

# COAST ARTILLERY JOURNAL



ANTIAIRCRAFT EARS

MAY-JUNE, 1936

# Report Documentation Page

*Form Approved  
OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>JUN 1936</b>	2. REPORT TYPE	3. DATES COVERED <b>00-05-1936 to 00-06-1936</b>			
4. TITLE AND SUBTITLE <b>The Coast Artillery Journal. Volume 79, Number 3, May-June 1936</b>		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Coast Artillery Training Center, Coast Artillery Journal, Fort Monroe, VA, 23651</b>		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>	<b>Same as Report (SAR)</b>	<b>82</b>	

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# THE COAST ARTILLERY JOURNAL

Member Affiliated Military Magazines

Published as the Journal of the U. S. Artillery from 1892 to 1922

LIEUT. COL. E. E. BENNETT, C.A.C., Editor

VOLUME LXXIX

MAY-JUNE, 1936

NUMBER III

Publication Date: June 1, 1936

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THE COAST ARTILLERY JOURNAL IS NOT RESPONSIBLE FOR OPINIONS EXPRESSED IN PUBLISHED CONTRIBUTIONS

THE COAST ARTILLERY JOURNAL pays for original articles upon publication.

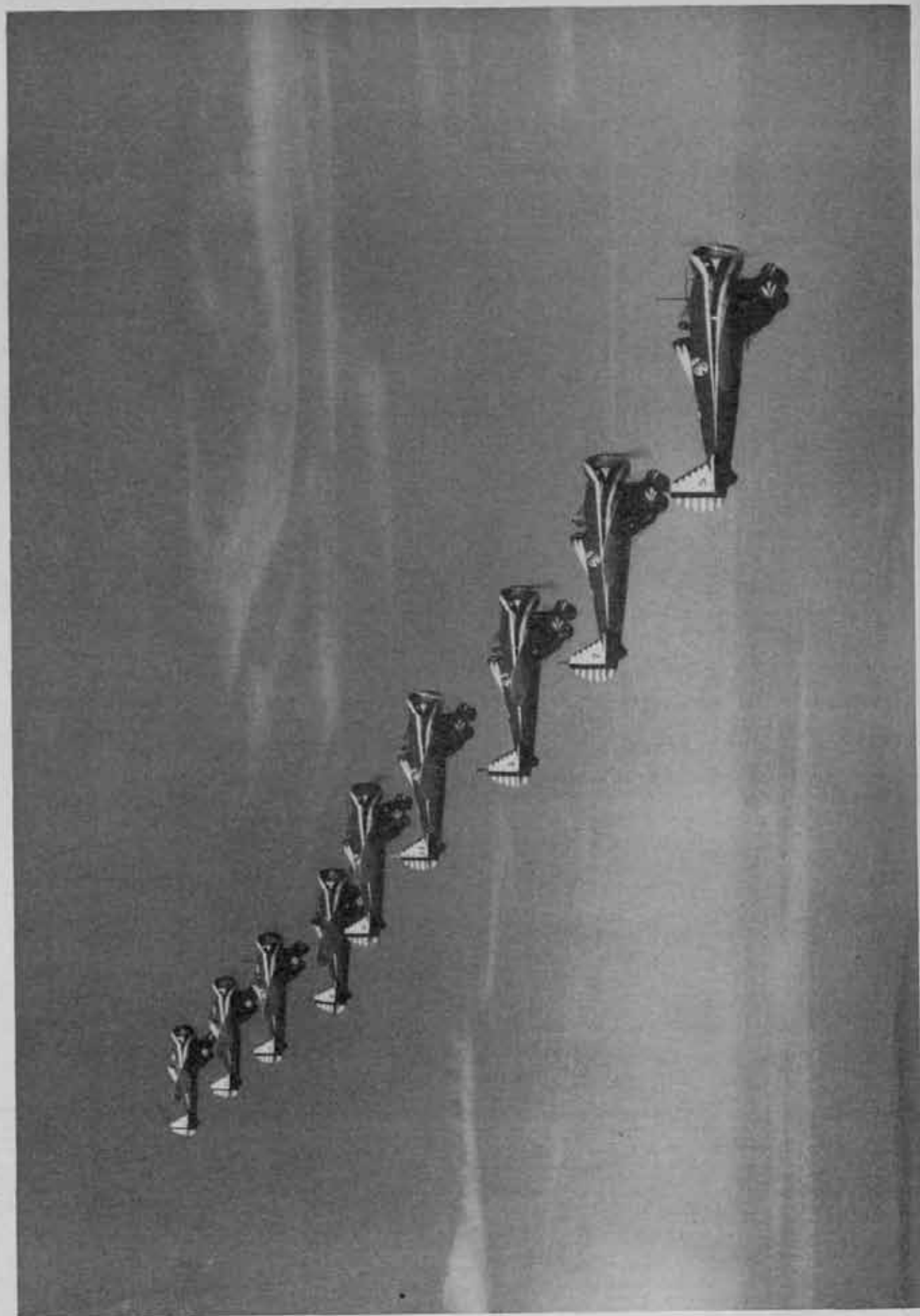
Published bi-monthly under the supervision of the United States Coast Artillery Association for the information of the Coast Artillery personnel of the Regular Army, National Guard and Organized Reserve.

Publication Offices, 1406 East Franklin Street, Richmond, Virginia; Editorial Offices, 1115 17th Street, N.W., Washington, D. C.

Terms: \$4.00 per year. (Coast Artillery Association members, \$3.00 per year.) Single copies, 75 cents.

Entered as second class matter at Richmond, Virginia, under the Act of March 3, 1879, for mailing at special rate of postage provided for in Section 412, Act of October 3, 1917.

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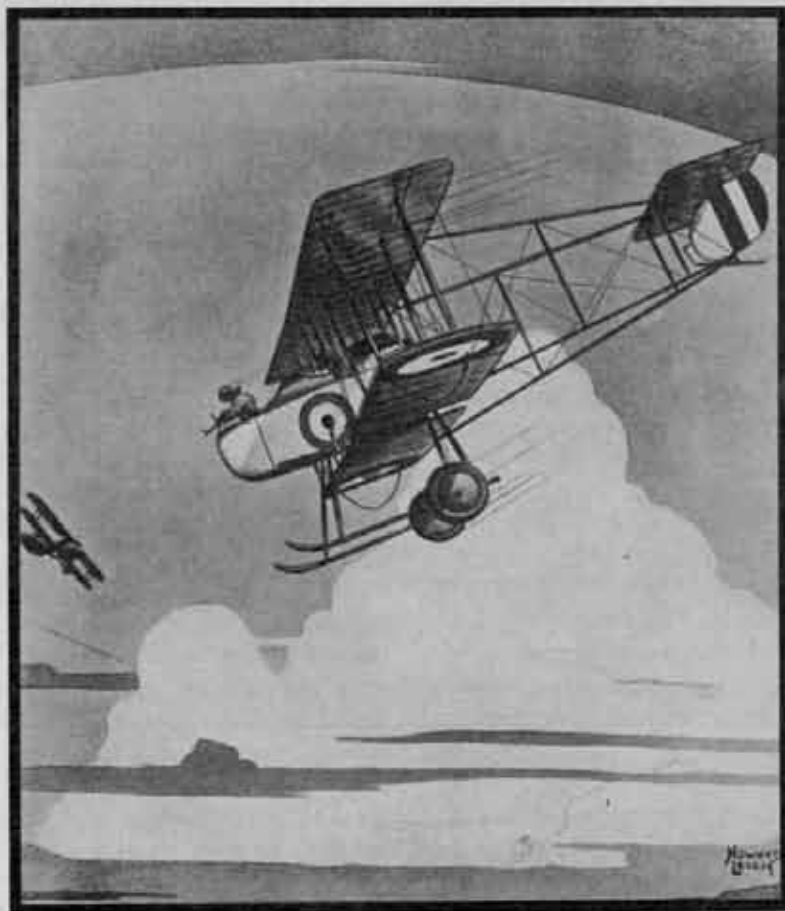
# Fighting for Observation

By MAJOR CLAIRE L. CHENNAULT  
*Air Corps*

## THE DEVELOPMENT OF AERIAL COMBAT

PRIOR to the beginning of the World War, Germany, England, France, and Italy had organized air services. Italy had learned the value of aerial reconnaissance during the Italo-Turkish War, 1911-1912, but did not continue to develop her air service after the close of that war.

The general opinion of European military authorities seems to have been that aerial observation would be valuable in special situations but that it was not sufficiently important to warrant expending any considerable amount of money for its development. There were, however, a few enthusiasts who perceived that aircraft would play an important, if not decisive, part in any future war. In 1912, General Sir James Grierson said, "Warfare will be impossible unless we have the mastery of the air." General von Hoepfner describes the short-sightedness of the German High Command with regard to aerial observation in his book, *Deutschlands Krieg in der Luft* as follows: "In general, not any too much expectation was put on aerial reconnaissance. It was estimated that after a few weeks none of our own and no



Vickers Gun Bus

Ninety per cent of all pursuit effort during the World War was expended in support or denial of aerial observation.

hostile planes would be seen in the heavens. The performance of the fliers who reported comprehensive information daily, surprised the high command, who doubted

the details that were given and were willing to wait for confirmation through some other medium of intelligence."

It was this unwillingness of the German High Command to accept the reports of their aerial observers which lost them the opportunity to destroy both the French Fifth Army and the British Expeditionary Force in the latter part of August, 1914.

The ante-bellum development of heavier-than-air craft in Germany, Italy, and France was confined almost wholly to types suitable for observation. It must be remembered that at this time experts were almost unanimous in

the belief that airplanes would never fight in the air but would deliberately avoid combat in order to obtain information for the high command. There was no appreciation of the necessity for denying aerial observation to the enemy. Presumably, the enemy was welcome to all the information that his unreliable air service could obtain.

There is an indication, however, that the British military authorities anticipated some aerial combat, for in February, 1914, the war office prescribed certain flight tests and minimum performance characteristics for both single- and two-seater fighting airplanes. The result of the foresight of the British authorities was that the Royal

NOTE 1. The views and opinions expressed in this article are those of the author alone and do not necessarily represent the views of the War Department.

NOTE 2. The term "Fighter" is used by the British with the same meaning as our term "Pursuit." Each term is applied to that class of aviation whose principal function is aerial combat. Single-seater, two-seater, and even multi-seater airplanes may be employed for this purpose. In the third section, the term "Fighter" is applied to a specialized type of pursuit airplane designed for close, maneuvering combat, while the term "Interceptor" is applied to the type of pursuit airplane designed primarily for interception and combat with bombardment aviation.

Flying Corps entered the field with airplanes better adapted to fighting than those of the other powers.

Aerial combats during the early months of the war resulted from the aggressive disposition of individual pilots—not from design on the part of the military authorities. On August 15, 1914, Reuters' correspondent reported that "A French airplane yesterday encountered a German airplane. The French pilot chased the German, firing with a Browning (pistol). The German aviator did not reply but 'fled.'" The morning *Post* (London) reported an aerial combat on August 28, 1914, as follows: "An English pilot, emerging from a cloud, found immediately beneath him a German airplane. Swooping down to within revolver shot, he emptied all his chambers with an effect he could not observe because the cloud once more enveloped him. Later on when he emerged from the cloud again, he saw underneath a small crowd gathered around a smashed airplane and he came to the conclusion that his revolver shots had not been without effect."

The combat reported on October 16, 1914, is the first which reveals deliberate intent to destroy hostile aircraft in aerial combat. The report states: "A Royal Flying Corps airman in a fast scouting monoplane, and carrying two rifles, gave chase to a hostile machine but lost sight of the enemy in clouds. Then a German Otto biplane came on the scene, a slow 'bus' but one having the engine behind (pusher), and therefore, if well armed, a formidable opponent. The English pilot obtained a position behind the enemy and, when within sixty yards, he fired one rifle without result. His superior speed taking him ahead, he turned and again getting astern, emptied his magazine at the German, who began to descend. Then the Englishman stopped his engine and began a downward glide whilst reloading. During this operation the magazine jammed but he managed to insert four cartridges and to fire them at his opponent, who disappeared into a bank of clouds. The Englishman followed but never saw him again." Here is revealed the beginning of aerial combat tactics in the statements that, "The English pilot obtained a position behind the enemy" and, "he turned and again getting astern. . . ." Thus aerial combat, born of the twin requirements, maintenance of aerial observation of the enemy and denial of hostile aerial observation of friendly forces, came to be accepted by military authorities as not only possible but highly desirable.

As the war progressed it became more and more evident that the success of ground forces depended upon aerial observation, and the fight for it became more bitter. It is estimated that ninety per cent of all the pursuit effort during the World War was expended in support or denial of aerial observation. Germany and the Allied



Sopwith Camel

powers engaged in an intense rivalry to produce the most effective fighting airplanes and armament. It takes time, however, to effect changes in airplane design and produce the new types. Our own experience in the World War illustrates this point perfectly. Despite the pressure brought to bear upon our airplane designers and manufacturers and despite our vast resources of money, raw materials and technical experts, we were unable during nineteen months effort to produce a single airplane of American design for service over the lines.

It has been estimated that a minimum of eighteen months will be required to design a new airplane and begin quantity production. Another six months will be required to equip a number of organizations with sufficient aircraft for active operations.

The time required for the training of first-class pilots for active operations under modern conditions is from twelve to eighteen months. This time is the minimum required for the completion of ground school, primary, basic, and advanced flight training, aerial gunnery and bombing, instrumental and navigational flight training, and training in the tactics of the individual pilot, small units and large organizations. The employment of reserve officers may reduce the number of new pilots required for war service in some classes of aviation but it is believed that few reserve officers, called to active duty, will be found suitable for pursuit operations. The average age of first-class pursuit pilots will be considerably less than 30 years, probably about 25 years, and very few reserve officers will be less than 30 years of age.

But even if sufficient pilots were available for the immediate organization of all the additional pursuit units required for war operations, there would still remain the necessity for designing and producing an effective type of pursuit, "fighter," airplane. The high degree of specialization attained in modern airplanes makes it most desirable that a suitable type be designed for each field of employment. A compromise or all-purpose airplane must sacrifice efficiency in one or all fields of employment. The Germans suffered severely at the battle of the Somme because the bomber-fighter could obtain neither air supremacy nor support the operations of other classes of friendly aviation. Without doubt, thousands of German casualties resulted from the fact that some 60



Fokker D VII

airplanes were not of the proper type for accomplishing the missions assigned them.

We must develop and produce in peace sufficient airplanes suitable for close maneuvering combat in support of aerial observation or the ground forces will pay the penalty in war.

#### THE EFFECT OF PURSUIT ACTION UPON AERIAL OBSERVATION

The first battle of the Somme, June-December, 1916, is generally recognized as having determined the effect of pursuit operations upon the action of all classes of aviation supporting the ground forces.

Between October, 1914 (when the desirability of controlling the air with fighting type airplanes was first recognized), and June, 1916, the development of fighters in Germany and England proceeded along widely different lines. This difference was the result of a fundamental difference in the conception of the rôle of the fighter held by the authorities controlling the development of military aircraft in the two countries.

In Germany, where aviation was controlled by army officers with no flying experience, a general purpose type known as the bomber-fighter had been produced. This plane was looked upon as an all-purpose airplane of the aerial battleship or flying fort type, capable of conducting both offensive and defensive missions. It was employed at the beginning of the battle of the Somme in organized squadrons (*Kampfgeschwader*) having as many as 43 airplanes. In addition to being equipped for bombing, it was equipped for aerial observation and combat. It was presumed to be capable of denying the operation of hostile observation airplanes and of defending itself against the attacks of hostile fighters, for which purpose it had a number of machine-gun positions.

The bomber-fighter was slow and unmaneuverable. It could not support its own observation nor deny hostile observation. Its ability to defend itself in the air contributed nothing to the support of friendly ground and aerial forces. However, a few single-seater fighting types were developed contemporaneously with the bomber-fighter. These fighters were normally assigned, in small units, to armies or corps for the purpose of defending the ground troops from hostile air attacks.

English airmen anticipated the development of aerial combat, and in February, 1914, the War Office issued a table of minimum performance characteristics for the guidance of manufacturers in the construction of both single- and two-seater fighters. Long before the beginning of the battle of the Somme, English fighters had been organized in flights and squadrons.

The strength of the rival air forces at the beginning of the battle of the Somme has been estimated as follows: The Royal Flying Corps had 167 airplanes of all types in the Fourth Army area and an additional squadron of eighteen BE 2 C's co-operating in the Gommecourt attack. Of this total, about 75 airplanes were single-seater fighters.

The Germans had the following units in the Somme area on June 30th:

6 Reconnaissance Flights . . . . .	42 airplanes
4 Artillery Flights . . . . .	17 airplanes
1 Bomber-Fighter Squadron . . . . .	43 airplanes
1 Bomber-Fighter Flight . . . . .	8 airplanes
1 Single-seater Detachment . . . . .	19 airplanes
<hr/>	
Total . . . . .	129 airplanes

It is evident that the Germans were outnumbered by the British but the greatest disparity was in the relative number of single-seaters, 75 British and 19 Germans.

The Royal Flying Corps assumed the offensive at the beginning of the battle and maintained control of the air until corrective measures were taken following a complete reorganization of the German air service in October.

The results of this domination of the air by the Royal Flying Corps are clearly portrayed in an extract from General von Below's memorandum on the experiences of the German First Army in the battle. He wrote, "The beginning and the first weeks of the Somme battle were marked by a complete inferiority of our own air forces. The enemy's airplanes enjoyed complete freedom in carrying out distant reconnaissances. With the aid of aeroplane observation, the hostile artillery neutralized our guns and was able to range with the most extreme accuracy on the trenches occupied by our infantry; the required data for this were provided by undisturbed trench reconnaissance and photography. By means of bombing and machine-gun attacks from a low height against infantry, battery positions and marching columns, the enemy's aircraft inspired our troops with a feeling of defenselessness against the enemy's mastery of the air. On the other hand, our own aeroplanes only succeeded in quite exceptional cases in breaking through the hostile patrol barrage and carrying out distant reconnaissances; our artillery machines were driven off whenever they attempted to carry out registration for their



own batteries. Photographic reconnaissance could not fulfill the demands made upon it. Thus, at decisive moments, the infantry frequently lacked the support of the German artillery either in counter-battery work or in barrage on the enemy's infantry massing for attack. Heavy losses in personnel and matériel were inflicted on our artillery by the enemy's guns, assisted by excellent air observation, without our being able to have recourse to the same methods. Besides this, both arms were exposed to attacks from the air by the enemy's battle-planes, the moral effect of which could not be ignored."

The explanation of the failure of the German air service and the success of British aviation is clearly stated by General von Hoepfner in *Germany's War in the Air*:

"Their air force had a superiority that far exceeded our expectations and gave them practically an absolute mastery in the air. Our weak aviation units had been reduced to a state of impotence by the mass attacks of hostile squadrons and there was nothing to prevent the enemy from carrying out reconnaissance missions and participating in attacks. They were able to make distant flights without hindrance.

"With us, our infantry and artillery had reached the point where they were not interested at all in aerial observation and all they asked of our aviators was to free them from the hostile planes which were after them continually. Our pursuit and combat squadrons tried to satisfy them but their planes were not *suitable for this sort of mission*, and after having met with heavy losses, they were obliged to give it up. The effect was deplorable. Since the troops now suffered more than ever, aviation was completely discredited. . . . All this was due doubtless to our numerical inferiority and to errors in *employment* which cannot be denied.

"One of the chief mistakes in the early weeks of the battle of the Somme was the failure to recognize the *importance of the single-seat pursuit planes*. The Second Army had few single-seaters and made poor use of what they had."

The failure of German aviation during the months of July and August, 1916, resulted in a decree from His Majesty, The Emperor, an extract from which follows: "Owing to the increasing importance of aerial warfare, all the aerial activities throughout the army, whether offensive or defensive, at the front or in the interior, were to be grouped in one branch of the service." In compliance with this decree, anti-aircraft, aerial defense, balloons, dirigibles, the meteorological services and the air force were put under the command of a "General in Command of the Air Forces" who was charged with securing unity and method in the construction, concentration and use of all aerial means of waging war. General von Hoepfner was given the new title and the officer who had been Chief of Aviation, Lieutenant Colonel Thomsen, became his Chief of Staff, October 8, 1916.

Prior to the reorganization of the German air service, Boelcke had been transferred with his trained pursuit unit from Verdun to the Somme. Airplanes for the unit arrived on September 16, and on its first patrol the morning of September 17, the unit of five planes shot down five British planes. With regard to the operations of this trained pursuit team, General von Hoepfner wrote as follows:

"Therefore, if the enemy's superiority in the air, so great at the beginning, was broken at the end of the battle, the credit was due in great measure to Boelcke and his pursuit squadron. In their gallantry and unity of effort they became the model for all the German pursuit squadrons. Proof of their activity can be seen in 87 air victories during the battle of the Somme (September 16 to about December 1). Our pursuit squadrons compelled the enemy, who had hitherto been so sure of themselves, to adopt a less aggressive attitude and this was *thankfully received by the troops on the ground*."

The British reaction to the operations of Boelcke's pursuit squadron is clearly revealed in General Trenchard's report to Headquarters the evening of September 17:

"I have come to the conclusion that the Germans have brought another squadron or squadrons of fighting machines to this neighborhood and also more artillery (observation) machines. *One or two* German airplanes have crossed the line during the last few days . . . and new wireless calls have been intercepted. With all this, however, the aircraft guns have only reported 14 hostile machines as having crossed the line in the Fourth Army area in the last week ending yesterday, whereas something like 2,000 to 3,000 of our machines crossed the lines during the week."

On September 22, General Trenchard expressed the view that the Royal Flying Corps should undertake a more vigorous offensive policy in order to counter a more aggressive enemy.

On the initiative of General Trenchard, Sir Douglas Haig sent a letter to the War Office on November 16, asking for twenty fighting squadrons *extra* to what he had already estimated would be necessary to sustain the offensive in the early spring of 1917. This number would give a proportion of *two fighting squadrons to one artillery squadron*.

Sir Douglas Haig's request for two pursuit squadrons to one artillery squadron is of particular interest because it fixes a definite ratio of strength for pursuit, and observation. The functions of the units designated as "Artillery Squadrons" by the British correspond very closely to those of our observation units attached to divisions.

These extracts from the letters and records of the high command of both the German and British forces engaged in the battle of the Somme should convince the most skeptical that friendly observation aviation can be maintained and hostile observation denied only by the vigorous action of effective pursuit forces.

#### MODERN REQUIREMENTS FOR THE SUPPORT OF OBSERVATION

The British *Manual for The Employment of Air Forces with The Army In The Field, 1932*, deals with the subject of air superiority as follows:

"1. The gaining and maintenance of air superiority is of first importance to ensure to the Army its air observation and the minimum of interference to its maintenance and movement, whilst denying to the enemy similar advantages. The struggle for air superiority will begin as soon as the opposing air forces come within range of one another, and will continue throughout all phases of the campaign.

"2. Air superiority is obtained by the combined action of

bomber and fighter aircraft. The detailed measures to obtain and maintain the requisite air situation must vary with the circumstances of the campaign, but purely defensive measures will rarely be successful.

"3. The method of obtaining air superiority which is most likely to be successful is a combination of heavy and continuous bombing attacks on the most vulnerable objectives and *offensive* action by fighters. These operations will bring about the required air fighting, and once the enemy has been forced on the defensive in this way he may find it difficult to assume the offensive."

The same manual deals with the employment of fighters as follows:

"1. The role of fighter aircraft is to seek out and destroy the enemy aircraft while covering and protecting the freedom of our own. Protection by direct defensive measures alone is ineffective and uneconomical."

Experience has taught the British that aerial observation is vitally necessary to the operation of ground forces and that aerial observation can be maintained only by the aggressive action of adequate pursuit units. The denial of hostile observation is also highly desirable and, while the British doctrine does not specifically include this mission, it is implied in the directive, "to seek out and destroy the enemy aircraft while covering and protecting the freedom of our own."

The mission of pursuit aviation in the army zone of action then is twofold: first, to support all classes of friendly aviation and, second, to deny freedom of action to all classes of hostile aviation. Pursuit aviation, properly equipped and employed, is capable of accomplishing this twofold mission due to the relatively limited area of operations. Employment, as pointed out in the British manual, will depend upon the circumstances of the campaign but offensive action only will assure effective results.

Today the consensus is that pursuit has two broad functional missions: first, the denial of hostile bombardment and, second, the support of the operations of ground forces. It is also generally agreed that pursuit requires two types of airplanes for these missions.

For the denial of bombardment, an "interceptor" type is required. The interceptor should be light, have a high rate of climb, does not require a high degree of maneuverability and should have heavy guns capable of being fired accurately at long ranges at large, non-maneuvering targets.

For the support of the operations of ground forces, a fighter type with the maximum degree of maneuverability is required. The fighter need not have the maximum rate of climb but should climb as fast as observation airplanes. It does not require heavy armament as most of its combats will be at close ranges and of the maneuvering type. Rather than heavy guns, it should have small-caliber guns capable of extremely rapid fire. The fighter should carry more fuel than the interceptor to enable it to remain in the air for longer periods.

We have endeavored to avoid the expense and incon-

venience involved in the development and employment of two types of pursuit airplanes in the past by developing a compromise "interceptor-fighter" type, or all-purpose pursuit plane. Recent improvements in both bombardment and observation airplane designs indicate that this compromise type will be ineffective for at least one, if not both, of its two general missions. A highly specialized pursuit airplane is required for each mission. The interceptor with its high rate of climb, wide radius of turn and limited endurance is not suitable for close combat with maneuvering observation and fighter aircraft. Relieved from the requirement for close combat and violent maneuver, the interceptor may be built lighter with improved climb and slower landing speed.

The trend of technical development indicates that the time has arrived when a distinctive, highly specialized fighter airplane must be developed for the support of the operations of our ground forces. Failure to do this will result in those forces being compelled to attempt operations without adequate aerial observation while exposed to the attack of all classes of hostile aviation.

Certainly no commander would relish such a prospect, yet the German Army at the battle of the Somme in 1916 found itself in exactly this situation. With almost an equal number of airplanes, the German air service was helpless because a majority of their planes were not of the proper type and could not carry out the missions assigned them. Later, an insignificant number of single-seater pursuit fighters brought down from the Verdun front under the command of Boelcke, were able to restore a satisfactory measure of freedom of action to German observation and limit the operations of all classes of British aviation.

This situation may develop in the future unless the fundamental principles governing the functional employment of fighting type airplanes are thoroughly understood and timely measures taken to provide the proper types and trained personnel. Should we go to war today, eighteen months must elapse before we could furnish effective support for our aerial observation. Furthermore we could not prevent hostile aviation from operating freely in the army zone until our deficiency in fighter type pursuit could be remedied.

The pursuit complement of our G.H.Q. Air Force is designed primarily for the interception of hostile bombardment. It is neither large enough nor is it properly equipped for the support of ground operations. It consists of only three groups—as compared to a conservatively estimated requirement of nine groups for the support of four armies. Its principal mission is generally stated as follows: "To provide security from hostile aerial attacks upon our air force, airdrome areas or bases." Certainly a pursuit force of the interceptor type is required for this mission and it is equally certain that a force assigned this mission will not be available for other missions.

# Protection of Marching Columns

ONE of the vital problems of the next war will be the protection of marching columns of infantry against attacks by hostile aircraft. Our present antiaircraft defense is directed against hostile planes actually attacking. Antiaircraft machine guns placed in the column must deliver high-angle fire at short ranges. Motor vehicles can be utilized to place machine guns where they can fire effectively on attacking planes before they reach the marching column. Motorized machine guns can leapfrog ahead of the column by section, platoon, or company, and occupy positions with the mission of preventing hostile air attacks.

The route of march is reconnoitered by an officer, who has with him one or more men from each section of machine guns. The reconnoissance officer looks for terrain where hostile aircraft may attack the column successfully. He points out to a section representative the general location for the guns, leaves him on the road, and moves on. If the reconnoissance officer decides that more than one section of guns is needed for the defense, he leaves additional guides as required.

If the route at any place is such that the ground troops are unable to disperse quickly, as in cuts, on bridges or fills, or near streams or swamps, two or more sections may be required. Especially dangerous are those parts of the route where the troops are unable to disperse quickly, and there is concealment for the approaching planes. No effort is made to protect the column on roads winding through woods, in open ground where surprise attacks are impossible and dispersion is easy, and in similar places, unless sufficient guns are available.

