of peace establishments, to be filled up with trained reservists on mobilization will hardly do. *In principle the peace and war establishments of the air defence troops should be the same*; in no other way can the defences hope to be ready when wanted."

While we are not in the same geographical situation it is well we appreciate the fact that when air defense is needed it is needed at once. There is no time to obtain guns, ammunition, equipment, or men. It is hardly conceivable that the decision in any future war will be won in the air but it is certain that the nation well provided with air forces will not fail to use them and that their efficient use will greatly influence the final outcome.

The Coast Artillery Corps may well be proud of its accomplishments in the development of antiaircraft artillery. But this is not the whole story. It is now time to pay more attention to the entire subject of defense against aircraft. We have an important part in it—we believe the *most* important part—but there is much to be done in cooperation with the Air Corps and other branches in the development of an efficient information and command system and various other problems connected with a complete and effective air defense.

Aircraft in War in Ten Years' Time

By LIEUT. COMDR. J. D. PRENTICE, R. N.

EDITOR'S NOTE: *The following article written by Commander Prentice in 1928 appeared originally in the Journal of the Royal United Service Institution. It is published here for the interest our readers may have in British thought on this subject.*

MANY books have been written about the future of aircraft and there are, I suppose, few subjects upon which opinions differ more completely.

Colonel Fuller, for instance, draws pictures for us of armies sneezing themselves into impotence, or falling "into a mystic sleep"; of the entire personnel of battle fleets affected with such violent stomach aches that they surrender unconditionally to single submarines; and of whole cities laughing themselves into insanity, while their governments weep melancholic tears as the enemy's ultimatum is signed. All these things, he suggests to us, may be brought about by aircraft and gas! It is only fair to add that he disarms our criticism by admitting that his pictures are exaggerations.

"Neon," on the other hand, in his "Great Delusion," classes all air warfare as freak warfare, and proves, to his own satisfaction, that aircraft never have had, and never will have, any decisive effect in war. In spite of clever arguments, however, he reminds one rather of the man who said of George Stephenson's first locomotive that "it was contrary to the law of God, because it would prevent cows grazing, hens laying, and would cause ladies to give premature birth to children at sight of these things going forward at the rate of four and a half miles per hour."

Between these two extremes are to be found writers of every shade of opinion. Each advances as proof of his theories instances of notable achievements or notable failures by aircraft, according to his prejudice in their favor or against them. We are told in one book that aircraft had little or no effect upon the war in Morocco, although the French used them lavishly and at great expense; but the same book makes no mention of the efficiency of our air control in Iraq nor of the saving in expense which this has effected over older methods. Other authorities ask us to believe that, because airships have crossed the Atlantic and because they can now carry aeroplanes, therefore America will soon be within striking distance of Europe by air. Aeroplanes let down from these monsters are to "fight defending aircraft in their native air or rain death and destruction from the skies." Yet no attempt is made to calculate how many aeroplanes or what weight of bombs an airship could carry across the Atlantic when already laden with sufficient fuel to bring her back again! Still, apart from such prophetic utterances, there seems little effort to forecast the immediate future in technical development of aircraft designed for war pur-

poses. One reason for this omission may be that, to quote Mr. J. M. Spaight, "extreme differences of opinion prevail which relate not only to such indeterminate questions as the capacity of aircraft in the future, but to matters of (one would have thought) present and ascertainable fact."

Yet, if we are to attempt to forecast the use to which aircraft may be put in a future war, we must first of all arrive at some reasonable estimate of what the capabilities of service aircraft will be at that time. There has been steady development up to the present: will it continue?

Mr. F. Handley Page, speaking to the Aeronautical Society a short time ago, stated that there was scope for improvement under four headings, namely:

- (1) Structural design;
- (2) Aerodynamical design;
- (3) Power unit and air screw;
- (4) Design from the users' point of view.

With regard to the last, he was particularly caustic about the present designs, saying that "the open cockpits, projecting gunrings and guns, pumps and other excrescences of the present fuselages add to resistance and tend to reduce all aircraft to one common level of inefficiency."

The methods by which improvements can be attained are too technical for me to go into, but I think it is fair to say that development is proceeding and that it will continue. The development of service machines differs very considerably from that of commercial machines and "record-breakers." Commercial machines are designed for money-making purposes; record-breakers to achieve some special result; but the factors which govern the utility of aircraft in war are many. Speed, rate of climb, ceiling, maneuverability, armament, blind spots, number of crew, all these affect the fighting value of aircraft, and the attainment of a high standard in any one of them re-acts upon the others and upon that factor, most important of all with regard to the strategical value of aircraft, radius of action.

Again, expert opinion is divided with regard to the relative value of these various factors, and it is extremely difficult to predict what line or lines development will follow or how rapid it will be. If, however, we study the progress which has been made in the past and assume that similar progress may continue to be made during the next ten years, we should arrive at some approximation of the capabilities of aircraft at the end of that period.

There are three main factors which govern the strategical use of aircraft. These are speed, radius of action, and armament of hitting power. It is with these three alone that I propose to deal. In order to arrive at some reasonable forecast of the capabilities of aircraft in 1938, I have adopted the graphical method and have plotted the speed and radius of action of the most distinctive types which have been in use since 1916 (see

DEVELOPMENT OF SERVICE AIRCRAFT (BRITISH)

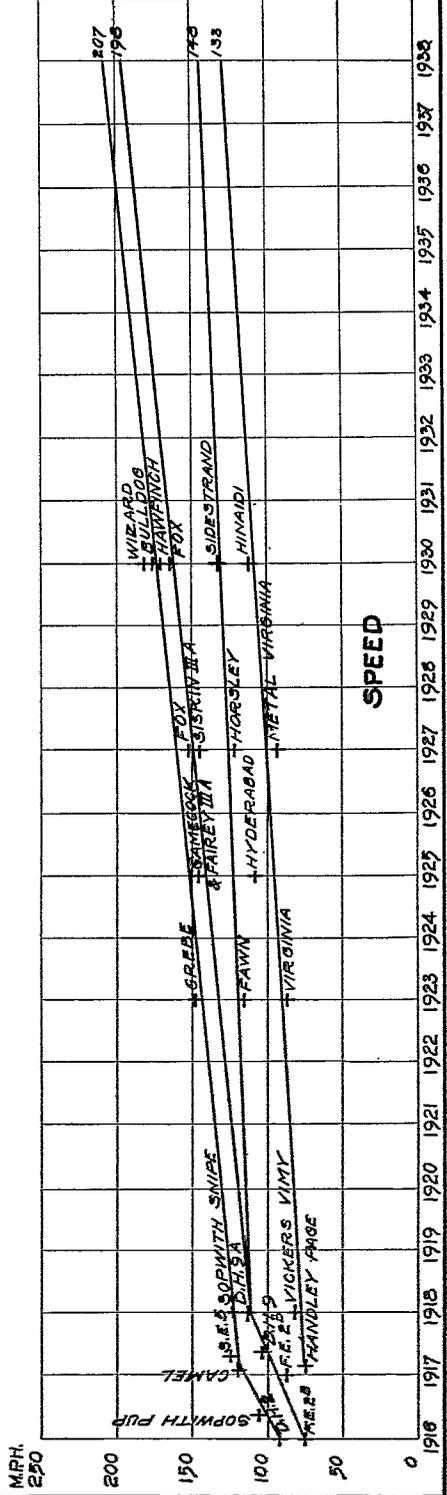
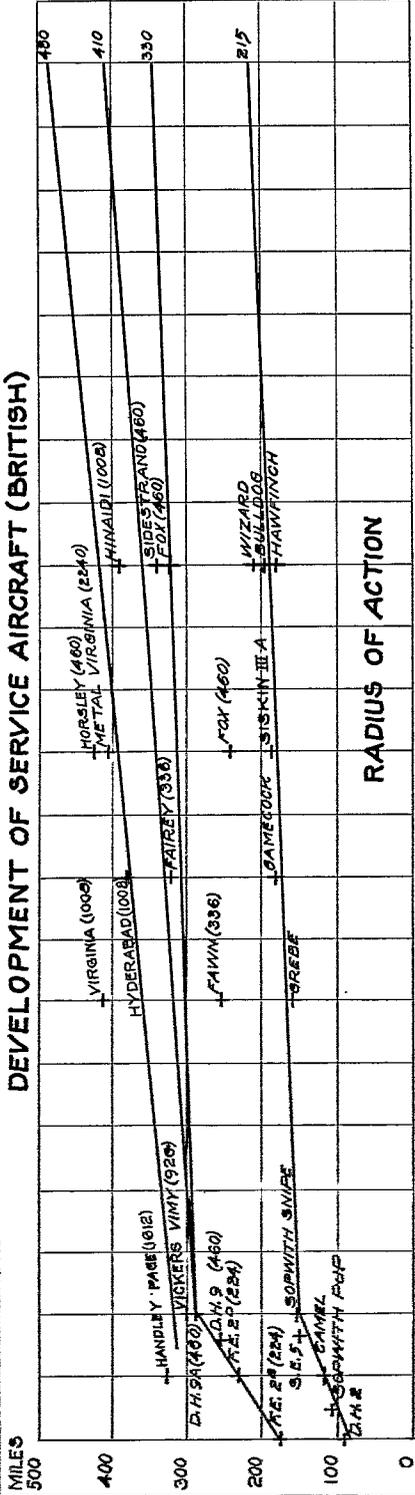


diagram). This method is certainly not infallible and is, doubtless, open to criticism from both those who do and those who do not believe in the future of aircraft; nevertheless it is likely to form a better guide than some of the rather vague and wild assertions often made.

The first and most obvious thing which the graphs show is the rapid development which took place during the war and the comparatively slow rate of progress since 1918. This, of course, is partly due to the greater demand which the war set up, but also, I think, to the fact that, in peace time, far more trouble is taken to ensure that a machine is the right machine before it is produced in large numbers for service use. The time taken from the commencement of the design of a new machine to the final delivery of the first development order is, in peace time, about three years. During this period it is subjected to severe tests and thus, though slower, development is surer than in war.

On examining the graphs, taking each type of machine separately, we see that:

Fighters have consistently increased in speed while their endurance has remained the same or has slightly decreased. Hence, their radius of action has increased in direct proportion to their speed. If development continues along the present lines, we should, by 1938, have a fighter with a speed of two hundred and seven miles per hour and an endurance of about two hours at that speed, or a radius of action of just over two hundred miles.

Day bombers, during the war, followed the fighters very closely with regard to speed, while increasing much more rapidly in radius of action. Since 1918 they have split into two groups, one of which has continued to approach, if not to surpass, the fighters in speed, while the other has improved much more slowly in this respect.

It is when we come to examine the radius of action of these machines that we find the most difficulty in obtaining anything like a satisfactory answer from the graphs. Of the fast group the oldest and slowest machine, the Fairey III F, has the greatest radius of action. The machine which followed it, the Fox of 1927, fell away badly in this respect, but the new Fox which should be in service by 1930, has practically regained this lost ground, while carrying a heavier bomb load at a considerably higher speed. This last has been taken as the highest development of the type up to date and the line of the graph has, therefore, been drawn through this point. The positions on the graph of the three types of slow day bomber are so scattered with regard to radius of action that the line is, frankly, pure guess work; it is, however, drawn as fairly as possible between the three points and the result is, I think, not improbable.

These graphs give us for 1938 two types of day bombers; one with a speed of nearly two hundred miles per hour, and a radius of action of three

hundred and thirty miles; the other with a speed of about one hundred and fifty miles per hour and a radius of action of four hundred and ten miles.

Night bombers have developed along lines which are more easy to follow. From the time of their appearance with the Handley Page of 1917 their advance in both respects has been steady. By 1938 we should have night bombers with a speed of one hundred and thirty miles per hour and a radius of action of four hundred and eighty miles.

I have not plotted a graph for the armament factor since this appears to be becoming fairly constant for the various types, namely:

Fighters: Two guns.

Day bombers: One thousand eight pounds of bombs and four or five guns.

The bomb loads are marked in brackets below each type of machine on the radius-of-action graph. Although there are one or two exceptions to the above loads, it will be noticed that the general tendency seems to be to standardize these armaments, and it does not seem likely that there will be very much during the next ten years.

Carrier-borne aircraft do not yet show sufficient signs of development along original lines for separate graphs to be plotted for them. They appear merely to lag about three years behind the machines in use in the R. A. F. Carriers are still using the Flycatcher, a machine produced in 1923, as their fighter, and, as a reconnaissance machine, are just getting the Fairey III F, which was in use in the R. A. F. in 1925.

So far as can be foreseen, both fighters and reconnaissance machines will develop in regard to their endurance more than their speed. Both the restricted space and the restricted time available in a carrier for landing purposes will tend to force them in their direction. We may expect to see a fighter with a speed of about one hundred and sixty miles per hour and an endurance of about three and one-half hours, and a reconnaissance machine with capabilities very similar to those of the slower type of day bomber.

Flying boats have developed capabilities which very closely resemble those of the large night bombers. I think that we may safely forecast a similar efficiency for them in 1938; but one thing must be remembered: in calculating radius of action, endurance at full throttle has been taken in every case. The result, therefore, is obviously less than the endurance at cruising speed. If, however, adverse winds, war conditions, time taken in avoiding enemy aircraft, finding the objective, etc., be taken into consideration, I think that the results are fair for bombing machines. For reconnaissance purposes the radius of action of flying boats might well be increased by one hundred miles.

Airships have, at present, little value for war purposes and I see no

reason to believe that their value will increase during the next ten years. Their vulnerability will always prevent them from being used for offensive operations. They may possibly be used as refueling ships for heavier-than-aircraft, and for the transport of stores and spare parts. But at the present rate of progress it is unlikely that many of them will be in the air by 1938, and their utility in these directions must remain small.

There is one purpose of which large numbers of small airships might be used in the next war. We are told that "the radius over which sound can be detected increases with the height of the apparatus"; and, as in the last war "Blimps" were used very extensively for the detection of submarines, so in the next some similar type of small airship may be used to give warning of the approach of enemy aircraft.

SUMMARY OF DEVELOPMENT

From all this it appears probable that in 1938 we shall have the following types of machines at our disposal for war purposes:

Royal Air Force:

<i>Type</i>	<i>Speed m. p. h.</i>	<i>Radius of Action miles</i>	<i>Armament</i>	
			<i>guns</i>	<i>bombs</i>
Fighter	207	215	2
Day bombers	198	330	2	460 lbs.
	148	410	2	460 lbs.
Night bombers.....	133	480	4-5	1,008 lbs.
Flying boats	133	480	4-5	1,008 lbs.
		(with bombs)		
		580		
		(reconnaissance)		

Fleet Air Arm:

Fighter	160	280	2
Reconnaissance ..	155	400	2	460 lbs.
Torpedo B	150	230	1

Airships:

- A small number of large ships.
- A large number of small ships.

THE USE OF AIRCRAFT IN WAR

Having visualized the types of aircraft which we may expect to see in ten years' time, we may next examine the question of the uses to which they may then be put and of the effect which they will have in a future war. Here again, expert and other opinions range from "everything" to "nothing," and in this case there are no data wherewith to plot a graph.

The International Commission of Jurists, which met at the Hague in 1923, propounded the following rules for restricting aerial war:

"Aerial bombardment for the purpose of terrorizing the civilian population, of destroying or damaging private property not of a military nature, or of injuring non-combatants, is prohibited."

“Aerial bombardment is legitimate only when directed at a military objective. . .”

“In cases where the objectives . . . are so situated that they cannot be bombarded without the indiscriminate bombardment of the civilian population, the aircraft must abstain from bombardment.”

These proposals have never been ratified.

According to some people we may expect to see such international agreements obeyed in the spirit as well as in the letter. According to others all restrictions will be completely disregarded, and aircraft will be used to spread destruction amongst the civilian population with the object of breaking down their morale and compelling the enemy's government to sue for peace. The real answer will probably be found to lie somewhere between these two extremes, but, in any case, it must depend to a great extent on the nature of the war.

From the point of view of air action, wars may be divided into three categories:

- (1) War between countries whose land frontiers adjoin;
- (2) War between countries separated by a narrow strip of water;
- (3) War between countries separated by large expanses of water.

Take the first case, and let us suppose that, facing each other, there are two armies, each of which is at least partly mechanized. Behind these armies are two air forces, each capable of striking to a depth of five hundred miles into the heart of their enemy's country with large night bombers, to a depth of four hundred miles with their comparatively slow day bombers, and to a depth of three hundred and thirty miles with their fastest and most dangerous bombing machines. For defence against bombing attack these air forces will have fighters with a superiority in speed of seventy-four miles per hour over the night bombers, of fifty-nine miles per hour over the slow day bombers, but of only nine miles per hour over the fast day bombers. In addition, they will probably have improved listening posts in the air, as well as on the ground, and antiaircraft artillery which will surely be more efficient than in 1918.

In 1918 aircraft casualties sometimes amounted to at least eighty per cent, per month. In 1938 we may expect them to be, if anything, heavier. In 1918 this country alone was producing over two thousand six hundred and sixty aeroplanes per month. Today a new “development order” takes ten to twelve months to complete, and the large bombing machines take longer to build than the small fighters. It is improbable that any country can be in a position, at the commencement of a war, to produce machines at the rate of nearly three thousand per month; therefore, it seems, that the numbers of aircraft available for offensive purposes will tend to diminish during the first month or two of a war.

Now let us suppose that of these two imaginary countries whose frontiers adjoin, one, Red, concentrates its air attack against the civilian population of Blue, while the latter directs its whole military effort, air

and ground, against the opposing army. The result of the war will not depend upon which first causes the greatest panic in the opposing country—Red's bombing attacks, or Blue's invasion, for presumably, the Blue army, with its entire air force assisting it, will be able to drive the Red troops before it.

The mobility of a mechanized army has been estimated at a hundred miles a day. If then, the rival armies were entirely mechanized, it would only take five days for the Red aircraft to be driven out of range of the Blue civilian population. Even if the armies of 1938 have less than this degree of mobility, it is probable that, within a short space of time, Red would be forced to divert his air attack to the Blue army and its lines of communication. Bombing the civilian population alone would not stop the advance. In the meantime Blue would be striking further and further into the heart of Red country with his aircraft.

In the end a compromise in the use of aircraft would probably result; a compromise which would be extremely unpleasant for any civilians living in the neighbourhood of objects of military importance, such as munition factories, railways, etc., or in proximity to the actual fighting area. Nevertheless the civilian population would no longer be the direct target.

Whatever the outcome, there can be little doubt that the occupation of country is still the most effective method of suppressing its inhabitants. The man with a rifle and bayonet can kill you with moderate certainty if he is close to you and you are unarmed. The aeroplane overhead may miss you or may even be brought down by one of your own defensive measure. Even in Iraq we find police following up air operations and occupying villages which have no air defence.

In the second case, where the countries are divided by a narrow strip of water, we are faced with a very different problem.

To carry out an overseas invasion in these days of submarines and mines by means of mechanized armies with their mass of attendant paraphernalia, would be a lengthy operation, even supposing that it were possible. In this case I think war between two countries so situated might well become a struggle between air forces. But even so, it is the civilian population. Modern life is so dependent upon mechanical aids that it is easier to disorganise it by destroying machinery than by killing people.

So far as our own country is concerned food supply is likely to be the most crucial problem. Even in ten years' time the London docks may be difficult to destroy from the air, but the radius of action of aircraft will have become considerably greater than the maximum distance which even one of our fastest liners can cover in the dark. In view of their high speed and large numbers, aircraft could search vast areas of water, while a two hundred and thirty-pound bomb would easily sink an unarmed merchantman. Hence, if a continental enemy finds that his attacks against our country itself are proving fruitless or too costly, he may well turn to

Germany's methods: declare a blockade and try to divert or sink every ship making for a Channel or East Coast port.

"By all probabilities of the case, it (the air arm) will be able to impose upon seaborne commerce, in the busiest traffic lanes, a degree of control exceeding anything yet experienced," and "who is going to be able to control the air for twenty-four hours a day out on the ocean and in the big three-dimension atmosphere?"