At times the column may be operating alone or as a leading battalion, and contact with enemy ground forces may be expected. The problem of moving the machine guns far enough to the front to enable them to protect the head of the column then becomes difficult. It may be solved by sending a motorized combat patrol with the reconnoissance officer, and by adding riflemen to the machine-gun crews to assist in their defense. The guns would also be available for defense against motorized or mechanized forces. In such cases the movement of the reconnoissance officer ahead of the advance guard should be restricted to a maximum distance of about one-half mile. In dangerous territory, where contact is imminent, the size of the point and the advance party and their distance from the main body may be increased so that the machine guns will have a protected area of about 1,000 yards in which to operate. The reconnoissance officer would then locate the guns himself and dispense with the section guides.

The section guide stops the section when it arrives in trucks, and points out to the leader the general location of the guns. The gun position should be at least 150 yards off the road, out of the zone of attack of the hostile planes, and on a high point from which there is ob-

serva-tion and field of fire in the probable directions of attack. Covered or concealed positions for the guns should not be occupied. The hostile pilot, intent on attacking the column, is unable to put effective fire on a single machine gun out of his line of flight. Also, if the pilots locate the guns during their reconnoissance, it may discourage attacks. The guns are sited to fire on the attacking planes before the planes open fire on the column.

The position is occupied until the tail of the marching column has passed beyond effective range (about 1,000 yards); then the section entrucks and moves ahead along the route of march to a new position selected by the reconnoissance officer. If many moves are to be made, the reconnoissance officer must take with him sufficient guides, or devise a means of replacing those left behind.

A battalion with a machine-gun company of twelve guns can protect itself easily on ordinary terrain. A section can cover about one mile of the route and can move efficiently at least once an hour. This makes twelve guns available for each 2½ miles of the route of march. It will seldom be necessary to protect the entire route so that the strength can be increased in the more dangerous places.

The scheme of the antiaircraft defense here discussed should be effective against low-flying planes employing machine-gun fire and bombs (about 3,000 feet or lower). It is doubtful if any arms now in the infantry regiment will be effective at higher altitudes; likewise there is doubt about the accuracy of bombs dropped from higher altitudes on small targets. A plane flying one mile high at a rate of 200 miles an hour, must drop its bombs at a great distance from the target. So many factors of accuracy confront the bomber, that when we consider the precision methods of the artillery and the results, it becomes doubtful if an infantry column is a suitable target. Fragmentation bombs, persistent gas bombs and gas released from tanks would be the most dangerous weapons of the hostile air force, but to be effective they must be dropped on or very near the column. There would be casualties, no doubt, but it is questionable if they would be worth the risk and cost.

We hear that hostile aircraft will prevent all daylight marches in the next war. It is easy to visualize situations where half a regiment will be more valuable at noon than the whole regiment will be at the next midnight. One of the most difficult problems of modern warfare is the massing of large bodies of troops quickly so that a concentrated attack can be made. Days, hours, and even minutes will be valuable, and the daylight hours may have to be utilized. An efficient defense against hostile aircraft will drive them to such high altitudes that troops can be moved in daylight, with a minimum of casualties and delay.



*A unit umpire, wearing white hat band, with regimental commander as unit moves forward*

## Modern Umpiring

Photos by Signal Corps, U. S. Army

By MAJOR WILLIAM HONES  
Infantry

THE average officer has frequently been called upon to umpire in some form of field exercise. When this duty arose he rustled a copy of the exercise, plus a list of the controlling signals and, thus equipped, sallied forth to assist in making that Red-vs.-Blue contest a tactical success. Once in the field, he followed the action with interest, but with his weather eye eternally on the alert for *errors*, *ERRORS*, *ERRORS*. These he cherished against that inevitable time of reckoning—that period of terror—that “razz-fest” disguised as a critique, at which all the worthy umpires would attempt to justify their existence by putting the bee on those whose actions they had followed. Woe to the umpire who failed to reveal little errors, medium errors, big errors. Forthwith he became a pariah among his fellow-umpires, for his action struck at the very roots of the ancient and popular fallacy that the job of umpiring presupposes great tactical knowledge.

Now the umpire system devised for and operated during the First Army Maneuver last August took much of the curse off this venerable institution. Emphasis fell squarely where it belonged—on the *control* and *training* of the participating troops. Errors were paid for on the spot but not by ruling out 20% of a command for the duration, as you shall presently see. The critiques did not resemble the blistering talkathons of yore where only a commander's unborn children escaped the grandiose tactical condemnations of umpires whose vision was limited to a microscopic segment of an action largely uncontrolled. An army was assembled to learn something about the business of war from actual experience on the ground—not from a conference 24 hours later. The First Army learned—and learned on the ground where it fought.

To learn something about the business of war from actual experience on the ground—not from a conference 24 hours later.

We are faced with the unequivocal fact that umpiring must be recognized and included as an integral part of our tactical instruction, if we hope to derive the maximum training values from our annual field exercises. The methods we adopt must be based on the fundamental idea of effecting a tightly-knit control of both the problem and the participants. At the same time simplicity must be preserved lest our system become so complicated that it bog down the exercise. The umpire system developed for the First Army Maneuver takes a long stride in the right direction. It is not considered perfect but it is *known* to be highly workable. Improvements will and should come.

When preparations for the First Army Maneuver were well under way, the G-3 section of the army staff cast about for pertinent information on umpiring. Three sources were available: the War Department's *Manual for Umpires of Field Maneuvers*; The Infantry School's mimeographed instructions on umpiring; and the personal experiences of the officers of the section. It was soon discovered that the problem of umpiring a maneuver as large as this one required a good deal of imagination to supplement the available information.

Definite plans were not formulated until a careful study had been made of:

- (1) Maneuver directives of the commanding general, First Army;
- (2) Exercises drawn up as a result of those directives;
- (3) Troops participating in the maneuvers (number,





An area umpire followed by his flagman

branches, and components represented, state of training, etc.);

(4) The maneuver terrain;

(5) The Regular officers available for duty as umpires (numbers, branches, etc.).

The first difficulty occurred in the selection of umpires. All available officers had been well picked over. Much of the best umpire material had already been assigned to other duties. In future maneuvers this procedure should be reversed; umpires should be selected before any other assignments are made.

Work now began on a pamphlet of "Instruction for Umpires." Although the finished product will undoubtedly be regarded as crude and inadequate in future years, it does provide a sound ground-work for further development and it does set forth the best thought and best material available on the subject at the present time. It must be remembered that each maneuver needs its own particular set of instructions for umpires. The 1935 vintage is merely a guide for the present and a basis for the future.

The first week of August found 150 student umpires assembled at army headquarters at Pine Camp. Here, for the first time in the history of our military service, a well planned school for umpires was inaugurated.

The school was conducted in a large assembly tent, in which a 9' x 14' map of the maneuver area (scale 12 inches = 1 mile) had been prepared in the manner so familiar to those who have sweated blood during the open season on monographers at The Infantry School.

Scheduled instruction provided the necessary background for student umpires. Humor and the urge to get acquainted, two vital elements that are often frowned upon or entirely neglected in our schools, were utilized to the utmost and with marked success.

In the background persisted the governing thought that the umpires must bear an absolute good will toward their duties—that they must not be irritated, worried over their jobs, pressed or harassed. Instructors brought humor into their work to give an air of informality, thus melting that reserve which many men bear toward a

school. The class responded splendidly.

Instruction covered the history and development of this particular maneuver, the umpire system, study of the maneuver terrain, the duties of the various classes of umpires, signals, transmission of information, decisions, the communications system, a study of each exercise, and a detailed reconnaissance of the terrain for each exercise.

At the opening of the school, all umpires were given definite assignments that held throughout the maneuver. By the end of the course every umpire was thoroughly familiar with each exercise and its terrain. He also knew the governing "Umpire Instructions" and the scheme of communications. After that each officer drew on his background of military experience, his initiative, and his native intelligence—and the system worked.

The organization is shown in the accompanying diagram (top of next column). Subsequent experience has indicated that it would be better to have only one deputy chief umpire, neither Red nor Blue, junior to and operating under the chief umpire, with the umpire groups reporting directly to the latter.

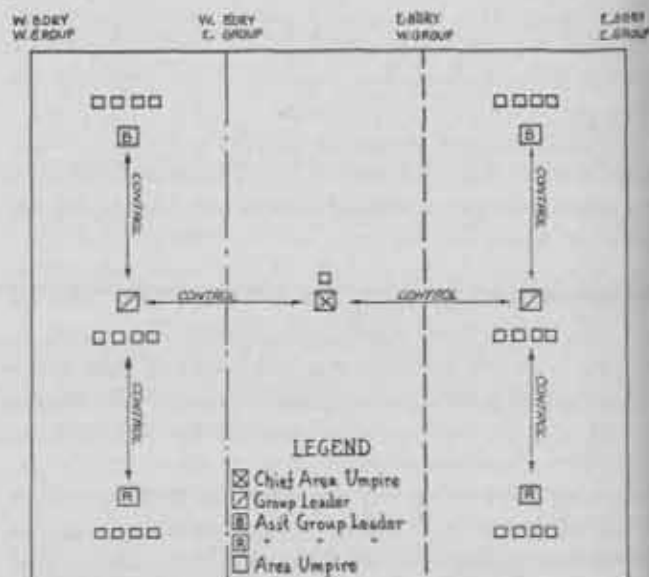
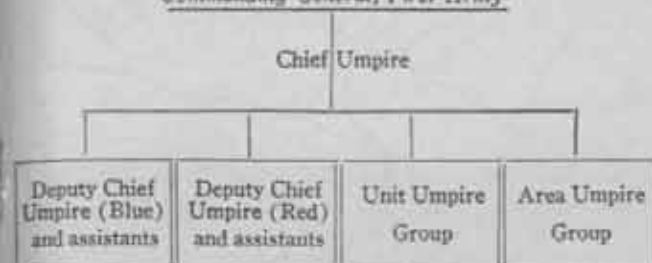


Figure 1

*Commanding General, First Army*

Communication from the two umpire groups was routed directly to either (or both) of the deputy chief umpires.

With the close of the school and the arrival of the troops, the unit umpires joined the organization to which they were assigned. The deputy chief umpires with their assistants, and the area umpires, moved to a camp established by the 1st Squadron, 3d Cavalry, near the center of the maneuver area at Sterlingville. Here they settled themselves in a group of tents equipped as offices. In a large assembly tent, a board had been installed with a 9' x 14' map on each side—one map for each deputy chief. The umpire telephone switchboard, the mess, the living quarters, etc., were set up close by.

Before going further, it may be well to describe the classes of umpires mentioned and define their duties.

The chief umpire, at army headquarters at Great Bend, was responsible for the smooth functioning of the entire system. He made major decisions influencing the progress of the maneuver.

The two deputy chief umpires (Red and Blue) at the control office in Sterlingville, plotted on their big maps all information of the warring factions as fast as it came in from the front. They made decisions affecting their respective sides. Each had a group of officer assistants to plot the maps, assist in decisions, act as trouble shooters, keep records, etc. From here, direct telephone lines led to the headquarters of the army and two corps, and through them to the permanent camps of the five divisions and the air squadrons at the field near Watertown. A message-dropping ground, for the use of the umpire planes, was located near the deputy chiefs' office.

A unit umpire was assigned to the headquarters of each division, each brigade (infantry and artillery), each regiment (infantry, artillery, and engineers), each battalion of field artillery, and to the air field. These officers lived with the units to which assigned and reported to the deputy chiefs all orders issued by those units. In the exercises each umpire checked his unit across the control line to prevent it from "jumping the gun." When the action began, they promptly reported any new orders issued, the location of the reserves and command posts, the position of all weapons (machine guns, howitzer-company weapons, artillery), the times and places that columns halted, etc. When their units contacted the enemy, they went forward and located the area umpire in their front and advised him of the situation in his rear.



*Umpire switchboard at Sterlingville*

The umpires with the artillery battalion accompanied their units into position, checked the position selected to see whether the assigned missions could be fired from them, and checked the laying of the guns. They then rode across country to the area into which the guns of their battalion had been ordered to fire and assisted the area umpires by marking localities under fire.

In the front lines, where the theoretical bullets whistled, the area umpires held forth. In addition to the white hat-band worn by all umpires, area umpires wore a white band passing from front to rear over the left shoulder so that they could be readily located from a distance. They stalked about indicating the actual fire of the front lines—the rifle and machine-gun bullet, the explosion of the hand grenade, the bayonet thrust, and the burst of the 37-mm. projectile. Each controlled the action of a front-line battalion. In training, they had been assigned to overlapping areas, each group making a thorough and painstaking reconnaissance of its particular area and ignoring the adjacent area.

The chief area umpire controlled the two groups (east and west), each of which operated under a group leader. These groups had been divided into two sub-groups (Red and Blue) under assistant group leaders (see schematic diagram, Figure 1). The chief area umpire was

<u>UMPIRE REPORT</u>	
Exercise No. <u>4</u>	August <u>18</u> 1936
Umpire (name and rank) <u>Jones, Maj.</u>	
Assigned to <u>3d Bn., 390th Inf.</u>	
Report No. <u>21</u>	Location <u>RJ 117, Sq. 15</u>
Hour <u>11:44</u> <u>A.M.</u>	
<u>Head column, 390th Inf.</u> <u>at RJ 117 Sq 15 at 11:40</u> <u>A.M.</u> <u>1 Btry Art., C.P. 390th Inf.,</u> <u>as shown other side.</u>	
Prisoners: <u>12 lost to 412th Inf.</u>	
Dead: <u>27</u>	
Wounded: <u>38</u>	
Were troops acquainted with the situation? <u>Yes, except KE 390</u>	

Front

Figure 2

Back

Umpire report form

furnished a station wagon equipped with extra supplies, telephones, etc. Each of the two group leaders were also given a station wagon and, in addition, one of the three radio-equipped trucks borrowed from Company F, 67th Infantry (Medium Tanks). The third radio-equipped truck, located outside of the office of the deputy chief umpires, maintained contact with the two mobile trucks.

All of the other thirty area umpires were mounted. Each one was assigned a mounted messenger and a mounted flagman. The messenger carried two panels (type AL-121) and the flagman four flags (to be described later).

These area umpires, like the deadly projectiles whose effect they represented, arbitrarily ruled the front lines. They decided whether Reds or Blues could advance or must retreat. They heeded no arguments advanced by discontented combatants, nor offered any apologies. When a machine gun kills your men in actual warfare, the fact that you are certain that the enemy couldn't fire on them, or that friendly troops wouldn't fire on them, avails you nothing. The fact remains that the men are dead, regardless of who killed them. Like the decision of the machine gun, the decision of the area umpire had to be final.

Every hour on the hour all action ceased for twenty minutes, and each area umpire displayed his panels, in the form of a letter V, in front of the center of the battalion whose action he controlled. The V pointed toward the enemy and remained in position for twenty minutes to be observed, or photographed by umpire airplanes which had sole use of the air for that period.

The flagman of each area umpire carried four flags—red, white, blue, and white with a red square in its center. The flags, 36" x 40", were mounted on six-foot staffs. The red flag controlled the movements of the Red force, the blue flag the Blues. The white flag indicated "Cease all action." The white flag with the red center meant artillery fire, and any unfortunate unit that found itself within 150 yards of this (when it was displayed) was adjudged under artillery fire.

The flag signals originally adopted were similar to those used at The Infantry School, *i.e.*, "red (blue) flag, vertical and advancing: Red (Blue) has fire superiority and can advance in short rushes of not to exceed one squad to line abreast of point where flag halts. Blue (Red) cannot advance," etc. These signals are all very well for demonstration troops such as those at The Infantry School, who daily wage war against Blue (Red)



Wounded

flag enemies. But, in the First Army, with its short period of training for troops wholly unacquainted with this ritual, these signals had to be discarded after one trial. The single signal, "red (blue) flag displayed: Red (Blue) can advance (or must retire) to line abreast of point where flag is posted, if proper methods be adopted," successfully replaced those discarded.

The Signal Corps, under the direction of the chief area umpire, established 19 telephone lines for the umpires from the switchboard at Sterlingville to points in that part of the maneuver area in which contact was certain to occur. Ten enlisted men of the Signal Corps connected the telephones and manned the stations designated for each problem. Each telephone operator had a Klaxon siren for summoning umpires to the telephone. Unfortunately, the Klaxon signals could not be heard above the din of battle and were discarded after the first day.

Motor messenger routes were planned to handle written messages. A preliminary study of each exercise indicated that all action would take place within a certain, well defined area. Based on this, the chief area umpire announced the messenger route for each day. Of the three routes used throughout the maneuver, each operated with three station wagons. A white cross on the radiator of each vehicle indicated that it belonged to the umpire system.

Once a route had been established it was not changed during the day. Two of the three station wagons covered it in a clockwise manner, while the third traveled counterclockwise. Each trip began and ended at the same message center at the office of the deputy chief umpires.

Drivers were instructed to pick up all messages handed to them, stop at each operating telephone station for messages or instructions left there, pick up only umpire personnel, and continue on the assigned route unless the chief area umpire directed otherwise.

The large maps of the deputy chief umpires were divided into squares numbered in red. Numbers were given to all road junctions, crossroads, hills, stream crossings, stream junctions, etc. Unnumbered terrain features on the Geological Survey maps, from which the enlargements had been made, were arbitrarily numbered for purposes of identification. Every umpire was issued a special tactical map of the maneuver area (scale 1:62,500). This tactical map was divided into squares numbered in red; terrain features were numbered in exactly the same fashion as described above. This expedited the rendition of reports. For instance, instead of reporting an incident "just north of unnumbered road junction 1600 yards northwest of RJ 532 (600 yards north of Strickland Corners)," this simplified map made it possible to report the incident as "just north of RJ 111, Square 14." When this terse bit of information reached the office of the deputy chief umpires, square 14 on the 9' x 14' map was quickly located, and in it RJ 111.

The umpire report form (see Figure 2 for both sides) proved to be another innovation that saved time and made for greater accuracy. Each umpire carried a sheaf of these forms. A few marks on one of them conveyed a wealth of information to the deputy chief umpire.

Although prisoners were captured, the umpires returned the majority to their respective outfits, giving due credit to the captors on report forms. The captors were



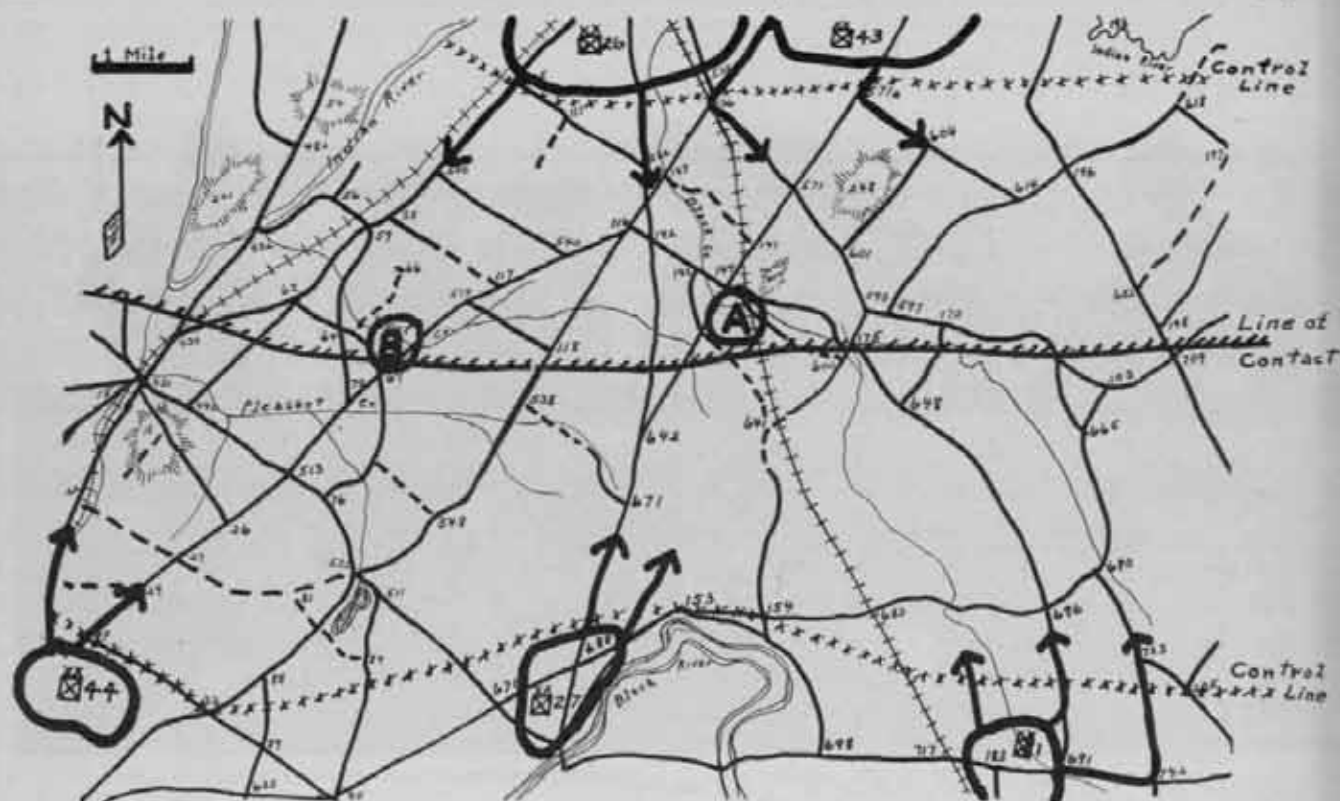


Figure 3

permitted to retain only an occasional prisoner in order to give the intelligence boys some victims to work on.

Theoretical casualties were duly charged up to all units.

The handling of the "wounded in action" proved to be unique and sensible. In a field exercise it is customary to penalize units that fail to adopt proper tactical methods by ruling out certain men as "wounded." By virtue of their theoretical wounds, these men are thereafter out of the action and lose all further training. How often have our hearts bled at the ghastly spectacle of groups of "severely wounded" by the side of the road. Resting comfortably in the shade, they merrily wise-cracked at their less fortunate comrades who plodded on through the dust and heat toward the enemy.

To prevent just such incidents, twelve men were selected daily from the leading battalion of each infantry regiment. This battalion had a full-strength medical detachment to handle casualties. An umpire with twelve prepared tags, each describing a certain type of wound, picked out twelve victims at random and tagged them. He then directed the men to fall out by the side of the road to be handled by the Medical Department personnel. Severely wounded, as indicated by their tags, were evacuated to the rear, through the various medical channels, and hospitalized. Slightly wounded were returned to their units after treatment. In addition to the normal maneuver duties of treating a few emergency cases and issuing the well-known CC pills and iodine, the medicos were thus afforded an opportunity to solve such problems as would confront them in war.

Wounded, dead, and prisoners having been assessed against a unit, it carried on with its *theoretical* reduced strength. To a casual observer it may have appeared that the 1st Battalion of the Nth Infantry had 230 men available for an attack, but the area umpire on the spot knew that only 170 men were present for duty—his report forms told him so. The battalion commander knew that 60 of those present were only ghosts of men who had once stood in his ranks because that absolute dictator, the area umpire, said so.

The exercises allowed sufficient time for the preparation and distribution of orders. This permitted all information to be thoroughly disseminated; even Private John Doughboy, in the rear rank of the last squad, always had a pretty good idea of what the war was all about. The chief area umpire made a tour of the maneuver area prior to the playing of the first exercise and explained to the assembled officers of each division the detailed organization and operation of the umpire system. All participants were thus given first-hand information of what to expect from the umpires. This, of course, made for that co-operation so vital to the success of the maneuver.

Having discussed the details of the operation of the umpire system, let us now apply that system to a particular exercise. The I Corps (Blue, north) consisting of two divisions, and the II Corps (Red, south), consisting of three divisions, have been assigned missions which will bring about contact along the line marked CONTACT on Figure 3. Control lines, which cannot be crossed until a certain specified time, have been designated (lines marked XXXX on map).

It being obviously impossible to follow 150 umpires all over the field, we will confine our attention to two individuals, Major U, a *unit* umpire, and Major A, an *area* umpire.

Prior to the opening of the exercise, Major U, who is attached to the Nth Infantry of the 44th Division (south-western corner of map), learns from the unit umpire with the brigade just what orders have been issued by the brigade and by the 44th Division. (This information has been reported by the respective umpires to the deputy chief umpires at A.) He then listens to the orders of the regimental commander and transmits them to the deputy chief umpires.

At the deputy chief umpires' office (A on map) copies of all orders have been received. The story, plotted on the 9' x 14' map, shows that Red (south) will march in seven columns and Blue (north) will march in four columns (see arrows on map). The 44th Division, with which we are concerned, will march in two columns. Based on this information, and with a knowledge of the exercise, the chief area umpire and his two group leaders decide upon the establishment of the motor messenger routes. Area umpires are at once dispatched to take the drivers over their respective routes. The chief area umpire and his assistants then decide which telephones will be connected initially, and notify the Signal Corps. All umpires are informed of the motor messenger routes and of the initial establishment of the telephone stations. Each group leader makes his plans for the distribution and assignment of his area umpires according to the situation in his particular area. Our friend, Major A, is a member of the West Group of area umpires. His group leader informs him of orders issued by the participants and tells him that he (the group leader) will be, initially, at CR 69 (point B on map). He directs Major A to be at RJ 30 (point where east column of 44th Division crosses its control line) at 7:00 o'clock on the following morning.

Seven A.M. finds Major A with his messenger and flagman at RJ 30. All three are mounted. At 7:15 he notes the advance guard of the Nth Infantry approaching. It is accompanied by Major U who sees that no one crosses the control line before 7:30 (as prescribed in the exercise). When the leading element crosses the control line, Major A joins the head of the column and Major U drops back to join the regimental commander.

The column advances without incident until CR 27 is reached. At this point Major U comes forward and tells Major A that the regimental commander has directed the last battalion in the column to leave the column at RJ 26 and move across country to RJ

76. Major A knows that Telephone Station No. 12, at CR 513, is in operation, so he prints a message to his group leader, setting forth this information, and sends it to the telephone station by his mounted messenger. The telephone operator transmits the message to the group leader (at B). When the column reaches RJ 26, another umpire will be on hand to accompany the battalion that is leaving the column at that point.

At 8:00 all movement ceases for twenty minutes. Major A directs his flagman to set up the white flag and display the two panels in the form of a V at the head of the column, pointed toward the northeast. An umpire plane appears overhead photographing the white V's displayed on the landscape. At 8:20 the white flag is lowered and the advance continues. As the column approaches CR 513, Major A observes that that CR is visible to enemy observers on the high ground north of Trout Brook. He concludes that Blue artillery fire could and might be brought to bear on CR 513. His flagman is ordered to place the white flag with the red square (indicating artillery fire) in the center of the crossroads, and an area of 300 yards in diameter is theoretically under hostile artillery fire. The column is forced to the fields. Major A goes to the telephone and informs the office of the deputy chief umpires of the location of the head of the column and of the artillery fire.

The march continues. Near RJ 70 the point is fired upon by the enemy from the vicinity of CR 64. Major A notes this on an umpire report form. The mounted messenger gallops back to CR 513 and hands the report to the telephone operator with instructions to give it to the motor messenger when he passes. Major A rides forward and meets the area umpire assigned to the force opposite him. They compare notes, discuss the situation



The group leader's radio

and decide what course of action should be adopted in each of several eventualities. Major A then rejoins the battalion.

It soon develops that the Blues are hesitating. The Reds, on the other hand, have acted promptly and pushed their entire advance guards forward in an approved manner. The machine guns of the Reds are quickly brought into action to cover the advance. Major A goes forward and again meets the area umpire with the Blues. They decide that Red can advance. The red flag is moved forward and displayed. The blue flag is carried to the rear and displayed. Red can now advance to the line marked by the red flag, if proper measures are taken. Blue must retire to the line marked by the blue flag.

In order to determine the exact situation and to confer with other area umpires, Major A frequently displays the white flag to halt the action. But despite these delays, the action is progressing with greater speed than it would in actual warfare. The area umpires arbitrarily indicate when and where artillery fire is falling by the display of artillery flags. This teaches the infantry to use cover and to avoid areas that might come under artillery fire.