The protection of our commerce with fighters whose radius of action is two hundred miles and whose endurance is two hours will prove a difficult problem. If we adopt the convoy system the attacker will only have to concentrate his forces before delivering an attack. Even if we could provide a carrier to accompany each convoy, the enemy may well be able to bring sufficient aircraft to bear to smother the carrier in, spite of her machines. This very serious problem may be most difficult to solve. Our hope of salvation lies firstly in the offensive striking power of the R. A. F. bombing squadrons. We must trust these to sicken an enemy of war before we are sickened or starved.

The third type of war which may occur is that in which the countries are separated by large expanses of water. In this case the air will give the defender an even greater advantage than he has at present.

If we have arrived at a stage where all machines, except fighters, have a radius of action which is greater than the distance which a fleet can cover in the hours of darkness, the possibilities of approaching the enemy's coast without his obtaining accurate information of the fleet's movements will be very small.

With the improvement in efficiency, aircraft will have become indispensable to the fleet; yet the chances of carriers being able to operate or even to survive within range of enemy shore-based aircraft will have become correspondingly small. If a fleet is to operate overseas, therefore, it must first establish advanced aerodromes. With the increase in the size and speed of aircraft these aerodromes will have to be larger than those which would suffice today, and the stores which they will require will be more numerous and bulky. For the protection of these aerodromes, military forces will be required. In fact, to maintain a fleet within five hundred miles of an enemy's coast will necessitate combined operations on a grand scale.

In short, it seems reasonable to conclude that in ten years' time aircraft will very materially affect the course of war; that only where the belligerents are within air-striking distance of each other, but separated by water, will aircraft be the most decisive factor in hostilities; and that whatever type of war this country may be engaged in, the Navy, the Army and the Royal Air Force will find themselves mutually dependent upon each other.

Chemical Warfare Tactics

SNOW PROBLEM

For officers of all arms

By LIEUT. COL. CHARLES E. T. LULL, Chemical Warfare Service

MODERN warfare demands an ever-increasing breadth of tactical knowledge on the part of the individual officer. The several combat arms enter into intimate cooperation in the teamwork of battle. The types of weapons within units are becoming more and more diversified. The far-reaching and searching effects of the enemy's means of combat now jeopardize not only front line elements and their supporting auxiliaries, but also reserves and installations of command, supply and evacuation.

It is no longer sufficient for any officer, therefore, to know the tactics of his own arm. He must have, in addition, sufficient knowledge of the powers, limitations, and tactics of other arms to cooperate with them and profit by their support; and, if necessary, to control their tactical employment. To fulfill his responsibility to the troops under his leadership, he must also know the effects of combat means at the disposal of the enemy so as to recognize their menace and be prepared to minimize their destructive effect.

It is with full appreciation of these requirements that the War Department has caused the special service school of each branch to include in its curriculum instruction in the tactics of other branches. The general service school studies each of the arms and services as a foundation for courses in their combined tactical employment.

The result of this wise policy has been quite satisfactory, and officers are, as a rule, equipped to go beyond the narrow limitations of their own technical specialty and adapt themselves to the broader phases of their profession. School instruction by itself is insufficient, however, to fit an officer for his responsibilities in the field. To gain full appreciation of military materiel and familiarity with the methods of its use, he must come into actual contact with it and take advantage of every opportunity to observe the work of troops charged with its operation.

To the enterprising officer, anxious to improve his professional efficiency, there is no lack of opportunity to make such contacts and observations. It simply requires, as a rule, a little effort on his part. The presence of combined arms in a number of our larger posts, especially in foreign service garrisons; the summer exercises, both Regular Army and National Guard, in Corps Areas; and such exhibitions as the one held each year at the Aberdeen Proving Ground and in the various military carnivals throughout the country. There is, however, a marked limitation to

knowledge and experience which can be gained either in schools or by the observation of weapons and their employment. While such training and experience are invaluable in equipping an officer for his rôle in the teamwork of tactical operations, they fail to give him an adequate appreciation of the real effects of the enemy's combat means.

This limitation of peace-time training has always been recognized, and ingenuity has been taxed to the utmost to overcome it, but without success. The harsh school of battle remains today, as it has been in the past, the only school in which true impressions of the battlefield can be gained. As a result, the officer, until seasoned by battle, will always be handicapped by the lack of this essential element of preparation to meet his responsibilities in the field.

Experience has shown that habit and instinct play, in battle, a far more important part than do logic and mental calculation; that officers and men will generally do what they are in the habit of doing, but that they cannot be expected to do things to which they are not accustomed. It is, therefore, in the attainment of sound battle habits and instincts, that we must seek, in time of peace, to compensate for the lack of experience which only battle itself can supply.

In military drill, developed as a result of thousands of years of battle experience, we have a system for the formation of habits of action which will cause the soldier to function effectively and sub-consciously even when his mind is dulled by the nerve-racking effect of modern battle. In the training of the officer, repeated insistence on the lessons of former wars and on their application to varied situations develops certain habits of mind which serve to guide him under the unfamiliar and bewildering conditions of campaign. These mental habits are such, for example, as cause the trained officer to sense, instinctively, the vital necessity of outposts when encamped in the presence of the enemy; and, in battle, the need of flank protection and liaison with units on right and left. The development of such mental habits in connection with chemical warfare has been chosen as the subject of this study.

The agents of chemical warfare, unlike other means of combat, are controlled in their behavior by the normal processes of nature. Dispersed in their persistent form, they lie as liquid or solid substances on the ground, foliage or other surfaces, and evaporate like snow or water under the influence of sunlight, heat and wind. When dispersed into the air as gases, drops of liquid, or solid particles, they drift with the wind and dissipate, like smoke or fog, under the laws of motion and gravitation. By observing snow, surface moisture, smoke or fog, we can form accurate impressions of the corresponding behavior of chemical warfare agents. By contact, in our daily life, with the ordinary phenomena of nature, we gain familiarity with the operation of their natural processes. As a result we

know, instinctively, how to protect ourselves from their harmful effects, and how to carry on our activities in spite of the obstacles they create. Similarly, by intelligent and systematic observation of these same natural phenomena, we can interpret the information they convey into tactical knowledge of chemical warfare. As a result we will be prepared instinctively, to guard against the harmful effects of the chemical means of the enemy, and carry our missions in to execution in spite of his casualty-producing agents.

In our present study we shall limit our discussion to conditions arising from the enemy's employment of the one chemical agent commonly known as "mustard," or "yperite." For the purpose of simplicity, and to establish a logical basis for further study along this line, we shall also confine ourselves to the "contact" effect of this agent, as distinguished from what we may call its "gas" effect. Mustard, it will be remembered, was the most effective of all chemical agents used in the World War. At the time of the Armistice, it was freely employed by both sides. It is still the outstanding means of chemical warfare, and the field of its use has been considerably broadened by recent developments in technique. Its tactical use, the method of its dispersion, and its general behavior are characteristic of all the so-called "persistent" agents. It is from the similarity of its behavior to that of snow and surface moisture, that mustard lends itself, particularly well, to study along the lines we are now considering.

Mustard is an oily liquid of about the consistency of heavy lubricating oil. Dispersed either by artillery shell, aircraft sprinkling, bombs, armored cars, tanks or other means, it falls and lies upon the ground, foliage and other surfaces. It evaporates under the influence of sunshine, heat and wind. Contact with liquid mustard or with ground, porous wood or other porous substance infected by mustard, causes severe burns. The evaporation of mustard sets up clouds of poisonous gas. Depending upon the amount of chemical used, the nature of the ground, and the weather, an area infected remains dangerous for a normal period of from one to two weeks. Where evaporation is rapid, this time may be considerably shortened. Where evaporation is slow, it may be prolonged for a month or more.

Conditions which cause snow to disappear quickly, and surface moisture to dry up, also favor the rapid disinfection of mustardized ground. Similarly, those conditions which cause snow to remain on the ground, and surface moisture to persist, cause a corresponding persistence of mustard infection. By observing snow and surface moisture, therefore, and noting the places where, and conditions under which they tend to disappear, we can learn to estimate the behavior of persistent chemical agents.

With this elementary conception of the analogy of chemical warfare

to natural phenomena, our problem becomes quite simple. It consists, logically, in first observing, methodically, the behavior of snow and surface moisture, and then in applying the lessons gained from these observations to the solution of simple tactical problems on the ground on which the observations were made. This system was used with exceedingly satisfactory results, by officers of all arms in the Third Corps Area in 1927. Briefly stated, the procedure was as follows.

Where opportunity occurred to observe the effects of a snow storm which resulted in covering the ground, the places were noted:

First, where the snow disappeared within twenty-four hours.

Second, where it lingered on the ground for several days, often a week or more, after the storm.

Third, where the snow persisted for long periods of time after it had disappeared from the rest of the country.

It is evident that the nature of these observations was based on climatic conditions in the Third Corps Area. In colder climates, where the snow lies on the ground for long periods, the method would have to be modified to meet prevailing conditions.

Where no opportunity to observe snow was afforded analogous conditions were observed after rain storms, with due allowance, of course, for the effects of drainage. It was the moisture of the ground, rather than running or standing water, which was significant. This was the situation at Fort Eustis, where no snow fell while these problems were being solved. Comparisons of results showed, however, that the conclusions based on the observation of moisture coincided with those officers in Maryland and Pennsylvania, whose deductions had been based on the observation of snow.

In both cases, the prevailing weather was observed and its effect on the general rate of disappearance of snow or moisture was noted. The officers gained a clear conception of the causes of the phenomena they observed. The impressions thus gained gave them an understanding of the whole problem of chemical persistency in the field, so that the answers to the questions of its tactical application became self-evident.

These observations were followed by a series of three simple tactical problems. In order to coordinate results and, in particular, to compare the conclusions of officers of the different arms, the general directive prescribed certain guiding features and requirements. It left to local Commanding officers, however, the choice of terrain and the detailed preparation of the problems themselves. The situations involved were so simple, however, that any officer might have visualized his own and obtained results of equal value.

The directive prescribed that problems be based on the operations of a battalion of infantry, a battery of artillery, or an appropriate corresponding unit of any other arm, on local terrain assumed to have been infected

by mustard two weeks before, and under situations with requirements as follows:

Situation No. 1, involving a temporary halt in the course of a route march. Requirement: Selection of halting place and precautions to be taken during the halt;

Situation No. 2, involving an approach march, or movement into position. Requirement: Selection of lines and formations of advance, with precautionary orders;

Situation No. 3, involving a bivouac. Requirement: Selection of ground, and precautionary instructions.

To avoid confusion by the introduction of too many factors into these initial problems, the "gas" effect of the mustard was assumed, in each case, to be negligible owing to the time elapsed since infection. The problems reduced themselves, therefore, to the simple question of carrying out the desired operations with a minimum of "contact" casualties.

This assumption is, of course, dangerous and would be entirely unwarranted in the field. An area which has been infected by mustard should always be considered as a gas-trap until proven otherwise. Where it or its vicinity must be crossed, gas masks should be worn and every precaution should be taken to avoid their premature removal. Especially, should such an area be avoided as a bivouac. Gas poisoning is accumulative and a light concentration breathed over an extended period is as harmful as a much heavier concentration breathed for a short time only. When tactical necessity is imperative, however, areas of this kind may have to be crossed, or even occupied, though it be at the cost of casualties. When such a necessity arises, the knowledge and instincts gained by these methods may spell the difference between success or failure of an officer's mission.

The solution of simple practical problems, like those outlined above, requires neither equipment nor money. Technical knowledge of chemistry is unnecessary to a clear understanding of chemical warfare fundamentals. Valuable results can be secured from a minimum expenditure of time and effort. Systematic observation and common sense applied to this phase of military training will result in sound tactical knowledge of the conditions on which chemical warfare is based.

The Coast Artillery in the Philippines

By COL. E. D'A. PEARCE, C. A. C.

I. FORT MILLS

1. *Situation.*

FORT MILLS is situated on the Island of Corregidor at the mouth of Manila Bay, thirty miles from the City of Manila. It can be reached only by a two and a quarter-hour boat trip (one round trip daily, from Fort Mills and return). Corregidor is called the Paradise of the Philippines on account of its cool climate and panoramic beauty.

2. *Quarters.*

Half of the quarters are on top of the island (Topside), six hundred feet above sea level. The remainder (except nine sets at Kindley Field) are one-third way down (Middleside). All quarters on Topside are concrete. These are of the same plan: Three or four bedrooms, two baths, living and dining rooms, kitchen, storeroom, and two servants' rooms and bath. The Commanding General's and Field officers' sets are bungalows; all others are double two-story sets. Officers of the 92nd Coast Artillery (PS) are quartered at Kindley Field (about two and one-half miles from Topside); all the sets are wooden bungalows.

3. *Troops.*

There are four regiments at Fort Mills: The 59th (TD), Coast Artillery (American); the 60th Coast Artillery (AA), (American); the 91st Coast Artillery (HD), (Philippine Scouts), and the 92nd Coast Artillery (HD), (Philippine Scouts). Two batteries of the 92nd are designated as the Guard Battalion, on duty as prison guards for the Corregidor branch of Bilibid Prison.

4. *Subposts.*

There are four subposts, which with Fort Mills, comprise the Harbor Defenses of Manila and Subic Bays. For the past two years it has not been necessary to detail any officers, except those who volunteered, to outpost duty.

These subposts are:

(a) Fort Drum, one hour by boat from Fort Mills. The professional experience of a tour at Fort Drum can be obtained at no other post in the service.

(b) Fort Hughes, on Caballo Island, thirty-five minutes by boat from Fort Mills.

(c) Fort Frank on Carabao Island, one and one-half hours by boat from Fort Mills.

(d) Fort Wint, on Grande Island, at the entrance to Subic Bay, three hours by boat from Fort Mills.

5. *Sports.*

For golf and tennis, see paragraph I, 8 (b and c).

(a) Baseball: We have a fine diamond and grandstand at Topside, and a field at Middleside. Interbattery and interregimental schedules.

(b) Bowling alleys: Six alleys, interregimental and interbattery tournaments for officers and men.

(c) Basketball: Two good basketball floors; league schedules annually for regiments and batteries.

(d) Miscellaneous: Good facilities for boating, fishing, and a good swimming beach. Boy Scout troops.

6. *Library.*

An excellent library, comfortably housed, of six thousand volumes of fiction and six thousand of non-fiction. The annual new book list approximates one thousand. Average daily circulation of one hundred and fifty volumes.

7. *Post Exchange.*

The Fort Mills Post Exchange, one of the largest in the service, has many branch stores or concessions, and can supply all except the most exceptional wants. Some of the features are:

(a) Tailors: Ample tailoring facilities for the entire command; tailoring well-done and inexpensive.

(b) Shoe shop: Facilities for all sorts of leather-work; boots, leggins, and shoes can be made here at lower prices than in the States; hand and custom-made shoes.

(c) Dress-making: Materials of all sorts suitable for summer dresses available here, and plenty of dressmakers (very inexpensive).

(d) Oriental stores: Several Indian and oriental stores offer a good line of linen, shawls, and other oriental goods at prices much lower than those in the States.

(e) Fresh milk: The Post Exchange now sells a re-constituted, homogenized milk, which has all the properties and the taste of good fresh milk. In addition various brands of canned or powdered milk, such as Klim, are sold both at the Post Exchange and Commissary, so that the diet of babies is well provided for; e. g., Bear Brand whole milk.

(f) Studio: A good photographer maintains a twenty-four-hour developing and printing service at the Post Exchange studio. Prices are low. A large offering of camera supplies in the main store, Post Exchange.

8. *Corregidor Club.*

(a) The Corregidor Club is the center of social life at Fort Mills; it is a very attractive and well-maintained officers' club. All officers are members; initiation fee, ten pesos; monthly dues, six pesos. The club maintains the following: a dining room, in which prices are very reasonable; a guest house, with servants' fees only; and a good bar, at which various soft drinks can be obtained. There are two or three dances every month, with an average attendance of one hundred officers and their families.

(b) Golf: There is a good nine-hole golf course, supported by the officers of the post. More than forty officers and their families habitually use the course; interpost or intrapost tournaments are frequently held.

(c) Tennis: An abundance of tennis courts for officers and enlisted men. Several tournaments scheduled annually. Interpost matches.

9. Shows.

There are two very good moving picture shows every night. Vaudeville or amateur dramatics frequently. Change of program daily.

II. TRIPS

Each officer is entitled to:

1. *Detached Service.*

(a) One month for each year of his tour to visit Camp John Hay (Baguio), Mountain Province—an Army rest camp over five thousand feet above sea-level. Nine hours north of Manila, by train or automobile. Excellent roads. This post has all the facilities and comforts of our most exclusive summer resorts in the United States. It is inexpensive and unsurpassed in natural beauty. A long and well-kept eighteen-hole golf course, tennis, riding, rare opportunities for excursions.

The climate is comfortably warm during the day and cold enough at night to require an overcoat.

(b) One month during his tour to visit the Southern Islands. This trip can be made in one or more weeks on a commercial steamer or by various government boats. One generally visits Zamboanga, Iloilo, and Jolo. The chief interests are the people, Moros, the wonderful fishing, and the purchase of black coral and Moro goods.

(c) Ten days during his tour for the purpose of visiting Northern Luzon, exclusive of Baguio. This trip offers opportunities for observation of very primitive people in their natural conditions, such as those in the Bontoc.

2. *Leaves.*

Every officer may take leave for the purpose of visiting China and Japan. Besides the interest of sight-seeing, one can get exceptional bargains in Chinese rugs, leather goods, cloissonné, furs, shawls, linen, etc. Some officers have the opportunity to take trips on Navy boats to such places as Java, Borneo, French Indo-China, and India.

III. CLIMATE

There are three general seasons: The cool season from October 15th to March 15th, the hot season from March 15th to June 15th, and the wet season from June 15th to October 15th. During the cool season it seldom rains and the weather is ideal, the temperature varying little from 79° F. The hot season is short with an average temperature of 84° F. and no rain; the wet or typhoon season has steady rains of four to eight

days' duration and high winds. On the whole the climate is ideal for eight months and quite bearable the other four. The schools open in June and end in March.

IV. UNIFORMS

Hongkong khaki breeches and shirt, and campaign hat constitute the duty uniform at Fort Mills; after retreat, the white uniform; and for formal occasions, the mess jacket with white or black trousers. The white shirt with black tie is not worn with khaki uniform by officers in the Philippine Department. Dinner clothes can be worn in the evening on the transport; black dress trousers and shoes, and dress shirt may be worn with the mess jacket. All necessary articles of uniform can be bought to better advantage in the Islands than in the States. The tailors here can make uniforms in from one to three days after the arrival of the transport; however, if an officer, upon receipt of his orders, will mail his measurements to the Post Exchange officer, Fort Mills, one or more uniforms will be completed for him before his arrival. The prices at the Fort Mills Post Exchange are:

Hongkong khaki breeches	\$3.50
Hongkong khaki shirt	2.75
Hongkong khaki blouse	4.00
White dress suit	7.50
Mess jacket (3-piece)	9.25

It is customary to buy at least four khaki shirts and breeches, three white dress suits, and one khaki blouse and one mess jacket.

Officers are advised to bring the lightest-weight uniforms they possess for wear on the transport as the heat is very intense during parts of the voyage. Mail orders to Fort Mills Post Exchange for uniforms can be delivered to the States in approximately two and one-half months after such orders are mailed from the States.

A local firm offers sport shirts and men's underwear of a good grade of crepe at much better prices than can be obtained in the States.

V. WHAT TO BRING

1. *Women's Clothes.*

(a) All types of clothes are needed, including winter clothes for China and light weight sports clothes for Baguio. The former cannot be purchased in the Islands, the latter can be found at various shops. Some materials deteriorate more rapidly than others, such as taffeta, georgette crepe and heavy silks. The first two materials are liable to go to pieces rapidly, while black silks mold badly. Lace chiffon, cotton nets, heavy crepes, and crepe de chine are the most satisfactory materials for evening. For daytime wear all kinds of cotton goods wear best as constant washing is necessary. The dry-cleaning establishments are not very good and are a nuisance to use for persons living on Corregidor.

(b) In Manila there are a number of very good shops where American hats can be purchased at States' prices. There are numerous hat places in which one may buy Italian straws, bankok, mediocre quality of felts, and Baliwag or Balibuntal hats, which are the trade names for the beautiful hats made in the Islands. These native-made hats are very reasonable although the blocking is not done cleverly. The colors and quality are very pretty and are attractive with the embroidered voile dresses. As to hose: silk hose can be obtained very easily and should be purchased in Manila or ordered from the States as needed, as they go faster than in U. S. For sports, nine-tenths of the women wear socks or dispense entirely with hose; this custom has become very popular.