Finally the unit umpire of that Blue artillery battalion, whose job is to shoot up the area in which Major A is operating, appears on the scene and begins marking these areas where artillery fire is theoretically falling. Prior to this Major A had been marking localities where he *thought* artillery fire might fall, but this newcomer eliminates guesswork; he has data of the Blue artillery and therefore *knows* where the fire will fall. Meanwhile, Major A continues to keep the deputy chief umpires abreast of the situation either by telephone or by appropriate data on his report forms which he dispatches by motor messenger.

Major U, at regimental headquarters, listens in and promptly reports all pertinent information to the deputy chief umpires. Normally he utilizes the messenger routes and the umpire telephone system, but in exceptional cases he uses the tactical wire of the unit, through its division headquarters to the trunk lines. From time to time Major U goes forward and tells the area umpires with the front-line battalions what is going on in his sphere of activity in the rear. The unit umpires with the brigade and division do likewise.

Major A's group leader is a busy man. He has a telephone station established at CR 69 (see B on map). One or more area umpires, with mounts and orderlies, are in reserve there. Again and again he makes the prescribed circuit of his area. En route he checks the activities of the umpires in his group, replaces unserviceable equipment, supplies additional report forms, picks up messages, and coordinates the work. A radio truck follows the group leader as he tears about the area in his station wagon. Near RJ 434 the driver of the radio truck honks the horn and both vehicles stop. The group leader hurries back to the radio, adjusts the head set and receives a radio telephone message from the deputy chief umpires. On he goes.

Near RJ 440 he notes a farmer engaged in an argument with a captain of artillery whose battery is located in a nearby field where "OFF LIMITS" signs adorn the fence posts.

"What's going on?" asks the group leader.

"These men have put their cannons in my field," replies the irate farmer, "and it ain't rented for this here sham battle, neither."

"Come, come, Captain," says the group leader, reaching for a report form to record the words that will burn holes in the captain's pay check, "you know better than that. You have had instructions to keep out of fields marked 'OFF LIMITS.'"

The captain is eager to explain. "Major, I saw that this field was off limits, but that was such a swell position for my battery that I couldn't pass it by. I asked this man's wife if I could put my battery in that field and she told me I could."

"Will you please call your wife?" asks the group leader. The farmer summons his wife from her housework. She gives a startled look at the 75's in the field.

"Sure," she confides, "I told this here young man he could put his battery in that field, but I thought he meant one of them batteries like we hev on our radio. I didn't say nothin' about cannons."

This is ironed out. The "cannons" are moved, the farmer is pacified, and the group leader hurries on.

Meanwhile the deputy chief umpires and their helpers are not catching up on any lost sleep. Motor messengers bring in sheaves of umpire report forms. Umpire planes drop more reports, the telephones ring interminably, and the radiotelephone maintains the tempo. Trouble shooters are dispatched in motors to get some particular bit of information. News from front and rear is only a few minutes old when it is plotted on the big maps. The deputy chiefs observe the action as it moves across the maps. From time to time they make decisions; major matters and debatable issues are telephoned to the chief umpire for decision.

So much for this thumbnail sketch of the First Army's umpire system. The effectiveness of that system is attested by the commanding general of the First Army. He states, "The execution of the umpiring scheme during the exercises disclosed the soundness of the umpire instructions adopted."

To function successfully this umpire system must be adequately supplied with wire, motors, and mounts. Above all the chief umpire must be given virtually a free hand in selecting his officer-umpires. Even then his task is not easy for he must find officers who combine outstanding physical activity with such mental attributes as decisiveness, sound judgment, lively imagination, and an unflinching sense of humor.

Adverse comments directed at this umpire system were few and far between, and even those were usually without foundation. Of course, there is the newspaper story that an area umpire carrying a red flag was chased by a cow—but that's bull.

# Is Philippine Neutrality Practicable?

By MAJOR JOHN C. NEWTON  
*Infantry*

ON July 4, 1946, the Philippine Islands becomes a free nation. Meanwhile, after 37 years of parental direction, the United States has relinquished almost all control over the internal affairs of the Commonwealth. Only in regard to foreign relations has it reserved the right to intervene. Ten years hence, if all goes well, the last ties will be severed and a carefully nurtured young ram will run free among the wolves.

The seven thousand islands composing the Commonwealth are flung twelve hundred miles north and south. The most northern is one hundred sixty-five miles from Taiwan (Formosa) and the most southern thirty miles from British Borneo.

Situated as they are, they screen the coast of Asia and the water approaches to that tempestuous continent. The Philippines possess much that is attractive, but in the eyes of the powers their greatest charm is geographical. He who possesses the Philippines is in a favorable position to dictate the future course of the Orient.

The Commonwealth must look to its defenses. To guard against aggression there has been planned a regular force of 19,000 men, trained reserves, and the spare parts which make up modern armies.

A number of leaders of the Commonwealth believe that their future freedom can be guaranteed by the great powers having interests in the Far East. They submit that their situation is so important, commercially and strategically, that it would be cheaper for all concerned to leave them alone, lest possession or attempts to possess cause another danger spot on the face of the troubled world. In line with this policy, the President of the United States has been asked to negotiate with foreign powers for a treaty which shall guarantee the perpetual neutralization of the Philippine Islands when real independence shall have been achieved.

One does not have to be an historian to question the value of a neutralization agreement. When national interest conflicts with a promise, the memory of a nation is as fleeting as that of a mirror. Perhaps a brief study of the history of similar agreements will indicate the degree of faith that may be placed in this safeguard.

The first complete plan for the establishment of a form of perpetual neutrality was embodied in the Treaty of Amiens in 1802. The British had captured the island of Malta from the French during the Napoleonic wars, and in the territorial adjustment incident to the proposed peace, neither nation was willing to renounce its claims. As a compromise, it was decided that Malta was to be given to the semi-religious order of the Knights of St. John, who had possessed it from the seventeenth century to 1798, when France had seized it from them.

**When national interest conflicts with a promise, the memory of a nation is as fleeting as that of a mirror.**

This treaty provided the Maltese with the protection of Great Britain, France, Austria, Spain, and Portugal. To a small defenseless country such protection was a trifle more than ample. Perpetual neutrality was then proclaimed. The British were to evacuate their troops within three months.

In this spring of 1936, a traveling Filipino will note with interest that on the battlements against which stormed Suleiman the Magnificent, the troops on guard are still English. The fleet of the Lion still rides easily at anchor in the roadstead of a possession of the Empire. So much for Malta.

The Swiss Confederation is widely heralded as a state enjoying the blessings of permanent neutrality. Switzerland has engaged in no wars for 120 years. One might assume from this that the great powers occasionally respect neutrality agreements. They do, but there is always a reason. The natural defensive strength of this little mountain state with its heavily fortified passes may have had something to do with their observance of this one. Moreover, the Swiss seem to have accepted the assurances of permanent neutrality guaranteed them by the Congress of Vienna in the spirit of caginess for which they are famed. Be not deceived by the mildness of the waiter at the Grand Hôtel d'Angleterre; he is a capable soldier and an excellent shot. At Geneva, that porter trundling the luggage of assorted statesmen bent on peace, is a sergeant of machine guns—a good one. He believes in peace, he believes in neutrality, and he also believes stoutly in bands of interlocking fire as a first-rate method of preserving the same. If you have any doubts as to his abilities as a fighter, dismiss them. Europe has none at all.

The Filipino may well survey the example of the Swiss Confederation. Here is a warranted neutrality backed up by large quantities of ability to give a considerable headache to any army desiring to end the *status quo*.

The most publicized invasion of a neutral state was Germany's 1914 jaunt through Belgium. Belgium had been forcibly brought to statehood during the period 1830-39 by a group of European nations actuated by mutual suspicion, jealousy, and a desire to check the growing influence of France on the continent. In creating a neutral barrier state, one of the aims was the *protection of the Germans*. The aims in creating neutralized Luxembourg were somewhat similar.

A candid diplomatic sense of humor must have been



tickled as the grey outriders of the Duke Albrecht galloped across the border to meet the troops of a neutral state fighting to protect France—the country it was designed to curb!

The Philippine Commonwealth may note this statement in the Treaty of Versailles: "The treaties of April, 1839, which established the status of Belgium before the war no longer conform to the requirements of the situation." This is a high-sounding manner of saying that when requirements of perpetuity cease to exist, neutrality falls of its own weight.

The United States has taken two flyers in the ethereal realm of *haut politique* as applied to neutrality. The first of these was as a member of the International African Association, which was recognized as the *de facto* government of the Congo Basin. We participated in the effort to create a perpetual neutral state of the 900,000 square miles of mid-Africa, now a Belgian colony. Leopold of Belgium, chairman of the governing executive committee of the Association, used his position to further Belgian influence and power in the river area and Belgian control of governmental and private enterprise became paramount. The King's personal purse was extensively involved but eventually the projects assumed such magnitude that Leopold was unable to finance further development. Forthwith the people of Belgium became shareholders. The bonds of Belgium became closer and closer until, in 1908, annexation of the Congo Basin was formally announced as an accomplished fact.

Although we had been a party to the perpetual neutrality agreement, we made no objection. Then, as now, we had no desire to become involved in European controversies.

The leaders of the Philippine Commonwealth may well devote some thought to this example of what happens when a foreign power is given extensive opportunity for the development of natural resources of a weaker country. It results in the "adoption" of the land—the beneficent power disregarding neutrality covenants when they conflict with expedience or with its "place in the sun."

Located in the south Pacific are the Samoan Islands, to most of us a tropical pudding composed of palm studded atolls, languorous maidens, and seasoned with a slight dash of beachcomber, errant missionary, and renitance men. Unfortunately for the Samoans, the chancelleries of the world are full of gentlemen devoid of romance. Languorous and dusky maidens are not permitted in their official lives. The gently-waving palm trees left them unmoved, but they *did* like the harbors of

Samoa, since in no other part of that region of the Pacific were such to be had. A naval base was indicated for Samoa—likewise a cable station.

After some years of commercial relations with the Samoans, the United States acquired a naval station on the island of Tutuila at Pago Pago (pronounced Pango Pango—a minor oddity). Germany had also established commercial relations and was toying with the idea of annexation. The threesome was complete with Great Britain, for she also had visions of adding this tropical pearl to the imperial necklace. In the years preceding 1889 the three countries jockeyed for position and commercial privileges, until finally a German and an American man-of-war faced each other in Pago Pago Bay.

Serious international complications threatened, but in March of 1889 these warships were sunk in a tropical hurricane. This paved the way for a discussion of the differences in a more friendly spirit. After some diplomatic exchanges, the three nations signed an agreement stipulating that the islands were to be "perpetually neutral" territory—the subjects of Great Britain, the United States, and Germany, to have equal rights of residence, trade and protection. It was apparently expedient to make some mention of the Samoans, so it was announced that they were to receive "freedom, independence, and the right of choosing their own rulers in the manner to which they had been accustomed."

After ten years of futile effort to run the islands on this basis, a bold division was decided upon. The United States received Tutuila, Germany got the rest, and Great Britain was compensated by Germany in another sphere. The Samoans got a little additional civilization, exemplified by more missionaries, pants, and the common head cold. This share of the Samoans should be viewed closely by the Filipino, since he is interested in schemes of perpetual neutrality.

A new nation, taking out a stack in the poker game of *real politik*, should keep in mind the character and past reputation of the players. Those polished gentlemen toying with their ships, who are they? Their prototypes are Bismarck, Talleyrand, Metternich, Cavour, and Baron Tanaka. The houseman and interpreter of the rules is Machiavelli.

With such playmates, only a grim and polite realism backed up by willingness to draw and shoot at any sign of crookedness, will insure the integrity of the little fellow's stack. He must, like the Swiss, make it a highly questionable undertaking for anyone to attempt to slip him one off the bottom of the deck.



THE CASUAL OBSERVER sees wars continue to be waged in various parts of the globe. He sees that when treaties clash with national ambitions aggressor nations do not hesitate to disregard their treaty obligations. America cannot afford to relax her vigilance.—PERSHING.

# Bombardment of the Hartlepoons

By CAPTAIN W. A. MURLEY, M.C., R.A.

EDITOR'S NOTE: A short account of the bombardment of the Hartlepoons by Colonel L. Robson, C.M.G., D.S.O., V.D., appeared in the May, 1922, issue of the COAST ARTILLERY JOURNAL. Because of its importance and absorbing interest to all Coast Artillerymen it is believed that a more detailed account of the action should be published. Colonel Robson was fire commander at the time of the engagement, therefore he was in the very best position to give a detailed description of what actually took place. Captain Murley's article is based on Colonel Robson's report, other official documents and the statements of eyewitnesses.

This article is an adaption from the original which was published in the October, 1935, issue of the *Royal Artillery Journal*. To the Editor of this publication we are indebted for permission to reprint.

The outstanding lesson to be learned from this minor action is the fact that two small batteries, mounting minor caliber armament, suffered very slight damage and were able to continue firing after being treated to a veritable rain of shells from high-powered naval guns at almost point-blank range, a further proof (if any be needed) of the efficacy of seacoast batteries.

ON the memorable morning of December 16, 1914, the ancient towns of Hartlepool and West Hartlepool were the recipients of some special and unwelcome attention from a German battle cruiser division. It is believed that a brief narrative of the artillery action which, although a mere incident of the war, is of historic interest because it was the only occasion when enemy ships ventured within the range of our seacoast batteries. Also a study of this "hammer and tongs" action between forts and ships will be of absorbing interest and value to all Coast Artillerymen.

The old town of Hartlepool is situated on a promontory just north of the wide entrance to the River Tees. Lack of space prevented expansion of its boundaries and resulted in the rapid growth of its younger sister, West Hartlepool. Although closely adjoined the towns are entirely separate, each functioning under its municipal government with its boundaries clearly defined. In 1914 the combined population was approximately 91,000. Hartlepool was a busy place, it being the home of a large fishing fleet, while the advent of the war had greatly increased its normal activities which numbered six docks (including the Victoria Dock), four large timber yards, several ship-building plants, three storage tanks of the Hartlepool Gas Company and many other commercial enterprises. The geographical location of the Hartlepoons is significant for the reason that the excellent harbor was separated from Heligoland by only 330 nautical miles, 12 hours steaming time, which during the winter months could be covered under the cloak of darkness.

## THE OBJECT OF THE BOMBARDMENT

The northeast coastal towns were the first to receive the attentions of the enemy. Yarmouth had been bombarded early in November for no apparent reason, characterized by Mr. Churchill as a "silly demonstration." Perhaps an inkling as to the inner workings of the German logic may be gleaned from the writings of Admiral Scheer in which he states:

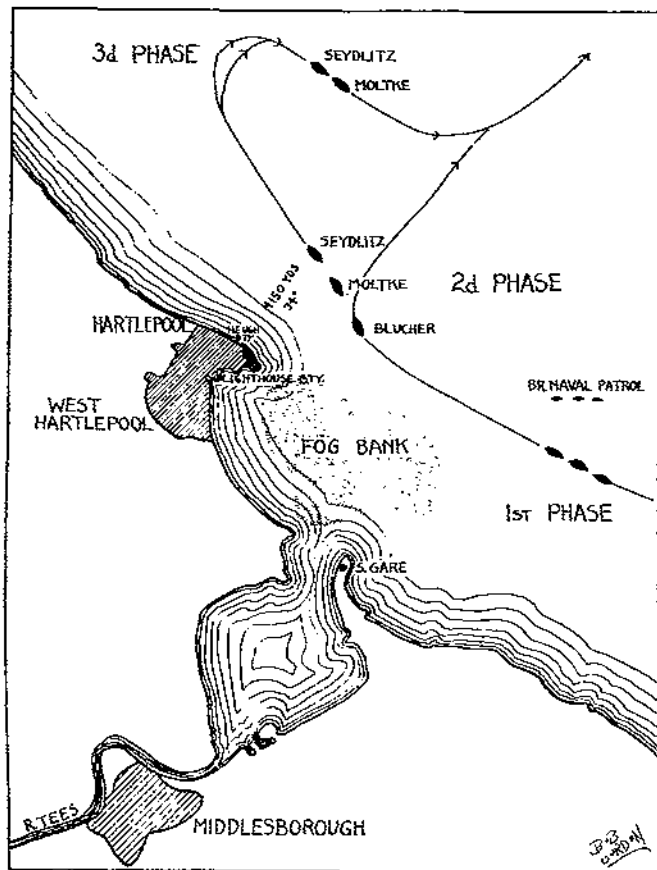
In the first months of the War many efforts had been made to conduct our operations in such a way that would cause the enemy such losses as would enable us to speak of a real equalization of forces but in vain, the results of our mine laying were unknown while the successes of our submarines did not weigh much in the scales as the ships that they torpedoed had no fighting value. On the other hand raids by our cruisers were much more likely to bring considerable portions of the English fleet out of their harbors and thus give our fleet a favorable chance of intervening if kept in close touch with the cruisers. . . . On December 15, the big cruisers under the command of Vice Admiral Hipper sailed under orders to bombard the fortified towns of Scarborough and Hartlepool and to lay mines along the coast for there was constant traffic between the east coast ports.

It is highly probable that the decision to attack Hartlepool was influenced by other factors. Incidentally Hartlepool was the only town selected for bombardment which could be classed as a "fortified town" and its fortifications were of a secondary nature as will be pointed out later. There may have been other motives prompting this action. At that time there were strong rumors of a German invasion. That this was not treated lightly is evidenced by the defensive preparations initiated by Lord Kitchener and Lord Fisher; also, about this time Kitchener's "first hundred thousand" had completed their training and were ready for dispatch overseas. It is, therefore, not unlikely that one of the reasons for the German demonstration against the east coast was to cause a public demand that Kitchener's army be kept in England for home defense. If such was the intention it had quite the opposite effect, for one of the most notable results was the rapid rise in recruiting figures, not only in the bombarded areas but throughout the country.

## DEFENSE ARMAMENT

The main defenses of the Hartlepoons consisted of Lighthouse Battery and Heugh Battery. Both were situated on the point of the promontory north of the Tees River and within 150 yards of each other, being separated only by a pathway which formed the battery boundaries on the seaward side. Lighthouse Battery on the south side of this pathway was built in 1855, seven years after the lighthouse (from which it takes its name) was erected. For some unexplainable reason the battery was located about 25 yards south of the lighthouse, which blanketed a part of its field of fire on the left front. This dead area was approximately 16 degrees. This circumstance greatly interfered with the proper functioning of the battery. The original armament of this battery consisted of four 64-pounders. These were replaced in 1907 by a single 6-in. breech-loading rifle.

Heugh Battery on the north side of the pathway was built in 1859, and its two 6-in. breech-loading guns were mounted in 1899. Both batteries were low-sited, being



The three phases of the attack.

approximately 50 feet above mean sea level. With a total of three 6-in. guns the two batteries represented the seaward defense of the Hartlepoons. At South Gate (south of the River Tees) and about five miles from Hartlepool was a battery of two 4.7-in. quick-firing guns. These did not open fire during the engagement as a thick fog bank hid the hostile cruisers from this battery. These guns, with a maximum range of only 7,000 yards, covered the entrance to the River Tees, but throughout the bombardment the hostile cruisers were beyond their range. The 6-in. guns mounted in Lighthouse and Heugh Battery had a maximum range of 11,200 yards. Throughout the entire period of the war the artillery defenses of the Hartlepoons were, except for a small sprinkling of regular troops and reservists, entrusted to the local territorial unit, the Durham Royal Garrison Artillery.

The fire commander's post, located about 500 yards north of Heugh Battery, was built into the high wall flanking the inner side of Hartlepool's promenade. Like the batteries, it was low-sited, being little more than 50 feet above mean sea level. The view of the sea area to the south end of the harbor entrance was interrupted by the intervention of the small bluff on which Heugh Battery was built, and also by the lighthouse. As a result of the representations of the fire commander, the post was moved to the B.C. station of Heugh Battery about two weeks before the bombardment occurred. Although this position gave better observation, the view to

the southeast was still restricted by the lighthouse, only a hundred yards distant. The Port War Signal Station at the outbreak of war was a little north of Heugh Battery, but owing to the restricted view from that position was moved into the lighthouse itself. The fire commander was in telephonic communication with South Gate Battery and Fortress Headquarters at West Hartlepool by telephone through the General Post Office. He was also in direct communication with the batteries. All telephone lines within the batteries were supported on poles.

The infantry defense in the immediate vicinity of the batteries was provided by two companies of the 18th Battalion Durham Light Infantry.

#### NAVAL CRAFT BASED ON HARTLEPOOL

Based on Hartlepool was a division of "E" class destroyers, the *Doom*, *Waveney*, *Moy*, and *Test*, and one submarine (C9). The two light cruisers, *Patrol* and *Forward*, acted as depot ships to the destroyers and submarine respectively. The destroyers, each with a complement of 70, carried four 12-pounder guns and two 18" torpedo tubes. Capable of a speed of 24 knots, the ships were 225 feet long with a draught of 12 feet. All were equipped with wireless.

Although the two light cruisers were of the same class they differed slightly in construction, as will be seen from the following:

	"Patrol"	"Forward"
Displacement .....	2940 tons	2850 tons
Length .....	370 feet	360 feet
Beam .....	38¾ "	39 "
Maximum draught .....	14 "	14 "
Guns .....	9-4"	9-4"

Both ships, with a complement of 268, carried two 14" torpedo tubes and were capable of a speed of 25 knots. All the naval vessels were berthed in the Victoria Dock.

#### THE WARNING

At about midnight on December 15 the Fortress Commander received the following message from Fortress Headquarters:

A special sharp look-out to be kept all along East Coast at dawn tomorrow, December 16th. Keep fact of special warning as secret as possible; only responsible officers making arrangements to know.

Beneath this was written:

In connection with above, the Fortress Commander wishes you to take post from 7:00 to 8:30 A.M. If all quiet at latter hour, troops may return to billets.

It is noteworthy that the special warning was received by Fortress H.Q. direct from War Office. This was unusual, as all previous warnings of the movements of enemy vessels had been received through the Post War Signal Station. The special warning was communicated only to the officers. The following morning, in accordance with the normal daily routine, the detachments took

up their manning stations an hour before dawn and the guns were prepared for action, both batteries being reported ready by 6:30 A.M.

The four destroyers had left the harbor at 5:00 A.M., their instructions being to patrol parallel to the coast at a distance of about five miles from the harbor entrance. In this they were following their usual daily routine, as the special warning had apparently not reached the commander of the naval craft. The *Patrol* and *Forward* and the submarine were at their berths in the Victoria Dock.

#### THE BOMBARDMENT

The morning of December 16th dawned with a heavy sea mist, and at about 4,000 yards to the east a fog bank completely obscured the view. Visibility southwards was a little better, being good up to about 6,000 yards. The sky was overcast. There was a slight breeze from the northeast, and, except for a slight rolling swell, the sea was calm. The tide would be at its lowest at about 8:30 A.M.

At about 8:00 A.M. the Fire Commander received a message from South Gare Battery:

"Dreadnoughts steaming north."

This was followed almost immediately by a message from the Signal Station:

"Three warships coming in at great speed."

As the approach of the ships was obscured from the Fire Commander by the lighthouse, he inquired:

"What nationality?"

"They are our ships; they are flying the White Ensign, and have answered our signals," came the reply from the Signal Station.

In reply to a further query, it was stated that the ships appeared to be of the "Indomitable" class.

The guns of both batteries had meanwhile been manned.

Almost immediately after this conversation the ships were heard to be firing seaward.

"What are they firing at?" enquired the Fire Commander.

"I presume at the enemy," replied the Signal Station.

"Are you sure they are not firing at our own destroyers?"

"I can't see what they are firing at," came the reply.

At that moment the leading ship loomed into view out of the mist, and by its color and silhouette the Fire Commander was definitely able to identify it as being German.

That there should have been any doubt as to the ship's nationality was, to say the least, singular, for a reference to a 1914 copy of "Jane's Fighting Ships" shows a distinct difference between the distinguishing characteristics of the British and German battle-cruisers of that period.

Any lingering doubts were swiftly dispelled when the leading ship, later identified as the battle-cruiser *Seydlitz*, opened fire with her 11" guns on Heugh Battery. The time was then 8:10 A.M. The first round fell beside

the low wall which formed the boundary between Heugh Battery and the broad pathway leading to the promenade. This round which was dead range and only about 25 yards to the left of the guns as viewed from the seaward side, killed a sentry and three men of the infantry guard, as well as completely wrecking all telephonic communication within the batteries.

A second round fell within a few feet of the first, killing two men of the Durham R.G.A. who had rushed to the assistance of the infantrymen. Another round struck the end house of one of the terraces immediately in rear of Lighthouse Battery, two of the occupants, both women, being killed.

The *Seydlitz*, as she steamed slowly north, was immediately engaged by both guns of Heugh Battery at a range of 4,150 yards and a bearing of 34 degrees. Fire was opened with high explosive ammunition. The method of ranging was by bracketing on the observation of single rounds. Lighthouse Battery, in accordance with the distribution of fire scheme, immediately engaged the rear ship of the three, since known to have been the battle-cruiser *Blucher*. The action had now become general, all three ships pouring broadsides of 11", 8" and 4" projectiles on the batteries, the *Seydlitz* and the centre ship, since known to have been the battle-cruiser *Moltke*, engaging Heugh Battery while the *Blucher* engaged Lighthouse Battery.

That the gun detachment of the shore batteries did not suffer complete annihilation from the ships' intensive fire was due, paradoxical though it may seem, largely to the fact that they were firing at such short range, which for the bigger guns must have been almost point blank. The angle of fall was therefore insufficient to ensure the operation of the fuzes, all of which were delay action, and there were consequently many "duds." Two 6" shells, landing on the concrete aprons of the guns of Heugh Battery ricocheted and burst harmlessly in the parade behind the battery. The range to the target was quickly found, and as the shell power of a 6" shell was obviously insufficient to penetrate the sides of the heavily armoured ships, the M.P.I. was raised to the upper-structures and the more vital parts where considerable damage was seen to result.

Although the narrow strip of land in front of the battery and the ground round about was being plowed up by the enemy projectiles, the detachments served their guns and overcame the confusion of action with commendable calm and precision.

The worst thing of all was seeing each ship momentarily lit up by a nasty yellow glare and having to wait for the result. It was only a matter of a few seconds at that range. Each salvo as it arrived was preceded by an appalling "onde-de-choc," that curious double report which occurs when you are stationed in line with a high velocity gun at short or medium range. The shells were so low that the wind of each salvo knocked down any men that happened to be on the parapet, and caps were snatched off heads and whirled away like leaves.



The two leading ships, about 1,000 yards apart, were meanwhile steaming slowly northwards, the *Seydlitz* still followed by the guns of Heugh Battery. At a bearing of about 3 degrees, No. 2 gun came within the blast angle of No. 1. The time was now about 8:25 A.M. As the range was long and observation was difficult, both guns were ordered to change target to the *Moltke*, which up to that time had not been engaged, and fire on her was continued until she too came within the blast angle of No. 2 gun. Until this time, the B.C. of Heugh Battery had given no thought to the third ship, the *Blucher*. He now saw that she was practically stationary and that she was not being engaged by Lighthouse Battery. Both guns of Heugh Battery were immediately trained on to her, fire being opened with armour-piercing ammunition. This appeared to have little effect, and after firing 19 rounds a change was made to high explosive ammunition. Immediately fire was lifted on to her upper-structures the *Blucher* steamed eastwards at high speed, still engaging the battery with her aft guns.

The other two ships had meanwhile been bombarding both the Hartlepoons, the chief objectives apparently being the steel works, docks, ship-yards, gasworks, and the railway freight and passenger stations. After some fifteen minutes steady bombardment of these objectives both ships turned about and steamed in a southeasterly direction obliquely across the front of the batteries, again opening fire on them with their starboard broadsides. As the *Moltke* reëntered the field of fire of No. 1 gun she was again engaged by both guns of Heugh Battery until she disappeared into the mist to join the *Blucher*. A change of target was then made to the *Seydlitz* as she followed in the wake of the *Moltke* and fire on her was continued until she too disappeared into the mist, the last round from the battery being fired at 8:52 A.M. at a range of 9,200 yards without reply from the ships.