(c) Very effective and pretty dresses for daytime wear, ready made or embroidered to be made up, can be had from numerous peddlers and shops. These are very cheap and cool and are laundered beautifully by the lavanderas. Certain shops in Manila feature these: voile, canton linen, net and pona in smart lines.

(d) Shoes can be made to order fairly well and cheaply, if the shoemaker is given a model to copy exactly. American shoes may be bought in Manila stores.

2. *Furniture.*

Any veneered furniture is certain to be ruined in the Islands. The veneered portions separate from the rest of the furniture and curl up due to the heat and humidity. Pianos, radios, and good books are usually ruined in this climate. Pianos designed for tropical use may be rented from a music house in Manila. Upholstered furniture and rugs may be brought if watched carefully during the rainy season. Any furniture with glued joints should be left in the States.

3. *Automobiles.*

The question of bringing a car is controversial. If an officer is assigned to the 92nd Coast Artillery (PS) at Kindley Field he will have considerable need for a car although there is sufficient government transportation for ordinary purposes. Some officers living at Topside and Middleside believe that a car is a great convenience, even a necessity; the majority opinion is that there is little need for a car here. In this connection it is pertinent to state that the street car system provides half-hour service between Topside and Bottomside, passing within a short distance of all major activities.

4. *Radio.*

A radio set may be brought if not mounted in a veneered cabinet. There are several programs broadcast from Manila, although there is no broadcasting on a scale similar to that in the States. The climate is particularly severe on radio and electrical equipment, but a radio can be kept in good working condition if installed in a dry cabinet heated by an electric light.

VI. OUTSIDE CLUBS

The chief clubs in Manila are the Army-Navy Club and the Polo Club; others are the Elks, the Columbia, and the Spanish clubs. There is a five-dollar initiation fee for the Army-Navy Club, and seventy-five cents dues per month.

VII. HOTELS

There are a number of good hotels in Manila, among them the Manila Hotel, the Luneta, and the Leonard Wood. Next to the Army-Navy Club the Manila Hotel is the center of social life for the Army in Manila.

VIII. SERVANTS

Servants are generally good. They are all men except the laundresses and nurses. Their wages are fixed at the following prices:

Chinese cooks, not more than	\$25.00
Filipino cooks, not more than	20.00
Combination cooks and houseboys, not more than.....	20.00
Combination Filipino houseboy and lavandero, not more than	17.50
Houseboys and mess attendants	12.50
Nurses (amahs) not more than.....	10.00
Lavanderas, not more than	10.00
Combination lavandera and amah, not more than.....	15.00

IX. MONEY

The unit of currency is a centavo, equal to one-half-cent gold. The silver pieces are one peso (fifty cents gold) and five, ten, twenty, and fifty centavos.

X. SCHOOLS

There is a post school, primary and intermediate grades, at Fort Mills. The Brent School, in the wonderful climate of Baguio, is an excellent boarding school under the auspices of the Episcopal Church. For further particulars write to: Headmaster, Brent School, Baguio, P. I.

XI. AMATEUR RADIO STATIONS

There are three amateur radio transmitting stations on the post in daily communication with the States. Messages not of a commercial nature are sent gratis; it is customary to inclose ten cents with each message to cover mailing costs. These stations can be reached by practically any amateur radio transmitting station in the States. Messages are ordinarily handled in five days, thus effecting a saving of nearly a month's time in the delivery of private messages.

XII. COOKS AND BAKERS SCHOOL

All officers below field grade in the Philippine Department are required to attend the School for Cooks and Bakers for one month at Fort McKinley unless they already have a Quartermaster certificate in that course.

XIII. SUMMARY

In general, the instructions to Coast Artillery officers under orders to the Philippines may be summed up in the slogan, "Don't worry." Practically every need of an officer and his family can be supplied at Fort Mills.

WAR DEPARTMENT

Office of the Chief of Coast Artillery
Washington

January 28, 1930.

Brigadier General W. E. Cole,
Fort Monroe, Virginia.

Dear Cole:

Incident to your promotion to the grade of general officer your connections with the Coast Artillery Board have been prematurely terminated. At this time I desire to express to you my appreciation of the fact that during your tenure of office the work of the Coast Artillery Board has been characterized at all times by zeal, intelligence and excellent judgment.

I have been impressed recently with the work done by the Board in preparing the new T. R. 435-55 and the program for the long range development work which is to be held in Panama next summer. I believe that the changes in Coast Artillery target practice which you have instituted in the new regulations are wise and will have a beneficial effect on our sea-coast and antiaircraft firings. The program for long range development work appears to be so well done that I feel sure that very effective results will be attained in the experimental work.

I am forwarding a carbon copy of this letter for file with the Coast Artillery Board.

Very sincerely,

ANDREW HERO, JR.,

Major General,
Chief of Coast Artillery.

Buena Vista—a Western Thermopylae

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

THE war with Mexico, when it is thought of at all, is too often passed over lightly as an imperialistic and perhaps not entirely righteous contest.

It is true that the territorial concessions arising out of the war approximated in area the Louisiana country, acquired some forty years earlier. But it is sometimes forgotten that an equal amount of gold was paid in each instance; and that, in the case of Mexico, a considerable quantity of blood was added to the purchase price.

The part played by the Regular Army in this important chapter of national history is unceasingly gratifying. At the same time the military student, and particularly the artilleryist, finds in the war much of professional interest.

The Army of the United States at the time war was declared consisted of not much over seven thousand five hundred men. The majority of its units were stationed along the gulf, in western Louisiana, under command of Col. and Brevet Brig. Gen. Zachary Taylor, 6th Infantry.

Upon the admission of Texas into the Union, Mexico severed diplomatic relations with the Washington government. Shortly after this Taylor was ordered to proceed westward with his troops and to station himself at some suitable location north of the Rio Grande. This move was formally announced, however, as being merely for the purpose of preserving order along the border and to facilitate the development of Texas.

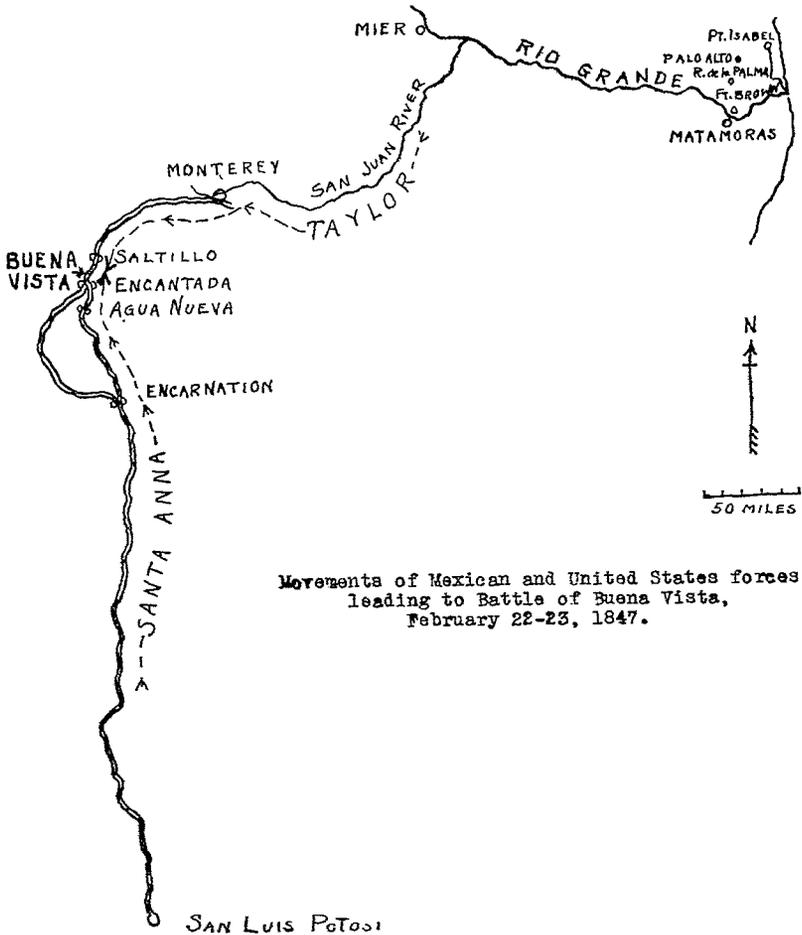
The site selected by Taylor for a camp was not far from the mouth of the river, at a point later designated as Fort Brown.

It was while encamped at this position that one thousand six hundred Mexican cavalry troops crossed the river and on April 24, 1846, fell upon and routed a small scouting detachment from Taylor's army. Following by a week this, the first engagement of the war, a much larger Mexican force crossed the river with the mission of cutting the line of communication between Fort Brown and the supply head, Point Isabel. The resulting battles of Palo Alto and Resaca de la Palma thrust Mexican troops out of Texas, but they also definitely committed the United States to war.

Congress promptly and liberally supported Polk in his requests for men and money to undertake the aggressive operations which had now become inevitable. These requests, however, in no wise taxed the strength of the nation. The meagre manner in which the small Regular Army was supplemented in men and materiel resulted in a general numerical inferiority in the ensuing battles; a condition which, nevertheless, imparted a distinctive flavor to those engagements.

The military operations of the war may conveniently be divided into two broad phases.

First is the thrust of Taylor, with the main body of United States troops, from Texas into Coahuila. This was accompanied by minor parallel invasions; overland through Chihuahua on the west and by water to Tampico on the east. At the same time Kearny advanced across New Mexico,



while California capitulated at a show of combined military and naval force.

The result of these maneuvers was to bring a considerable portion of Mexican territory into the hands of the United States. This, in fact, marked approximately the extent of military action which the Washington administration originally thought would be necessary to conclude the war.

It soon became evident, though, that the loss of the occupied territory disturbed the central Mexican government very little. And Santa Anna, who now resumed control of affairs in Mexico, proceeded to organize the country for an extended war. These facts led the United States reluctantly

to realize that nothing short of the reduction of the City of Mexico would suffice to conquer a successful peace.

The war then entered what may be considered its second and serious phase, which was planned as a joint land and water expedition against the Mexican capital accompanied by an entirely subordinate demonstration from the north.

But by reason of the aggressiveness of Taylor, affairs in the north eventually accumulated much greater importance than had been expected or intended.

President Polk and his advisers decided that Maj. Gen. Winfield Scott, the ranking officer of the army, should lead the expedition to Mexico City by way of Vera Cruz. This necessitated the breaking up of Taylor's army which, besides the bulk of the Regulars, included practically all of the militia then in the field. Politics undoubtedly entered into this arrangement, although it is not subject to serious military criticism.

This scheme, however, did not please the doughty Taylor. It implied a defensive rôle close to the Rio Grande, which he saw as a relegation to personal obscurity. He had no alternative but to follow Scott's orders and release nearly all his Regulars and about five thousand militia. With the remainder, however, he tempted fortune by advancing still further into Mexico.

Santa Anna watched the weakening of Taylor's army with interest and, understanding Scott's intentions, determined on a plan of action which was eminently sound. Working on interior lines, it was his strategy to concentrate his full strength in turn against each invading force.

He lost no time, therefore, in gathering together the bulk of the Mexican Regulars with the best of the National Guards, composing them into an army of some twenty thousand with which he started north to annihilate Taylor's remaining command of less than five thousand.

It is to be doubted whether Taylor's professional reading included the campaigns of Leonidas, yet the tactics of his army in meeting the advance of Santa Anna are strikingly reminiscent of the battle of Thermopylae.

By this time Taylor's column was based at the town of Saltillo, over two hundred miles from Point Isabel.

From here the only fit road south passed through a defile for fifteen miles to Encantada, where a pleasant valley spread out to break the ruggedness of the mountain country. This defile must be borne in mind, for it played an important rôle in the impending action.

Half way along this narrow pass between Saltillo and Encantada was the hacienda San Juan de la Buena Vista. Taylor did not pause here, however, but moved his troops on into the open country beyond Encantada, to the little town of Agua Nueva.

The location of Agua Nueva impressed Taylor as offering ample space for

the drilling and maneuvering of his troops while awaiting the approach of the Mexicans, and seemed an appropriate place at which to make a stand. He was also impressed with the idea that here he controlled the first water for many miles along the path which Santa Anna must follow on his way north. He, therefore, occupied the town on February 10, 1847, and spent the intervening days preparing for the approaching battle.

But in his dispositions Taylor failed to duly weigh the possibility of Santa Anna turning his flank by taking a circuitous road west of Agua Nueva to Encantada. It was not, in fact, necessary to march through Agua Nueva in order to reach Encantada, although it was impracticable for Santa Anna to reach Saltillo, Taylor's base, without entering the narrow mountain pass at Encantada. The danger of thus cutting the vulnerable line of communications by such a flanking movement must have appealed to many officers if not to Taylor.

Early in February Santa Anna had set out from San Luis Potosi for the north. Before meeting the United States troops he was obliged to march over two hundred miles, the latter part of which distance was over desolate deserts, waterless and especially fatiguing to infantry and artillery.

As it approached Taylor's position, the "Liberating Army of the Republic" was composed of not less than seventeen thousand of the best soldiers in Mexico, well distributed among infantry, cavalry and artillery. Opposing its advance, the United States force consisted of less than five thousand men. It was, therefore, necessary to combine with very effective fighting a happy turn of events, if a deplorable rout was to be avoided.

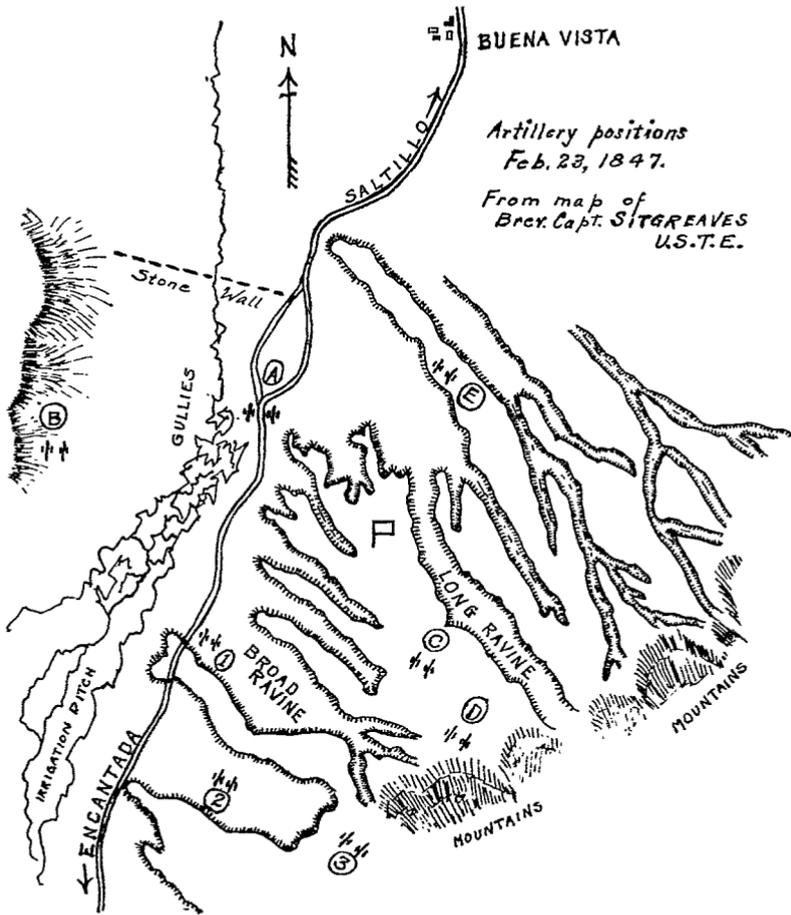
Nearing Agua Nueva on the night of February 21, Santa Anna detached a force of two thousand cavalymen under General Minon to proceed over the mountains, capture Saltillo and cut off a retreat. He elected, however, to push forward with his main army and force the fight on level ground near Agua Nueva. There can be little question of the wisdom of this decision, since the preponderance of Mexican force held every promise of an overwhelming victory in open battle.

But fate intervened at this juncture.

From reports brought in by pickets, General Taylor mistook Minon's cavalry movement to be an advance of the entire Mexican army, which he thought was taking the long flanking road to Encantada and would so be due shortly to fall on his rear. As this enterprise presented itself to Taylor its disastrous possibilities became obvious, and a retreat to Encantada and beyond was therefore hastily decided upon.

So it was that the U. S. Army of Occupation fell back some fourteen miles during the afternoon of February 21st, to a position well north of Encantada and midway along the defile between that point and Saltillo.

The situation selected was ideal. Credit for its choice must be given to Brig. Gen. John E. Wool, who, two months earlier, pointed it out with the remark, "This is the very spot of all others I have seen in Mexico which



- A—Battery "B", 4th Artillery; 5 guns. Captain Washington.
- B—Battery "C", 3rd Artillery; 2 guns. Captain Bragg.
- C—Section of Battery "C"; 1 gun. Lieutenant Kilburn.
- D—Section of Battery "B"; 3 guns. Lieutenant O'Brien.
- E—Battery "E", 3rd Artillery; 4 guns.

These guns were principally 4 pounders, with a few 6 pounders. Their mobility more than compensated for their lightness.

- 1—Three Mexican 16 pounders, one 7-inch howitzer.
- 2—Five Mexican 12 pounders.
- 3—Five Mexican 8 pounders.

Santa Anna also had three 24 pounders at San Luis Potosi, but it is doubtful if these reached Buena Vista.

I should select for a battle were I obliged with a small army to fight a large one."

Advancing to engage Taylor at Agua Nueva, Santa Anna found the town abandoned with every evidence of precipitate withdrawal. Here he made an erroneous estimate of the situation in concluding that the United

States force had fled rather than retreated. He, therefore, pushed his column forward rapidly and, lured with a false sense of victory, came upon the Army of Occupation ensconced among the benches of the gorge near Buena Vista ranch.

It is impossible to study these movements without observing the good fortune which attended General Taylor. Before the battle he was many times criticized, in and out of the Army, for his lack of professional qualifications. The results of the battle silenced his critics and swept him into the White House. But in analyzing his tactics it must be admitted that he rather unwittingly fell back on a greatly superior position which had been located by his second in command, and that in so doing he unconsciously lured his opponent into an extremely dangerous situation.

It was noon on the 22nd of February, 1847, when Santa Anna found his army well wedged in a passage which was dominated by Taylor's command. To retreat with such a preponderance of force as he possessed was out of the question, yet his troops, wanting water and food and wearied by a long, arduous march, were in poor shape for fighting. The terrain was unsuited to cavalry, his favorite arm, and the best artillery positions were in the hands of his enemies, yet to advance infantry against the threatening guns which Santa Anna found before and above him was most uncomfortable. He, therefore, resorted to the pen.

Dispatching a flowery note, Santa Anna pointed out that Taylor was surrounded by twenty thousand men and had a very dark future. "But, as you deserve from me consideration and particular esteem, I wish to save you from a catastrophe; and for this purpose I give you this notice, in order that you may surrender at discretion."

Visions of the traditional treatment of prisoners by Mexican armies may have arisen before Zachary Taylor when he received this communication. Or, more likely, his innate contempt for his foes asserted itself. "Let them come; damned if they don't go back a good deal faster than they came," he had announced a few days earlier at Agua Nueva. Yet if he held such thoughts this day his model adjutant, W. W. S. Bliss, framed for him a reply which carried, in coldly gracious terms, a refusal to surrender. So the battle began.

The first day's action, commencing in mid-afternoon, was confined to a struggle for the few remaining positions of value and, despite fairly heavy casualties, was generally favorable to the Mexicans.

During the night each army undertook to consolidate its position and to prepare for the decisive struggle which all realized would come with the dawn.

The outlook for Taylor was by no means prepossessing. Facing him were the most formidable of the Mexican Republic's armed forces in the proportion of four to his one. With him were four thousand seven hundred troops, ninety per cent of whom were hastily mustered volunteers. And

behind all of this must have been the thought that he had wandered far afield, despite orders from Washington that he hold no ground south of Monterey; that in combining imprudence with insubordination he was guilty of the gravest fault of a soldier. Nothing short of victory could sustain his military reputation, while defeat would dissipate his budding political ambitions.