In engaging the *Blucher*, the single gun of Lighthouse Battery opened with high explosive ammunition, at a range of about 6,000 yards and a bearing of 52 degrees. The method of ranging was by observation and correction of single rounds. During the observation and correction of the first two rounds, which fell short, the range closed to about 4,500 yards. The third round, a direct hit, carried away a good part of the fore-bridge and disabled two 6" guns, as well as exploding their deck supply of ammunition and killing nine seamen and wounding three. It was extremely unfortunate that the next round was a misfire, owing to a break in the electrical circuit, and a change was immediately made to percussion firing. Some delay was caused by the misfire, and when fire was continued further corrections were necessary before more hits were observed. Further misfires occurred while at the percussion method "owing to the split pin below the adjustable bushing having jarred loose or broken." The break in the electrical circuit was subsequently found to have been caused by the "A" lead becoming detached from the gun and cradle contact. This was remedied, and the last three rounds were fired electrically.

The *Blucher* had meanwhile taken up a stationary position in line with the lighthouse and the gun of Lighthouse Battery, thus rendering herself immune from that gun, and she was not engaged again until the guns of Heugh Battery were brought to bear upon her toward the end of the action. For the greater part of the action she was therefore able to pour uninterrupted fire on the batteries. While the other two ships were engaging Heugh Battery, the *Blucher* was firing black powder-filled shells on the rocks in front of the battery. This attempt at producing a "smoke" screen, which, during the war was probably the earliest of the experiments in that direction, was fairly effective and greatly interfered with the laying of the guns and the observation of fire. South Gare Battery was not engaged in the action, as by the time the identity of the ships was established they were out of range.

Throughout the action, in the absence of telephonic communication, orders and corrections to the guns were passed by megaphone, and this was apparently effective in spite of the noise of our guns and the arrival of enemy projectiles. Even had the telephone lines not been shattered by the first round from the ships, it is extremely doubtful whether the telephones would have been of any use. During the latter part of the action the Heugh Battery Commander fought the guns from a position midway between each gun, the Fire Commander passing observations and corrections by megaphone from the B. C. post.

#### NAVAL CRAFT ENGAGED

After the action it became known that the four destroyers when northward of the batteries observed the approach of the enemy ships and were immediately engaged by them. As they were apparently unable to get within effective torpedo range of the battle-cruisers and were therefore quite helpless against such heavily armed and armoured ships, the destroyers spread, all except the *Waveney* having suffered damage.

The *Patrol* and *Forward*, with the submarine, left their berths in the Victoria Dock immediately the presence of the enemy ships became known. *Patrol* was struck by an 11" shell, apparently an "over" intended for the batteries, when she was heading for the harbor exit, and later went aground after being engaged by one of the enemy ships. By the time *Forward* and the submarine reached the harbor exit the action was over and the enemy vessels had disappeared into the mist.

#### CASUALTIES

The casualties to naval and military personnel were:

Naval	Killed	Wounded
H.M.S. <i>Patrol</i> .....	4	7
H.M.S. <i>Doon</i> .....	3	6
	—	—
Total .....	7	13

Military	Killed	Wounded
Durham R.G.A. ....	2	..
Royal Engineers .....	..	6
18th Durham Light Infantry	5	7
	—	—
Total. ....	7	13

All casualties to military personnel were caused outside the batteries. That there were none inside was largely due to the foresight of Colonel Robson, who was responsible for the erection of a camouflage extension along the top of the wall in rear of the batteries a year or so before the war. This extension, as well as forming a background against which it was difficult to locate the guns from seaward, gave a false impression of the height of the batteries, which probably accounts for the large proportion of "overs" from the ships. Nearly all the casualties were caused when the troops were leaving their billets to fall in on parade. Although no shells actually burst inside the batteries there were many fragments collected after the action.

Immediately behind the Lighthouse Battery, according to an eye witness' account, a private in the Durham Light Infantry on sentry duty walked his post throughout the entire action in the approved Buckingham Palace style—backwards and forwards, one-two-three-four-about, he went through the whole of the prescribed action.

An officer asked him why he had not taken cover. His reply was classic:

"E-ee! booger! I was that there feart 'ad I done nowt I'd ha' roon aw-a-ay!"

The youngster's bear was fully exposed, and the opening salvo had demolished the row of houses in front of which he had to pass continually.

Casualties among the civilian population amounted to 112 killed and about 200 wounded. Of these only 23 received their death wounds while in their houses, all the others being struck down while in the streets. Among the killed were:

Men .....	43
Women .....	32
Children .....	37

Damage to property was very extensive. The three storage tanks of the Hartlepoons Gas Company were evidently a tempting target, for all three were struck and swallowed up by huge flames which were visible for many miles. Direct hits were obtained on many of the ships in harbor and also on the railway and freight stations. One shell, narrowly missing the 8:27 A.M. train to Leeds as it steamed out of West Hartlepool station, crashed through the wall of the station platform. Many shells fell in the grounds of the Workhouse, causing damage to buildings but no loss of life among the inmates. In both towns many residential premises were completely wrecked. The damage was not confined to any particular area, but extended practically the length and breadth of both towns, and in a few cases to the

countryside beyond. The shipyards and docks suffered extensively.

#### ENEMY CASUALTIES

According to a report copied from the German press, the casualties to personnel among the three ships amounted to 80 killed and about 200 wounded. All three ships were damaged, the *Blucher* more seriously than the other two. In his book *The German High Sea Fleet in the Great War*, the late Admiral von Scheer, after mentioning that five battle-cruisers (the *Seydlitz*, *Moltke*, *Blucher*, *Von der Tann* and *Derfflinger*), left their base on December 15th for a rendezvous due east of Whitby with the object of bombarding that town, Scarborough and Hartlepool, writes:

The big cruisers then divided into two groups for the bombardment of the coastal towns, the northern section, the "Seydlitz," "Moltke" and "Blucher," making for Hartlepool. An officer of one of the U-boats who had reconnoitered the area beforehand rendered good service in locating the place. Shortly before they were off Hartlepool the cruisers were attacked by four torpedo-boat destroyers of the "River" class that ran out to sea and were brought under fire at a range of about 5 km. The sinking of one destroyer and heavy damage to another were observed. After firing some torpedoes without result, they turned away. We gave up pursuing them so as not to lose time for the bombardment. The "Seydlitz" opened fire on the Cemetery Battery and scored several hits so that at last the fire was only returned by one 15 cm. gun and one light gun from the battery. The "Moltke" was hit above the water-line, causing much damage between decks but no loss of life. From the first, the "Blucher" came under a lively fire from the land batteries; she had nine killed and three wounded by one hit alone. Fifteen cm. howitzers and light artillery were used on land; the "Blucher" was hit six times altogether.

This account is inaccurate in some respects, as although all except *Waveney* received damage, none of the destroyers were sunk, and all were able to make port. The Cemetery Battery retreated to, about 2½ miles north of Heugh Battery, had been derelict for many years before the war, and no shells fell in its vicinity during the bombardment. There were no howitzers and light artillery used on land—only the three 6" guns.

The news of the bombardment was received in Germany with great acclamation, the action being considered of sufficient import to warrant the award of a silver medal, specially struck, to each one who took part.

#### THE BOMBARDING VESSELS

The *Seydlitz* and *Moltke* were two of the most powerful ships of the German High Sea Fleet. Of immensely strong construction they were in many respects similar, the *Seydlitz* being slightly bigger. Of 25,000 tons displacement, her measurements were: Length, 656 feet; beam, 93 feet; freeboard (maximum), 33 feet. With a complement of a little over 1,100 both ships carried the following armament:

11" guns .....	10
6" guns .....	12
24-pounders .....	12

Their maximum speed was about 26 knots.

The *Blucher* was an older and smaller ship of 15,500 tons displacement. With a complement of 847, her armament was:

8" guns .....	12
6" guns .....	8
24-pounders .....	16

According to the German official historian of the war, during the 42 minutes bombardment the three ships fired 1,150 projectiles. Many grim relics of the action, in the shape of shell fuses, bases and fragments, were exhibited in a shop window in West Hartlepool soon after, and were later offered for sale by public auction, the proceeds being devoted to a local war charity organization. A complete fuse fetched something like \$50.00 while the less interesting shell fragments ranged from \$1.25 upwards.

#### A COMPARISON OF SHELL EXPENDITURE

Compared with the deluge of fire from the ships, the number of rounds fired by both the shore batteries during the action totalled only 123. Of these, 108 were fired by Heugh Battery (47 from No. 1 gun and 61 from No. 2), and the remaining 15 from the single gun of Lighthouse Battery. It is estimated that the 123 rounds were distributed as follows:

<i>Seydlitz</i> .....	70
<i>Moltke</i> .....	20
<i>Blucher</i> .....	33

The slow rate of fire—an average of one round per gun per minute for the three guns—was due chiefly to three causes: (1) the smoke and dust caused by the striking of the enemy projectiles, which, as already mentioned, greatly interfered with the laying of the guns and the observation of fire, (2) the single gun of Lighthouse Battery being masked by the lighthouse for the greater part of the action, and (3) the great number of misfires which occurred, most of them on the gun of Lighthouse Battery. Although a misfire can seldom be justified, the four which occurred between the two guns of Heugh Battery during the firing of 108 rounds, reflects, in the very difficult circumstances, a very high standard both in preparation for action and in fire discipline. There is no record as to whether both guns or only one sustained misfires, but the number of rounds fired by each gun (47 by No. 1 and 61 by No. 2) points to No. 1 as being the unlucky gun. During the 42 minutes of the action, the time for each round fired by No. 1 gun gives an average of 54.7 seconds, and for No. 2 gun 40.3 seconds. Considering the delay caused by interference with the laying of the guns and range-finders due to the smoke and dust raised by the striking of enemy projectiles, and, through the same cause, the difficulty in observation and correction of fire, combined with the fact that there were four changes of target and that there was probably delay in passing orders and corrections through the tremendous din caused by the firing of our guns and the striking of

enemy projectiles, the figures compare very favorably with the 8 seconds standard time allowed when engaging a target under peace conditions.

The calm state of the sea made perfect shooting conditions for us, as did the complete lack of wind. It was no virtue that we "hit and hit" at that absurd range, but the shell-power against heavy armour was hopeless. The damage we did was most surprising.

Lighthouse Battery, despite the good effect obtained against the *Blucher* at the beginning of the action, when a direct hit, which caused great damage, was registered by the third round, thereafter fared badly, no less than 14 misfires occurring after this good work. One of these misfires, as already explained, was due to one of the electric leads becoming detached. On changing to percussion there was no better result, 13 misfires occurring during the attempts to fire the gun by this method. All these misfires were due to the striker becoming decentralized. The break in the electric circuit was subsequently discovered and remedied. But much valuable time had been wasted, with the result that, partly due to the delay caused by the misfires and partly to the *Blucher* placing herself in the dead area formed by the lighthouse, only 15 rounds were fired by Lighthouse Battery throughout the action. It is probably needless to mention that the offending lighthouse was demolished very soon after the action, its place being taken by a temporary wooden structure erected at a more appropriate spot away from the batteries.

#### FATE OF THE BOMBARDING SHIPS

The *Blucher*, after completing a dockyard re-fit from the damage she received at Hartlepool, was again ready for sea in time for the Dogger Bank action on January 24, 1915, when, after putting up a good fight and receiving terrific punishment, she was sunk by the gunfire of our ships. The *Seydlitz* and *Moltke* survived until the end of the war, although both were heavily engaged by our ships at the Battle of Jutland on May 31, 1916, the *Seydlitz* barely making port after being hit 28 times by gunfire and once by torpedo, which seems to indicate that the Germans were confident that their ships were sufficiently well armoured to withstand the fire of the comparatively puny guns of the Hartlepool batteries. These two ships, with the *Von der Tann* and *Derfflinger*, were part of the High Sea Fleet surrendered to our Grand Fleet and escorted to Scapa Flow in 1918, all four ships being later scuttled by their crews.

#### CONCLUSION

The action at Hartlepool would seem to indicate that in sending three of their largest and most powerful ships the Germans had either a wholesome respect or a supreme contempt for the few small guns of the harbor defenses. Assuming the former to be the case, it was apparently considered necessary to send these very valuable, heavily armed and armoured ships to accomplish what could have been done by much smaller and less valuable ships, except

that the risk of losing the smaller ships would have been much greater. If our comparatively weak defenses were held in contempt, the Germans no doubt considered that their prize ships, with their overwhelming gun superiority, could quickly silence the few small guns of the shore batteries.

The bombardment was apparently worked to a timetable divided into three phases of 15 minutes each: (1) an intensive concentration on the batteries, (2) a bombardment of important objectives, and (3) a further concentration on the batteries while the ships withdrew.

Soon after the action the Hartlepool defences were strengthened by the addition of a monitor carrying two 12" guns. This monitor was allotted a definite position for mooring, and when moored she formed part of the defences and was under the orders of the Fire Commander. However, the commander of the monitor was, in addition, given a roving commission and was able to put to sea at will. The monitor was often away from her appointed moorings, therefore the unusual situation of a naval vessel being under the orders of an artillery fire commander did not give rise to any awkward complications.

The reports issued shortly after the action showed the *Von der Tann* as being one of the bombarding ships, but

it was later discovered that she had been at Scarborough and that the *Seydlitz* was at Hartlepool. This mistake arose after an examination of the many unexploded 11" shells, for besides a difference in weight of about 185 lbs. there was also a difference in the number of impressions of rifling shown on the rotating bands. A reference to *Jane's Fighting Ships* showed the guns of the *Von der Tann* as of 45 calibres and those of the other ships as 50 calibres, with a difference in weight of projectiles of about 180 lbs. It was therefore assumed that the *Von der Tann* was one of the three ships, but apparently the ammunition originally intended for that ship was also issued to the other ships. Although Admiral Scheer in his book pays tribute to the commander of a German submarine for taking bearings which were of value in piloting the ships to Hartlepool, there is now evidence that each ship carried a skipper of a German trawler who, from past experience when making use of the fishing port, was familiar with the approaches.

The Durham Heavy Brigade are justly proud of their distinction of being the only coast defence unit to be engaged in action during the whole period of the war, and the manner in which they acquitted themselves on that memorable day was in accordance with best traditions of the Royal Regiment of Artillery.



### ERRATA

The JOURNAL exercises all possible precautions to avoid typographical errors, but in spite of our best efforts, mistakes will occur. On page 22 of the January-February, 1936, issue appears two formulæ as follows:

$$X' = \frac{6,975,277 \cot \phi}{(1-.00676866 \sin^2 \phi)} \frac{1}{2} \sin (d \lambda \sin \phi)$$

$$Y' = \frac{6,975,277 \cot \phi}{(1-.00676866 \sin^2 \phi)} \frac{1}{2} \cdot 2 \sin^2 \frac{(d \lambda \sin \phi)}{2}$$

They should read:

$$X' = \frac{6,975,277 \cot \phi}{(1-.00676866 \sin^2 \phi)^{\frac{1}{2}}} \sin (d \lambda \sin \phi) \text{ in yards}$$

$$Y' = \frac{6,975,277 \cot \phi}{(1-.00676866 \sin^2 \phi)^{\frac{1}{2}}} \cdot 2 \sin^2 (d \lambda \sin \phi) \text{ in yards.}$$

On the same page, second column the expression

$$Y = 2,000,000 + Y_1 + Y' \text{ should read}$$

$$Y = 2,000,000 + Y_1 + Y' \text{ (when P is south of Lat. } 40^\circ 30' \text{ N).}$$

It is recommended that the necessary changes be made in all retained copies of The JOURNAL.

# Rough on Flies

BY FIRST LIEUTENANT A. S. BARON  
*Coast Artillery Corps*

*Nobody cares about the fly: the only question is how the devil did he get there?—PETER PLYMLEY'S LETTERS.*

**H**OW many times have you organization commanders received (or heard about) a communication similar to one of the following?

"Memorandum to Captain X: the Surgeon, while making his sanitary inspection this morning, found two overturned fly traps near the Company "J" kitchen. Other traps were not properly baited. You will reply by indorsement hereon as soon as these deficiencies have been corrected."

Or, "The Commanding Officer, on his tour of inspection, noted several broken or missing covers on the garbage stand of your organization."

A few skins like these set me to reflecting. Obviously there was need for a fool-proof arrangement for destroying flies that would not subject the organization commander to the risk of periodic criticism by higher authority. I made a truly scientific approach to the problem, taking into account the habits of flies, kitchen police, garbage-can tops, sanitary inspectors and commanding officers.

The small post, Kilauea Military Camp, on the island of Hawaii, where I was stationed, afforded an excellent proving ground for experimental fly traps. The trade winds blew from an adjoining cattle ranch straight through the dining-room doors. At meal times it was always a scramble to see whether the soldiers or the flies would get their food first. The ever increasing swarms were a challenge to inventive genius. Flies had to be destroyed on a grand scale. Puny methods would not suffice.

The equipment then in use was of the conventional type. The stands were screened on the front and had wooden backs and hinged tops; that is, they were supposed to be hinged. Usually the hinges were broken. Each stand had a daily attendance of four million flies by actual count and every fly that visited the premises was obsessed with the idea of reaching the garbage cans. The thought occurred—why not make it easy for them? Why not combine garbage stand and fly trap in one assembly that would both kill flies and save skins.

Having hit on the basic principle the rest was easy. The accompanying photograph shows the details. The garbage is the bait for the trap, and ideal bait it is. Mister Fly has a nice large opening below the spring-closed doors through which he enters. Once inside, he is attracted to the spacious sunniness of the trap directly above and, presto! you have him just where you want

him. That night it rains, and the day's catch is killed, or soon dies of starvation. When the device requires emptying, it is only necessary to "Flit" the victims, lift off the trap assembly, remove the screen cover and dump the corpses.

The construction is simple. Any company mechanic can do the job.

If you haven't a concrete base from which to start, build the block sloping slightly forward, to facilitate drainage when washing.

The corner posts and door jambs should be anchored to the concrete by means of angle brackets and bolts imbedded in the masonry. Corner posts should be 4" x 4".

Door jambs are made of 1" x 3" backed with 1" x 4" so that the 1" projection acts as the door stop.

Width of doors: 32".

Doors have screen-door spring hinges and handles.

Space between bottom of doors and concrete floor: 14".

Inside measurement of stand frame should be the height of a G.I. can plus two feet.

If the stand is to hold more than six cans, it is suggested that the fly traps be built in more than one unit. The light construction, if over-extended, gets rickety from handling.

The trap is of the conventional prismatic type, with a close-fitting removable top. During the closed season on flies the traps are stored and the opening at the top of the stand is covered.

I may seem to be over-enthusiastic about a familiar housekeeping problem, but both flies and unsightly garbage stands are a nuisance and a constant source of annoyance at all posts. The remedy suggested has been tried and it works. It is guaranteed to reduce both the number of flies in the kitchen and the volume of paper work in the orderly room.



*The Baron fly trap.*



# The Training of the Antiaircraft Searchlight Battery

BY CAPTAIN ARTHUR B. NICHOLSON, C.A.C.

THE "Moonlight Cavalry," officially designated as the Antiaircraft Searchlight Battery, has generally failed to secure the place in the sun (or should one say moon?) to which its inherent possibilities entitle it. The lack of effectiveness sometimes displayed under severe test (for example, multiple-plane attack), has been largely responsible for this lack of confidence. The principle responsibility for this condition should be charged to a mental attitude or perhaps three of them, viz:

- (1) That the sound locator is fundamentally inadequate, if not almost worthless;
- (2) One might as well disregard the locator data after the initial setting and depend principally upon searching, since the slow moving (90 miles per hour) bomber could not in a reasonable time move out of the area of search;
- (3) The defeatist attitude that may be summed up as follows: The odds being so heavily against the searchlights, it is useless to attempt more than the solving of the old problems in the simplest possible manner.

While these conceptions are not universally accepted they have seriously interfered with progress and development in antiaircraft searchlight technique and matériel.

Experience gained during the past two years while working with Battery "A," 63d Coast Artillery, against single- and multiple-plane attacks (the latter composed of from four to seventeen planes), has been such as to justify taking serious issue with all three assumptions.

Because there are only six antiaircraft searchlight batteries in the Corps, very few Coast Artillery officers have the opportunity to serve with this type of armament, the importance of which can hardly be exaggerated considering the fact that they are the controlling factor in defense against night bombardment. To many, a description of searchlight technique will be nothing new; however, it is possible that some of the lessons learned during the past two years may be of value. Furthermore, since Battery "A," 63d C.A. (AA) is equipped with one Duplex Unit, M1927, including comparator and distant electrical control, and four lights to which data must be telephoned and set by hand, it is possible that officers of other organizations having the older types of equipment may find something of interest in a description of the training methods employed.

## PRESENT SOUND LOCATOR ADEQUATE

Battery "A" first began training against high-speed targets in the spring of 1934, the target plane being a

B-12 Martin Bomber with a speed of 180 miles an hour. It soon became evident that the sound locator was not only a distinct aid in making the pickup, but that consistent pickups on high-speed targets were practically impossible without constant reference to reliable sound locator data. With high-speed targets this is much more important than with the slower targets.

At that time the majority of the personnel were insufficiently trained. The only light doing good work was the one using data from an experienced locator crew. The others manifested a tendency to go into action approximately on data furnished and then to rely upon searching. With the slower types of planes this could be done with comparatively satisfactory results, as searching eventually discovered the plane within the general area of the initial data. With high-speed targets, the crew soon realized that the plane had, within a comparatively few seconds, moved many degrees from the area searched. With a target traveling a quarter of a mile in five seconds or less, searching a given area more than once was useless.

No better object lesson was needed to cause the light crews to rely constantly upon locator data. With a high state of training this data consistently would be within  $3^\circ$  of the target both in azimuth and elevation, and the search should cover only this probable error. Light crews should always be trained to search only in that area, even though the data error may be more than three degrees. Bringing the target within the area searched should be accomplished by thorough and progressive training of the sound locator crew, not by allowing the light crew to increase the size and speed of the search, to the detriment of later efficiency.

The necessity of making long predictions for sound lag, which may be rendered ineffective by maneuver during the prediction period, is a weakness of the method and not of the instrument. Since antiaircraft tactics are based upon engaging the attacking plane while crossing the decisive zone, even this weakness is less serious than is generally supposed; for it should be remembered that the bomber must fly a straight and level course for a sufficient period to set the sight and release the bomb.

Excellent results can be obtained with the older types of equipment. In its work against the 180-mile-per-hour bomber this organization had one T4E2 Locator, with the Acoustic Corrector, M1, and two exponential type locators, Model 1925. The latter were equipped with improvised Jackson sound lag charts incorporating the  $\frac{1}{3}$  sound lag time feature and a figure of dead time; also improvised sliding azimuth and elevation scales with the

corresponding 3 to 1 multiplication feature. One crew obtained excellent results with the exponential horns, in fact they were better than the results obtained with the T4E2 Locator. While the present locator (MIAI) is definitely superior to earlier types, with intelligent and careful training excellent results can be obtained with the latter.

#### TRAINING IN FUNDAMENTALS KEY TO SUCCESS

In the early stages of training, emphasis should be placed on method. The personnel should be impressed with the idea that results will take care of themselves once each individual has thoroughly mastered the fundamentals of his job. The battery attempting work against unlighted planes before the fundamentals are fully mastered is in precisely the same situation as a football team that attempts involved trick plays before the members of the team have thoroughly mastered blocking and tackling. Attempting work against unlighted planes with poorly trained personnel will result in discouragement and delay in reaching the peak of efficiency, since the men will forsake all data in desperate attempts to accomplish "lucky" pickups by wild searching.

#### TRAINING OF LISTENERS

The almost universal conception of "a listener" as a person of rare and exceptional qualifications must be entirely forgotten. It is believed that this prevalent idea of the listener as a genius born for the work has done great harm. A minor result of this false premise is a tendency to breed "temperament" in the listener who sometimes is prone to believe that he is irreplaceable. A second minor result is the failure to train sufficient reserve listeners in the belief that only the chosen few have the necessary qualifications. Out of 125 men given preliminary tests and training on the Binaural Trainer, M-1, fully 80 were capable of becoming satisfactory listeners, 25 of becoming superior and 20 of becoming excellent to superior with longer training.

Although listeners require the longest time to train, and are adversely affected by such factors as lack of practice and variations from the peak of physical condition, almost all men have the requisite natural ability. Since the natural sense of sound direction depends upon whether or not the sound wave strikes each ear in the same phase (and not upon volume), partial deafness in one ear has been found to have no adverse effect. Superior ability as a listener requires superior intelligence and ability to concentrate, especially when following a maneuvering target or one out of many targets. The possession of these qualities is fully as vital to the superior performance of the duties in other key positions and their absence in the listener is not inimical to the ultimate efficiency of the battery.

There has been a tendency to regard the listener as being so vitally important that the training of the other members of the team mattered very little. This attitude has had the effect of placing the listener on a pedestal.

Under no circumstances is the foregoing to be construed as minimizing the importance of long and thorough listener training, which is absolutely essential.

The training of the listener should start with the Binaural Trainer M-1. This is a device whereby the sound of an airplane in flight, transcribed upon phonograph records, is transmitted electrically through trombone type tubes of variable length to the headset of the listener. By turning a wheel, similar to the control of the sound locator, the listener can vary the lengths of the tubes carrying the sound. By varying the length of the tubes a sound wave emanating from the same source can be made to strike the ear drums at different times, thereby producing the same effect as turning the two horns of a sound locator away from the sound source. By rotating the control wheel in the direction toward which the sound has gone, i.e., "following" the sound, the listener can bring it back to the centered position. The instrument is provided with a pointer and scale of reference numbers whereby the instructor can check the accuracy of the students' centering of the sound. The fact that initially many students will not be able to show a satisfactory degree of accuracy is meaningless.

The most important feature of the device is that the instructor can cause the sound to simulate all the movements, changes of direction and speed of the sound of an approaching, crossing or maneuvering plane, thereby giving the student an excellent course of basic training. By a second control wheel, the instructor can cause the sound heard by the listener to move from the center to one side in the same manner as the sound of a moving plane when the sound locator horns are left stationary. To correct for this the student should turn his control against that of the instructor in order to center the sound. By a continuous turning of his control, with gradual changes of speed and occasionally of direction, the instructor can produce a thoroughly realistic imitation of a "track" of an actual plane.

With continual practice the accuracy of the student's sense of centering, the delicacy of his perception of changes in speed and direction and the rapidity of his responses thereto will increase progressively. Only after he has gained the proficiency with the binaural trainer should he attempt work with an actual plane. Training an inexperienced listener upon an actual plane, without this basic preliminary training, will result in much futile floundering and a waste of a pilot's time and gasoline.

If the instrument is not available, valuable basic training can be given by utilizing a motor vehicle or a buzzer as a source of sound. Since the effect, in all but the final stage of training, is practically the same for the azimuth and elevation listeners, both can be given this basic training upon the azimuth horns. This training should progress to include changes in speed and direction of the vehicle (or buzzer) as the student's proficiency develops. In this preliminary training the emphasis often is erroneously placed upon the idea of the testing of the listener by having the sound source stop at points of

known azimuth. Occasional tests of this character are desirable but the emphasis should be upon the progressive training of the listener.

Not until after the student has satisfactorily completed the preliminary training is he ready to start work with actual planes. Thereafter his development is largely a matter of continual practice; by this alone will his fineness and delicacy of perception be sharpened. A greater degree of concentration can be attained if the listener is blindfolded.

#### TRAINING OF ACOUSTIC CORRECTOR OPERATORS

Enlisted men with the intelligence, discernment, decision and discriminating judgment to become good acoustic corrector operators are hard to find. Due to lack of smoothness in tracking by the listeners, corrections will be more or less erratic. The corrector operator must have the judgment to disregard the slightly erratic measured corrections and apply only correct predictions. Good corrector men can smooth out most of the errors caused by erratic listening. More time and attention must be devoted to their training than to that of any other position. Their work, with that of the listeners, is the keystone of searchlight efficiency. It is believed that the ultimate efficiency of a searchlight battery depends to a greater extent upon the judgment exercised by the battery commander in his selection of acoustic corrector operators than upon any other factor.

The corrector operator's work is divided into two principal parts: first, the measuring of the angular travel of the target during the sound lag period; second, applying a prediction based thereon. In order to make intelligent decisions and exercise the discriminating judgment required by his work, the corrector operator must have a broad, intelligent grasp of the entire problem. Especially he should be thoroughly instructed on the following:

(1) The reading of the sound lag cylinder indicates the **SLANT RANGE** to the former position of the target, expressed in seconds required by the sound of the plane to traverse the distance.

(2) **SOUND LAG TIME** is merely **SLANT RANGE** expressed in terms of time.

(3) The **SLANT RANGE** is the hypotenuse of a vertical right triangle of which the vertical side is the altitude of the plane and one angle is the angle of elevation of the horns.

(4) The plane is moving along its course while the sound is traveling to the locator.

(5) His job is to determine how far along its course the plane moved during the time the sound was traveling to the locator.

(6) That he is doing this indirectly by measuring how far the apparent sound source travels during a given number of seconds. If he takes the measurements briefly and frequently, the apparent sound source will tag along at a fairly constant distance behind the plane, and its

travel will be approximately the same as the travel of the plane.

(7) The necessity of keeping the period of measurement short, in order to get away from the angular travel error and changing slant range, is the reason why the reading of the sound lag cylinder is only  $\frac{1}{3}$  of the true sound lag time. This shortening of the measurement period is compensated for by gearing which automatically multiplies the correction by 3.

(8) When the operator matches pointers, he is getting the searchlight ahead of the locator by the amount of this travel; if everything has been done correctly, the light should be very near the plane. If he matches the prediction pointer to a faulty measurement a bad miss is sure to result.

Most important of all, a corrector operator should keep constantly in mind that he is measuring the travel of a plane, which cannot suddenly jump ahead, stop, or go backward, and that any measurement which indicates such a phenomenon is an error and should be disregarded. Corrections never change suddenly nor much at a time.

The stop watch man (ordinarily one of the two corrector operators) calls "Ready, Take," in a low tone, starting his stop watch at the command "Take." At the expiration of the number of seconds indicated by the sound lag pointer he calls "Ready, Off." At "Take," both men press in on the corrector knobs, thereby causing the measuring pointers to rotate through the same angle as do the horns during the measuring period.

When the sound of the plane is faint, due to long range, wind, or other causes, or the listeners are inexperienced, the track will not be uniformly smooth. With a gusty wind and intermittent fading of the sound, a listener may become uncertain and stop for a moment, or he may suddenly discover that he is behind the plane and speed up, or worst of all, he may discover that he is ahead and go backward in order to center the sound. Listeners must be trained to catch up gradually if behind and to slow down gradually if ahead, making every effort to produce a smooth track. Interchanging with the corrector operators during the training period helps to give them a broad grasp of the locator problem and to realize the consequences of uneven tracking.

If the travel is erroneously measured the result will be a pointer reading radically different from the preceding one, perhaps even in the opposite sense. To move the prediction pointer to match such an indicated measurement would be to assume that the plane had suddenly jumped ahead, stopped or gone backward—all obvious absurdities—and would result in pulling the light far off the target. The corrector operator must be taught the dangers of blind matching of pointers without regard to the probable accuracy or obvious error. He must know that the position of the measurement pointer does not guarantee the true position of the plane ahead of the sound. At best it is the result of a measurement, and that measurements are always subject to error. With a smooth track, two or more corrections will show varia-

tions. The best measurement is the "center of impact" of a group of variations. Because corrections never change suddenly it should not be assumed that the correction is changing unless proved by at least two readings. Even then the corrector operator should be cautious about giving them full credibility, since variations are more to be expected than bona fide changes. It is better to give them partial weight by moving the prediction pointer to "split the difference" between the old and the new positions. If a third measurement confirms the first two variations, full weight should be given and the prediction pointer moved to the new position.

A change, once started, will continue in accordance with a progressive rate, according to the course of the plane. Experience will teach the corrector operator to recognize this. Once recognized, he must not only give proper weight to the expected variations, but to a certain extent predict them, steering a course between the unevennesses of successive measurements. He can quickly detect actual maneuvers of the plane and readjust his prediction accordingly. He soon learns that the elevation correction for an approaching target changes very slightly, because the decrease in sound lag and consequent decrease in the measurement period is offset by the increase of angular speed with nearness of the target. When the target is low and at close range, the great increase in angular speed causes the correction to jump abruptly.

If the target is coming directly toward the locator the operator should give no credence to possible variations of the azimuth listener; adding a prediction to the error in azimuth obviously will cause the light to miss the head-on target.

The operator learns by experience that when the listeners first get on target, the correction is always approximately of the same amount, he should apply this correction automatically by the time the listeners are approximately on target so that if it is necessary to put the light in action it will be close to the target without waiting for the greater accuracy of a measurement.

When an approaching target passes directly overhead, the elevation corrector operator should be taught to switch automatically his "Up" correction to one of the same amount "Below" as soon as the horns commence their rapid 180° traverse. The saving of seconds in bringing the light to the approximate new position of the target may be of great value.

It is obvious that men with the requisite imagination and intelligence to fill this position in a superior manner are rare, but it is necessary to find and train them if results of a high order are to be obtained.

#### THE LOCATOR COMMANDER

Training is the most important factor in attaining good results with the searchlights, therefore the locator commander should be carefully selected. He must not only have a thorough grasp of his problem and know how to solve it, but he must be able to impart this knowledge

to his men in the most lucid terms. He must be analytical and watchful of the work of his men, particularly of the acoustic corrector operators, and tireless in analyzing their errors and in explaining what is right or wrong.

Upon the approach of the target, he should direct the listeners to its approximate azimuth and elevation and thereafter should not interfere during the track, except in multiple-plane work or when they have become confused and appear to be deserting the assigned target. Except in cases of this character nothing but harm is accomplished by attempting to direct the listeners after they are on the target. An attempt to comply with such instruction distracts the listeners and usually results in a false centering. Usually admonitions to the listeners from the locator commander are solely the result of guesses. No matter how opinionated by virtue of experience he may be, the guesses are far more likely to be wrong than are the listeners.

If the listener is not susceptible to training and instruction he should have been eliminated before the end of the preliminary training. It is doubtful if any listener has an arbitrary error, either right or left. Checks, made by comparing the data sent to the light against the actual position of the light while illuminating the plane, show that the data was just as frequently wrong to one side as the other and that the errors narrowed down progressively to very small limits as the state of training approached the peak. It is impossible to justify the application of an arbitrary correction based upon an error which may occur in the opposite sense the next time. If the application of such a correction does not do harm instead of good, credit must be given to good luck and not to good judgment. Under no circumstances should any arbitrary correction be applied except one which is based upon an accurately measured error. The temptation to use the arbitrary correction knobs seems to be almost irresistible to a locator commander and great effort was devoted to training commanders to leave them absolutely alone. Far more harm than good has been done by their use. Their removal from the acoustic corrector would be an improvement. It is the mentally lazy non-com who insists upon substituting arbitrary corrections based upon ignorance for the thorough training of his men.

He must, however, be imbued with the necessity for the most accurate levelling and orienting possible. Since much more accurate orientation can be attained by orienting upon a star he should be able readily to identify certain stars.

At the approach of the target, having first directed the listeners to its approximate azimuth and elevation, he sees that approximate data (carrying the usual corrections for the normal case when the listeners are first centered) is sent to the light as soon as the listeners are approximately on the target.

He should be alert to note the probable course of the plane and apprise his men thereof, to notify the section that the target is about to pass directly overhead or to cause the azimuth listener to cease tracking when the

predicted elevation has reached 80 to 85 degrees, and rotate the horns 180 degrees in azimuth as rapidly as possible so as to pick it up, and get his light on the new track with the least possible delay. He should see that the listeners are centered and that one good prediction has been applied before the locator is reported "On Target."

#### TRAINING OF THE SEARCHLIGHT CREW

It is fundamental that the searchlight crew set and follow the data sent to it by the sound locator, no matter how faulty it may be. In no other way can ultimate efficiency be attained. The area of search should be just large enough to cover the probable error of the data; an amplitude of from five to seven degrees, plus or minus, should be sufficient after locator training has become fairly satisfactory. The point of searchlight training most difficult to attain is a sufficiently slow search. The controller operator, or the distant electric control operators, must be made to realize the great speed at which a distant part of the beam travels when the light is slowly turned through a small angle. Unless the beam searches slowly it will sweep across a target so rapidly that the controller operator will miss the flick.

With the high-speed target and the slow rate of search it is imperative that the light be referred constantly to its rapidly changing data. The search must include the area around the target within limits of from five to seven degrees, in both azimuth and elevation. With distant electric control, this is easily accomplished by allowing the comparator searchlight pointers to rock back and forth, with the center on the constantly moving sound locator pointers. With hand control the problem is not so simple; here the "track" is not "flowing data" but a series of successive settings of definite data, therefore the light should search the vicinity of each setting before jumping to the next. Since the target is moving rapidly and the data stationary, this does not mean that the search should extend in rear of the data setting. It is advisable to first search forward and then if necessary return to the starting point. By searching five to seven degrees ahead of the data and coming back to, but not in rear of it, the area searched will extend both ahead and behind the target.

With the hand-controlled light, the controller operator should not be required to set azimuths or elevations. Nothing should be permitted to distract his attention unnecessarily from his principal duty—that of searching and looking for flicks. In using the distant electric control the chief operator constantly looks along the beam. He should never disturb the focus of his eyes by looking at lighted dials. The azimuth and elevation control operators, respectively, match the pointers and follow the data, relinquishing control to the chief operator as soon as the latter sees a flick. The advantages of this scheme are obvious.

An approximation of this method can be adapted to the hand-controlled light. In this case the azimuth setter,

with one hand on the controller bar and his eyes on the azimuth scale, keeps the light searching about the successive azimuths transmitted to him by telephone. The elevation setter functions in a similar manner, moving the drum of the light by any convenient means while keeping his eyes on the elevation arc, each operator allowing free movement to the other. The controller chief occupies his normal position, keeping his vision directed along the beam, his hands resting lightly on the bar but not interfering with the searching and data setting operations, ready to take over complete control the moment he sees a flick.

#### THE LIGHT COMMANDER

The light commander should be an instructor. He must understand the importance of a high degree of accuracy in levelling, orientation and thorough checking of electrical connections. He should know that the most accurate orientation can be accomplished by pointing the beam at a designated star rather than by the use of the crude sights on the light drum. To save time he should have his light pointed in the approximate direction of the approaching target before data arrives. He trains his controller operator to traverse the light rapidly 180 degrees when the target passes overhead. He should be thoroughly instructed as to the proper time for going into action, out of action, and changing target, under varying conditions, and should have a complete grasp of the entire problem in order that he may act more intelligently, especially in case of "Light Commanders' Action" which will be the normal condition in actual service.

#### ARBITRARY CORRECTIONS

Experience has indicated that thorough training will eliminate many errors which commonly have been charged to combinations of parallax, non-standard atmospheric conditions and locator inaccuracy. The optimum accuracy of the locator being within plus or minus three degrees under adverse conditions, obviously its data should not be changed unless the change is based upon accurately measured errors known to be both consistent and constant. At present only flat corrections can be applied by means of the arbitrary corrector device.

Due to the continual and unpredictable variations of the angular travel error, an attempt, by either locator operator or platoon commander, to apply worthwhile corrections, based upon accurate measurement of wind or other non-standard condition, by means of flat arbitrary corrections, is almost hopeless. Correction of this kind will be good only for a single position and course of the target and will vary constantly and consistently with the angular travel.

Nor is the application of arbitrary corrections for parallax justified. The incorporation of a parallax corrector in the acoustic corrector would be desirable, but to encumber the high-speed work of the locator crew with attempts to approximate the variations of the parallax error from zero to slightly more than a degree, by means



of a chart or other device, is believed to be unwise.

For these reasons the application of a so-called "trial shot correction" based upon an initial course of the target plane (with lights on) is highly undesirable.

#### DEAD TIME

While not applicable when electrical data transmission with the comparator is used, dead time is a highly important factor with hand control and telephoned data; in certain cases it may amount to more than the sound lag time. The dead time error is seriously aggravated by the fact that, with high-speed targets, the pointers may move several degrees while a two or three digit number is being transmitted. Experiments, including several flights in the target plane, resulted in the determination of nine seconds as the total dead time necessary to place the "center of impact" of the data on the 180-mile-per-hour target at altitudes above 10,000 feet. Its application was accomplished by adding  $\frac{1}{3}$  its value, or three seconds, to the readings of the sound lag cylinder. For low, fast targets a slightly greater figure probably would be necessary.

#### PROGRAM OF TRAINING

In bringing a battery composed almost entirely of inexperienced men in all the key positions to a fair degree of efficiency, the total time required depends inversely upon the proportion spent initially in basic training. If the first four to six weeks are devoted solely to elementary training, the total time required to attain superior efficiency (high-speed, high-altitude and multiple-plane work) will amount to about ten weeks. If the battery is composed largely of experienced men out of practice, the time can be shortened, not by cutting out part of the program, but by the difference in the length of time required to improve progressively.

During the initial stages, the greatest efficiency will be attained by working with a plane flying with running lights. Each member performs his own operations to the best of his ability with complete disregard of results. The attention of officers and non-commissioned officers is devoted to supervision and instruction. The plane should fly a circular course at an altitude of from 4,000 to 7,000 feet, occasionally cutting across the circle and reversing the direction of rotation. For better supervision in this preliminary training the light locator sections should be located within a few hundred yards of each other.

There is no such thing as being "close," or "pretty good," when shooting with searchlights. There are no sevens, eights or nines; only bullseyes and misses. A beam may have been close to the target throughout its course but might as well have been a mile away if it fails to make an actual flick.

No gambling should be done with half-way methods. If the training rests upon fundamentals, thoroughly inculcated, results are bound to follow. Because of the fact that progress in work against unlighted planes cannot easily be determined, the battery will appear to whip

into shape suddenly, often barely in time to save the battery commander from a nervous breakdown.

There can be no resting upon oars once the peak of efficiency is reached. A battery, trained to the nth degree, will ordinarily lose 25% or more of its efficiency after one month's continuous layoff; principally because of the intangibles which adversely affect the listeners.

Keeping up a high state of training after target practice is over by the holding of one drill a week, weather permitting, will prove far more economical in the end than attempting to rebuild the organization each year just before target practice. In addition the satisfaction of knowing the battery is constantly ready for off-season calls and can, in a short time, be brought to the peak for such occasions as tactical inspections, is more than worth the trouble.

#### THE MULTIPLE-PLANE ATTACK

In the defense of any important rear area objective attack by multiple planes within a narrow sector is to be expected as normal. This form of attack throws a great overload on the defending searchlights, necessitating the adoption of specialized counter-measures and types of training of searchlight crews if the attack is to be successfully combated. The normal targets of the searchlight platoon will consist, not of a single plane, but of a large number attacking simultaneously from different directions. Successive attacks will be delivered at short intervals, probably 30 seconds to one minute apart. It is obvious that the training of the searchlight battery should be directed to meet such an attack once the efficiency of the personnel has been fully developed.

The specialized training required is almost entirely limited to light and locator commanders. With rapidly changing situations in any part of the area, and constantly varying between different parts of the area, it is unwise to place complete dependence for the functioning of the lights and locators upon a communications system. Further, one commander cannot be expected to handle all situations and make the split second decisions necessary, (especially when several are required at the same time). A separate commander is required at each light and locator. It is impossible to get out all the messages necessary in the time available. Decentralization of control to the greatest possible extent is the ultimate goal.

The platoon commander should exercise only general supervision, ordering changes of targets when a target maneuvers off the usual course, assigning a suitable target to a light and locator which happens to be disengaged at the moment and whose commander appears to be making a faulty choice, putting lights into action and out when unusual situations dictate or other reasons make it necessary, but otherwise interfering as little as possible. Except when unusual situations arise, smoother, more effective, more dependable functioning can be expected under the conditions of "Light and Locator Commanders' Action," with no interference from the C.P., after the training of light and locator commanders has reached the nec-

essary stage. For this reason, if it is possible to lay only a part of the telephone net under a given service condition, it should include the lines from the outposts to the forward lights. In actual service, with properly trained light and locator commanders, communication with C.P. over the command net can be better spared than can the outposts' intelligence information.

The locator's work is especially adapted to automatic functioning. The locator commander should be trained to track a target only until it is picked up by another light, then to change target without command by returning to the search of his sector, or, if no planes should be in that sector, then to any adjacent sector where planes are reported or heard. If the target being tracked is not picked up by the time it crosses the forward line of lights, the locators should not continue to follow it if by so doing they risk losing a closely following second target. That is, it would be better to give up the first rather than risk losing both first and second through a desperate attempt to get a late pickup on the first. Practically all work of locator commanders is best handled entirely without outside control, each searching his own sector, or picking up other targets if there be none in his own sector.

Although it will be best to allow the light commander to go into action on his own judgment and initiative, if desired he may originally go into action upon command from the C.P. If, however, the command should be delayed, he should go into action on an approaching target when its elevation is about  $40^\circ$ , or the range is about 3,000 to 5,000 yards. If the range is too long, the risk of losing the target through inability to see flicks, or because of maneuver during the long prediction period, more than offsets the slight advantage of the chance long range pickup.

If tracking a distant crossing target approaching an adjacent light, he should go into action with the nearest light, even though the elevation may be quite low. Once picked up, the forward light passes the target to the rear light, continuing to carry it at least until the rear light has it definitely in its beam. The forward light then changes target, provided the succeeding target is then close enough, (3,000-5,000 yards or  $40^\circ$  degrees elevation). If the succeeding target has not yet come within range, the forward light should continue to carry the first, or it should go out of action until a second target becomes available. These tactics are designed to give quick pickups at ranges where they are possible, and to obviate the service condition of a distant target dodging the beam when the range is too great.

The forward lights (and their locators) should not track any target which has not been picked up by them, past the forward line of lights, if in doing so the chance

of picking up a succeeding target would be lessened. The danger of incurring fatal delay is aggravated by the lack of a fast traversing mechanism in both light and locator. If the first target be tracked too far in azimuth, or overhead in elevation, an undue length of time is required to return to the proper direction for succeeding targets.

The rear lights should go into action on their locator data in the attempt to make the original pickup. They should pick up targets in the beams of the adjacent forward lights but should carry such targets only to the approximate bomb release line; in no case longer than 9 seconds of continuous illumination. If the forward light has, by the end of the 90-second period, picked up a succeeding target, the rear light should drop the first to relieve the forward light. If the forward light has not picked up a following target the rear light should immediately be referred to its own data so that it may aid in the pick up. If it is definitely known that there are no succeeding targets there is no objection to the rear lights' carrying its target beyond the 90-second period.

The crux of the operation is in the necessity of the rear light dropping the first target at the proper time to relieve the forward light of the second target in time for the next succeeding target to be picked up. Time should be kept by the rear light commanders, who should not be interfered with except in an emergency.

The 90-second period of illumination is sufficient to place effective fire on a target under normal conditions. This period cannot be shortened to less than one minute without detriment. If succeeding targets should follow at intervals as short as 30 seconds, one minute will be close to the maximum period of illumination that can be given each target with only two rings of lights.

The successful handling of at least three targets, following at intervals of 30 seconds, by one forward and one rear light is necessary to demonstrate that the operation can be repeated continuously. Once functioning, the system will work for an indefinite number of planes attacking in column of single planes at intervals of one minute or greater, and possibly for somewhat shorter intervals. This is based on results attained in the three advanced practices of Battery "A" held in October 1935.

The conclusion has been reached as a result of these advanced practices that two such attacks within a platoon sector, one on each of two routes at the same time, can be handled successfully. Attack on three such routes at the same time, at intervals of one minute or less, must obviously result either in the missing of some of the planes on one of the routes, or in reducing the period of illumination of each target below the minimum, since, with the five-light platoon, the center forward light does not have a rear light to which it can pass targets.



WITHOUT WAR, inferior or decaying races would easily choke the growth of healthy, budding elements, and a universal decadence would follow.—VON BERNHARDI.

# A Practical Improvised Radio Truck

BY LIEUTENANT GEORGE E. KEELER, JR., C.A.C.

**A** RADIO TRUCK recently devised for use with the 69th C.A. (AA) Fort Crockett, Texas, has several unique features that may be of interest to the service, since no radio truck is provided for use with motorized regiments.

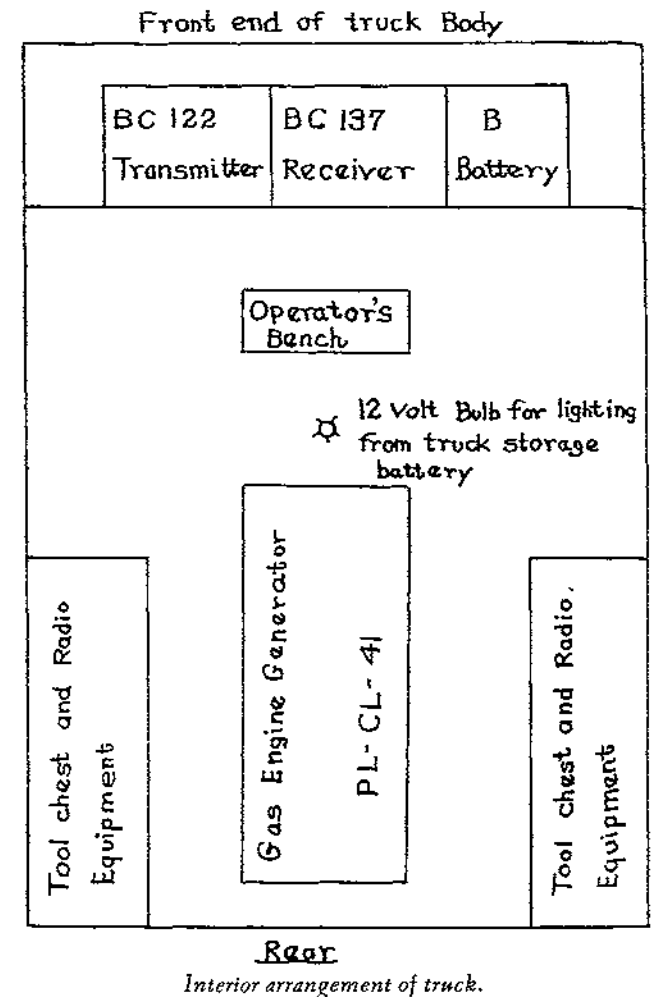
The truck used is a 2½ ton Dodge cargo. The appearance of the vehicle is in no way changed, and it was necessary to make only one very small hole in the truck body to run a ground wire to the frame of the chassis.

The arrangement of the interior of the truck is shown on the accompanying sketch. The transmitter and the receiver of the radio set (S.C.R. 136) are cushioned by rubber blocks and mounted on a bench attached to the front of the truck body. The tool chest and the gas engine-driven generator are securely anchored to the truck body. The antenna, an inside loop arrangement of 420 feet of W-29 wire, is carried on insulators attached to the wooden bows. Spark suppressors are used on the truck and gas engine generator.

The truck conversion was easily and inexpensively made. All materials used were procured locally, without cost, with the exception of the spark suppressors. The method of mounting is compact and neat in appearance. If necessary the installation can be removed easily and quickly.

During the six months since the 69th began experimenting with this truck it has had a variety of tests. Its use at the Leon Springs Military Reservation while the regiment maneuvered with the 2nd Division in October, 1935, proved that rough going and cross country work had no deleterious effect on the efficient operation of the set.

On March 3, 1936, a two-way transmitting and receiving (IC and ICW) test was made between the truck and a fixed station at Fort Crockett. For this test the fixed station was equipped with a B.C. 127 transmitter and B.C. 137 receiver, the antenna was of the 2-wire crow-foot type, 28 feet high, with counterpoise. The radio truck was in motion during the entire test, running at a speed of 25 miles per hour between Fort Crockett and the Municipal Airport, Houston, a distance of about 50 miles. No difficulty was experienced in either sending or receiving while the truck was in motion. The signal strength as reported by the fixed station at Fort Crockett was R5 until the Airport was reached; then, while the truck was parked between two hangers the strength was reported as R4. Transmitting on 650 K. C. the radiation was 2.5 amperes; on 450 K.C. it was 1.5 amperes. In another two-way test, the set gave excellent results in



communicating with an airplane by voice. Signals were still clear and distinct when the plane reached 3,000 feet altitude and was 25 miles away.

This method of using radio equipment now issued to motorized units has many advantages. With the standard equipment thus mounted, one man can operate the radio section. Inclement weather has no effect on the functioning of the set, when mounted on a truck the effect of ground dampness on oscillation is eliminated. The time necessary for setting up a field antenna is saved. The inside antenna has a non-directional effect. Radio communication is available at all times on the march, and this brings up to the possibility of convoy control by radio with present radio equipment.

To Staff Sergeant Raphael Meyerson, 69th C.A., belongs the credit for devising and constructing this system of mounting radio equipment.

# Emergency Methods of Fire Control

## Part V

By MAJOR JAMES T. CAMPBELL, C.A.C.

IF a battery is able to fire with no more information than it can get from a single, poorly situated, and poorly equipped observing station, that battery can go a long way toward meeting emergencies. It will be able to fire before it has had time to set up its normal range finding system. It will continue to fire when its regular system gives poor results or fails completely. The key men in that battery will have a more comprehensive understanding of the devices employed in standard procedure, and will know how to make modifications if necessary.

The question of how much information a single station can furnish is, in itself, a topic big enough for separate discussion, but that discussion will have to wait until we have a better idea of what is needed. When forced to employ an emergency method of fire control the best plan is to make a few assumptions and then go ahead. Assume that the station is equipped with the usual azimuth instruments, one for the observer and one for the spotter, and a time-interval bell in working condition. If the station has a reasonable height of site, it will be able to furnish the following data:

- (1) An estimate of the range to the target.
- (2) An estimate of the direction of movement of the target, in terms of the angle between the keel-line of the ship and the observer-target line.
- (3) An accurate measurement of the azimuth of the observer-target line at each time interval.
- (4) Reasonably accurate measurement of lateral deviations, in angular units.
- (5) Sensings of range deviations, subject to the following conditions:
  - a. Shots not in line with any part of the target cannot be sensed for range.
  - b. Shots in line with some part of the target and short can be sensed as short.
  - c. Shots in line with the target and over will be lost.
  - d. Some of the shots that hit the target will be observed as hits, while others will be lost.

The situation selected for the development of the illustrative problem is one in which the observing station is close to the guns. The case in which there is a considerable distance between the guns and the observing station will be dealt with later. The battery used in this problem has four 155 mm. guns; the time interval is twenty seconds; the firing interval is twenty seconds; and the dead time is forty seconds. Firing data are sent to the guns twenty seconds before firing, and corrections

may be made in the data at any time before they are sent out. Hit-bag dispersion, with one probable error equal to one per cent, gives the necessary scattering of shots. The methods used will work equally well with either Case II or Case III pointing.

In figure 1 the range and azimuth of any point on the plot are the range and azimuth of that point from the observing station; to determine its range and azimuth from the directing point of the battery, relocation is necessary. On the  $110^\circ$  board, this plot would have been drawn according to readings on the station arm, and the relocation would have been made by reading on the gun arm. Actually it was plotted on the Cloke board according to readings on the relocating arm. Relocation was made by the offset method, described briefly as follows: To find the range and azimuth from the directing point, *G*, to any given point, *P*, bring the fiducial edge of the plotting arm to point *P*, set the rider so that its tip touches point *P*, move the oriented platen to the rider, and read the required data from the relocating arm, opposite the mark on the platen representing point *G*.

The azimuth of the line from the directing point to the observing station is 5,848 mils; the distance is 447 yards. If the plot were made on the  $110^\circ$  board, the gun arm center would be 200 yards forward and 400 yards to the right of the station arm center when the plot is viewed as the reader sees it in the figure. On the Cloke board, viewed from the same relative position, the mark on the platen representing the directing point is 200 yards downward and 400 yards to the left of the center of the platen.