Taylor was favored, however, in two important respects. He had with him a considerable proportion of trained and skillful officers, and his own personality was exceptionally suited to bringing forth the best efforts of the rank and file of his heterogeneous command.

Engaged at Buena Vista were Porter, Braxton Bragg, Jefferson Davis, McDowell, Donaldson, Dix, Buford, Albert Pike, Thomas, Reynolds, all names to conjure with in later years. And what professional attainments Taylor may have lacked in the eyes of these officers he made up for by the blind devotion with which he inspired his men.

For Taylor combined those two essentials to generalship, courage and ability to lead. He was among the last of the stalwarts with whom these personal virtues served, in lieu of technique, to command success at arms. Scorning the uniform and other military niceties, he exasperated his West Point subordinates and embodied the ideal of his unpretentious soldiers.

His troops, in fact, were hardly soldiers in the formal sense, any more than he; restive under discipline, children of the era of Jackson democracy, but sincere in their intention to fight and quite willing to follow their picturesque leader.

If they were outwardly drab their opponents were, in contrast, attended by ample of pomp and circumstance. At dawn priests could be observed at their orisons, blessing the Mexicans and invoking the wrath of God upon the invaders. Bands played and the colorful uniforms of Santa Anna's army moved forward.

But it was topography, it soon appeared, that was to govern the action of the day.

Taylor's center was firmly established across the high road, with artillery so emplaced as to make a frontal attack inadvisable. His right faced gullied ground, so impassable that it was not used at any time during the battle. His left was spread across a plateau running eastward to towering mountains.

The broken ground over which the Mexicans must advance limited their tactics in two vital particulars. It prevented an advantageous concentration of their preponderance of force at any given point; and it rendered the attacking artillery virtually immobile. Without these limitations it is doubtful if the attack could have been withstood.

Courage, however, was not wanting on either side. The feeble fighting of the Mexicans at Palo Alto and Resaca de la Palma was not repeated at Buena Vista. Here is to be seen the high tide of Santa Anna's military

career, the display of all the enthusiasm with which he had injected his troops.

Flinging themselves against the far end of the line on the upper plateau near the mountains, two Mexican brigades under Ampudia found a soft spot—the Second Indiana Foot—which, giving way, opened a path past the entire front.

By 9 o'clock the battle was going very badly indeed, with Mexican foot and horse well up and beyond the line, when General Taylor arrived on the scene. Until then he had been at Saltillo seeing to the safety of his stores. His absence, while felt, was probably compensated for by his timely arrival at this instant. With him were the First Mississippi Rifles, Jefferson Davis commanding, and this regiment, launching a spirited counter-attack, from the left rear, stopped the advancing Mexicans and forced them back along the base of the mountains.

With his front once restored, Taylor assumed direction of the battle. He took a position near his center, east of the road, on the plateau where the fighting was thickest. Here, slouching on his well-known white horse, one leg across the pommel of his saddle, he uttered those racy commands which have come down to us (and doubtless many others which never found their way into print).

One of his Regimental Commanders sending word that he was surrounded, Taylor sent the reply, "Now you have them just where you want them; give 'em hell," which, it appears, was done. A glossy historian credits him with remarking, at the height of battle, "A little more grape, Captain Bragg"; but those on the spot claim he shouted, "Double-shot your guns, Bragg, and give 'em hell"—just the impetus needed to pull the dizzy artillerymen out of a tight hole. Such was Taylor through the battle; disdainful of his opponents, fearless for himself, and utterly confident of victory.

Yet in examining the details of the battle we find that, behind Taylor and the undoubted valor of his men, materiel offered an important contribution to the final outcome.

The artillery at Buena Vista consisted of fifteen field guns of the 3rd and 4th U. S. Artillery. The battle largely revolved around these guns, and the student of modern tactics is surprised to find Taylor, an infantryman, detailing foot regiments to support gun batteries.

Buena Vista, indeed, marked the end of an era in the evolution of artillery. From the "battalion gun" doctrine of Gustavus Adolphus, Napoleon had developed a highly mobile arm which could precede infantry on the battlefield and even produce a decisive effect, as at Wagram. But this close fighting of artillery was ruled out by the increased effectiveness of the infantry rifle, which appeared shortly after the war with Mexico.

But in 1847 foot troops were armed with flintlock muskets for which paper cartridges were supplied. These pieces could not be fired with effect

until the advancing line was quite close, after which it was always a question whether they could be reloaded for another volley before the second wave of the advance was on the firing line.

Each field piece, however, combined the fire-power of many muskets and added a shock factor which was particularly great where bodies advanced in column as was usually necessary at Buena Vista.

Thus artillery at this time served for close as well as for long range firing. Two decades later the machine gun proved its ability to supplement fire by files at short range and so replaced cannon on the extreme front; but at Buena Vista this function was still performed by the field piece discharging canister or grape. Occasionally when these gave out a similar result was produced by the expedient of loading two round shot with a single charge of powder so that the shot, bursting inside the gun, scattered a rain of fragments for a short distance. Thus Taylor's command to Bragg, "Double-shot your guns," indicates that canister and grape were exhausted and that the enemy was close at hand.

At longer ranges the U. S. Artillery had a distinct advantage over the practically immobile Mexican guns. The modicum of attention which had been given this arm before the war brought about the adoption of Shrapnel's principle for projecting a *petit canon* into distant ranks. Santa Anna, on the other hand, contented himself with the obsolescent round shot which, at equal range, might even be dodged by the troops at whom it was aimed. So, even had he been able to maneuver his guns with the same freedom as did Taylor on the fairly level plateau, their supporting value must still have been relatively less.

As it was, the only serious damage done by the Mexican artillery was when the tide of battle swept the United States troops well within its range. But Taylor, for his artillery, reported, "Always in action at the right place and right time"; while Upton adds, "It served as rallying points for the broken and hard-pressed infantry which, but for its presence, must have been driven in confusion from the field."

Time and again the Mexicans advanced against the guns of Washington, Bragg and Sherman, to be forced back by direct blasts of canister. Santa Anna, with an abundance of personnel, undertook to meet this fire with open breasts on the same theory as, years later in France, machine gun nests were defied. In one instance he captured a gun by the costly method of advancing fresh troops between rounds of the smoky, slowly served muzzle loaders until the cannoneers were finally driven off, only to find a fresh section wheeled up from the left and the vicious cycle renewed.

At last the setting sun commenced to throw long shadows into the valley; firing slackened until, as darkness grew, it ceased altogether.

The Army of Occupation was badly shaken at the end of the day. Its leaders had no feeling of elation, except insofar as the position to which they had retired was still held. Losses had been heavy—six hundred and

sixty-six casualties, or one for each seven men engaged. Dead on the field were two hundred and seventy-two officers and men, a heavy price for the barren mountains under which their surviving comrades spent the night.

Meanwhile a close chain of sentinels was spread across the front and the few remaining units at Saltillo were brought forward as reinforcements for the ensuing day.

But with dawn of the 24th a welcome sight became visible. The pass, so far as the eye could see, had been vacated by the Mexican army. The camp fires which had burned through the night had covered but another ruse *a la* Princeton.

Taylor, however, was in no shape to follow through. He was more than satisfied to permit Santa Anna to retire southward at his own gait.

The Mexican losses in dead, wounded and captured amounted to something over two thousand. Double this number deserted during the night of the 23rd. In fact it was only by assembling his troops and marching rapidly toward Mexico City, proclaiming a "victory" at Buena Vista as he went, that Santa Anna was able to prevent the disintegration of his command.

As with most momentous battles, the negative as well as the positive aspects of Buena Vista must be considered as the results of the engagement are weighed.

Had the Mexican army broken through the pass and gained Saltillo, as it had every expectation of doing, there would have been few survivors of the Army of Occupation to recite the story of the disaster. The road to the Rio Grande would have been open and Texas quickly entered by a formidable force.

In such event it is inevitable that the basic strategy of the war must have been materially modified to meet this new danger. Polk could never have permitted his only remaining army to advance against Mexico City with a large Mexican force once entrenched in United States soil. And the withdrawal of Scott (who landed at Vera Cruz on March 9th), would have presented exactly the fillip to popularize the war in discordant Mexico.

The Mexican war psychology has been to respond quickly to victory and to suffer corresponding dejection at defeat. It is not surprising, then, that defeat—or at least lack of victory—at Buena Vista, should have been followed by an insurrection at the Mexican capital. On his return Santa Anna was able to patch up a political truce, but the rift continued and succeeding war measures were never supported with unanimity.

Whatever confidence his followers, political and military, may have had in Santa Anna was fatally shattered by the guns at Buena Vista. Lesser leaders had failed at Palo Alto and Monterey, but he had been loud in declaiming his ability to retrieve these losses. His failure to do so produced a general inertia which made possible the advance of Scott to Chapultepec with a mere seven thousand men.

Avoidable Delays in Target Practice

By MAJ. O. H. SCHRADER, C. A. C.

TO begin, the experiences of the writer have not been either unique or unusual. Every Coast Artillery officer who reads this article will "second the motion" say "Amen" and then "let it go at that."

The purpose of this article is (1) to crystallize opinion in the Corps, (2) to stimulate discussion of the subject, (3) indicate a possible remedy.

We all know that it takes only a few minutes to fire a target practice with big guns, mortars, mines, G. P. F.'s, 75s, 3-inch antiaircraft or anti-aircraft machine guns. We also know that on the average it takes nearly a whole day, sometimes a week to finish a series. The principal cause of delay is the fact that the field of fire is not safe, due to the presence of boats of all kinds.

It appears that Commanding officers of Posts, Harbor Defenses, Artillery Districts and Corps Area are not clothed with the power to exclude shipping of any kind from the target practice area. Yet we must (in nearly all cases) fire over and into navigable waters.

I have informally discussed this matter with many officers and civilians, all agree that it is "too bad," a "crying shame," an "infernal nuisance," an "unwarranted expense," an "extravagance" or "what have you." Still Greek lobster men clutter up Narragansett Bay, cod fishermen hold up practice in Boston, rum runners cause the reg flag to come down on the towing tug in Puget Sound, salmon netters anchor in Columbia River and pleasure sailing craft and fishermen of all nationalities hold up fire in Panama, Sampans in Honolulu and so on ad infinitum.

Target practices in which I have been engaged have been held up time and again by our own (Federal) agencies, Navy, Coast Guard, Geodetic Survey, lighthouse service, cable ships, engineer boats, pilot boats, harbor police, port wardens' activities, fire boats, dredges, etc. This can't be laughed off by the fifty-fifty fiend.

The advantage always lies with the interrupter. He appears and "presto" everybody commands "cease firing" and the interrupter has the right of way. No one ever disputes him, because if you hit him you must pay, if you only come close you stand trial before a court, and if he thinks you come close although in fact he was perfectly safe, you must explain by "indorsement hereon" for the rest of your days and then be gossiped about in the long lulls between shots. Who doesn't remember the stories "I remember when Captain Ducrot or Lieutenant Dumjohn fired a practice and almost hit such and such a ship. He sure had an awful time explaining it." But I never yet have heard a story like the following: "Captain Smith, master of the S. S. *Wampus* who steamed into the field of fire while target practice was being held in Blank Bay had his master's

certificate suspended for thirty days by the Board of Inspectors for 'killing or maiming Battery A's figure of merit or score.' I have never even heard it suggested that the War Department send the association of Greek lobster fishermen a bill for coal consumed aboard the towing vessel during the time said fishermen held up the practice, but I have heard rumors that certain officers had to pay for damage that projectiles did to vessels. Also that claims had been paid to owners of houses for broken windows, addled pheasants eggs, etc., said damage being caused by gunfire.

Now let us turn the page.

(1) Hale and Yarvard have a boat race scheduled on the Thames. The course is laid out, buoys planted, and the course patrolled. Woe be unto the unlucky fisherman who crosses the course, ferries must stop, Government, state and municipal craft pounce on the interrupter, remove him, tow his boat away, threaten him, and perhaps fine him.

(2) Ditto (same story) different setting (Poughkeepsie).

(3) Ditto (same story) different setting (Lake Washington).

(4) Ditto (same story) different setting (Oakland Estuary).

(5) Ditto (same story) different setting (Newport Yacht Race).

(6) Ditto (same story) different setting (any water carnival).

The above suggests the following questions.

Why *can* a scheduled crew race be the occasion for closing waters to navigation?

Why *cannot* target practice by the United States Army be the occasion for closing waters to navigation?

Answer the above questions, if you do, the remedy suggests itself.

The writer just finished conducting antiaircraft machine gun target practice for a battalion. It was understood that it cost the Air Service twenty-five dollars an hour to keep a towing plane in the air (all things considered). Three fishing boats whose total catch amounted to scarcely five dollars held up our practice for hours. Is there a single corporation in the world that would not abate the twenty-five dollars nuisance by a cash payment of five dollars? Not that I favor buying off fishermen but I do steadfastly believe that the interests of the Government are paramount to those of an individual. If you don't believe this is true, try taking a drink of spiritus frumenti on the street corner in front of a policeman. You will be answered promptly.

In either case the principle or idea is the same. Why the difference I ask you, kind reader.

I believe the Army has the right to *enjoy* uninterrupted target practices. I believe the Government has the power to grant us this satisfaction. I believe that proper coordination of Governmental activities will obviate interference by them, and lastly, I believe if we try hard enough we can bring the millennium nearer. What do you believe?

COAST ARTILLERY ACTIVITIES

Office of Chief of Coast Artillery

Chief of Coast Artillery
MAJ. GEN. ANDREW HERO, JR.

Executive
COL. H. L. STEELE

Organization and Training Section

MAJ. S. JARMAN
MAJ. J. B. CRAWFORD
CAPT. J. H. WILSON

Personnel Section

LT. COL. H. T. BURGIN
CAPT. H. N. HERRICK

Plans, Finance, and Materiel Section *Intelligence Section*

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

MAJ. S. S. GIFFIN
CAPT. H. N. HERRICK

Aviation Developments Affecting Antiaircraft Tactics and Materiel

The Coast Artillery Corps is interested in the powers and limitations of aircraft because the tactics and employment of air forces depend upon the ability of the plane to perform the mission assigned to it. Our own Air Corps with its laboratories at Wright Field still leads in aviation development but commercial aviation is coming to the front fast.

A commercial transport plane is nothing but a bomber. Knock out the seats for the passengers, compartments for baggage, and all the unnecessary chair-car features, put in bomb racks, sights and bombs, gasoline tanks, machine guns, and a crew and we have a very efficient bomber. For this reason it should be our interest to keep in touch with the newest developments in commercial planes.

A new tri-motored all-metal transport plane (7-AT type) has been announced recently by the Ford Motor Company. This ship is very similar to the 5-AT type which will be continued in production. The most essential difference is the substitution of two Wright J-6 motors of three hundred horsepower each, for two of the three Pratt and Whitney *Wasps* as used on the 5-AT. The nose motor will be a four hundred and twenty-five horsepower *Wasp* which will give the ship a total of one thousand twenty-five horsepower. Economy of operation is claimed for the new arrangement.

The 7-AT has a wing spread of seventy-eight feet and a length of about fifty feet over all. It is about thirteen and one-half feet in height. It will

reach a top speed of one hundred and thirty-four miles per hour and has a cruising speed of one hundred and twelve miles per hour. The radius of action is six hundred and twenty-five miles. It has a service ceiling of fourteen thousand feet. It can carry a useful load of five thousand six hundred pounds, bringing its total weight to thirteen thousand pounds. The cabin space is about nineteen feet in length, four and one-half feet wide, and averages six feet in height. It carries fifteen persons including the crew. Baggage space is provided.

The general trend in commercial planes is toward higher speed. The Coast Artillery should anticipate this higher speed. It makes our problem more difficult. With a time of flight of twenty-four seconds it is now necessary to "lead" the bomber by two-thirds of a mile. If we double the speed of the plane our lead must also be doubled and we find our angular speeds increased accordingly. Our system of hand control for the guns may prove too slow for these increased speeds. To improve our situation a higher velocity gun would be useful. The latest gun is a great improvement over the older models. Many believe that a gun of a muzzle velocity as high as four thousand f/s is practical with the liner and should be developed. It cannot be denied that the time of flight factor is the most important consideration in accurate antiaircraft fire and the higher speed of modern planes and their ability to attain higher altitudes directly affects the time of flight feature.

Brig. Gen. William E. Gillmore, Assistant Chief of Air Corps, in a speech delivered at Ohio State University, states that commercial builders are now looking towards a speed of one hundred and sixty miles per hour, and that the Air Corps is setting its standard at two hundred miles per hour for fast ships. The Air Corps has built ships of two thousand four hundred horsepower with single motors up to one thousand two hundred horsepower. The modern motor weighs one-half pound per horsepower. Saving in weight is very important. Ethylene-Glycol as a cooling medium has placed the "water" cooled motor back in the running because it reduces weight. It also reduces air resistance and since the temperature of the motor is higher a greater fuel efficiency has been obtained. General Gillmore also stated that after a three months' visit in Europe where he inspected all the experimental laboratories he is of the opinion that we are leading all countries in aeronautical engineering. Therefore, by keeping in close touch with our own Air Corps both in the technical and tactical developments we cannot be caught napping.

A closer relation between the Air Corps and Coast Artillery is desirable so that each may understand the other's tactics, capabilities, and limitations. It may be accomplished in a number of ways. A spirit of cooperation between the Air Corps Tactical School and the Coast Artillery School already exists. The exchange of students and instructors is valu-

able. The continuation and further development of joint exercises should be carried on. The Coast Artillery is fully aware that it has a problem on its hands in its antiaircraft mission. The solution of this problem under rapidly changing conditions is not permanent. To solve it and keep it solved requires an accurate sensing of the trend in aviation development. In other words, we must keep on our toes and know at all times, just what we are up against.

Practice Marches for All Mobile Organizations

In a recent communication to Corps Area Commanders the War Department has directed that all mobile organizations of the Regular Army make one practice march of two weeks' duration and a minimum distance of one hundred miles. The daily march will not exceed the normal daily march prescribed in the Field Service Regulations and will be so conducted as to end early in the day. The country covered will be so selected as to bring the troops in contact with attractive and interesting surroundings and recreational advantages.

In favorable weather, except during the summer training periods, troops will spend one night each month in camp away from their garrison station. However, if unfavorable conditions exist the march will not be made, since the recreational feature of the camp is most desirable and if the march cannot be made under favorable conditions it will be dispensed with.

In addition to providing recreation for the personnel and breaking the monotony of garrison duty these marches should be the means of bringing the Army in close touch with a greater number of our citizens. It is an opportunity to instruct the people in the life and work of the Army and this opportunity should not be neglected. Notices in the press, the use of the band for public concerts, courteous treatment of visitors, participation in local functions where convenient should go far towards establishing more cordial relations.

Air Defense Maps

In the January number of the JOURNAL there was an article discussing the desirability of an Antiaircraft War Game Board for training purposes. This article voiced the conclusion that a War Game Board similar to the familiar Coast Artillery Harbor Defense Board was not considered with favor. However, those who write articles in the COAST ARTILLERY JOURNAL are only expressing their own ideas and thoughts on various subjects and their opinions are, after all, only opinions. It is noted that the Coast Artillery Board has the question of an Antiaircraft War Game under consideration as a project and has made no recommendations as yet as to its desirability. So it appears that the writer of the previous article might be accused of usurping the functions of the learned Coast Artillery Board.

However, the officer who proposed an Antiaircraft War Game has exceptional mechanical and electrical inventive ability and he is invited to expend his energy upon a board which is something more than a toy because it is capable of use in actual service.

Almost any system of air defense contemplates the location of hostile air forces at a considerable distance from the bombing objective in order that the defense forces may obtain the time necessary to make preparations to meet the attack. Defense forces consist of air forces and ground forces. Air forces are entirely offensive in their use. Their best method of defending an area or establishment to which they may be assigned is to launch an aggressive attack against the approaching bombers as soon as they are located. On the other hand the ground forces are entirely defensive in their activities. They are compelled to await the attack in place and to strike when the raiders come within range. Both the air forces and the ground forces need advance information—to the air forces it is vital, to the ground forces it is useful.