These preliminary remarks should be sufficient to orient the reader in the illustrative problem. As soon as the observer identified the target, he gave his estimates of range and target angle—8,000 yards, 60 degrees, coming in from right to left. On the next time-interval bell, the reader reported the azimuth to the plotting room—1789 mils. The plotter located the point corresponding to this azimuth and the estimated range. (Point *A*, figure 1). For the purpose of this discussion, the time intervals are numbered consecutively, for each twenty seconds, labeling the first observation, time 1. A line was drawn through point *A*, making an angle of 60 degrees with the observer-target line, to represent the reported movement of the target. On time 2, the observed azimuth was 1778 mils. The armsetter brought the relocating arm to this azimuth and the plotter, using his target, plotted the point *B* at this azimuth and on the line representing the reported course. Points *A* and *B* established the rate of travel, which was used in predict-

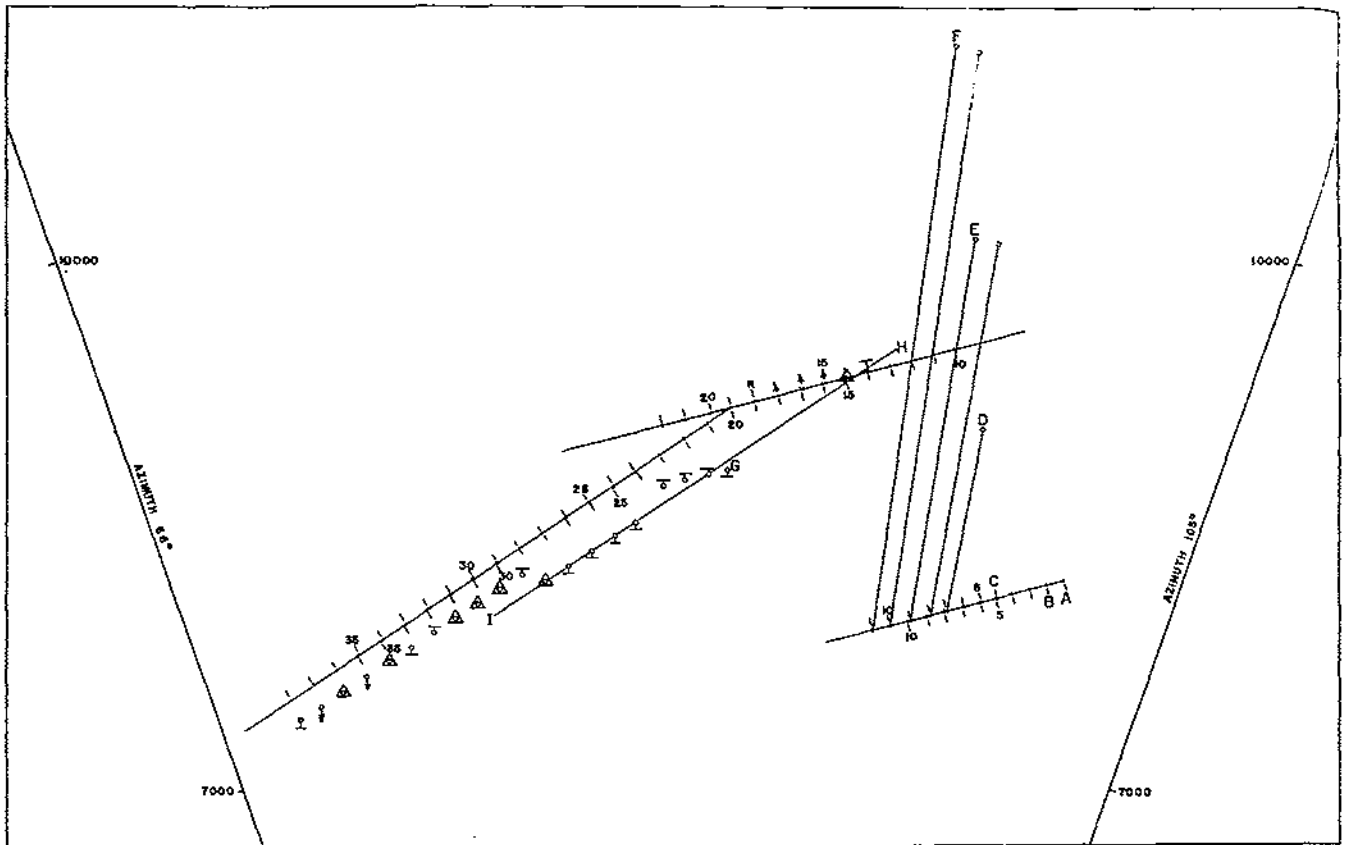


Figure 1.

ing the firing data for the salvo fired on time 4. In the figure, all plotted points are identified by short marks drawn downward and marked occasionally with the number of the bell on which the observation was made. All setforward points are identified by short upward marks, numbered according to the time interval on which the data taken from them were good for firing. The first setforward point is marked C.

The range and azimuth of the setforward point, C, from the directing point, was determined by the relocating method previously described. Ballistic corrections were applied to these data, and the resulting firing data were sent to the guns immediately after the bell on time 3. A two-gun salvo that was fired on time 4, fell just before time 5, and was reported *left 3 mils, both short*.

A correction of *right 3 mils*, applied to the firing data, is not exactly equivalent to *right 3 mils* as viewed from the station, but, with a comparatively short distance separating the guns on the station, the difference is negligible.

The spotting indicated that the range was short, but the amount could not be determined. The adjustment correction therefore would depend upon the probable error of the estimated range, and this, in turn, depended very largely upon the height of the station and the skill of the observer. Assume that these things had been considered beforehand and that the decision was to increase the range in increments of 1,000 yards until the target was crossed. Here one sees the necessity for firing

two shots in the ranging salvos, and wonders whether the number should not be increased to four. A *lost* shot would be interpreted as an *over*, therefore increasing the number of shots increases the reliability of the spotter's reports.

It might be difficult to find a satisfactory way to make accurately these first groping corrections. Fortunately, this is not necessary, and no refinement is justified beyond what can be made by estimate on the plotting board. The plotting arm is brought up to the setforward point, as before, but the rider, instead of being set at that point, is moved along the arm a distance corresponding to the desired correction. When the platen is then moved to the rider, the range read from the relocating arm includes the adjustment correction. With the correction made in this way, the relocation is correct and the range correction does not throw the shot off the observer-target line. A mark on the plotting board, at the tip of the rider, records the correction for use after the bracket is found. In figure 1: D, E, and F are marks of this kind.

The time of flight was about twenty seconds. The interval between the first and second salvos was sixty seconds, to allow time for the correction that was made after the first shot. It was known beforehand that after each salvo the correction would be increased until the target was crossed, and that it would not be necessary to delay firing while waiting for spotting. The interval between salvos was increased to forty seconds so that no unnecessary salvo would be fired after the target had



been crossed. It takes a little over twenty seconds to make a correction, but it takes almost no time to order *Cease Firing*.

Salvos were fired on the data taken from points *D* and *E*. The first of these salvos was spotted *right 2, both short*. The second was spotted *both lost*. Since overs could not be observed, this salvo indicated that the target had been crossed. While the guns were laid on the data taken from point *F*, the order to cease firing was given.

The salvo that completed the bracket was fired on time 9 and spotted on time 10. The course was immediately shifted so that it would pass about half way between points *D* and *E*, since these points indicated the data that gave the bracket. The azimuth observed on time 10 was again set on the board and marked on the new course. The azimuth observed on time 11 established the rate of travel along this new course, enabling the plotter to locate the setforward point for firing on time 13.

On time 13 the battery opened fire at the rate of one salvo every twenty seconds, four shots per salvo. This increase in the rate of fire may be questioned; if so it can be defended. If the battery had not had the good luck to get a straddle on the first salvo—it was reported *right 1, SLLL*<sup>1</sup>—and had been forced to search further for the range, there would probably have been a waste of ammunition. On the other hand, time was passing and the target was not stationary. It was known that the range was almost correct, so that there was some chance of hitting. Also, the larger the number of shots, the more reliable is the information derived from them. Regardless of whether the increased rate is right or wrong in theory, the results in this particular case justified the action.

After the first salvo (*SLLL*), the range officer decided to await developments. He made no correction. The next two salvos were:

Salvo 2	<i>Line</i>	<i>SLLL</i>
Salvo 3	<i>Lost</i>	<i>LLLL</i>

The second salvo justified the decision to wait, but the third gave a sharp warning. At this point the range officer might have used the over-short rule to get a range correction, but he was more concerned with the direction of the course than he was with trifling changes in the range correction. He knew that if the target slipped out of the hitting area so quickly after a straddle and a bracketing salvo, he would have to make a drastic change in range to find it again. To be certain he decided to wait for one more salvo.

Salvo 4	<i>Lost</i>	<i>LLLL</i>
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This was the signal for action. He gave the command, *Relay*, and ordered the correction 260. (This correction is given in reference numbers and indicates a change of

down one fork—or four per cent—from the normal correction, 300, used in firing the earlier salvos). The fifth salvo was already in the air, but the relay saved the salvo that would have been fired on time 18. The fifth salvo was reported *LLLL*, but gave no further information.

The range officer marked each setforward point on the plotter's course with a symbol to show what happened to the salvo fired on the data taken from that point. Above the setforward point for time 13, he drew a short horizontal line to show that the salvo fired on that point gave a preponderance of overs. Around the point for time 14, he drew a triangle to indicate that the range to this point appeared to be correct. Above each of the setforward points for times 15, 16, and 17, he drew an arrow pointing upward to show that these salvos were definitely over. He marked the setforward point for time 18 with an *R* to show that this salvo was relaid.

When the data for time 19 went out to the guns, the range officer knew that it included a down correction of four per cent or 330 yards.<sup>2</sup> He therefore marked point *G* on the plotting board, 330 yards short of the setforward point for time 19, to indicate the data on which that salvo would be fired. He could not use his percentage corrector to give him an "improved range," as he would in the method given in the preceding article of this series, because the percentage corrector carried gun ranges while he was interested in ranges from the station.

When the spotting on the sixth salvo, time 19, came in—*right 1, SSSL*—he drew a short horizontal line under point *G* and decided upon an immediate change in the direction of the course. He selected the line *HI* as the most likely course.

As soon as the plotter finished his prediction for time 22, based on the plotted point for time 20, the range officer drew a line through the last plotted point (time 20) parallel to line *HI*, instructed the plotter to make his predictions along the new line, and ordered a new adjustment correction of 267 (down 3.3 per cent) to take care of the displacement of the plotter's new course from the line *HI*.

The next three salvos fell:

Salvo 7	<i>R<sub>2</sub></i>	<i>HLLL</i>
Salvo 8	<i>R<sub>1</sub></i>	<i>SLLL</i>
Salvo 9	<i>R<sub>1</sub></i>	<i>HLLL</i>

While he kept a record of these salvos on the plotting board, the range officer knew that his recent change in course and correction had not had time to take effect, so he took no action on them. Three more salvos:

Salvo 10	<i>L<sub>3</sub></i>	<i>SSSL</i>
Salvo 11	<i>L<sub>1</sub></i>	<i>HSSS</i>
Salvo 12	<i>L<sub>3</sub></i>	<i>SSSL</i>

The correction called for by the over-short adjustment rule, *up* 1.4 per cent, was applied, making the net cor-

<sup>1</sup>In reporting sensings the lateral deviation is that of the center of impact of all shots that are seen; when all are lost the lateral deviation is lost. For example: Salvo No. 7 was reported *R2-HLLL*—decoded this means Right 2 mils, one hit, three lost. *L3-SSSL* means Left 3 mils, three short and one lost.

<sup>2</sup>A correction of 260 was ordered. Each unit in the reference number is equal to one-tenth of one per cent of the range, therefore, forty units is equal to four per cent. Four per cent of the range at this point on the course is approximately 330 yards.

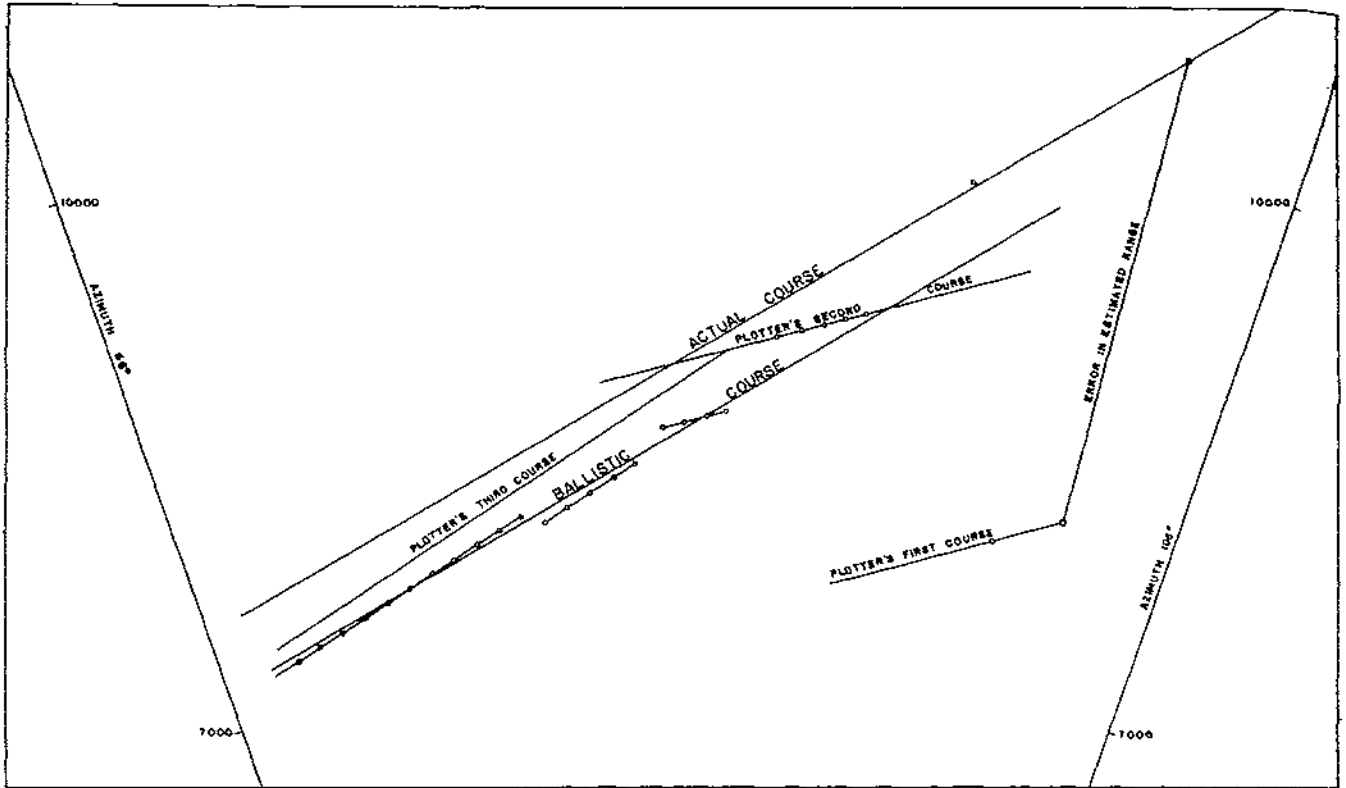


Figure 2.

rection 281. The next two salvos were fired before this correction could get into the data:

Salvo 13	$L_3$	SSL
Salvo 14	$L_1$	HSSL

If these salvos are considered together with the three preceding the over-short rule calls for *up* one per cent. This checks the change already ordered as closely as might be desired.

Beyond this point the shoot is without incident. The next four salvos gave five hits, four shorts, and seven overs. The three salvos after that gave one hit, five shorts, and six overs. No correction was indicated. The last four salvos gave three hits and thirteen shorts. If the firing had been continued, the range officer might have made a change in the direction of the course; he probably would have made a simple change in the range correction; he would be justified in doing either.

Figure 2 shows how the actual course of the target compares with that used by the plotter. It also shows the course which, together with the ballistic corrections that were used by the battery, would have kept the center of dispersion on the target. This is labeled *Ballistic Course*. The rows of small circles show the results of adding adjustment corrections to the data read from the plotter's course. The whole process of adjustment was an effort to make these circles lie on the ballistic course.

On the whole, this battery has done almost as well without range finding as it could have done with it. It found the target by changes in range. When it had found the range at two points along the course, reasonably spaced in time, it was able to work out the rate of change of range. That was about all the standard system could have furnished.



THE APPLICATION OF THE GOLDEN RULE to international affairs is a worthy goal, but unfortunately nations are just as self-centered and just as sensitive to opposition as are individuals that compose them.—CAPTAIN A. T. BEAUGARD, U. S. NAVY.

# Vivisection of the 251st C. A.

BY MAJOR GEORGE C. MCFARLAND, C.A.C.

WHENEVER an individual or a team wins a place in the sun, that individual or team is placed on the operating table and dissected to find out what "makes the wheels go round." Training methods used by the coaches and trainers are studied in an effort to find a better way to build up other teams. Tactics and strategy are analyzed as well as the make-up of the individual members of the team. It is only natural to strive for improvement—usually this can be accomplished by an intensive study of the success or failure of others. The 251st Coast Artillery, having been awarded the Coast Artillery Association Trophy, is now on the operating table; ether has been administered and the surgeon is ready to proceed.

To all outward appearances the patient looks much the same as all other patients, except that he is smaller in stature, which is not his fault. He has used every known tonic in attempts to grow to full size. Soon he expects to gain weight by adding a Headquarters Battery, a Gun Battery and 2nd Battalion Headquarters. After these additions he will need two machine-gun batteries and a gun battery to attain full stature; it is hoped that the National Guard Bureau can prescribe the proper diet to bring about the desired growth.

As to personnel, the 251st probably is not much different from any other Coast Artillery Regiment, except in one particular: there is no recruiting problem; in fact there is a Battery "X," composed of applicants for enlistment who faithfully attend drills and undergo instruction without pay, each one hoping there *might* be a vacancy and that he *might* be selected for enlistment. This condition results from the untiring effort on the part of officers and men to make the work of this regiment interesting and instructive.

Three schools are conducted within the regiment; viz:

- (1) An officers' school conducted by the Instructor, in which officers present individual subjects assigned in advance, with no officer exempt.
- (2) An officer-candidate school conducted by designated officers of the regiment, open to candidates for commission. Admission to this school is based on an entrance examination which includes algebra, trigonometry, U. S. history, and composition. Complete records are kept on each student. The course includes class work and home work; it is difficult enough to require study, energy and determination on the part of the candidate. Extreme care is taken in the selection of officers. The candidate must qualify not only in military matters, but also as a promising member of the community, and equal to the standard of the other officers in the regiment; he must believe in the National Guard to the extent that he is willing, yes even eager, to give up many hours in addition to the regular drill periods.
- (3) The regular extension school course is open to both officers and enlisted men.

All these schools are conducted outside of drill periods, are voluntarily attended, and the attendance is 100%.

There is a very close liaison between the officers of the regiment and the Reserve officers in this locality. Weekly luncheons given by the latter are attended by a majority of the officers of the 251st. Some Reserve officers faithfully attend regimental drills; included in this group are Coast Artillery, Infantry, Field Artillery, Ordnance and Quartermaster officers. The problems of each component are thoroughly understood by the others.

At intervals of three months there is an inter-battery competition. This covers close order drill, manual of arms, dissembling and assembling the service pistol, making and adjusting packs, display of equipment, and first aid. In the squad drill one squad from each organization is drilled for five minutes, each squad independently executing each command. All other events have two entries per organization, one a N. C. O. and the other a private first class or private. The battery representative in the manual of arms is determined by elimination. In the preparation of packs, display of equipment and first aid a maximum time of five minutes is allowed. The entire program requires one hour. This is followed by dancing or other social entertainment. No man is allowed to compete a second time until the entire roster of the battery is exhausted and then he cannot enter an event in which he has competed previously. This type of competition develops and brings to the surface the best qualities in men. After this competition has been held a few times, each battery has a number of men qualified to act as instructors in each subject. Interest in these competitions is very keen and the competitive spirit runs at a high pitch.

On drill nights the noncommissioned officers of each battery get together for supper; the cost of this meal is kept low, usually from 25 to 30 cents. After mess certain N. C. O's are called upon for short talks on some military subject. The drill schedule for that night is then outlined and all questions settled prior to assembly.

Every possible contingency was studied and everything possible was done prior to camp. A plot drawn to scale was made of the camp site, on this each tent was located. Kitchen sites were selected and piped for gas; field ranges were modified by installing a baffle plate to accommodate them to this kind of fuel. Prior to departure each officer was thoroughly familiar with every detail of the camp layout and there was no necessity to ask questions after arrival. The gun positions were selected, base lines surveyed and all arrangements made to emplace the guns and be ready to function with the minimum delay.

During the armory training period all necessary charts, such as trial shot charts for the guns, fire control charts for the machine guns and target courses for use of the

Air Corps, were prepared. The trial shot charts varied from the normal, in that the horizontal and vertical projections were superimposed and mil scales were used instead of lines. A correction chart was made for the guns, which tied together the three deviations (lateral-vertical-and range) and gave a correction in altitude. Officers were thoroughly drilled on hypothetical trial shot and adjustment problems. The record section was drilled on a device which operated as follows:

Representation of a sleeve target was painted on a section of cloth stretched on a frame, to which was attached roller skates, so that it could be moved easily across the armory floor. A variable "V" with one leg numbered and the other lettered had a flashlight bulb at the apex. Two contacts each connected to battery terminal were placed in rear of the cloth so that when the legs of the "V" touched them an electric circuit was formed and the light flashed. By varying positions of the legs of the "V" and recording the letters and numbers on the legs,



Top: Major General Paul B. Malone presenting the Coast Artillery Association Trophy to the 251st C.A. Left to right—Gen. Malone; Brig. Gen. H. H. Morehead, Adjutant General, California N.G.; Col. John H. Sherman, Commanding 251st C.A.; Mr. Sgt. R. H. Neff, 251st C.A.; Col. Hercourt Hervey, Commanding 160th Inf., Calif. N.G.; Brig. Gen. Walter P. Story, Commanding 80th Brigade, Calif. N.G.

Bottom: Escort of General Malone's car and troops of the 251st C.A. marching to the amphitheater for the presentation.

observers could be trained and their observations checked. This device was designed and built by 2d Lieutenant M. H. West and proved invaluable in training the record section.

For the machine guns a plotting board was made utilizing a 1,000-yard base line and a 10-second observing interval. By plotting the target for 10 seconds before it entered the field of fire and extending its course through the field, ranges were determined and from them lateral and vertical leads for opening fire. After fire was opened adjustment was by tracer. As a result of this method only very small adjustments were necessary. After the record firing was completed two courses were fired (without tracers) using initial leads throughout. The target was shot down on the second course, and found to have approximately the same number of holes, proportionate to the number of rounds fired, as when using tracers.

The searchlight battery employed no new or unusual methods but concentrated on long hours of training for the listeners, utilizing the gun target plane during daytime and their own plane at night.

In preparation for and during the summer training period the regiment had the full cooperation of all officials of the city and county of Ventura. We attribute our success in target practice to the fact that we were prepared; preparedness being the foundation upon which our military structure is built.

All the personnel fully understand that the regiment will have keener competition each year. They hereby serve notice that they are not content to rest on laurels already won and that they will go after the coveted trophy with renewed energy and a determination to again be designated as the outstanding Coast Artillery regiment in the National Guard.

#### PRESENTATION OF THE TROPHY

In the beautiful setting of the Organ Amphitheater at the San Diego Exposition grounds, on the afternoon of April 25, Major General Paul B. Malone, Commanding the IX Corps Area, officially presented the Coast Artillery Association Trophy to the 251st C.A. Prior to this General Malone had been received with full military honors and escorted by the 251st to the Amphitheater. In the receiving party were General H. H. Morehead (former Commanding Officer of the 251st and now State Adjutant General), Colonel John H. Sherman, Commanding Officer of the 251st, Mr. Frank G. Belcher, President of the Exposition, Colonel Hercourt Hervey, Commanding Officer 160th Inf., Calif. N. G., Brigadier General Walter P. Story, Commanding the 80th Brigade, Calif. N. G., Major Stanley F. Griswold, U. S. A., and many other dignitaries of the Army, Navy and the Municipal Government of San Diego.

After the introductory remarks of welcome General Malone, in a memorable address, officially presented the Trophy to Colonel Sherman. In this he pointed out the part played by the National Guard in our scheme of



OFFICERS OF THE 251ST C.A., CALIF. N.G.: *Front Row, left to right:* Maj. G. C. McFarland, Instructor; Capt. F. H. Awes; Capt. J. B. Willey; Capt. C. L. Randall; Maj. F. B. Haines; Capt. M. A. Herbert; Capt. E. H. Depew; Lt. Col. J. H. Sherman; Col. J. T. Geary, N.G. Officer, 9th C.A.; Brig. Gen. H. H. Morehead, A.G., Calif. N.G.; Maj. J. D. MacMullen, Inspector; Maj. Paul Ingelbreit; Maj. G. W. Oertly; Capt. C. R. Bauer; Maj. E. G. Colby; Capt. H. A. Wood; Capt. R. C. Wueste. *Back Row:* Maj. L. D. Farnsworth, Inspector; Capt. C. R. Ogden; Lt. Vivian Rapp; Lt. C. V. Fry; Lt. E. M. Kananen; Lt. B. Kearney; Lt. S. L. McIntire; Lt. A. Long; Lt. J. D. Condit; Lt. L. A. Milz; Lt. J. V. Long; Lt. W. H. McKinley; Lt. V. J. Brustkern; Lt. H. Buehl; Lt. L. S. Unkrieh; Capt. H. J. Lovejoy.

Defense and especially complimented and congratulated the 251st on its outstanding performance and general excellence, calling special attention to the fact that the trophy had been won in the keenest kind of competition from the entire Coast Artillery National Guard, an achievement in which each and every member of the regiment could take great pride. He expressed himself as being proud of the fact that the 251st is a part of his command.

After the presentation ceremonies the regiment, in mass formation, took part in the retreat ceremony of a Provisional Company of the 30th Infantry now stationed in the Exposition grounds. In the evening the officers of the 251st were honored at a stag dinner given by the Chamber of Commerce of San Diego. The entire officer

personnel of the 251st were seated at one table, as special guests of the Chamber. Other guests included representatives from the Army, Navy, civic bodies and other distinguished civilians. General Malone was again the principal speaker of the occasion.

April 25, 1935, will long remain a red letter day in the annals of the 251st C.A. It marks the culmination of a long upward struggle to reach the pinnacle of success in their avocation on the part of busy men, faced with the necessity of earning a livelihood, who have not lost sight of the necessity for adequate preparedness and are willing to give unstintingly of their time and talents to the end that this nation may be better prepared to defend its honor and uphold its prestige should the occasion arise.

## An Antiaircraft Data Table

BY CAPTAIN JOHN E. REIERSON, C.A.C.

THE antiaircraft data table, used in antiaircraft instruction, is approximately eight feet long, three feet wide and two and one-half feet high. These dimensions give a convenient scale of 1 inch equals 100 yards. Pieces of 2" x 4", two and one-half feet long, are attached to the rear legs by large screws. A section is cut from the corners of the table so that the outside surface of the 2" x 4" is flush with the rear edge of the table top.

A heavy wire, representing the course of the target, is attached to the top center of each upright. Any point on this wire may represent a trial shot point. This wire supports a frame (see "A" in figure) on which are target positions, represented by elliptical targets painted on blocks, labeled  $T_1$ ,  $T_0$ , and  $T_b$ .  $T_1$  is the position of the target at the instant of observation,  $T_0$  is the position of the target at the instant the gun is fired and  $T_b$  is the

predicted future position of the target. Horizontal projections of the target positions also are represented by blocks.

A small pulley wheel is pinned to each corner of the frame "A," the upper wheels running on the wire and the lower on a track. The  $T_0$  blocks are attached to a metal strip "b" by screws and the assembly is supported on the frame by pinning each block to its base. Holes are drilled in the bases (metal strips "a" and "c") so as to give  $T_0$  any desired position between  $T_1$  and  $T_b$ , or the  $T_0$  assembly can be removed altogether when discussing position finding by the later types of data computers. The positions  $T_1$  and  $T_0$  coincide in the latter as there is no "dead time" and, because of electrical transmission there are no dead time angles. Either end block may represent  $T_b$ , thus giving courses left to right and right to left.





A gun position is selected in the front center of the table. A heavy wire representing the trajectory and a smaller wire representing a line passing through the axis of the bore are soldered to the muzzle of a miniature gun which is free to rotate. Rubber strips,  $3/16$  inches wide (cut from an inner tube) are stretched from the carriage to each target position. A pin with a U-shaped head is used in the  $T_p$  block to support the wire representing the trajectory.

The target assembly "A" is moved along the wire by means of a small rope passing through a pulley attached to the lower end of one upright. This rope is given several turns around a small drum fastened to the leg just below the other upright. The free ends of this rope are fastened to the lower ends of short metal strips attached to the rear of each lower corner block, thus concealing the ropes when observing the table. As the target frame moves, the rubber strips stretch or contract and the elements entering into the computation of firing data are correctly represented.