This information will be obtained, possibly to some extent, through air or naval reconnaissance, but more accurately and certainly through a system of ground observers in communication with a center or subcenter headquarters where the Air Defense Commander receives the information which the observers furnish, collates, coordinates, disseminates it, and issues his orders.

How far should this observation system extend? In England it is to extend all over the southeastern portion. In our country due to its greater distances it will naturally be minimized. If a bomber travels at one hundred and fifty miles per hour, if it requires five minutes to receive the observers' messages, ten minutes to estimate the situation, make the decision and issue the orders, ten minutes to get the airmen out of the poker game, four minutes to warm the motors, ten minutes to climb to fifteen thousand feet, and twenty minutes to arrive at the selected point of contact the distance of the farthest observer can be figured. Without doubt the total time indicated above can be reduced—the ships can be warmed while extracting the fighters from the poker game, etc. The defense will be all-round so it can be seen that a considerable area would be covered even with only a seventy-five-mile radius. Night and varying weather conditions would have some influence. For instance, it has not been demonstrated, as yet, that a pursuit ship can locate a bomber at night unless illuminated¹ by a searchlight and, for obvious reasons, searchlights can not be provided at great distances from the object to be defended.

What kind of information will the observers send in to headquarters? They will mention the number and kind of planes, formation, altitude (estimated), course, speed, and time of passing a known point (i. e., a point known to headquarters). Any other information found of value would, of course, be required.

Hostile bombardment will almost certainly be accompanied by its own pursuit and possibly by attack. Bombardment attacks on important objectives will be launched with every effort strained to produce a mighty and decisive blow. At night, especially, the bombardment formation may possibly split up into small detachments as it nears its objective. By so doing it can simultaneously attack a larger area, when appropriate, and can confuse the defense by causing a diffusion of its efforts. The defense must take every precaution lest pandemonium rule.

The Defense Commander and his staff would have to be supermen and possess superlative imaginations to constantly maintain a mental moving picture of this situation. It would not be possible and a graphic representation of some kind is indicated just as for the Division Commander and his staff. Due to the rapidity of the action and the fact that operations are being conducted by one hundred and fifty-mile an hour machines instead of three-mile an hour humans a mechanical device of the very highest order is called for to produce a graphic picture of the situation at any instant.

Without attempting to go into the details of the form this device should take, it is believed that its necessity is obvious. It should be more than a game to play with on rainy days. The electrically minded may visualize a map representing an area equal to a New England state with observation stations located by red lights which glow as the hostile formation passes, clearly indicating the course to the bombers' objective and possible points of interception by defense pursuit. The area immediately ahead of the moving bombers could be red-tinged by some ingenious system of lighting indicating immediate danger of bombardment, with a green area farther in advance indicating imminent bombardment, and an orange area for warning and an alert. Searchlights, guns, airdromes, and friendly flights should also be indicated. A code system could be devised so that the flashing of a light on the board would at the same time send a warning to air forces, ground forces, civil authorities, and civilians. Perhaps this is too elaborate and lacks universality. A simpler form might be more practical. The officer who had plans for an Antiaircraft War Game is invited to try his hand at this one.

The Coast Artillery School

Now that the Coast Artillery has gone antiaircraft it is only natural that the courses given at the Coast Artillery School should be affected and should need some revamping. Under the present policy instruction in antiaircraft will receive the same attention as is now given seacoast artillery. Not only will the tactics and technique of antiaircraft artillery receive more attention but more time will also be spent on the study of the tactics and technique of air forces. It is obvious that if we are to be

prepared to meet our enemy of the air that we must know a great deal about him. We must know what he can do and what he can't do and arrange our defensive tactics accordingly.

For next year's course at the school an Air Corps officer will be added to the faculty and students will be instructed by this officer in those tactical principles which our own Air Corps will use in combat and especially in attacks on ground forces and establishments.

Nearly all courses will be affected. The Advanced Course students will receive instruction in the Tactics and Technique of Aviation and will become familiar with Air Corps combat orders. They will also receive the same instruction in the Tactics and Technique of Antiaircraft Artillery as is to be given the Battery officers. More thorough instructions in the operation and functioning of the Antiaircraft Information Service will be given.

Battery officers will spend more time on the Tactics and Technique of Antiaircraft Artillery and will become thoroughly familiar with antiaircraft materiel and gunnery including the adjustment of antiaircraft fire. "Become familiar" fails to express the thought exactly because students will not only be required to understand the theory but will be required to actually operate antiaircraft instruments, guns, and equipment.

The special courses for National Guard and Reserve officers will likewise contain more antiaircraft instruction and will familiarize officers with the powers and limitations of aircraft.

The Advanced Engineering Course will concentrate on antiaircraft position-finding equipment, data transmission systems, searchlights, sound locators, and comparators to the end that a reservoir of officers will be formed highly qualified for engineering work in the development of antiaircraft equipment.

Due to the fact that there is a scarcity of officers now on duty in harbor defenses of any considerable experience with antiaircraft artillery it is probable that a short extensive antiaircraft course may be given during the latter half of June for certain selected officers.

The 4th Coast Artillery (HD), Fort Amador

After two months of most intensive artillery training, all batteries of the 4th Coast Artillery, with the exception of Headquarters Battery, fired their record practices during the month of November. All batteries had previously fired Officers' Adjustment Problems and their preliminary practices during the month of October. The thoroughness of the state of training of all the batteries was reflected in the uniformly excellent results obtained in the various practices.

Battery "D," manning Battery Parke, two six-inch disappearing guns were the first to fire and were out to beat their record-breaking time made

last year of fourteen and three-tenths seconds per round. This they did by making a new record for their Battery of thirteen and thirteen-hundredths seconds per round. Twelve broadside and five bow-on hits were obtained in this practice.

Battery "A," manning Battery Merritt, twelve-inch mortars, had decided to show the Artillery at large that fixed mortars could really be fired at thirty-second intervals and when the smoke of the firing had cleared away, the official time was announced as twenty-nine and twenty-nine-hundredths seconds per round. This battery obtained four broadside hits and five bow-on hits.

The next practice was that of Battery "I," manning Battery Warren, two fourteen-inch disappearing guns. Last year, this battery made the almost record-breaking time of thirty-two and two-tenths seconds per round, but reduced the time this year to thirty and five-tenths seconds per round. One of the features of this practice was the fact that the guns kept in step throughout the salvo fire employed for the record shots, no time out being necessary for any cause whatsoever during the entire practice. Three hits were obtained on the broadside target and four on the bow-on target.

The last battery to fire was Battery "G," manning two fourteen-inch railway guns. The installation of these guns had only been completed a few weeks previous to the scheduled time for the practice, and Battery "G" faced a tough proposition in getting them ready for the firing in the allotted time, especially as most of the fire-control system had to be improvised. However, with much hard work on the part of the battery personnel, the practice was held on the date scheduled and while all reports have not been completed, it is known that the battery was well within the "K" factor assigned to it; this in spite of a slow and cumbersome loading system which is part of the equipment of this type of armament.

All in all, the 1929 artillery season will no doubt be remembered as one of the most successful ever enjoyed by the Harbor Defenses of Balboa.

The 61st Coast Artillery (AA), Fort Monroe

During the past several months the regiment has been busily engaged with the duties which are reserved for the closed season—overhaul and care of equipment, gunners' instruction, troop schools for officers, etc.

At the present time an added incentive exists to bring all motor equipment to the very peak of condition. Orders have been issued directing the movement of the regiment to a new station, Fort Sheridan, Illinois. The movement will be made by marching and will begin during May.

The 61st anticipates a busy summer. A part of the regiment will be detached and proceed to Camp Knox, Kentucky, where it will conduct the summer training of Reserve officers which is held there annually. The re-

mainder of the regiment will proceed to Fort Sheridan (Chicago) and establish itself at that post. The need for an antiaircraft regiment in the middle West principally for the training of Reserves and R. O. T. C. students is responsible for the change of station.

While there will be many regrets upon leaving Fort Monroe and breaking loose from the environments and established relations which exist here there is naturally high excitement at the thought of the long move and much conjecture as to what conditions will be found at Fort Sheridan.

Fort Sheridan is one of the most beautiful and desirable of Army stations, twenty-six miles from Chicago. Highland Park, a town of about ten thousand, is two miles from the post. Trains (electric) run hourly between the post and Chicago.

Fort Sheridan is a divisional post. At the present time Infantry, Cavalry, Field Artillery, and Signal Corps are stationed here. There are fifty-one sets of well-built married quarters (gas range and coal furnaces) and eighteen two-room bachelor sets.

Schools are in Highwood (one-half-mile from the post) and in Highland Park (high school). Schools are free. Elm Place School, Highland Park, charges thirty-five dollars per year.

There is no golf course on the post. The Exmoor Club gives service rates—twenty-five dollars per year. Old Elm Club (men only) is free. There is a good swimming beach on the post.

The reservation of Fort Sheridan, consisting originally of six hundred and thirty-two acres, was presented to the Government by the citizens of Chicago.

The 61st will find Chicago friendly to the Army. If there are any pineapples east it will not be at the 61st.

The 64th Coast Artillery (AA), Fort Shafter

By CAPT. J. T. DE CAMP, 64th C. A. (AA)

About the first of last November, large sighs of relief could be heard ascending all around Fort Shafter and Luke Field. The regiment had finished its target practice season on schedule. Rains, clouds, stray airplanes, sampans, submarines, Mr. Liaison, and other well-known obstacles offered the usual opposition. Six machine gun platoons, three searchlight batteries and six gun batteries had to hold practice (you battalion outfits think this over).

Scores varied from plus thousands to minus thousands. This was possible due to the value of the slant range factor. One battery got ambitious and fired a string at seven thousand three hundred yards slant range and surprised itself in getting a hit. Another day, General Conner, the Department Commander, came out and Captain Jacobs of "F" Battery put

on the show. On one of the early strings they demolished the sleeve. After that the General departed, apparently well satisfied.

On November 1st, the schedule for 1929-30 started. Just now gunners' instructions and small arms firing are the main objectives. However, it is also the open season for inspections. After a summer in the field this means a great amount of extra work for everybody. Outside of this routine, each battalion is making an overnight march once a month. While different problems are worked out in conjunction with these marches, pup tents and rolling kitchens seem to draw the spot light.

The above doesn't sound very interesting, in fact our main interest just now is in athletics. Post teams are about to start competition in basketball and boxing, in the Navy Sector League. The Navy Sector League is composed of teams from all Army Posts (outside of Schofield Barracks) and teams from the Navy and Marines. At the end of the season, the Sector-Navy champs tangle with Schofield for the island service championships.

Both of the above sports are very popular in Hawaii. Each Post has a local league in each sport from which talent is picked for the Post teams. "K" Battery won the Shafter championship in basketball. At this writing "E" and "I" Batteries are neck and neck in boxing.

Officers who have not been in Honolulu for some time will be interested to know that the Sector golf course, located at Fort Shafter, in the old rifle range area, has been completed and now is in full operation. The course is nine holes and, while somewhat restricted, is quite tricky, besides having a splendid location from a scenic standpoint. It is open to Army and Navy officers and families and boasts of a professional and a club house. Its popularity is rapidly increasing and a large crowd is out every day. However, the quality of golf, in most cases, would take more than a T. R. 435-55 to analyze.

Clouds—the editor, in his letter, asked, "Why cloud difficulties in fair Hawaii?" Following is a layman's explanation.

The usual direction of the wind in this group of islands is from the northeast. The first obstacles encountered on Oahu is the Koolau Range (Pali) which runs roughly in a northwest-southeast direction along the western or "windward" side of the island. This directs the warm, moist air currents upwards into colder regions—thus clouds and rain. Rainfall is very heavy along the range. As the clouds are blown over, the rainfall decreases, usually being either intermittent showers or light mist around Honolulu, hence "liquid sunshine." By the time the clouds have reached Fort Kamehameha or Luke Field, rain has usually ceased. For this reason the southwest corner of the island beyond Pearl Harbor known as the Ewa district is the most favorable for antiaircraft work.

The difficulties in this region are that small cloud banks are usually

blowing over from the mountains, particularly if there is the usual breeze. One minute the course is cleared, the next minute the course is obscured from some station.

In searchlight work the cloud effects are not so obvious. The sky may seem perfectly clear—yet, when the lights are turned on, it is apparent that the sky above is filled with a fine mist resulting from the break up of the clouds a few miles further towards the northeast.

To summarize: One usually finds this condition; rain over the Koolau Range and adjacent lowlands, breaking up into various sized cloud banks, which in turn, dissolve into a mist as the wind carries them along toward the southwest. *Q. E. D.*

**THROWN FOR A LOSS BY THE
C. AND G. S. SCHOOL**

But not for the first time. This is only our way of calling attention to a rather obvious error which appeared in the "tail piece" on page 52 of the January JOURNAL. It has to do with the normal anti-aircraft artillery reinforcement which was prescribed by a C. and G. S. School instruction circular for the Infantry or Cavalry division when acting alone. On page 72 the amount of anti-aircraft artillery is stated correctly as embodied in the recommendations of the Chief of Coast Artillery.

We repeat it lest the students collect some U's on our account.

When an Infantry or Cavalry division is acting beyond the support of Army or Corps anti-aircraft artillery it will be reinforced normally by the following anti-aircraft units:

The 2nd Battalion (which is machine guns), excepting Batteries "G" and "H";

Battery "B," which is a gun battery, and to which is attached

The 1st Platoon, Battery "A" (the searchlight battery) and

The 1st Section, Combat Train.

A Medical Detachment is also included.

PROFESSIONAL NOTES

Duties of the Regimental Sergeant Major

The following was issued in memorandum form by the adjutant of an antiaircraft regiment covering the duties of the sergeant major. References to Army and Training Regulations are included for convenience in quickly locating those which pertain to his duties. As stated, it is intended that additions be made to the initial memorandum so that eventually a newly detailed sergeant major may have a manual to which he may refer not only for general information concerning his duties but also those duties which may be peculiar to that regiment. While it is realized that the number of regulations and manuals published is voluminous and that much of our time is taken up in their study it was believed that time would be saved by including in one set of instructions all that applied to this most important noncommissioned staff officer.

This matter is believed to be of general interest. Comments or additions to these instructions are solicited from our readers.

Message Center—To act as chief of the message center, Antiaircraft Defenses of the Canal Zone: This will include the training of all other members of the message center, as outlined on pages 138 to 147, incl., U. S. Army Training Manual No. 24, 1925. (Other references, Section IV, TR 160-5, Nov. 7, 1923, and paragraphs 5 and 8, T & T AA DCZ "Manning Tables.") For details of organization and training not covered by regulations, see Regimental Communication Officer (paragraphs 1 c and 20 c, TR 160-5).

Every Tuesday morning to devote two hours to the instruction and training of the message center personnel, furnished from Headquarters section, Headquarters Battery, 65th Coast Artillery.

Drill—Ceremonies—Guard Mount—For details of your functions at drill and ceremonies see paragraph 8 c, Changes 2, TR 420-60, and paragraph 6 b, (3) Changes 2, TR 420-65.

For duties at Guard Mount see TR 135-5.

Confidential Duties—To have charge of and file all papers which are required to be kept in the safe.

To prepare all confidential papers.

To keep officer's efficiency report records up to date on card file and write letters required by paragraph 15. AR 600-185.

These duties will not be delegated without special permission from the adjutant.

Routine Duties—To receive and open the mail, taking charge of all incoming papers, stamping date of receipt on same and causing proper distribution thereof.

To properly note in a suspension list papers requiring follow-up action and appropriate action to be taken to insure the prompt return of all correspondence which is to be sent to another office.

To prepare all routine indorsements on which the office policy is known.

To write suggested indorsements when the action of the Regimental Commander can be reasonably anticipated.

To oversee and supervise the distribution of out-going papers, obtaining receipts for same, when necessary.

To place the official seal on all papers requiring such authentication.

Records—To keep the following records:

a. Duty roster of officers.

b. List of all reports, prepared within the regiment, showing name of each report, authority for same, form number if any, number of copies required, by whom prepared, to whom submitted, and channel through which it is to be forwarded.

c. Regimental discipline chart.

Supervisory Duties—To distribute work among subordinates and clerks.

To check all AA Defense and Regimental Orders, Memorandums and Bulletins to see that they are published in the proper category and are numbered correctly.

To oversee the enlisted office force.

Training—To assume the responsibilities for and control the training of all subordinates and the clerks as contemplated in paragraph 11, TR 10-5.

Training to include:

a. Instructions in customs of the service and military courtesy; respect to superiors to be extended on all occasions (Paragraph 2 c, AR 600-10).

b. Necessary professional and technical training required by the duty performed. Model forms to be used in the training of clerks. A detailed list similar to this paper of all duties and responsibilities of each enlisted member of the office force to be prepared and furnished to the persons concerned. Such instructions will be sufficiently specific as to give each new member of these headquarters a comprehensive idea of what is expected of him.

It is desired that work be so arranged that at least one and one-half hours per day, can be devoted to training.

Inspection—Every Friday morning to make an inspection of the office, special attention being paid to the condition of typewriters and office labor-saving devices. Any person who does not strictly comply with the provisions of Section IV, AR 30-2720, to be reported to the adjutant.

To examine the desks of clerks and ascertain if they are keeping their files up to date and are provided with the necessary hand books, regulations and model forms.

To examine the headquarters correspondence file and determine if the papers filed during the last week have been correctly filed and appropriate correspondence made. (A check of these items taken at random is deemed sufficient if found correct.)

To see what extra copies of papers are removed from the file.

Example—It is expected that, by example, attention to duty, cooperation with other headquarters and tact in dealing with subordinates, you will do your part in making this headquarters of the Antiaircraft Defenses the most efficient in the department.

High Speed Targets

By MAJ. E. W. PUTNEY, C. A. C.

Targets may be divided into two classes; i. e.:

- a. Towed.
- b. Self-propelled.

Thus far the Coast Artillery has made use only of towed targets.

The first requisite for a high-speed, towed target is a towing vessel capable of high speed. The Coast Artillery has no such vessels. A destroyer probably will be reasonably satisfactory; when the use of one is possible.

With the types of towed targets used to date, the stresses have been such as to require the use of inordinately heavy towing gear. It is believed that a thirteen-foot Sea Sled, provided with mast and stays, and with a watertight cover could be towed at a speed of twenty miles per hour by a forty or fifty-foot motor boat, capable of itself making thirty miles per hour (without a boat in tow), provided that a light tow line were used. Whether this target would tow in a straight line or would yaw can be determined only by experiment.

This experiment could be made at no great expense. The market price of the thirteen-foot Sea Sled is two hundred and twenty-nine dollars. It is probable that the entire cost of the target would be not over three hundred dollars.

As a further development it appears feasible to provide radio control for a Sea Sled target. It is believed that an experimental model would not cost over one thousand two hundred dollars and that later models would cost less than one thousand dollars each.

It may be argued that this target is likely to be hit and that each hit will be expensive. It is doubted that many of these targets would be destroyed or damaged by gun fire. However, a method of making up the cost of targets hit has been suggested. When an organization damages or destroys a target by fire, then decrease the ammunition allowance of that organization by enough to cover the cost of the target and place such

organization in a class by themselves. Should an organization destroy a target with the last round of a practice; then, the allowance of its next subsequent practice would be diminished. Whenever a target is hit the organization should cease firing as soon as the hit is known.¹

It is believed that for a high speed target; we, first of all, must abandon the proposition of dragging a log, or an assembly of logs, through the water, and, as we ourselves have no towing vessels capable of real speed, we should proceed to develop a self-propelled target. It is to be noted that "Sea Sled" does not apply to just any boat having the appearance of a sled; but only to a certain type of boat made exclusively by the Sea Sled Corporation.

The target proposed will provide better visibility than any target at present used by the Coast Artillery.

Policy for Selection of Students for Command and General Staff School

In the selection of student officers of the Regular Army for the 1930-32 Class of the Command and General Staff School at Fort Leavenworth, Kansas, the Secretary of War has directed that they be selected from officers of field grade who will be less than fifty years of age on September 1, 1930, from captains who on October 1, 1929, were among the first one thousand five hundred on the promotion list, and who on September 1, 1930, will be less than fifty years of age, and from captains below the first one thousand five hundred on the promotion list on October 1, 1929, who are particularly qualified for higher training and who on September 1, 1930, will be less than forty-five years of age. However, the number of officers from this latter category will not exceed ten per cent of the total authorized for any branch.

All officers recommended for the detail must possess those qualifications which make them suitable for higher command and general staff training.

A departure from past policies in the selection of students for this school is that graduates of the 1929-30 Classes of the advanced courses of special service schools will not be recommended for detail as students of the 1930-32 Class at the Command and General Staff School. Hereafter graduates of advanced courses will be required to serve at least two years with troops or on other duty before being detailed as students at the Command and General Staff School.

The total number of students for the 1930-32 Class is one hundred and thirty-two. One hundred and twelve of this number have been allotted to the arms, ten to the services and ten to the Secretary of War. The apportionment of students to the arms is as follows:

¹ Radio fire batteries could be required to use a deflection offset so as to minimize probability of destruction of targets.

Infantry	46
Cavalry	14
Field Artillery	19
Coast Artillery	12
Engineers	7
Air Corps	10
Signal Corps	4
	<hr/>
	112

The apportionment of students to the services is as follows:

Adjutant General's Department.....	1
Quartermaster Corps	3
Judge Advocate General's Department	1
Finance Department	1
Medical Department	2
Ordnance Department	1
Chemical Warfare Service.....	1
	<hr/>
	10

Policy for the Selection of Students for the Army War College

It has been decided by the Secretary of War that the class which will enter the Army War College, Washington, D. C., in September, 1930, will total seventy-five student officers, of the Regular Army. Fifty-five of these will be selected from the arms, ten from the services and ten by the Secretary of War.

In making their selections, Chiefs of Branches will be limited to officers of field grade, to those who will be less than fifty-two years of age on September 1, 1930, to those who are not graduates of the Army War College and to those who are considered by their respective chiefs of arms and services as possessing those qualifications which would justify their training for higher command and general staff duty.

At least fifty per cent of the quota from each arm or service will consist of officers who upon graduation from the War College will be available for duty on the War Department General Staff.

Each of the arms has been allotted students as follows:

Infantry	20
Cavalry	8
Field Artillery	9
Coast Artillery	9
Air Corps	4
Engineers	4
Signal Corps	1
	<hr/>

The apportionment to each of the services will be as follows:

Adjutant General's Department	1
Quartermaster Corps	2
Judge Advocate General's Department	1
Finance Department	1
Medical Department	2
Ordnance Department	2
Chemical Warfare Service	1

10

Winter Tests of Radio and Planes by Air Corps

Experiments in long distance radio communication between aircraft and permanent ground stations were conducted in January by the Army Air Corps. The tests were made in connection with the winter maneuvers of the First Pursuit Group over a stretch of country extending from Detroit to Spokane and back.

The flight had two principal purposes.

To measure the endurance and efficiency of the personnel, planes, and equipment under weather conditions where the temperature is habitually about forty degrees below zero.

To test the value of the short wave radio as a means of communication between air units operating in isolated regions and remote posts of command.

The flight consisted of eighteen pursuit planes and two Army transports under command of Major Royce. One transport was equipped with short wave and transmitting sets. The transmitter operated on a thirty-two or fifty-four-meter wave length. All planes were equipped with skis instead of wheels.

Experimental Reorganization of the War Strength Infantry Battalion

As a result of studies and experiments conducted with the 29th Infantry at Fort Benning, Georgia, last summer and fall, the Infantry Board has recommended for further study and test a War Strength Infantry Battalion made up as follows:

Battalion Headquarters
Battalion Headquarters Company
3 Rifle Companies
2 Caliber .30 Machine Gun Companies

The Secretary of War has authorized the Chief of Infantry to organize the 29th Infantry, in whole or in part, as an experimental battalion to conform to the recommendations of the Infantry Board.

The object of these experiments and tests is to produce an organization which will give the maximum striking power and capacity for sustained effort without a disproportionate loss of mobility or increase of vulnerability.

The following changes from the existing organization greatly increase the fire power of the experimental battalion:

- 2 Automatic Rifles per squad, instead of 1, in Rifle Companies
- 2 Machine Gun Companies, instead of 1

The addition to the Battalion Headquarters Company of

- 1 Machine Gun Platoon of 4 caliber .50 machine guns
- 1 Cannon Platoon of two 37-mm. guns and two 75-mm. mortars

The effect of these increases is:

Strength of battalion increased (by 326)	to	1178
Automatic rifles	“	by 54
Machine guns caliber .30	“	12
Machine guns caliber .50	“	4
37-mm. guns	“	2
75-mm. mortars	“	2

Roadspace (troops and combat train) increased by 993 yards

Under the plan recommended by the Infantry Board, the regimental Howitzer Company will cease to exist and its three platoons will go to make up the Cannon Platoon of the Battalion Headquarters Companies.

Monthly reports will be made on the progress of the tests of the suggested organization, or any modifications thereof, and final report will be made by March 31, 1930.

Observation Car for Dirigibles Developed

The Air Corps has just conducted what is believed to be the first successful experiment in America with a Sub-Cloud Observation Car suspended from a dirigible in flight. Such a car was successfully used by the Zeppelins on numerous bombing raids during the war, when conditions were favorable for its employment.

The use of an observation car permits the airship to fly in or above the clouds where it is hidden from view of the ground, while the observer in the car, lowered by means of a cable below the clouds, directs the airship's flight. The cable holding the observation car contains a telephone core, by means of which communication is maintained with the airship's crew through a voice telephone. For emergency a mechanical signaling device can be used. At the present time an ordinary captive balloon type telephone system is used, in which the observer at all times has his head set attached and reports direct to the pilot of the airship above.

It is considered possible that this arrangement, somewhat modified, can be used in the future, not only for bombing operations, but for assisting all types of dirigibles to land in fog. It can be used on dirigibles for any type of special observation, including special photography where cloud ceilings permit cover for the airship.

The contrivance was developed and perfected by the Materiel Division of the Army Air Corps at Wright Field, Dayton, Ohio. Upon its being found satisfactory, the car was given a practical try-out by the 19th Airship Company stationed at Langley Field, Virginia.

YOU TELL EM

Who Else Wants to Ask Some Questions?

Headquarters

Reserve Officers' Training Corps

University of Cincinnati

Cincinnati, Ohio

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

I gather from your letter that you have had personal experience with the paucity of materiel with which we have to work.

Our greatest need is to keep abreast with what is going on. On a job like this we ought to be fully acquainted with the latest developments in policy, materiel, and methods, not only for the Coast Artillery Corps but for the other branches as well.

It is a bit difficult to tell you exactly what we would like to see appear in the JOURNAL. Incidentally and right here let me say that you seem to be making a go of the JOURNAL. I am glad to see this for I have felt for some time in the past, that the JOURNAL was not performing this mission. There is one category that the JOURNAL should not be in and that is the kind where, as like unto newspapers and women, there is no interest in back numbers.

To come back to the subject matter again, the following is a topic list of the subjects that would be of particular interest to us here. They may not be generally applicable but they are something for you to consider.

Why not select some well-conducted AA target practice fired recently and give it to us completely from preparation to analysis?

To which we reply: This is one of the driest subjects in the world. The form for analysis may be found in TR 435-55, which, by the way, is about to be revised (yes, again). We contemplate publishing an article on the target practices fired by Battery "E," 63rd Coast Artillery (AA), the battery which won the Knox Trophy, when, and if, Captain Sweet ever writes it for us. The methods used in hit determination for AA guns will probably undergo some change in the near future. Capt. A. M. Jackson is now working on a "talking picture" scheme which he has promised to write up when the development is nearer completion.

How does our AA equipment compare with that of foreign powers? What are the various powers doing in this line?

We make answer: It is as good as any and better'n' some—perhaps a little better than the best. England is at present outstanding in AA

development among foreign countries (See Capt. Krohn's article on Anti-aircraft Gunnery—British, in the November number). It should be remembered that our standard instrument is the Vickers, which is British. The British are away ahead of us on joint air force—antiaircraft training and in the development of air defense tactics. We need more joint exercises with the Air Corps to develop our ideas along air defense lines. The joint exercises to be held at Aberdeen in May will be more elaborate than any previously held. Those we have held previously might be classed as bush league affairs.

Give us an article on the trend of development in railway artillery.

We exude: There have been some minor developments in railway artillery materiel in our service which have been duly noted in the pages of the Journal, specifically in the August number. There is nothing new in foreign countries. Frankly, we have been concentrating our expenditures on the development of anti-aircraft materiel. Put it down that there is no trend, at present, in railway artillery. Probably you saw where a 14-inch railway gun was recently ushered to the West Coast, by Captain Parmelee and his crew. It was left at Benicia because it can't be fired at MacArthur (citizens object).

Tell us something about the development and use of the single conductor mine group, its powers and limitations. Also some idea as to the relative costs of the old and new systems.

We advise—reading Major Clark's interesting article on mine defense in the September Journal. Of course if you want the details you must know that they are rather confidential and may be found in the 1929 edition of the Submarine Mine Manual which will soon be available. (We are told that the new Submarine Mine Manual may not be marked "confidential." What is the world coming to?) The cost of single conductor cable is about one-fifth that of nineteen conductor. The cost is not the only consideration. The difficulty of procuring nineteen conductor cable on comparatively short notice and its rapid deterioration were the greatest troubles with the former system.

It is understood that the original time of about two days required for the installation of a battery for sound ranging has been cut down. How has this been made possible? What is the accuracy to be expected from this new installation? What is being done with the First Sound Ranging Battery at Fort Eustis?

The answer to the last question is easy. The battery will be marched to Aberdeen soon and be demobilized. All terrestrial sound ranging will be turned over to the Field Artillery (See January Journal, The Reor-

ganization of the Coast Artillery). Also see Major Robison's¹ very well written article in the October Journal. There is no difference in accuracy due to cutting down the time. Major Robison¹ is expected (How about it, Jerry?) to write another article on this subject soon. Perhaps your question will remind him of it. Just now he is very busy getting the battery ready to move to Aberdeen where the personnel will form Battery "A," 69th C. A. (AA).

We are much interested in subaqueous sound ranging, but know very little about it. Why not give us an article on its mission, history, progress to date, accuracy in operation, and faults in operation?

Sh— Sh— You shouldn't have even mentioned this. It is highly confidential and we are not going to say any more about it. We have probably gotten into trouble now by leading you to believe there is such a thing. (Write Capt. Carl R. Adams at the school. He wrote a paper on it.)

Give us an article on counter chemical warfare measures as applied to installations and equipment.

Check. Much of this is confidential, too. The September number contained a short article on Recent Developments in Chemical Warfare but it was probably not what you are looking for. There is something in this number. We haven't read it yet.

Give us a short article, less most of the dry details, on the progress of mechanization, both here and in England and in other countries if there are any trying it.

We explode. Major Benson has been writing his head off on this subject and it all appears in the Journal. See January, March, April, June, July, August, and November numbers. We haven't much to show except in the vehicle developments taking place at Aberdeen. The 34th Infantry is motorized but not mechanized. The Cavalry has organized an armored car unit. Some experimental work is being carried on at Fort Benning. We understand the purchase for the Cavalry of six or seven Christie machines has been authorized. It is also understood a provisional mechanized force will be formed for experimental exercises next summer (One AA machine gun battery). (We didn't deserve this one.)

What is the status of the anti-aircraft protection that combat troops are supposed to provide for themselves?

We guess. It is mostly up in the air. The Infantry has been doing some experimental firing with rifles, automatic rifles, and machine guns

¹ Note: Name spelled correctly.

against towed targets. We venture the opinion that the present trend is that defensive fire against aircraft should be furnished by troops especially trained in it but that all troops should be trained to use small arm fire against low flying planes in emergency. The C. & G. S. School has recently assumed (for map problem purposes) the attachment to the infantry division of two antiaircraft machine gun batteries, an antiaircraft gun battery, and a platoon of searchlights. It appears that eventually the infantry division will contain antiaircraft troops, organically.

An article on the development and problems of the air forces in its cooperation with antiaircraft would be interesting.

We invite attention to an article in this number of the Journal. An article will be written following the joint exercises at Aberdeen and will discuss all phases. Other articles are wanted. The weakest point in air defense at present lies in the lack of cooperation between air forces and ground forces. It is not an unwillingness to cooperate but lack of training in combined defense.

Tell us something of the proposed reorganization of the Infantry division and its proposed component parts.

At the present time the Infantry is testing a new battalion organization at Fort Benning. You will find something about it in this number. The organization of the division depends upon the battalion so the division organization will not be fixed until a decision on the battalion is made.

I realize that some of the topics mentioned above fall under the heading of privileged communications as far as the general reading public is concerned. They are of interest to us, however, and I don't believe the interests of the Government would be prejudiced if we learned something about them.

Sincerely yours,

C. R. JONES,
Major, C. A. C. (DOL),
P. M. S. and T.

A Boost for Major Stewart and Major Perley

DEPARTMENT OF CALIFORNIA
RESERVE OFFICERS' ASSOCIATION OF THE UNITED STATES
San Francisco, California

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

Two articles in particular in December issue of the COAST ARTILLERY JOURNAL have made an especial appeal to me, and so interesting have I

found both, feel where possibly they should be placed in the hands of *every* Reserve officer, irrespective of branch: Hence, this letter.

The Department of California have in contemplation issuing a monthly magazine—"The California Reserve Officer—for distribution to our entire membership and as well all national and state officers, of which I am to be the editor. Progress indicates our first issue will be off the press February 1, and I would be indeed gratified to receive your permission to copy

"That Reserve Job"—By Maj. Reuben Noel Perley, C. A. C.

"Let's Get Acquainted"—By Maj. S. T. Stewart, U. S. A.

We, of course, giving credit to your paper as well as the authors. Providing it meets with your approval, it would be my purpose to use one of the articles in our initial number and the other at a later date. Also, is it presuming to ask that I feel free to copy from subsequent issues of your monthly, articles appealing to me as being of interest to *all* Reserves?

The writer has been a subscriber for a number of years, and am glad to take this opportunity of expressing appreciation of your magazine, the careful manner in which it is edited, its informative, instructive and interesting articles and dignified advertisements.

Sincerely yours.

W. W. BREITE,
Major, CA-Res.,
National Councilman.

Talk is Cheaper

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

I am enclosing a check for renewal subscription, and oblige.

Thanks for the personal letter with the statement. I got a nice one from Major Clark one year, when I wrote "Merry Xmas" on my check. Anyway, it is like a family letter when you are a long way from home.

I have been reading the "You Tell Em" column with much interest. I believe that the JOURNAL has been improving through the efforts of the last few and present editors, until it can now be marked as "an excellent solution."

We haven't much time to read it during the two-year course at the C and GSS, here, except the shorter articles, and look at the pictures. That is what I favor, more illustrations and less verbosity.

Yours for more pay,

R. T. GIBSON,
Major, C. A. C.

The Same to You and We Hope He Never Does

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

The sheriff hasn't caught up with me yet so here is my first check drawn for 1930. Have had your letter dated August 14th but never the money. My apology is the pay act of 1922. The JOURNAL is a mighty fine sheet and should have everybody's money. What you say about making it human is well to the point for I have seen old numbers that looked like the minutes of some engineers' convention.

Best wishes for a very happy and successful New Year.

Sincerely yours,

A. D. CHIPMAN,
Major, C. A. C.

Maybe It Isn't Amusing To Everyone

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

It is my opinion that you have done well with the JOURNAL, considering the short time you have been on the job. The mere fact that you have interjected some life into it arouses a little curiosity as to just what each succeeding issue will bring forth. You are presenting the matters of substantial interest and a little amusing chaff in a manner which is altogether pleasing. If you keep up the good work, and I am sure you will, we owe you an expression of appreciation and at least three dollars per year.

My check is enclosed. With the improvement you have effected the JOURNAL should sell itself, on its proven worth, to the officers of the Corps.

Cordially yours,

A. L. FULLER,
Lieutenant Colonel, C. A. C.

**Maybe We Can Get Him Back in the Coast Artillery
The Rifle Team is Blooey**

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

I intended to drop the JOURNAL but you have made it sufficiently interesting to me to want to continue to receive it.

CHARLES E. LOUCKS,
Captain, C. W. S.

It's All Right With Us

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

Reference your editorial "Showmanship" in the November JOURNAL, I am enclosing two papers which give some idea of the "showmanship" and publicity of one CAC-er.

I think you are doing great work in "reviving" the JOURNAL. It is getting to be a "human" magazine. Keep up the YOU TELL EM department.

There is an Infantry Association, an Order of American Military Engineers, etc. These organizations help in getting subscriptions for their magazines. (ouldn't something along these lines be done in the C. A. C.?)

Yours truly,

T. P. WALSH,
Captain, C. A. C.

**We Can't Keep Our Addresses Straight Thataway
Are You Reading it Now?**

The Editor, the COAST ARTILLERY JOURNAL

Dear Sir:

In reference to your letter, I would like to state that I have been a subscriber to the C. A. JOURNAL practically all the time since I came into the Army in 1909, until recently, when notices of expiration were sent to my former station at Fort Shafter, Honolulu, and never reached me.

Not being a heavy reader of the JOURNAL, but taking it, partly for reference purposes and partly to help the JOURNAL, I did not miss it until I got your letter. You may renew it now from date of expiration, if you have the back numbers—if not, from now on. I agree with you that the JOURNAL might be made more entertaining and less technical. However, I think its main mission should be to keep officers abreast of the times in artillery subjects, especially new developments and inventions.

A further suggestion I make with reluctance, knowing that you are working with short-handed clerical assistance the same as the rest of us in the Army—and that is that, if possible you keep track of changes of station of subscribers or make frequent checks of subscribers from latest directory. Many careless subscribers like myself fail to notify you of changes, in the pressure of doing more important things, and you might save a few subscribers by saving them this little trouble.

With best wishes for your success as editor of the JOURNAL, I remain,

Sincerely yours,

EDWARD P. NOYES,
Major, C. A. C. (DOL)

COAST ARTILLERY ORDERS

Brig. Gen. William M. Cruikshank, assigned to command Field Artillery School, instead of 2nd C. A. D. Fort Totten.

Col. William E. Cole, President, Coast Artillery Board, appointed brigadier general, and to command Fort Eustis.

Col. James B. Mitchell, retired.

Col. Frank S. Long, leave three months, 28 days, January 20.

Maj. Joseph A. Green, promoted lieutenant colonel, December 1.

Maj. Lloyd P. Horsfall, promoted lieutenant colonel, November 16.

Maj. Forrest E. Williford, promoted lieutenant colonel, November 24.

Maj. Shuey E. Wolfe, 12th, from Fort Monroe, to University of Cincinnati (R. O. T. C.), January 12.

Maj. Charles M. Wood, from Org. Res., 9th C. A. D., San Francisco, to recruiting duty, Denver, Colo.

Capt. Charles S. Denny, leave one month, five days.

Capt. Donald L. Dutton, from 62nd, to 5th, Fort Totten.

Capt. Joseph B. Hafer, from student, C. A. S., detailed in Quartermaster Corps and to Fort Slocum, February 1.

Capt. Everard F. Olsen, 7th, from Fort Hancock, to submarine mine depot, Fort Totten.

Capt. Berthold Vogel, promoted major, November 9.

1st Lieut. Edwin Byrd Fitzpatrick, resignation accepted.

1st Lieut. Claud T. Gunn, 52nd, Fort Eustis, transferred to Finance Dept., and to Chanute Field, Rantoul, Ill.

1st Lieut. Harold P. Hennessy, to sail, San Francisco, February 8 for Philippines, instead of New York, January 17.

1st Lieut. Hobart Hewett, 61st, from Fort Monroe, to Sperry Gyroscope Co., Brooklyn, December 10; twelve days' leave, December 21.

1st Lieut. Clarence M. Mendenhall, Jr., to sail from San Francisco for Hawaii, May 31 (delay authorized); granted two months, ten days' leave, March 10.

1st Lieut. Halvor H. Myrah, 62nd, from Fort Totten, to Kansas State Agricultural College, Manhattan, Kansas (R. O. T. C.).

1st Lieut. Arthur B. Nicholson, from Philippines, to 12th, Fort Monroe.

1st Lieut. Roy D. Paterson, from Philippines, to 6th, Fort Winfield Scott.