An azimuth scale at the gun shows the azimuth to any position of the target. A semicircular scale, graduated from zero, right or left, to 1,600 mils in the center, is attached to the lower  $T_p$  block; this shows the angle of approach at  $T_p$ . Another azimuth scale, with a movable pointer representing the direction of the ballistic

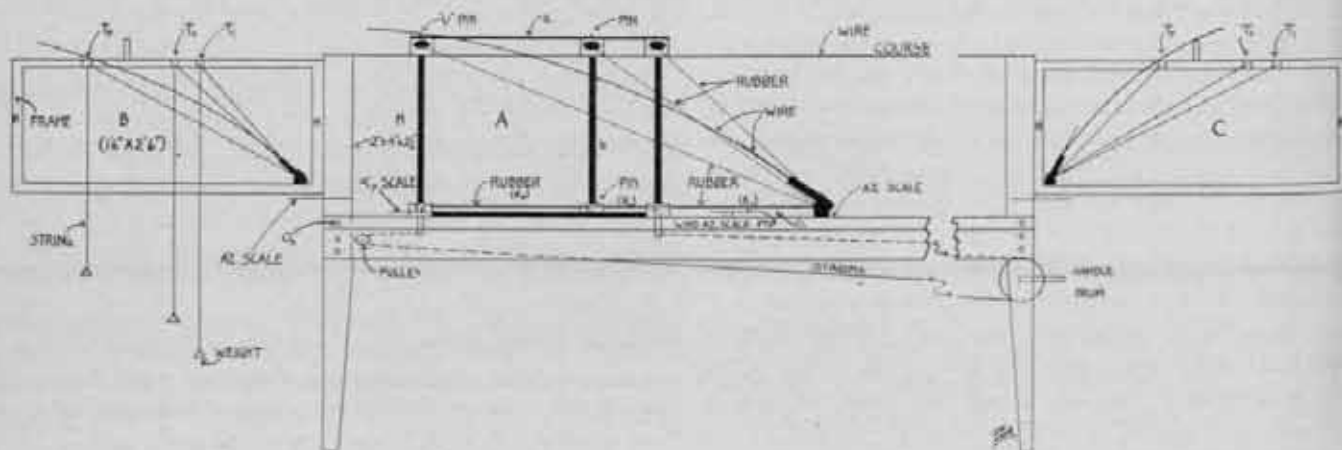
wind, is placed at any desired point on the table. There is a screw-eye at either front corner of the table representing an observation station, ( $O_2$ ) also one at the gun representing an  $O_1$  station. A point near the end of the wire (course of target) is chosen as a trial shot point. Strings from  $O_1$  and  $O_2$  represent lines of position to the above point; their horizontal projections and the altitude azimuth scales are provided for each station.

A round white cork, threaded on the wire trajectory, represents a burst or center of burst. The cork has a screw-eye, on its underside, for the attachment of strings representing lines of position, their projections and altitude. Graduated metal scales are threaded on the  $O_1T$  and  $O_2T$  lines of position, making it possible to read angular deviations of the center of burst.

A target frame is hinged to each upright. The left frame "B" represents a receding target. A slide in the upper member of the frame carries, on its underside, two labeled screw-eyes and one labeled pin ( $T_p$ ) representing each of the three target positions. Weighted strings passing through the several screw-eyes and pin represent the elements of data. If desired, tacks on the underside of the slide may be used to attach strings to show angular pointing corrections. The slide moves in a grooved slot thereby demonstrating the changing positions and variation of elements of data. An azimuth scale attached to the upright, just below the frame, shows the azimuth of the course. The right frame "D" is similar to the left in construction but shows a target coming in and rubber strips are used in place of strings. The upper bases of these frames are graduated in angular heights similar to a trajectory chart.

In addition to showing practically all elements of data, this table is useful in position finding and gunnery instruction.

Its cost, aside from the table, was but a few cents as it was made from scrap materials.



# Organization of A. A. Machine Guns

BY MAJOR WILLARD W. IRVINE, C.A.C.

IN the two preceding articles of this series, the question has been considered whether machine guns employed to defend the gun batteries and the searchlight battery should be an organic part of these units or should be included in the machine-gun battalion. In this article other changes in the organization of the machine guns of an antiaircraft regiment will be considered briefly by discussing two pertinent questions.

## IS AN INCREASE IN THE FIRE POWER OF THE MACHINE-GUN BATTALION NECESSARY?<sup>1</sup>

The increase in speed of airplanes within the past few years has reduced the effectiveness of a machine-gun battalion defending an objective against a bombardment attack in the following ways:

First: The period of time airplanes are under fire has been cut in half, reducing in the same proportion the number of hits that might be obtained.

Second: It is more difficult to secure hits on the faster moving airplanes.

Third: Airplanes can drop bombs at a greater distance from the objective, which forces part of the machine-gun defense to move farther away from the objective, thus spreading the same volume of fire over a greater area.

The significance of the first two effects is evident; only the third will be explained.

Present tactical teaching locates machine guns 500 to 1,000 yards from the objective which they defend,<sup>2</sup> apparently on the theory that it is necessary for airplanes to reach the objective before releasing their bombs.<sup>3</sup> Machine guns should defend to an altitude of at least 3,000 feet (1,000 yards). An airplane bombing at this altitude and flying at a speed of 200 miles per hour releases its bombs 1,335 yards from the objective as shown in the accompanying figure.<sup>4</sup> This being so, some machine guns should be located farther away from the objective than is now contemplated. This extension of the defense reduces the supporting distance between the 12 fire units (platoons of four guns)<sup>5</sup> of the machine-gun battalion, which in turn reduces the number of rounds that can be fired on a particular formation of attacking airplanes.

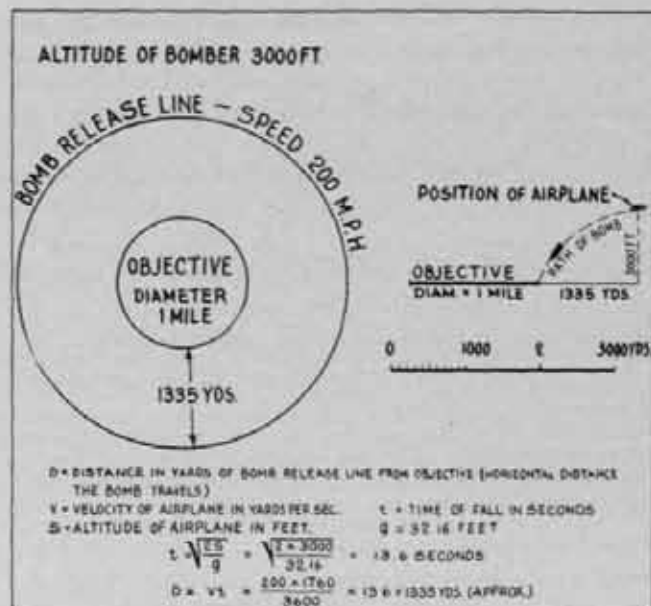
<sup>1</sup>The antiaircraft machine-gun battalion has 48 caliber .50 machine guns, organized into four batteries of 12 machine guns each.

<sup>2</sup>*Coast Artillery Field Manual*, Vol. II, Part One, paragraph 62: "Machine guns are located on high ground within 500 to 1,000 yards of the object they are defending."

<sup>3</sup>CAFM, paragraph 66: "The fact that it is necessary for diving bombardment and low-flying attack aviation to arrive at the actual objective before releasing their bombs and the fact that the range of the machine guns is short make it necessary that the machine gun defense be located in the immediate vicinity of the objective covered."

<sup>4</sup>Based on the formula in paragraph 56, CAFM.

<sup>5</sup>CAFM, paragraph 67: "The machine guns are disposed by platoons—"



The effectiveness of a single battalion of antiaircraft machine guns defending a typical rear area objective has not kept pace with the increase in speed of aviation, principally because of difficulties of fire control. These difficulties are explained, and a solution indicated, in an article entitled: "Notes on Antiaircraft Machine-Gun Fire Control" in the May-June, 1935, *COAST ARTILLERY JOURNAL* by Major General A. H. Sunderland, Chief of Coast Artillery, then President of the Coast Artillery Board. He states that the number of hits made in machine-gun target practices are few and that antiaircraft machine gunners fire without a standard sight and by a method, aptly described as gunner's guesses, which gives unsatisfactory results. Progress may be expected, as this matter is being given particular attention by the Coast Artillery Board as evidenced by the following note in the January-February, 1936, *COAST ARTILLERY JOURNAL*:

PROJECT NO. 1046—ANTIAIRCRAFT MACHINE-GUN FIRE CONTROL METHODS AND EQUIPMENT.—This test is the Board's main effort for the immediate future. All plans make way for a test next spring to include every scheme for controlling machine gun fire that appears to present any possibilities of being a success. A large part of the personnel of the Board, together with a fair percentage of the personnel of the Harbor Defenses of Chesapeake Bay, will move to Fort Story early in March to attack the problem of blending materiel and methods, in a search for the most effective means of destroying aerial targets by machine-gun fire.

When a satisfactory sight and fire control system is developed, the antiaircraft machine-gun battalion may be sufficient for the protection of a rear area objective; but, in the meantime, other measures of increasing its effectiveness should be considered.

### CAN A MACHINE-GUN BATTALION MAN MORE MACHINE GUNS?

An antiaircraft machine-gun battalion has 828 officers and enlisted men and 48 machine guns; an average of 17 men per gun. A machine-gun squad of eight privates and one corporal mans one machine gun.<sup>6</sup> In a rear area defense,<sup>7</sup> this number is essential only under exceptional conditions, for example, when the supply of ammunition is difficult or the machine gun has to be carried some distance and go into position quickly. Ordinarily, occupation of position is deliberate and ammunition supply is easy. Under these conditions it is probably practicable for nine men to man two machine guns, since two men can fire a machine gun during the short intermittent periods of time when it will be in action against airplanes.

The argument has been advanced that an antiaircraft

<sup>6</sup>The Infantry propose to carry the same machine gun across country and maintain water and ammunition supply with one less man per squad. The Marine Corps use about 30 less men for a battery armed with the same type and number of machine guns.

<sup>7</sup>A rear area is one not normally subject to attack by ground troops.

machine gun defense operates 24 hours a day, and, therefore, reliefs should be provided. A relief is not provided for the gun batteries or the searchlight battery. All antiaircraft artillery units depend upon timely information of approaching airplanes from aviation, from a ground intelligence service, or other sources. *For the first year at least of any defensive war engaged in by this country, it is probable that all antiaircraft artillery will be employed in rear areas, where surprise by large formations of airplanes is unlikely.*

A machine-gun battery has 187 officers and enlisted men and 12 machine guns. A number of experienced machine-gun battery commanders were consulted as to the practicability of a battery manning twice as many machine guns in rear areas. The consensus was that it could be done and a majority favored the change.

**CONCLUSION:** An increase in the fire power of an antiaircraft machine-gun battalion is desirable. One way to accomplish this, and the one which appears most practical, is to man more machine guns with the same personnel. The suitable number of machine guns could be determined by field tests.

## May I Publish This?

By CAPTAIN E. X. NOVITIATE

“MAY I publish this?” is a question often asked the War Department. The answer is usually “yes” with a warning that no reference can be made to the War Department’s approval. The policy is liberal; public and private discussion on appropriate occasions by officers of the Army, in support of the military policy of the United States as established by law, is not only authorized but encouraged by the War Department. (1)<sup>1</sup>

A member of the military service may publish articles on military subjects that are not prejudicial to discipline and that contain nothing of a secret or confidential nature. (2) Papers describing work of a general scientific or engineering nature may be presented before appropriate scientific or technical societies or published in appropriate publications, with the prior approval of the responsible chief of arm or service. (3) By custom, the above rules apply to platform and radio addresses, as well as to published papers, but permission to deliver an address is requested but rarely.

The general rules outlined above are subject to certain restrictions. An author is asked to differentiate between personal ideas or opinions, and official pronouncements. If a member of the Regular Army, his military status

**An author is asked to differentiate between personal ideas or opinions and official pronouncements.**

limits the extent to which he may, with propriety, make public presentations on political, diplomatic or confidential subjects and legal or administrative orders. Furthermore, he should not make any statements which might tend to prejudice discipline or to involve higher authority in controversy. (4) All public reference to private or personal transactions between officers is prohibited. (5) While official titles are prohibited in connection with commercial enterprises, (5) this does not mean that an officer is forbidden to use his title in indicating authorship of an article.

Although an author has followed regulations to the best of his ability, he may still doubt the propriety of publishing his manuscript and find it necessary to ask permission. If the article be of a technical nature, it will probably be submitted to a service journal. In such cases the editor, acting for his chief (who is charged by Army Regulations with the preservation of technical secrets (6) and who is responsible for the propriety of material published in his journal), (7) is generally able to decide whether publication is permissible. In doubtful cases, the manuscript may be referred to the office of a chief of arm or service, to a board of officers (such as The Infan-

<sup>1</sup>Numbers in parentheses refer to Army Regulations as follows: (1) Paragraph 6, AR 600-10; (2) Paragraph 8, AR 310-10; (3) AR 850-25; (4) Paragraph 5, AR 600-700; (5) Paragraph 2 d, AR 600-10; (6) Paragraph 4, AR 600-700; (7) Paragraph 10 b, AR 600-700; (8) Paragraph 7, AR 340-15.

try Board) to the commandant of a service school, or to The Adjutant General.

Manuscripts received by The Adjutant General are transmitted to the Assistant Chief of Staff for Military Intelligence, who directs their return by appropriate indorsement, after determining the propriety of publication. If a manuscript does not fall within those categories that require approval, it is returned with a statement to that effect. No attempt is made to pass upon articles submitted by Reserve or National Guard officers unless on active duty or in the federal service.

The foregoing remarks pertain to articles written by individuals. Official documents are subject to special restrictions. With respect to secrecy they are classified as "secret," "confidential" and "restricted." At times these terms have been used rather loosely in classifying documents. Too many papers were marked "secret" or "confidential" that should have had a lower designation or none at all. This practice not only slows office procedure but tends to bring about a disregard for the essential safeguards that should be applied to really secret papers.

According to regulations there are only a few classes of documents that must be marked "secret." These include war plans, defense projects, certain codes and ciphers, and papers pertaining to war-time movements of troops. However, custom, or carelessness, stamps many a document "secret" or "confidential" that would be perfectly harmless even if broadcast. The Navy, confronted with the same situation, took positive action to correct it by requiring the signer of a secret paper to certify that he considers it impossible to phrase the document in such a manner as to permit a classification other than secret. Our regulations have restricted the authority to issue "secret" documents to the higher echelons of the Army.

A completely revised edition of AR 330-5, covering secret, confidential and restricted documents, has recently been issued. It would be well for every officer to familiarize himself with these regulations, for the loss or compromise of a secret document may be a serious matter indeed. This becomes apparent once we realize that a document is marked "secret" only when the information it contains is of such nature that its disclosure might

endanger the national security; cause serious injury to the interests or prestige of the nation, an individual, or some governmental activity; or be of great advantage to a foreign nation. It is evident that documents of this classification should be held down to the minimum essential distribution on the one hand and scrupulously safeguarded on the other.

A confidential document, though not as important as the secret variety, demands more than ordinary care. All papers classified as "secrets" or "confidential," except correspondence, are now to be accounted for by periodic returns.

The originator of a document should so phrase it as to permit the lowest possible classification in the scale. He should also give careful consideration to the probable distribution of a document when assigning a classification. It is highly doubtful, for instance, whether any document sent to twenty-odd CCC camps can be kept a secret. It is also unlikely that any "confidential" paper sent to every officer in a corps area will long remain so.

It should be remembered that Army Regulations state that the contents of official communications will not be revealed except to those officially entitled to receive them. (8) The addition of the mark "Restricted," which has been adopted to replace "For Official Use Only," is designed to protect a document from publicity.

The technical details of new weapons and equipment are particularly difficult to keep secret. The terms "secret," "confidential" and "restricted" are applied to specifications, drawings, and models of technical developments. The fact that most of our new equipment is manufactured in private plants or at arsenals where civilian workmen have access to the plans complicates the problem of keeping information concerning it from leaking out. Fortunately, the Espionage Act provides penalties for the illegal disclosure of technical information relating to national defense irrespective of its actual classification as to secrecy, but even this safeguard does not always prevent foreign agents from obtaining it. However, the mere fact that leaks do occur should not engender carelessness in observing the letter and spirit of the regulations designed to preserve our military secrets.



*THERE MUST BE A NEW DEAL in Europe before any real armament limitations can take place and it must be based on economic lines rather than on folk lines or present national lines.*—COLONEL CHARLES G. METTLER.

# War at the County Fair

BY CAPTAIN EDWARD F. ADAMS  
*Infantry*

IT is generally acknowledged that certain portions of our training publications are a bit queer, but we refuse to become excited over that fact because we suspect that an entirely new set of ideas will supplant the present ones at the outset of our next war. Nevertheless, I was deeply interested in the reactions of an acquaintance who is positive our War Department is balmy.

He is a news reporter by profession. His military knowledge was gleaned through two years of ROTC and six months of enlisted service in the Guard; in the latter he has risen to the grade of corporal. I recently watched him instruct his squad in the art of advancing by short rushes and he made an excellent job of it; in his demonstration of how to drop to the ground at a run his impact with the armory floor shook the entire building. He has placed his training publications on a par with his Bible.

A few days ago I met him at the County Fair. He was particularly interested in the paraphernalia of a Regular Army company which was encamped there to display the usual models of trenches, wire entanglements and gas-proof shelters. This company was scheduled to hold a sham battle in front of the grandstand immediately following the afternoon horse races, so I bought my news-gathering friend a glass of beer and was in turn invited to join him in the press box.

The horse races were highly entertaining; the battle was more so. As the troops entered the field in a column of squads, their gleaming bayonets and their steel helmets, all neatly cocked at the same saucy angle, drew loud applause. It was evident that the company had spent several weeks practicing for this particular battle. Each squad and section leader timed his arm signals by his wrist watch, but the men were so well trained in their routine that signals were totally unnecessary. Each attacker knew exactly how many blanks to fire before rising for his short rush. Each knew just how many steps to run before dodging onto a new course and then falling to the ground to resume fire.

The first time they fell to the ground their technique was beautiful. However, one thing was plainly evident to my press box host; viz, they had never before tried it while wearing steel helmets. The helmets persisted in rolling off and each attacker, before resuming fire, had to crawl forward from where he had fallen in order to retrieve his tin hat. A few sly warriors attempted to remedy the situation by tightening their chin straps but the next rush proved this precaution insufficient. The tightened hats didn't roll off but the very tightest of them slid as far as the wearer's nose.

My host demanded an explanation and I was foolish enough to attempt one. "No, it's not a game they're playing; the damned things are supposed to stay on top

of their heads. No, there'd be no advantage in having it automatically cover the face at that special moment. Each man should resume firing immediately, as fire superiority is essential.

"Yes, those tin hats were designed by Brass Hats," (I considered his pun rather weak), "and the Brass Hats in Washington write our training manuals. No, they seldom test their words of wisdom on their office floor at the State, War and Navy Building. Why certainly, if you can think of something better I'll gladly write the Secretary of War and explain your plan in detail."

As we left the grandstand my friend was visibly tense with the fever of battle, so as a precaution against shell-shock I suggested another glass of beer. My first-aid treatment was effective, but seeing that he was still worried I led him off to visit the other Fair exhibits. He was mildly interested in the prize cow, the largest hog in the county and the champion onion, but he suffered a relapse when we reached the poultry show and waited for the blue-ribboned hen to settle down and lay her daily egg.

"If she were wearing a helmet" he remarked, "I'd expect her to commence firing immediately. Fire superiority is a necessity."

When a man appeared with a portable table bearing three walnut shells and a pea, and asked us to guess (for fifty cents) under which shell the pea was hidden; my friend picked up a shell and asked me if a helmet of that shape wouldn't be an improvement.

Later on, in the sanctity of the beer parlor, he attempted to fashion a helmet from a slice of cheese but was unable to settle upon a satisfactory model. Then he directed the bar-maid to bring a pencil and some paper, and with the aid of another glass of beer Volume II, BFM, was amended as follows:

"Being at a halt, quick time, double time, or running; to LIE DOWN:

"(1) Raise the right hand above the head and place same firmly on top of the steel helmet.

"(2) Advance the left foot, turn it across the front of the body and kick aside any stones or debris found there.

"(3) Place the weight on the left foot, pivot 180 degrees to the right and fall to the ground, landing on the buttocks and breaking the fall with the bayonet scabbard.

"(4) Roll over and regain fire superiority."

EDITOR'S NOTE: The tin hat was copied from that of the British Tommy. Could it be that our parade ground soldiers failed to borrow the technique of wearing when they appropriated the model?

The Tommy soon learned that the length of dangling leather was not a chin strap but a cranium surcingle. After all, the tin hat is heavy enough to be proof against blowing away, except in a Florida hurricane, so need not be secured under the whiskers. Shortened and fitted snugly behind the bulge (if any) on the back of the skull, the strap does permit the wearer to flop to the ground without losing the basin. Also, your good soldier faces to the front, whence the bullets are supposed to come. With the strap in reverse, a bullet can hit the helmet a healthy clunk without the strap cutting the wearer's throat. This is just a practical suggestion—take it or leave it.



# Forms of Attack That May Be Expected Against Harbor Defenses and the Key-note to Their Successful Repulse

BY MAJOR IRA B. HILL, C.A.C.

**W**E in the Coast Artillery are particularly interested in the types of attack that may be expected against fortified harbors, and in the defensive measures that should be adopted to thwart these attacks. The most superficial consideration of the question makes it apparent that the defense of harbors is not a problem to be handled entirely by the Coast Artillery. Cooperation by other arms, particularly the Navy and the Air Corps, is absolutely essential.

Attacks against seacoasts may be classified as purely naval, or joint naval and military. Those classed as naval will, for the most part, be directed against the elements of a harbor defense. In this discussion we will consider only such attacks as might be made against a harbor defense by any or all of the elements of a modern naval force, to include attacks by naval vessels and aircraft either jointly or separately. Landing attacks will not be considered, as it is believed that, except for small detachments, such attacks will not be attempted until the harbor defense installations have been rendered impotent.

The following represent the principal forms of attack that might be directed against a harbor defense:

Aircraft attacks on the fortifications; on naval forces within the harbor; on important establishments in or near the harbor.

Bombardment by naval vessels of the fortifications; of naval forces within, entering, or leaving the harbor; of important establishments in or near the harbor.

Mine laying off the entrance to the harbor, or in the channel leading into the harbor.

Mine sweeping off the entrance to the harbor or in the channel leading into the harbor, and attempts to destroy nets or other barriers to navigation at the harbor entrance.

Blocking attacks on the harbor entrance.

Torpedo attacks against vessels within the harbor.

Small landing raids.

In the future aircraft attacks launched from airplane carriers, undoubtedly will be a most serious menace to harbor defenses. The hostile fleet can lie out of range of the heavy artillery while the batteries and other defense elements are being subjected to destructive attacks from the air. These attacks might have for their object the neutralization of the defenses preliminary to a more determined attack participated in by naval, air and ground forces or any combination of these, or, more probably, the destruction of the naval forces and installations in or near the harbor.

Brigadier General H. Rowan Robinson, C.M.G., D.S.O., writes as follows regarding aircraft attacks against harbor defenses: "We have but little direct experience to

guide us as to the worth of aircraft in coastal operations, for they have as yet played no big part therein. \* \* \* We do know, however, that the conditions under which they may have to act in the attack are not always favorable to the development of their full capacity. \* \* \* If, however, it could be shown that a fleet and air force combined, unencumbered with an army and all its paraphernalia, would suffice, not indeed for the capture of the fortress, but for the fulfilment of the task most commonly involved, namely, the destruction of ships and establishments in the harbor, the chances of effecting surprise would be greatly enhanced, and operations of this nature might be undertaken far more readily. Such an issue might have a profound effect on naval warfare because attacks of this type, even if they failed to destroy the enemy's fleet, would certainly force him to a radical alteration of his basic strategy."

With the great increase in recent years of air forces throughout the world, there is no doubt that harbor defenses will be subjected to air attacks in the next war. Surprise will be an essential element in this type of attack and measures for defense against it will devolve principally upon the antiaircraft elements of the harbor defense. Security measures in the form of naval offshore patrols and air patrols will be essential, and the operation of all of these components should be bound together by an effective system of communications.

Bombardment by naval vessels, as an independent operation, probably would be attempted only as a reconnaissance, to draw fire from the harbor defense batteries, thus locating their positions, or as a diversion in connection with a larger plan of operations, such as the German bombardments of Hartlepool and Scarborough. If friendly naval forces were within the harbor, or were attempting to debouch from the harbor, they would be particularly vulnerable to the hostile fire and would be subjected to heavy losses.

Unless the guns of the hostile ships outranged the shore guns, thus allowing the ships to fire from stationary positions, such a bombardment would not be attempted, due to the limited effect to be expected and the danger to which the attacking ships would be exposed. At particularly favorable harbors a bombardment might be attempted by ships moving at high speed behind a smoke screen; this would require aerial observation to spot the ships' fire.

Minelaying operations off harbor entrances were frequently resorted to during the World War, by the Germans off the English coast and by the British off the

German and Belgian coasts. This is likely to be the first operation undertaken at the outbreak of war; it is one that requires the coordinated efforts of all defense forces to frustrate. The constant threat is of greater potential value than the material destruction to be expected. These operations can be carried out by small groups of fast-moving destroyers, working under cover of darkness or a smoke screen.

Hostile mine sweeping off the entrance to a harbor for the purpose of clearing a passage usually will precede some other form of attack. Frequently it will be covered by a hostile long range bombardment or possibly an aerial bombardment. Although a difficult operation, particularly if the defense forces are alert, it is nearly always a necessary preliminary to other operations and will be attempted whenever the necessity demands.

During the World War the British frequently were able to sweep mine fields well within the fields of fire of the German batteries on the Belgian coast. However, timely warning by friendly naval and air patrols will enable the coast batteries to make mine sweeping a very hazardous operation.

Very often the entrance to a harbor is so narrow as to make it vulnerable to a blocking attack. The attempted blocking of Zeebrugge by the British during the World War is an excellent example. While this type of attack may be easily frustrated, nevertheless, where the harbor entrance is favorable, it is always a possibility; and when the need is sufficiently great, it will surely be attempted by an enterprising enemy. The answer to it is an early discovery and sinking of the block ships.

Where a harbor entrance is wide and unobstructed, torpedo fire into it may be a great danger. At a properly defended harbor a torpedo and submarine net is always installed at the beginning of hostilities. Where a harbor is occupied unexpectedly or before a net can be constructed, this type of attack becomes a serious threat. Admiral Jellicoe says of Scapa Flow, before proper defenses had been provided, "The greatest anxiety constantly confronting me was the defenseless nature of the base at Scapa, which was open to destroyer and submarine attacks."

While these nets normally are constructed and supervised by the naval forces, they are usually placed within the field of fire of shore batteries for protection; this becomes a combined responsibility of the Navy and the Coast Artillery, requiring the coordinated efforts of both.

Landing raids are usually made by parties of naval personnel for the purpose of destroying shore batteries or other defense elements. In some cases the purpose might be to reconnoiter shore dispositions. Such attacks are always in the nature of a surprise and may be covered by some other form of attack as a diversion. Proper security measures by the defense, which must include shore patrols, will usually prevent the successful carrying out of such attacks. Landing raids have been tried out many times in joint maneuvers, but rarely have been successful.

Surprise attacks offer great possibilities if successful and provision against them never should be neglected.

From a consideration of the foregoing discussion it will be seen that, in practically every type of attack that may be expected against harbor defenses, the combined efforts of all the elements of the defense forces will be required to assure the frustration of the hostile operations.

The general mission of a harbor defense is: (1) to deny the enemy possession of the harbor or any of the naval or commercial facilities connected therewith; (2) to prevent the destruction of, or serious damage to, the port, the port utilities, or military or naval establishments therein; (3) to provide an area within the harbor in which naval vessels and merchant shipping will be protected against all forms of hostile attack; (4) and to assure safe entry into, and debouchment from, the harbor for our fleet.

In any given section of coastline the first class harbors, being of the greatest value to the enemy, are the points on which hostile attacks will naturally be focused. These harbors might be likened to the vital terrain features in a land defense system, the possession of which are essential to the success of the entire system.

Being on the frontier, these harbors are subject to attack at the beginning of hostilities, especially if the hostile naval forces possess freedom of action. Due to the extent of our coastline it is almost a certainty that some part of it will not be protected by our naval forces during the early stages of a war.

In order to insure the possession of all first class harbors, either as naval bases or commercial ports, harbor defenses are provided. These should include all defensive measures necessary to protect the harbor from hostile attack in any form.