1st Lieut. Gervais W. Trichel, 7th, from Fort Hancock, to Sperry Gyroscope Co., Brooklyn, January 3.

1st Lieut. Carl B. Wahle, to sail from New York for Hawaii, May 28, instead of March 28.

2nd Lieut. Samuel E. Anderson, transferred to Air Corps, November 21. Present duties.

2nd Lieut. Joseph A. Bulger, transferred to Air Corps, November 21. Present duties.

2nd Lieut. Howard G. Bunker, transferred to Air Corps, November 21.
Present duties.

2nd Lieut. Howard Earl Pearson, resigned.

2nd Lieut. Oliver H. Gilbert, 3rd, from Fort MacArthur, to Philippines, sail San Francisco, February 8.

2nd Lieut. Paul H. Johnston, transferred to Air Corps, November 21.
Present duties.

2nd Lieut. Alfred R. Maxwell, transferred to Air Corps, November 21,
President duties.

2nd Lieut. Julian Montgomery West, resigned, February 1.

2nd Lieut. Calvin L. Partin, relieved from Air Corps and from Fort Sam Houston, to Panama, sailing San Francisco, February 1.

2nd Lieut. Jacob G. Reynolds, 3rd, from Fort MacArthur, to Philippines, sailing San Francisco, May 29.

2nd Lieut. William M. Talbot, 51st, from Fort Eustis, to Panama, sailing New York, February 28.

2nd Lieut. Arthur E. Watson, Jr., 6th, from Fort Scott, to 9th, C. A. D. San Francisco.

2nd Lieut. Kenneth J. Woodbury, 9th, from Fort Banks, to Philippines, sailing New York, May 7.

Warrant Officer William J. McCartney, A. M. P. S., leave two months, twenty-three days.

Warrant Officer Peter J. McGreevy, A. M. P. S., from Panama, to Fort Hancock, instead of Fort Monroe.

Warrant Officer Nelson E. Smith, A. M. P. S., from Philippines, to Fort Monroe.

Master Sgt. Claud A. Sadler, 64th, Fort Shafter, retired.

1st Sgt. William M. Mangum, 62nd, Fort Totten, retired.

1st Sgt. John Morris, 14th, Fort Worden, retired.

1st Sgt. Thomas F. Spellman, 9th, Fort Banks, retired.

1st Sgt. Carson A. Whitlock, 13th, Barrancas, retired.

Sgt. James W. Tressider, Coast Artillery School Detachment, Fort Monroe, retired.

FOREIGN PERIODICALS

Journal of the Royal United Service Institution (British), November, 1929

Is War Possible?—By "Ponocrates."

A short discussion of the causes of war with particular reference to economic causes. The author states that if the issue be sufficiently large it is not probable that its settlement will be left to some international league of powers.

The Fleet of the Future.—By Capt. J. V. Creagh, D. S. O., R. N.

The author discusses the new agencies influencing naval warfare, the submarine, noxious gases, aircraft and aircraft carriers and antiaircraft artillery. A much smaller type of capital ship is forecast with higher speed. The submarine is expected to become of greater potential value. Capt. Creagh believes aircraft an essential weapon for ships and advocates complete control of it by the Royal Navy.

The Future of Mechanization.—By Capt. D. A. L. Wade, Royal Corps of Signals.

In which the complete motorization of infantry is recommended. Antitank defense, he states, should be in the hands of the Royal Artillery. The motorization of the infantry would not affect the need for tractor-drawn medium and heavy artillery.

Aircraft in War in Ten Years' Time.—By Lieut. Comdr. J. D. Prentice, R. N.

Some deductions as to speed and range of action of future aircraft bases upon past progress.

Principles of War.—By Admiral Sir H. W. Richmond, K. C. B.

A criticism of a previous article of the same title.

The Commander and His Officers.—By Captain L. H. B. Bevan, R. N.

An argument for the personal touch between the commander and his subordinates.

Panic in War.—By Brig. Gen. H. Rowan Robinson, C. M. G., D. S. O.

Naval Strategy in the Great War—A German View.—By Konter-Admiral A. D. Batsch (late Imperial German Navy).

The Supply of Mechanized Forces in the Field.—By Col. D. C. Cameron, O. B. E., R. A. S. C.

The British Army of the Rhine.—By Maj. E. E. Gawthorn, O. B. E., D. C. M., R. E.

Progress in Civil Aviation.—By Air Vice-Marshal Sir Sefton Brancker, K. C. B., A. F. C.

A brief résumé of aviation development in France, Germany, United States, and the British Empire with particular reference to air routes.

The Development of French Air Power.

Army Exercises, 1929.—By Capt. B. H. Liddell Hart.

A Pre-War Example of "Sanctions."—By Paymaster-Capt. H. P. W. G. Murray, D. S. O., R. N.

An account of the Pacific blockade of Montenegro and Albania, and the occupation of Scutari by International Forces in 1913.

The Modern Submarine Mine.—By Commander A. L. Gwynne, C. B., R. N.

A short discussion of the antennæ type mine as used in the British service.

Armored Cars and the Royal Air Force.—By Flight Lieut. V. R. Gibbs, D. S. C., R. A. F.

Military Musical Relics.—By J. Paine.

The Settlement of Soldiers in Civilian Life.—By Capt. T. B. Gravely, Royal Corps of Signals.

Brusilov.—By Col. A. P. Wavell, C. M. G., M-C.

A review of the "Memoires du General Broussilov, Guerre 1914-18."

The Royal Engineers Journal (British), December, 1929

Military Mining in the Great War.—By Maj. Gen. R. N. Harvey, C. B., C. M. G., D. S. O.

The Engineer School of Versailles.—By Gen. Robert Normand.

Survey in Relation to Gunnery Problems in Mobile Warfare.—By Col. M. N. MacLeod, D. S. O., M. C.

The author recommends the more general use of accurate survey methods to improve the fire of artillery in moving situations.

The Mechanics of Mechanization.—By Victor Wallace Germain.

Shishi Bridge, Chitral.

Afghan Wars.—By Col. F. C. Molesworth.

Large Scale Surveying in the Tropics.—By Maj. S. W. Kirby, O. B. E., M. C., R. E.

Proposed New Wagon Repair Depot, Egyptian State Railways, Gabbary, Alexandria.—By Maj. D. J. McMullen, R. E.

The Personal Card Index.—By Lieut. G. V. Micklain, R. E.

An t-Oglach (Irish Free State), January, 1930

The Spanish Ulcer.—By Capt. B. H. Liddell Hart.

An account of Wellington's Peninsula Campaign.

The Armies of Today.—A translation of a lecture by Colonel General von Seeckt.

Ireland and Aviation.—By Capt. O. A. Heron, Army Air Corps.

The Maneuver of Bantry Bay.—By Col. J. J. O'Connell, General Staff.

Discipline.—By Capt. Sean O'Sullivan, Adjutant General's Branch.

In Appropriate Nomenclature.—By Maj. N. MacNeill.

Recreational Training and Athletics in the Army.—By Capt. Patrick Tuite.

Memorial del Ejército de Chile, October, 1929

Military Valor.—By Col. Jose C. Torres.

Vittorio Veneto.—By Capt. Fernando Ahumada.

The Observation of Artillery Fire.—By Capt. Antonio Tovarias.

The Japanese Cavalry School.

Aviation Attack on March Columns.

Memorial de l'Artillerie Francaise, Third Quarter, 1929

Standardization of Gauging Temperatures.—By Col. M. L. Graux.

The Seventh International Lighting Convention.—M. J.-F. Cellier.

Photography of Projectiles in Movement.—By Maj. M. A.-M. Benoist.

Note on the Subject of the Correction of Parallax.—M. S.-C. Jean.

A Contribution to the Study of the Chilowski Effect.—M. A. Lafay.

Shock Waves and the Interpretation of Aerodynamic Photographs.—Col. M. C. Deve.

Interior Ballistics (Lecture given before the Artillery School, Fontainebleau).—Lieut. Col. M. F. Desmazieres.

Revista Militare Italiana, October, 1929

The Exercise of Command and the Staffs in Germany and France During the World War.—By Major Faldella.

Situation of Events in South Tripolitania. Spring of 1929.

The Offensive Action of a Division in Mountainous Terrain.—By Lieut. Col. Zannotti.

Continuous Trench or Individual Rifle Trench.—By Colonel Ferreri.

Rivista Militare Italiana, November, 1929

Situation and Events in South Tripolitania. Spring of 1929.

Peace and War.—By General Corselli.

The Exercise of Command and the Staffs in Germany and France during the World War.—By Major Faldella.

Employment of Bersaglieri Cyclists in Scouting.—By Colonel Soddu.

Rivista Militare Italiana, December, 1929

Situation and Events in South Tripoli. Spring of 1929.

The Infantry Regiment in the Attack Phase.—By Colonel Tenti.

The Motor Transport of Units.—By Lieut. Col. E. Cappa.

Economical Problems of Peace and War: Siderurgy.—By Maj. Carlo Rostagno.

Bulletin Belge des Sciences Militaires, October, 1929

The Operations of the Belgian Army (11 March, 1915-5 June, 1916)

The Tactics of Information.—By Col. d'E. M. Tasnier.

A Day on the Defensive (VII).—By Col. B. E. M. Janssens.

The Survival of a People (IV), The Serbian Rereat from the Danube to the Adriatic.—By Maj. F. Delvaux.

The Use of the 76-mm. Trench Mortar (conclusion).—By Captain Philippet.

The Battles of Aubers, Festubert and Loos (British Official History).—By F. V.

Bulletin Belge des Sciences Militaires, November, 1929

The Operations of the Belgian Army, January 1, 1915—June 5, 1916.

Some Considerations in Connection with Artillery Preparations.—Colonel Willemaers.

A Day on the Defensive (Part 8).—By Col. B. E. M. Janssens.

The Survival of a People (Part 5).—By Maj. F. Delvaux.

The Principal Lessons of the First Congress on Medical Aviation.—By Maj. De Block.

Revue Militaire Francaise, September, 1929

From Liao-Yang to Mukden (II).—By Lieut. Col. Desmazes.

The Motorization of Close Combat Agencies.—By General Chedeville.

The Capture of Neuville Saint-Vaast.—By Major Lefranc.

The French Artillery from 1914 to 1918 (conclusion).—Lieut. Col. Aublet.

Warfare Among High Mountains.—By Captain Turret.

Revue Militaire Francaise, October, 1929

From Liao Yang to Mukden (conclusion).—By Lieutenant Colonel Desmazes.

The Motorization of Close Combat Weapons (continued).—By General Chedeville.

A Concrete Case of Combined Tactics.—By Lieutenant Colonel X.

The Soviet Army.—By Captain Malraison.

Revue d'Artillerie, October, 1929

For the Understanding of the Theory of Relativity (conclusion).—By General Vouillemin.

Divisional Artillery. The Rôle of the Group Commander During Action.—By Maj. E. Ricard.

Artillery on the Offensive in Position Warfare.—By Capt. N. Aizier.

The 5th Group of the 23rd Regiment (155-mm. howitzers) in Morocco.—By Capt. F. Martegoutte.

Fire on Observation Balloons.—Capt. M. Tarbouriech.

Revista de Artilharia, September, 1929

The Count de Lippe and the Portuguese Artillery.—By Capt. Ernesto A. P. de Sales.

Aerial Mapping—The Problem of Photographic Restitution—Solution Adopted by M. H. Roussilhe (continued).—By Capt. Alexandre Gomes de Lemos Correa Leal.

The Theory of the Universe—The Optics of Light.—By Lieut. Col. A. J. Bernardes de Miranda.

Memorial de Artilheria, November, 1929

Internal Combustion Engines.

Chemical Defense.—By Eduardo Aguirre de Carcer.

The Exploitation of a Waterfall.—By Eugenio Otero y Montes de Oca.

Rivista Marittima, October, 1929

The Taranto Naval Base as It Functioned in the Replacements for Albania and Macedonia.—By Gen. A. Bollati.

The Command in Coalitions or Naval Alliances.—By Capt. G. Po.

Study of the Movements of the Case and Anchor of "Zeta" Mines—Ignition Systems.—By Capt. L. Caretti.

Modern Torpedoes.—By A. Del Gorno.

A New Submarine and Antigas Respirator.—By A. Belloni.

Considerations on the Attack Maneuver with the Torpedo of the Light Fleet.—By Comd'r. A. Voli.

Rivista Marittima, November, 1929

Naval Relativity.—By Beta.

French Strategic Theories.—By Comd'r. R. De Courten.

The Naval War in Libya During the World Conflict.—By Comd'r. L. Castaqua.

Organization of the Services.—By D. L. M. R.

The Navy in the XVIIth Congress of the National Society for the History of the Italian Revival.—By Capt. G. Almagia.

Rivista di Artiglieria e Genio, November, 1929

For a Manual of Colonial Military Art.—By Gen. Ambrogio Bollati.

The Problem of Ammunition Supply. Part II.—By Lieut. Gen. Renzo Garrone.

Having discussed this problem in Part I from an economical standpoint the author in this part discusses those elements which are most essential to increase the efficacy of the individual projectile against the target.

Study of a Mountain Foot-Bridge. (Knock down and packable) for Fort Troops and Pack Animals.—By Col. Luigi Calligaris.

Register of the Officers of the Ancient Corps of Artillery. 1816 to 1861.—By C. G.

Rivista di Artiglieria e Genio, December, 1929

The Problem of Ammunition Supply. Part III. By Lieut. Gen. Renzo Garrone.

On the Minimum Velocity of Projectiles Along Their Trajectory.—By Lieut. Gen. Antonio De Stefano.

The Military Science Section at the XVIIIth Congress of the Italian Society for the Progress of the Sciences.—By A. R.

The Scientific Activity of the Military Geographical Institute.—By Col. Francesco Redi.

The Scientific Activity of the Hydrographic Institute of the Royal Navy.—By Capt. G. R. Manóia.

Rivista Aeronautica, November, 1929

Epitomizing.—By Gen. Guilio Douhet.

Aviation as an Instrument of Attack.—By Col. M. Ajmone-Cat.

Memorial de Artilleria (Spanish), September, 1929

Algebraic Foundation for the Construction of Fire Adjustment Graphs.

In the Face of the Unknown—Chemical Warfare.—By E. M. Ch.

Artillery in the Approach.—By Jose Bartolome Fernandez.

Antiaircraft—Auxiliary Services—Searchlights.—By V. Balbas.

Memorial de Artilleria (Spanish), October, 1929

Tanks in the War of the Future.—By Francisco Marinas.

The Employment of Artillery During the Contact Phase of an Engagement. By Jose Bartolome Fernandez.

The Potentialities of the Catalanian Metal Industry in Industrial Mobilization.—By Jose Serrat Bonastre.

High Power Artillery and the Infantry Advance.—By Miguel Ribas de Pina.

Historical Observations on the Invention of Powder and Firearms.

BOOK REVIEWS

Ethan Allen. By John Pell. Houghton Mifflin Co. 331 pp. \$5.00.

In all phases of its development the United States has lent itself most favorably to the biographical interpretation of history; its aggressive and strongly individualistic empire-builders have proven rich material for the biographer.

One of the latest contributions to the list of biographers of outstanding American pioneers is "Ethan Allen" by John Pell, a lively, interesting and comprehensive account of the picturesque Revolutionary hero of whom the average American knows nothing more than that he "emerged from the wilderness at the head of a band of uncouth adventurers, captured a fortress, shouted an epigram, and disappeared again into obscurity."

Mr. Pell's volume is the result of most painstaking research into original documents of all types: the historical archives of Vermont, Massachusetts, New York and Canada; the files of the War Department and the Congressional Library; the recently unearthed papers of Sir Henry Clinton; family histories of the Allens and of other families associated with them; and collections of private documents bearing upon the activities of Ethan Allen. The result is an authentic, scholarly and enlightening work, written in a facile, readable style, covering a period of our history that is largely omitted from popular accounts of the Revolutionary epoch.

Descended from a family that came to Connecticut with Thomas Hooker in 1632, Ethan Allen was the pioneer son of pioneer parents, who, "like the Israelites raised families and moved." When Ethan was sixteen, a tall, handsome lad dressed in deerskin and moccasins, his father died and left him, the eldest of eight children, to care for the family. His schooling was at an end, but "he was a precocious, mercurial boy with a strange thirst for knowledge," and he studied the Bible constantly, but with a critical attitude. "He questioned the value of a theology which lent itself to so many interpretations"—a questioning which led finally to his open repudiation of all established churches and their creeds and made him as unfavorably known for his unorthodox religious views as he was favorably known for his expert woodsmanship and his talent for leading men.

His restless energy led him to take up a great tract of land in the virgin wilderness of the New Hampshire grants, where settlers were being established by authority of the royal governor of New Hampshire. But the grants were claimed by the colony of New York which refused to recognize the titles the settlers had received from the royal governor and sent armed sheriffs to enforce its claims. The New Hampshire men, realizing possession is nine points of the law, organized "a sort of unauthorized militia" to protect themselves against being dispossessed by the New York officers and Ethan Allen was made the "Colonel Commandant." And so "The Green Mountain Boys" came into existence—a reckless, hard-living, hard-fighting band of frontiersmen who were at Ethan Allen's call during the stormy years of controversy and war that followed.

When open hostilities broke out between England and her colonies Ethan Allen and his men promptly captured the unsuspecting British garrison at Ticonderoga; but when the Mountaineers were made a regular regiment in the Continental Army, Ethan Allen was not given a commission—his impulsive rashness made his good judgment questionable.

He accompanied the expedition of Generals Schuyler and Montgomery against Canada, but as a civilian, going ahead of the troops to recruit. When he had gathered up a handful of habitants he attacked Quebec himself, was captured and held as a prisoner for three years.

When he was exchanged he hurried back to the grants, to find them expecting an invasion at any time from a large British army gathered on the Canadian border.

This year—1778—ushers in the most interesting phase of Ethan Allen's colorful career. The people of the grants, "as independent, self-sufficient and pugnacious as ever," would not call upon New York for help—"they preferred to risk their necks rather than their land titles," so they organized an independent colony, called it Vermont, and applied to the Continental Congress for admission to the family of the thirteen colonies.

The application was refused—New York wielded much political power in Congress—and Vermont became an independent republic with Ethan Allen as brigadier general of the army and head of the diplomatic corps.

The one hundred and more pages Mr. Pell devotes to this part of Ethan Allen's history make fascinating reading. For three years he conducted a most extraordinary diplomatic campaign playing both ends against the middle. Through secret agents sent from Quebec, General Haldimand was trying to negotiate plans to have Vermont delivered to the British and made a royal province. By keeping the British dangling in uncertainty, Ethan Allen secured a promise that the army of ten thousand men on the northern border would not invade Vermont.

Allen was at the same time receiving messengers from General Clinton in New York, who was offering him strong inducements to come into the British fold. While he kept the British guessing, Allen was in communication with the Continental Congress and even made two visits to General Washington, who "found an original something about him that commanded respect."

Both sides suspected the Republic of Vermont, under Ethan Allen's leadership, of playing a deep and questionably fair game, but neither side could prove anything. When Cornwallis surrendered at Yorktown, the British General St. Leger, realizing his chance for invasion was gone, withdrew his army from the Canadian border—"he had been withheld from annihilating Vermont by absolutely nothing but conversation."

Whether Ethan Allen was at heart a loyal patriot or a British sympathizer will probably never be decided; but the results of his devious activities were always favorable to the cause of the Continental Congress.

Laying aside the gold braid and epaulettes he loved, Ethan Allen spent his last years in writing his long deferred treatise on religion—"Reason, the Only Oracle of Man," borrowing the money to pay the expense of publication, for like the other men of the grants, for all of his vast land holdings, he had little ready money.

The book on religious philosophy was received as one might expect: the free thinkers were enthusiastic, the skeptics amused, and the clergy furious, "In a sense, Ethan Allen's whole life was a rebellion against Calvinistic determinism. The Doctrine of Free Will appealed to him more than any other abstract idea. . . . If there was any dominant factor in his philosophy of life, it was the love of liberty. He was the slave of Freedom."

At fifty years of age, his body prematurely weakened by a life of imprisonment, exposure, and turmoil, he died sitting on the seat of his ox-cart, beside his

negro slave. And so passed one of the most colorful and unusual men of our Revolutionary period, interpreted by Mr. Pell's biography as "imaginative, meteoric, enthusiastic, with a touch of poetry." Lacking judgment, coolness and caution; impatient over details, but "the Champion Strong-Arm man of our country's history.

E. L. B.

The United States and the Caribbean. By Jones, Norton and Moon. Chicago, Illinois: The University of Chicago Press. 4½" x 7". 230 pp. \$1.50.

We are told that the Chicago Council of Foreign Relations offers this discussion of our Caribbean policy as its second book in a series of small volumes dealing with American foreign policies.

Chester Lloyd Jones discusses the development of the republics of this area, giving historical facts in each case with particular reference to their relations to the United States.

The second article by Henry Kittredge Norton, "The United States in the Caribbean" defends the policy of the United States in its dealings with these small republics, justifying its so-called imperialism by the benevolence of its motives. Admitting that the motive of self-preservation has entered into the repeated intervention of the great sister republic, still, Mr. Norton asserts that she has never gone in for the purpose of self-aggrandizement, but always with the idea of helping the weaker country to establish a stable government. He asks the critics who make the cry of "imperialism" to offer constructive help in solving the real problems which exist, for it is not likely that the United States can cease to participate in Caribbean affairs.

Mr. Parker Thomas Moon differs widely from Mr. Norton. He feels that the United States has not been honest with itself; that naval and financial policies hiding behind the Monroe Doctrine have been imperialistic; that what we say is not what we do. Mr. Moon, however, offers constructive and practical help as to a course of action based upon the original meaning of the Monroe Doctrine, and the Kellogg Pact, which if adopted, might lead to a happy issue out of our Caribbean perplexities.

To the student of today who may be the statesman of tomorrow a perusal of this little book will help to clarify his ideas when faced with the ever-recurring problem of intervention in the Caribbean.

The Corral of Death. By Malcolm Wheeler-Nicholson. New York: Houghton Mifflin Co. 1929. 5" x 7½". 238 pages. \$2.00

The tense, anxious days when Villa and his bandits raided the Mexican border and terrorized the sparsely settled country north of the Rio Grande live again in "The Corral of Death," a novel by Malcolm Wheeler-Nicholson.

Gordino, Villa's lieutenant, was taking his toll of life and property along the boundary river when Lieutenant Davies, the ink scarcely dry on his commission, joined a veteran cavalry regiment at a border post. The regiment, recently arrived from the Philippines, was being built up for the dangerous border patrol work by the addition of many wild-eyed range remounts and even more raw recruits; a situation that has the colonel almost apoplectic, the junior officers gloomily pessimistic, and the "hard-boiled" top sergeants working day and night.

Lieutenant Davies, embarrassed and awkward, arrives when experienced officers are badly needed; but thoroughly trained in a good school, Western bred, an expert horseman and quick to act in an emergency, he wins the admiration and respect of his "top," Sergeant Bannion, and gets his troop out into the field in record time.

Once out on patrol, Lieutenant Davies and his men meet quick action and plenty of it. Gordino has a blood feud with Sergeant Bannion for an affair at Juarez in which the bandit was decidedly worsted and has offered a reward for the dare-devil Irishman, provided he is taken alive. Around this fact centers the constant activity of the Mexican bandits against Lieutenant Davies' troop, which, being made up largely of recruits from the mountain country of the South, rises to the emergency and gives a good account of itself. Sergeant Bannion is finally captured by Gordino; and Lieutenant Davies, at the head of an expeditionary force of cavalymen and Texans, makes an adventurous dash across the Rio Grande and rescues him at the eleventh hour from the "Corral of Death," Gordino's walled enclosure for his wholesale executions.

Mr. Nicholson knows the cavalry life and he knows the border country. Sergeant Bannion, with his Irish wit, gives the touch of humor needed in a story of strenuous action; and the picturesque characters—rangers, cowboys, ranchers, soldiers and Mexicans—gallop from adventure to adventure in a swiftly-moving plot that holds the reader absorbed from beginning to end.

For anyone who enjoys adventurous fiction in a convincing army setting, "The Corral of Death" is to be recommended. E. L. B.

Marlborough, the Portrait of a Conqueror. By Donald Barr Chidsey. New York: The John Day Co. 1929. 6½" x 9¾". Ill. 300 pp. \$3.50.

"He did everything well. He was an admirable lover and later a faultless husband; he was a clever politician, a great diplomat; in an age when competition made traitors skillful, he was one of the best; he was an expert swordsman, a graceful equestrian, a crack tennis player, an excellent dancer. * * * Marlborough's talents were numerous; but his genius was confined to the military; he was one of the greatest generals of all history; perhaps he was *the* greatest."

Such is Mr. Chidsey's introduction to his work on John Churchill, Duke of Marlborough, the man who broke the power of Louis XIV by his victories of Blenheim, Ramillies, Oudenarde and Malplaquet. The idol of his generation, nevertheless he was "mean where money was concerned. Traitorous he was, too, and dishonest. At least he was all of these if you judge him by modern standards."

Born of a poor family, the Duke left one of the greatest of English fortunes and the story of the foundation of that fortune is worth repeating here. While he was an impecunious young subaltern in a Guards regiment, Barbara Palmer, mistress of Charles II, gave him five thousand pounds which he invested at ten per cent, and thereafter was never at a loss for money. This was a gift of appreciation in token of the extreme alacrity with which young Churchill escaped from the window of her bedchamber, clad in his underclothing, when the King unexpectedly called on her.

The fortune was enriched by graft. If he did not actually establish the custom of purchasing commissions in the army, at least Marlborough was responsible for its general adoption, and a goodly share of each purchase price remained in his own hands. He set out to "grab whatever he could grab" and his coffers were the recipients, among other things, of commissions on supplies purchased for the army in the field. Mr. Chidsey glosses over such peccadilloes by saying that this "was an accepted practise." Perhaps it was, however, it had never before been done on such a wholesale scale, nor so openly, and there can be little doubt that English politics suffered for several generations from the precedents set by Marlborough.

He was the intimate friend of James, Duke of York, the man to whom, more than anyone else, Churchill owed his success in life, yet when James sat on the throne of his ancestors, Churchill was the leader of those who called William of Orange from Holland in the "Glorious Revolution" of 1688, which deposed James. And no sooner was William on the throne than Churchill began a traitorous correspondence with the exiled monarch, and all the time his wife was the bosom friend of Anne, James' daughter, the next heir to the throne. And when Anne succeeded William, Marlborough, while commander-in-chief of the army in the field, not only kept up his correspondence with James but also paid court to Sophia of Hanover and her son, George, the next heir, who succeeded Anne, as George I. There were many strings to Marlborough's bow and if the Earl of Warwick was the King Maker of the fifteenth century, Marlborough is entitled to the same cognomen for his era.

But enough of the sordid; it is when we turn to his work in the field at the head of his troops that we find Marlborough at his best. Not only were his victories over the French—who had all the prestige and morale that go with the reputation of being the best troops in Europe—wonderful achievements in themselves, but they were accomplished in spite of odds such as few commanders have had to face. It was an allied army that opposed Louis XIV and Marlborough had negotiated all the treaties of alliance, a triumph of diplomacy. The Dutch were loath to enter, but their troops were urgently needed so their proposal to send two envoys with Marlborough with power to veto his plans if considered prejudicial to Dutch interests, was perforce accepted. The envoys were politicians with no knowledge of warfare "loud in the council chamber, timid on the field" and many of the commander-in-chief's plans were nullified by their timidity.

Another military custom of the age with which Marlborough had had a previous experience was hard to bear. When his army was joined by that of the Elector Louis of Baden, he had to yield up the command every other day, the Elector being a royal personage. Notwithstanding these difficulties he interposed his armies between those of the enemy, preventing their concentration and winning the immortal victory of Blenheim. Then when the troops went into winter quarters Marlborough had to defend his actions in Parliament and by devious political methods obtain the necessary funds for the next year's campaign. And this went on for twelve years. Truly, as Mr. Chidsey says, "this was a man."

While making no effort to tell the story of the campaigns in military phraseology, the author has given us a good military history of the war. Unfortunately no maps are provided, and military readers always want maps, but even without them the strategy and tactics can easily be followed from Mr. Chidsey's descriptions which are sufficiently clear for anyone to understand and, being written in an entertaining manner, make delightful reading.

The author, a young man of twenty-seven, is to be congratulated on producing such an excellent biography. The volume, too, is well illustrated by reproductions of contemporary paintings.

R. E. W.

Twelve Royal Ladies. By Sidney Dark. New York: Thomas Y. Crowell Co. 1929. 5¾" x 8½". Ill. 339 pp. \$3.00.

Now that woman has attained the suffrage and reduced herself to an equality with man, it is interesting to turn to bygone days, before the militants raged; and see how the sex was able to influence the world without thinking of suffrage.

All the subjects of Mr. Dark's sketches were women of importance; all played their part in history, some for good and some for evil, but on the whole the world was the better for their influence. These twelve royal ladies lived in the sixteenth, seventeenth and eighteenth centuries, during the period when feudalism was giving way to nationalism, when the map of Europe assumed its present general form and when the seeds of the World War were being laid.

It is noteworthy that almost all the twelve spent unhappy lives, a circumstance which moves Mr. Dark to comment that "it is better to be born and live in comparative obscurity than in the palace of kings." Only two can be said to have been at all happy. One was Sophia, Electress of Hanover, granddaughter of James I of England, who was never prominent, even during her lifetime and whose only contribution to the history of the world was George I of England, her son. To her obscurity may be attributed her contentment.

The other was Queen Christina of Sweden, and she, a queen in her own right, avoided the jinx by voluntarily resigning her throne at the age of twenty-eight and living a life of single blessedness and freedom until her death thirty-five years later. She was the only one of the twelve who was never burdened with either a husband or a lover and, judging from the marital difficulties of the others, that must have been a happy circumstance. In yet other respects Christina was a remarkable woman. She was the moving spirit in the peace of Westphalia which closed the Thirty Years War, a war which, to use Mr. Dark's words, "was supremely foolish and supremely wicked." Many had tried to end that conflict, but it was reserved for a woman to succeed where the men had failed. And she was but twenty-two at the time. Truly she left her mark for good.

Josephine de Beauharnais, the first wife of Napoleon, was probably the least capable of the twelve, which may account for her being, as Mr. Dark says, "the most lovable of his ladies, although his own account of Louise de la Vallière, the beautiful mistress of Louis XIV, would seem to give her a distinct edge over Josephine, in the matter of lovableness. She was "unique among the royal mistresses" in that she sincerely loved her lord. "She sinned knowing that she was sinning," but it was not for glory, ambition or riches, all of which she refused, nor was she essentially immoral. She sinned for pure love of Louis and refused to cover their relations with the customary *mariage de convenance* as she could not bring herself to be even the nominal wife of another. And when she was discarded for Madame Montespan she retired to a convent and was Sister Louise de la Misericorde for thirty years. The Judge will be lenient with her, but how about Louis?

The most romantic of the twelve was Mary, Queen of Scots, "a woman as gifted as she was beautiful, she threw away her crown and her life because she was unable to resist a wild physical passion for a complete and rather stupid scoundrel," the Earl of Bothwell.

Catherine de Medici, the evil genius of the massacre of St. Bartholomew, was a shrewd, intelligent and coldly calculating woman who ruled France through three reigns, whether for good or evil is best left to the reader of the book as there are two sides to the story.

Marie Antoinette, like Josephine, was not troubled with an excess of gray matter. Her alleged misconduct, most of which was baseless, was largely responsible for the French Revolution in which she, both literally and figuratively, lost her head.

Queen Mary of England, "Bloody Mary" as she is so often called, is another about whom there have been conflicting opinions. According to Mr. Dark she

was not the dour, cruel woman so often painted, although her responsibility for the persecution of the Protestants cannot be denied. In his opinion it was Mary's marriage with Philip of Spain which induced the mass of the English people to accept the overthrow of the old religion and become a truly Protestant nation.

Maria Theresa of Austria and Catherine the Great of Russia lived at the same time and governed their territories with vigor and success, but there the resemblance ends. Catherine's private life is too well-known for comment and Mr. Dark does not devote much time to it. Maria Theresa was a loving wife whose grief at her husband's death "was comparable to that of Queen Victoria after the death of Prince Albert."

Another loving wife was Henrietta Maria, daughter of Henry IV of France, wife of Charles I of England, who Mr. Dark persists in calling "the martyred king." Evidently there is a touch of the Jacobite in our author. After Charles' execution (the reviewer is *not* a Jacobite), Henrietta lived only for the restoration of the Stuarts, but when it came she was not in sympathy with the life of her son, Charles II, and lived, unhappy, in her native France.

The last of twelve is Caroline of Brunswick, the neglected wife of George IV of England, who was notoriously eccentric and indiscreet and seemed to have "a fancy to appear almost entirely unclothed." "Perhaps she deserved all she got" is Mr. Dark's comment. However, she had a sense of humor which "rarely flourishes among the exalted."

There is a fine human touch in these sketches, giving the effect of personal acquaintance with the subject rarely attained. Each one is illustrated by a portrait drawn by Mabel Pugh.

R. E. W.

The Old Army: Memories, 1872-1918. By Brig. Gen. James Parker, U. S. Army, Retired. Philadelphia: Dorrance & Company. 1929. 5¼" x 8". Ill. 454 pp. \$4.00.

In an introduction to General Parker's memories of the Old Army, General Bullard says, "This is the life of a restless, daring soldier in active service on both sides of this varied earth, a life unusual, apart perhaps from the common life of men and representing conditions that are past, but for all that none the less interesting; a life full of personal and human incidents." To this description of the book, little can be added. The volume is, first and foremost, an autobiography. The memories are those of the author; the scenes he describes are those which came under his own immediate observation. He omits much of his early years and much of his intimate life, but he includes a wealth of detail of his official life and of the events in which he was a participant or of which he was an eye-witness. With him we travel over the West and the Southwest in the days of the Indian and the buffalo; we pursue Geronimo into Mexico; and we see the insurrection of Aguinaldo and his followers in the Philippines.

Because of the period in the history of the Army which is covered, all of us in the military hierarchy will welcome the book and find it interesting. To those of the older generation it will recall memories of their own of times and events of which they were a part but which have gone, never again to return. To those of the younger generation it will visualize a part of the most romantic and interesting period of American history, of which they can know nothing except by hearsay. To all it will emphasize the great change in Army life which has occurred in the past third of a century.

At the risk of suggesting that the book be made too bulky, we believe General Parker could well have included more of the events in the West in the eighties in which he was not a participant but of which he had first-hand

knowledge. However, his own service covered a great deal of territory. He served in the Indian Territory in 1876-77, was in the Mexican border disturbances in Texas during the next two years, and then took part in the Ute campaign in Colorado in 1879-81. His next period of active service was in the Geronimo-Apache campaign in 1885-86. He participated actively in the Spanish-American War and Philippine insurrection and was with the Cuban army of pacification in 1906-09. His World War service included command of the 32nd and 85th Divisions in the United States and a short tour of duty at the front late in 1917. His services were recognized by the award of a Medal of Honor for distinguished gallantry at Vignau, P. I. in 1899 and a Distinguished Service Medal for services in 1917 and 1918. That, perhaps, is enough for one book. At any rate, we commend the volume as of particular interest to all who would understand the conditions of military service during the latter part of the Nineteenth Century.

R. A.

It Might Have Been Lost! By Thomas C. Lonergan, formerly Lieutenant Colonel, General Staff, A. E. F. New York and London: G. P. Putnam's Sons, The Knickerbocker Press. 1929. 6" x 9". Ill. 327 pp. (Appendices pp. 249-318; Index pp. 319-327). \$3.50.

When the United States entered the World War the Allies were in desperate straits. British recruiting was lagging, exempted men were not being "combed out," and the Irish question prevented a full utilization of the manpower of the United Kingdom. France had men sufficient for just one more drive like that on the Somme, and no more.

What wonder, then, that both of these nations welcomed American participation in the war and the prospect of American reinforcements! Our declaration of war was barely signed before Great Britain and France began representing to the United States their dire need of manpower. The lengths to which both nations went in order to use Americans as replacements to fill their own shattered battalions is not only unknown but also inconceivable to the average American. If the military authorities of our two great Allies had been allowed their desires there never would have been an American Army fighting as a unit under the American flag; Americans would have been fighting as an almost nameless leavening of British and French forces, and whatever credit might have been their due would have redounded, instead, to the glory of British or French arms. America and Americans would not have gained prestige in the war, but would have lost, instead.

The British and French authorities fought tooth and nail for their contention and continually increased the pressure toward that goal until the summer of 1918 when, seeing the light, they desisted from their machinations and their subtle planting of obstacles in General Pershing's path.

Nor may they properly be blamed for their endeavors. It is obvious, even to the layman, that the Yank would have appeared in force on the Western front much more quickly if the Allied program had succeeded. And that result was paramount in Allied eyes; they needed men and needed them immediately.

Colonel Lonergan, through access to official files in England and in France, has written the inside history of the struggle for amalgamation of Americans in British and French battalions. Based, as it is, on official documents, the book as a whole is incontrovertible and should go far to settle the blaze which started shortly after the death of Marshal Foch. A monograph covering the same general subject was prepared in the Historical Section of the Army War College and appeared in the summer of 1929. The suppression of this monograph leaves Colonel Lonergan's book as the most authentic account of a subject which

affected not only every member of the A. E. F., but every other American as well. A study of the secret files of the War Department would probably warrant the prediction that the full truth about this subject will never be known to the public at large.

Colonel Lonergan divides his book into four "parts," viz.: (I) The Proposal (II) The Struggle, (III) The Achievement, (IV) Appendices. The first part delineates the procedure which the Allies wished to adopt in the use of America's troops, the second part shows the maneuvers employed to that end, the third part summarizes the victory of the American viewpoint, and the fourth consists of the official documents upon which the book is based.

In reading the book, one gathers the opinion that Colonel Lonergan attributes to Great Britain the greater activity, although there seems to be ground for believing that France may have been more insistent and troublesome in her demands for amalgamating American reinforcements than was England. This, however, is a controversial question.

This reviewer regrets to note that the general excellence of the book is marred by the possibility that his old friend, "Tim," overlooked one bet. The trend of the whole book is a paean of praise to General Pershing for withstanding, single-handed and alone, the onslaughts of those nations who would rob American troops of their identity in order to benefit the Allied cause. We gather from the book (whether or not that impression was intended by the author) that Secretary Baker and President Wilson "passed the buck" to General Pershing on this all-important point and gave him but luke-warm support.

While we yield to no man in admiration of the ability, efficiency—genius, if you will—of General Pershing, we feel sure that he would be the first to disclaim sole credit for the magnificent and successful fight for American recognition on the European battlefield. And, similarly, the more we delve into the records of the war, the more are we moved to doff our caps to Secretary Baker (and to President Wilson, too) for the wonderful ability with which they played their rôles in the war. We are Republican by inheritance and inclination, yet we will maintain by oath, affirmation, or combat, that Mr. Newton D. Baker was the greatest War Secretary of all time—and no nations barred.

The bet which friend Tim overlooked throws important light on General Pershing's stand against our Allies, light so clear that we cannot understand how it could be ignored. And, as Error, once accepted by History, persists and almost defies correction, it is important here to invite attention to the instructions which were given to General Pershing in Washington before he went abroad. Paragraph 5 of these instructions reads as follows:

"5. In military operations against the Imperial German Government you are directed to cooperate with the forces of other countries employed against the enemy; but in so doing, the underlying idea must be kept in view that the forces of the United States are a separate and distinct component of the combined forces, the identity of which must be preserved. . . ."

These instructions were written by Brig. Gen. Francis J. Kernan, General Staff, without suggestion or advice from any other person. They received the approval of General Bliss and were signed by Secretary of War Baker without the change of a comma. They constituted General Pershing's objectives abroad.

It is difficult to imagine evidence which would show more conclusively that General Pershing, in fighting through thick and thin for American recognition in the war, was not exercising the discretion of which he was so eminently capable, but was giving an example of how a good soldier carries out his mission.

In this respect Colonel Lonergan's book appears incomplete. In general, however, it is an authentic and dispassionate narration of the events which culminated in the formation of the American First Army.

P. D. B.