The principal elements of an effective harbor defense should include: a naval patrol; a system of submarine mines, both controlled and uncontrolled; suitable anti-submarine and torpedo nets at the harbor entrance; an aerial observation and patrol force; seacoast artillery of long and medium ranges, both fixed and mobile; an anti-aircraft defense system including artillery, machine guns, and searchlights; seacoast searchlights of great power; and a complete communication system. To this should be attached a suitable force of highly mobile troops, composed of both infantry and light artillery to provide a beach patrol for the harbor and the contiguous coastline. The strength and composition of this mobile force should be sufficient to repel such landing raids as might reasonably be expected. If available, combat aviation should be held within striking distance.

While it may not be possible to provide all first class harbors with a complete system as outlined above, certainly the most important ones, particularly naval bases, should be so provided. Less important harbors, if worth defending at all, should be provided with the main elements of such a system.

It will be noted that such a defensive system contains

units from the Navy, Air Corps, and Coast Artillery, with units from the mobile forces attached. Where these latter are not available, Coast Artillery troops may be used for beach patrol to the great detriment of the efficient performance of their primary duties. The units enumerated, in order to provide an effective defensive system, should be organized and trained to function as a team under all conditions of service.

The functions of the naval forces assigned to a harbor defense are primarily to provide security, under all conditions of weather, by locating and reporting the approach of hostile naval forces. The delaying of hostile forces might be an added function where the naval forces assigned are of sufficient strength. In addition, the naval forces will have the mission of providing obstacles to hostile advance in the form of uncontrolled contact mines and submarine and torpedo nets.

Only observation aviation need be permanently assigned to harbor defense duty. There will never be enough combat aviation to provide each harbor defense with an effective striking force. Defense of harbors against aerial attack therefore can best be provided by a strong striking force of combat aviation located centrally with respect to several harbors. Where a hostile aerial attack is estimated to be of a minor nature, or where the harbor in question is out of striking distance of our combat aviation, the defense against aerial attack must be provided by the anti-aircraft units assigned to the harbor defense. Generally speaking then, and as far as the individual harbor defenses themselves are concerned, the Air Corps functions will normally be reconnaissance, observation and adjustment of artillery fire.

The bulk of the forces in any harbor defense will always be Coast Artillery. The main function of this arm will be to provide the fire power for the defence, both on the water and in the air. In addition the Coast Artillery will provide the controlled submarine mine defense, the main ground observation over the water and land area in and around the harbor, and, not the least important, the communication system between the various elements of the defense.

The World War left us very few records of operations of any importance where harbor defenses were attacked by naval forces. In the case of Gallipoli, General Von Sanders says, "A weakness in the defense, and one which was never eradicated during the campaign, lay in the divided

system of command. Engaged in the defense of the area were no less than three commanders, each independent of the other two." In their defense of the Belgian coast against the numerous attacks of the British, the Germans, in addition to their very complete system of coastal forts, had the coöperation of their navy and air forces. In the German operations against the Baltic Islands, Oesel, Dago, and Moon, the one thing that contributed most to the Russian failure was the total lack of coöperation between the army, navy, and air forces.

Coöperation may be defined as working together to secure a common end. The fact that forces have a common objective will not in itself always cause them to coöperate most effectively. In order to be effective, three main conditions must obtain. First, the troops or elements which are to coöperate must be under the control of a single commander. Second, the units must be properly trained, not only in the technique of their several arms, but they must be trained to operate together and in conjunction with one another under all conditions of service. Third, the organization of the system of command must be such as to enable the commander to employ the component parts when and where the situation demands. Admiral Jellicoe in his book, *The Crisis of the Naval War* says, "In the matter of organization we must be certain that adequate means are taken to insure that the different arms which must coöperate in war are trained to work together under peace conditions."

From a consideration of the foregoing it appears that the keynote of effective harbor defense is coöperation between the elements composing the defense. The main elements of the harbor defense, namely, the Navy, the Air Corps, and the Coast Artillery, being normally separate arms of the service, find no necessity in peace time to coöperate to any great extent in their training. Yet in time of war they will inevitably be thrown together in the consummation of a common purpose. Does it not seem that the effective coöperation desired should be started in time of peace, by the definite assignment to the more important harbor defenses (for training at least) of units of the different arms concerned? This would enable the harbor defense commander to develop his plans for defense along logical lines and to conduct training that will insure the highest degree of coöperation between the units that must function as an efficient and harmonious team under the stress of war.



*IT IS IMPOSSIBLE for nations to accept internationalism at the expense of nationalism because the policies of too many countries do not admit of compromise, and each tries to inflict his own interested point of view on the others.*—CAPTAIN A. T. BEAURGARD, U. S. NAVY.

# NEWS AND COMMENT

## The Tenth Legion

(A GRATEFUL ACKNOWLEDGMENT)

DURING the past several years subscriptions have been the motif of one of our favorite theme songs; we have sung this in every key from A flat to E minor (perhaps it was mostly flat). On this question editors must be persistent if not something worse. It is a part of the game and goes with the job. We wonder how many realize how difficult it is to wheedle \$3.00 out of some officers whose ancestral home was located close to the Scottish border. (No, we have not overlooked the Friday night poker game but we will let that pass.) If, like Abou Ben Adhem, editors could be permitted the luxury of "a deep dream of peace" probably it would take the form of being overwhelmed by a flood of subscriptions—each accompanied by a slip of paper representing three depreciated dollars. But peaceful dreams do not furnish the wherewithal to publish JOURNALS. Editors must go into the highways and byways to find guests for the intellectual feast they so painstakingly prepare. On occasion they must resort to dubious methods to coax the reluctant shekels from their hiding places. It is not unlikely that the art of legerdemain originated with the clan.

During the past few months the subscription list reflects a moderate growth. This has been due almost entirely to the efforts of a few loyal Coast Artillerymen who have interested themselves to the extent of making personal contacts and solicitations among their friends and acquaintances. They have gone out of their way, far and above the call of official duty, to render a real service to the Association and to the Corps. Some special mark of distinction should be bestowed upon them. In lieu of a more appropriate award we created the mythical "Order of the Illustrious." (No, it was not approved by the War Department, but we believe it should be.) At any rate we bestow it, *à la française*, with a kiss on each check. Experience has fully demonstrated that one personal contact, with a good word for the JOURNAL, is worth more than all the circular letters sent from the editorial office. Unfortunately this service has been undertaken by only a few. To this small valiant band our hat is off and we salute them with the profound deference and respect due the truly great. They are to the Editor what the Tenth Legion was to Cæsar. The crux of the screed is that we would like for others to emulate their worthy example (Regimental Commanders please note). Perhaps we should be content with what has been accomplished but there can be no standing still, either we go forward or backward and our goal is nothing less than 100%. What burns us up is the fact that, considering only the Regular Army personnel, the Coast Artillery is in third place (among the service JOURNALS) computed

on the percentage of subscribers to the total number of officers in the Corps. If we dared to permit any profanity to creep into the broadcast, we would say—"this is a hell of a note." Whoever heard of the Coast Artillery being any place other than the vanguard; but in third place it is and in third place it will stay unless about 100 non-subscribers can be made to see the error of their way and agree to separate themselves from three, fifty-nine-cent dollars, a mere trifle compared to what they will get in return, not to mention the honor of the Coast Artillery Corps.

And now for a less sour note. It is desired to give due credit and make grateful acknowledgement to the following officers who, since the previous issue of the JOURNAL, have been instrumental in rounding up the number of new subscribers set after their names:

Captain J. T. Rugan, Del.N.G. ....	5
Major C. S. Doney, C.A.C. ....	5
Major A. H. Warren, C.A.C. ....	2
Lieut. D. P. Ramey, Mo.N.G. ....	1
Captain D. T. Rutherford, C.A.C. ....	1
Lieut. Col. Albert Loustalot, C.A.C. ....	1
Major V. W. Hall, C.A.C. ....	1

The foregoing figures should be added to the score as published on page 137 of the March-April issue.

## Orchids

(FOR NON-SUBSCRIBERS ONLY)

THE question immediately arises as to how non-subscribers can be expected to see this; they should not but they will—lots of them, and we hope that it will prick their conscience a little—just enough to heed that still small voice.

No one turns deaf ears to words of praise but they are doubly appreciated when they come unsolicited and without expectation of favor. A recent letter is much too good to be interred in the files—therefore we are passing it along with the hope that it will fall under the eyes of some of those who have for the past several years closed their ears to all our entreaties:

"Inclosed find my check for \$3.00 in payment for my subscription to the JOURNAL. The magazine becomes more readable with each issue and the Coast Artillery officer who is not a subscriber has my sympathy—for he is missing something good. I would be quite as frank to tell you if the magazine was poor.

CAPTAIN, C.A.-RAI."

This is not faint praise. It was unsolicited and unexpected. It carries the ring of an honest statement made straight from the shoulder. We have nothing to offer in return except our thanks and grateful appreciation, coupled with the hope that it will be the means of convincing some non-subscriber that he is "missing something good."

# The United States Coast Artillery Association



*"The purpose of the Association shall be to promote the efficiency of the Coast Artillery Corps by maintaining its standards and traditions, by disseminating professional knowledge, by inspiring greater effort towards the improvement of material and methods of training, and by fostering mutual understanding, respect and coöperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserve and Reserve Officers' Training Corps."*

## OFFICERS

### President

MAJOR GENERAL A. H. SUNDERLAND

### Vice-President

COLONEL F. H. LINCOLN

### Secretary-Treasurer

LIEUT. COL. E. E. BENNETT

### Additional Members of the Executive Council

BRIG. GEN. J. J. BYRNE	LT. COL. C. M. IRWIN
LT. COL. SANDERFORD JARMAN	LT. COL. H. E. PRIDE
LT. COL. R. S. ATWOOD	MAJOR LEROY LUTES
MAJOR JOHN CASWELL	

## Meeting of the Association

THE March-April issue of the JOURNAL carried a very brief statement to the effect that a conference and general assembly of the U. S. Coast Artillery Association would be held during the coming summer. Arrangements have now progressed to a point where it is possible to elaborate upon this notice. The meeting will be held at Fort Monroe, Virginia, during the period August 21 to 23 inclusive.

A program for the meeting is being worked out under the direction of Brigadier General Joseph P. Tracy. It is a little premature to announce complete details at this time; however it is sufficient to say that everything possible will be done for the entertainment, comfort, recreation, amusement and professional advancement of visiting officers. During the period scheduled for the meeting the 246th C.A. (HD), Va. N. G., will be in camp at Fort Monroe, also about 75 Reserve officers will be undergoing training; thus insuring that the meeting will be well attended. It is hoped that many other members of the Association will find it convenient to enjoy the recreational advantages offered by the largest Coast Artillery

post within the continental limits of the United States.

Expenses while at Fort Monroe will be kept to a minimum. With this object in view arrangements have been made whereby visiting officers can be accommodated in the famous Camp No. 1, where an excellent mess will be in operation to furnish meals at cost. Sleeping accommodations will be provided for a few cents to defray laundry charges. This will be for men only; those who desire to bring the female members of the family will find accommodations at the Hotel Chamberlin at a very reasonable charge. Full pronouncements and a detailed schedule will be published in the next issue of the JOURNAL; also at the earliest practicable date notices will be sent to each chapter. It is anticipated that the program will include parades, reviews, artillery demonstrations consisting of artillery firing with 155 mm. guns and antiaircraft artillery firing at towed targets. Opportunity will be afforded to inspect the Coast Artillery School, barracks, batteries and the numerous other activities to be found at Fort Monroe. Ample provision will be made for recreational activities to include swimming, tennis, golf, horseback riding, etc. Naturally there will be a reception, and the *piece de resistance* of the meeting will be a banquet and a dance on the famous roof garden of the Hotel Chamberlin. It is hoped that the Secretary of War will be present during a part of the time. A special effort will be made to have a number of other dignitaries in attendance. More about this later.

No effort is being spared to make the meeting a success. A part of Saturday afternoon and Sunday will be devoted to sightseeing trips to points of historic interest in nearby Virginia, including Yorktown, Williamsburg, Jamestown, Langley Field and perhaps a fishing trip in the lower waters of Chesapeake Bay. It is suggested that all those interested note the dates on their calendar and watch for more complete details in the next issue of the JOURNAL or, if preferred, send an inquiry to the Secretary of the Association, 1115 17th St. N. W., Wash., D. C. The Hotel Chamberlin will offer special rates to visiting members of the Association. A thoroughly enjoyable and instructive visit at this hospitable resort is assured. Plan your vacation accordingly.

## General Steele Resigns

UNDER date of March 16, Major General Harry L. Steele, addressed the following letter to the Executive Council of the Association:

As I will relinquish the duties of Chief of Coast Artillery on March 31, 1936, I hereby submit my resignation as President of the U. S. Coast Artillery Association, effective on that date. I regretfully take this action believing that the way should be cleared for the election of my successor without delay.

The Coast Artillery Association has fully demonstrated its worth in maintaining the standards and traditions of the Corps, in fostering friendly competition and in developing *esprit* among the several Coast Artillery components of the Army. I hope that its activities and sphere of usefulness



may be further developed and broadened. My approaching retirement from active duty will not operate to prevent me from taking an active interest in its affairs and development.

While General Steele's resignation is deeply regretted, his action was in accordance with the practice which has obtained since the organization of the Association. In fact the possibility of conditions arising that would render such action advisable was anticipated by the framers of the constitution and section 6 provides that:

A vacancy occurring among elected officers may be filled by the Executive Council for the unexpired portion of the term.

On April 10 the Executive Council met and regretfully accepted the resignation of General Steele. At the same time Major General Archibald H. Sunderland was unanimously elected President to fill General Steele's unexpired term.

Although the Association is only five years old, it now boasts 24 organized chapters scattered throughout the United States and has more than 5,000 members enrolled. It has fully demonstrated its worth and is rendering a real service to the Corps. General Sunderland is in full accord with the precepts and principles of the Association and he will do everything possible to promote its welfare.

\* \* \*

### Command and Staff

**O**UR excellent schools teach the duties of staff and command in war, but little is said during those courses of the peace-time duties that confront an officer immediately upon graduation. No War Department regulation has been or can be devised to cover this subject minutely for, after all, a commander must be left free to choose his own methods. However, it does seem that some general guide might well be established.

A new commander is apt to assume that everything is running smoothly and satisfactorily if too many complaints and appeals from decisions of his headquarters do not crop up to interfere with his pastimes. Having confidence in his staff, he is prone to let these officers decide what matters should be brought to his attention. Such a hit-or-miss system may result in either a staff-run organization or in the commander being swamped under a mass of trifling detail which his staff should handle.

With a view to exercising command without infringing on any of the duties or prerogatives of staff officers, I put the provisions of the following memorandum into effect. It is the distilled product of many years of experience. I submit it for publication in the hope that others may find it a useful formula for eliminating misunderstandings, uncertainty and friction.

**MEMORANDUM: For the Staff.**

1. The following will be brought without delay to the attention of the Commanding General:

- a. Subjects of importance which require prompt action and are not covered by existing policies and instructions.
- b. Disapprovals returned from higher authority.

c. Errors, deficiencies or irregularities alleged by higher authority.

d. Communications that allege neglect or dereliction on the part of commissioned personnel.

e. Correspondence or proposed correspondence conveying even a suggestion of censure.

f. Appeals of subordinates from decisions made at this headquarters.

g. Subjects that affect the good name or reputation of an officer or organization.

b. Subjects involving financial or property irregularities.

i. Serious accidents involving personnel of the command.

2. The following will be presented to the Commanding General for final action:

a. Requests and recommendations to be made to higher authority.

b. Suggested disapprovals.

c. Communications that contain even a suspicion of a censure.

d. Communications that involve the good name of an officer or organization.

e. Reports of financial and property irregularities.

f. Letters to civil authorities in high positions.

g. Endorsements on efficiency reports.

b. Correspondence concerning war plans.

i. Communications of exceptional information.

3. A copy of these instructions will be kept exposed at all times upon the desk of each staff officer of this headquarters.—FRANK S. COCHEU, *Major General, U.S.A., Retired.*

\* \* \*

### How to Keep Posted

Extracted from a letter from one of our satisfied customers.

"Being located at the present time in a town which is quite distant from a city where troop school conferences are held I find the JOURNAL of much assistance in keeping me posted on the developments in the Coast Artillery and in serving as a supplement to my extension school text-books."

Very truly yours,  
1st Lieut., C.A. (AA)

\* \* \*

### How Did They Do It?

**F**ROM the far-off Philippines comes word that Battery "F" of the 59th Coast Artillery turned in the most stupendous score ever made by any Coast Artillery organization. Preliminary calculations give it a value of 509.6. We hope that a heartless Coast Artillery Board will not whittle this figure down to a size comprehensible to other organizations. At present details are lacking as to how Battery "F" turned the trick, but we hope to have a full account for publication in a subsequent issue of the JOURNAL. In the meantime this score is a fine "setforward point" for other batteries to shoot at.

## The Chilean Coast Artillery School

By *Commander T. W. Biggs, Chilean Army*

IN 1913, Captain John W. Gulick, C.A.C., then serving as Military Attaché to the U. S. Embassy in Santiago de Chile, undertook the work of organizing and conducting the first Officers' Course in accordance with American standards. His principal efforts were directed towards modernizing our fire control system, which was then so crude as to be practically non-existent. Funds were obtained and the necessary instruments and equipment were purchased in the United States and installed in our batteries.

Our lone American instructor had a very trying and formidable task with his limited knowledge of the language and customs of the service but his untiring efforts overcame all difficulties, with the result that when he left for home in 1915 we were able to carry on his splendid work. We have continued to seek his advice on technical matters and his willingness to help is proof of his unflinching interest and goodwill toward his Chilean friends in the Coast Artillery. Last year we had the pleasure and good fortune to again welcome him, this time as a general officer, and it was most gratifying to know that his merits had won for him a place of distinction in his country.

The purpose of the School today is to train officers and enlisted men in the use of all seacoast and antiaircraft armament; to operate and employ mines and other defensive elements, both marine and terrestrial (chemical agents included); to practice Infantry tactics, especially those connected with landing operations in cooperation with the Navy, as well as land defense of naval bases.

In addition to these functions, the School is also charged with the study of technical matters relating to Coast Artillery. Its conclusions and recommendations are submitted for approval to the Coast Artillery Department, whose Chief is the senior officer of the service.

The school year is a full twelve months' period beginning on the first of April. The following courses are given:

- (a) Battery Commanders' Course for junior lieutenants.
- (b) Petty Officers' Selection Course, for promotion to officer rank.
- (c) First Sergeants' Course, for promotion to petty officer.
- (d) First Corporals' Course, for promotion to 2nd class sergeant.
- (e) First Privates' Course, for promotion to 2nd class corporal.

The first and the last three courses are compulsory for all concerned, and failure to pass any of them means elimination from the service.

Superior officers, between the grades of lieutenant commander and commander must attend a short training period at the Naval Staff Academy, where they are instructed in the principles of high command.

The school has been in operation during the past 22 years, with an average attendance of four officers and 60 enlisted men. The annual program includes a two months' practical period of exercises and tactical problems which involve the firing of major and medium caliber seacoast batteries against moving targets, with day and night firings.

Other exercises deal with A.A. firing against towed aerial targets and Infantry terrain problems.

The School and Coast Artillery in general greatly admire the U. S. Coast Artillery JOURNAL, a publication of high value which has been a positive guide in all our studies, programs, and service regulations.

\* \* \*

### Corrected Versus Uncorrected Range

LIKE Banquo's ghost, this subject arises at intervals to plague us. It seems that it cannot be buried sufficiently deep under the files of the War Department to insure its permanent interment. The question has been argued pro and con for the past decade by some of the ablest minds in the Coast Artillery, but up it jumps again.

This time its resurrection was occasioned by a very innocent statement appearing on page 14 of Gunner's Instruction Pamphlet No. VI (Fixed Artillery) where the question was asked "What information is necessary for the operation of the (gun) deflection board?" Answer—"The wind reference number obtained from the wind component indicator; the corrected setforward range to the target obtained from the range percentage corrector and. . . ." The offending part of the answer was "The corrected setforward range." This was picked up during a tactical inspection by a former Coast Artilleryman whose opinion is entitled to the greatest respect, his contention being that the "uncorrected range to the target" should be used on the deflection board. When this was brought to our attention the question was submitted to the Director of the Artillery Department, Coast Artillery School, with the request that contact be established with the Coast Artillery Board to insure that both the School and the Board were in agreement on this subject. The reply received is of sufficient value to justify the publication of pertinent extracts.

Coast Artillery Field Manual, Volume I, Part 2, paragraph 88-b (1) describes the operation of the universal deflection board and specifies that the "corrected range or elevation be called out by the percentage corrector operator." Training Regulations 435-280 dated November 1, 1929, paragraph 20-b states:

"The final corrected range should in general be used when entering the firing tables to obtain the drift."

This question has been considered by the Coast Artillery Board on several occasions. Each time there was considerable difference of opinion as to the merits of using actual or corrected range for computing deflections, however, the conclusions of the Board may be summed up as follows:

- a. That in case of slow moving targets, no material error

will result from taking travel corresponding to firing tables time of flight for either map or corrected range.

b. That as a rule either map or corrected range may be used without material error in computing deflection corrections other than for travel.

c. That unless a means of arriving simply and quickly at the true time of flight can be developed an approximate map or corrected range (as determined in advance) be used in computing all deflection correction but it cannot be said conclusively that a corrected range would be preferable.

d. In C.A.M. No. 8, page 83 (f) (1) it is stated that the present method of using the corrected range for obtaining the time of flight and travel is the most practicable and correct method known. The study has indicated definitely that it is desirable to make use of the corrected range in computing the deflection correction for Case II firing.

From the foregoing discussion it is apparent that generally speaking there is so little improvement in the data to be gained by the use of corrected range that one would be at liberty to use the actual range if, by so doing, there would be a gain in the time required to calculate the firing data or a better time of flight for use in prediction would result.

\* \* \*

### Give the Editor a Break

*How to become an author, in one easy lesson.*

**A**CTUALLY, the title of this squib should be "Give Yourself a Break," for anything you may do to make things easier for the editor increases the chances for the acceptance of that article you are going to write for the JOURNAL, the *Saturday Evening Post*, *Woman's Home Companion*, or even *Captain Billy's Whiz Bang*.

Always remember that the editor thinks he is a busy man, and that his eyesight is not what it used to be. Give him a manuscript that is easy to read. Use a typewriter, and find out where that double-space gadget is before you start. You already have two strikes on you when you single-space a manuscript.

Use plenty of paper. Allow generous margins for making notations, for you may be sure they will be made. Your ideas on spelling, capitalization and punctuation may be entirely correct, and still not agree with those of the editor, and he has to keep a uniform style. If you must make interlineations in pencil or ink, write them legibly. Very few editors go in for cryptography and hieroglyphics. Start typing half-way down the first page.

Do not send a carbon copy. To do so tells the editor that you have submitted the original elsewhere, and he is not interested in seconds. Do not write reports. This is a magazine—not the commanding officer's desk. Try to get a little life—a little human interest—into your copy.

Do not explain why your article was written. If its purpose is not self-evident you had better do a bit of revising.

When you have finished writing your yarn, cut it. It is a rare literary gem that cannot be improved by drastic

use of a good, soft pencil, drawn horizontally through words. A short article stands a much better chance of acceptance than a long one. Remember that type is not made of rubber. If you write 1,231 words and the page holds 956, you may take it for granted that the editor will cut 275 words to make the article fit a page.

If you talk about places, furnish maps and be sure each place mentioned in the article is shown on the map. If photographs are to accompany your article, try to have them clear-cut and distinct. Sharp contrasts between light and dark areas always enhance the value of a photograph. Pictures showing masses of men or material as a blur on the landscape are of little value. It is much better to have a close-up view of a small part of the troops participating in a ceremony than to try to include the entire command in a 2x3-inch snapshot. The result is almost certain to be the same as looking through the wrong end of a telescope. Do not write on the back of a picture with a hard pencil. The pencil marks are certain to show up on the cuts. It is much better to paste a small flap of paper at the bottom and make all the notations necessary on this. If it is necessary to point out details on the photograph, paste a flap of transparent paper over the print and make your letters and lines on that. Drawings should be made in black ink; the bottle of blue ink on the office desk may be much more convenient but it will not reproduce photographically.

\* \* \*

### When Is a Sector Not a Sector?

**T**HE March-April issue of the COAST ARTILLERY JOURNAL carried a short article under the caption "Military English as She is Wrote." In this article the author opposed the creation of a stilted military jargon and defended the employment of plain understandable English provided the intent and meaning was clear. This article brought forth some comments from our readers (it is indeed a source of satisfaction to know that even obscure articles appearing in the JOURNAL are read). In one of these comments an officer of long and distinguished service stated in part as follows:

A facile and accurate use of the English language does not demand a restrictive use where the intent or meaning is clear. "Sectors" and "Zones" are only relatively associated with the geometric terminology from which they were borrowed. The refusal of one student at the war-time school at Fort Sill to recognize the adopted "sector" because "a sector is a slice of pie and only that" of course carried to a point of absurdity the resistance to restrictive military terminology.

In our humble opinion the English language is richly endowed with words sufficiently descriptive to permit of expressing fine shades of meaning without setting up a military jargon that has little application outside of the military profession. The trouble (if trouble there be) should be laid at the door of the users of the language rather than charged to the paucity of the English vocabulary.

# COAST ARTILLERY ACTIVITIES

## Office of Chief of Coast Artillery

*Chief of Coast Artillery*  
MAJOR GENERAL A. H. SUNDERLAND

*Executive*  
COLONEL HENRY T. BURGIN

*Personnel Section*  
LIEUT. COL. R. T. PENDLETON

*Matériel and Finance Section*  
LIEUT. COL. O. L. SPILLER  
MAJOR C. W. BUNDY  
MAJOR B. L. MILBURN

*Organization and Training Section*  
LIEUT. COL. E. E. BENNETT  
LIEUT. COL. C. M. S. SKENE  
LIEUT. COL. ROBERT M. PERKINS

*Plans and Projects Section*  
COLONEL G. A. WILDRICK

## News Letter from "The Gypsy Artillery"

(62d Coast Artillery (AA).)

COLONEL FRANK K. FERGUSSON, *Commanding*

*By Captain A. C. Spaulding*

THE breaking of records by the 62nd C.A. (AA) is a matter of routine. The 35 officers and 850 soldiers of the Gypsy regiment appear to have no respect for any kind of records and notification that they have broken another should excite no comment.

However, something which even the modest 62nd admits is a bit out of the ordinary recently occurred when Battery "C" submitted a report on the qualification of gunners during the 1935-1936 indoor training period. Without vain boasts or fanfare of trumpets that organization has broken the record of the 62nd, and we believe of the Coast Artillery, by attaining the unbelievable—a perfect score in the qualification of Expert Gunners.

On March 23, when the final report was submitted, the strength of Battery "C" was 116 enlisted men, present and absent; of this number 106 were present for duty. The report showed that 116 men had successfully passed all the examinations and were qualified as expert gunners. So far as is known, this is the first time that such a remarkable feat has been accomplished. The examination was conducted by officers from other batteries, naturally their own batteries would suffer by comparison: so there can be no implication of chicanery or boondoggling.

In achieving this remarkable result, Battery "C" not only crashed through to its "place in the sun" in the

Coast Artillery Corps, but, so far as can be determined, did something that has never been done in the United States Army. Other organizations have reported that every man qualified as pistol or rifle marksman or better, but from the meager records available it appears that their claims were disproved when re-qualification was ordered.

To Captain Lathrop R. Bullene, battery commander, and to 1st Sergeant Lemuel Presley, his right bower, belongs the credit for bringing his battery to this high state of training; not only in the qualification of expert gunners, but, also in target practice. At Aberdeen Proving Grounds, in September 1935, Battery "C" fired its antiaircraft guns against targets towed by fast airplanes (not on diagonal courses) and attained the remarkable score of 151.2—not quite enough to win the Knox trophy but enough to give other Coast Artillery organizations something to shoot at. (Never mind the dangling preposition.)

Battery "C" not only excels in antiaircraft artillery work, but it is more than holding its own in other activities. For example it was runner-up for championship in the post basketball league, and in plain, old-fashioned "soldiering" it has proved that its men can deliver the goods. Fort Totten mounts an "orderly-bucking" guard and the soldier selected as orderly for the Commanding

Officer is the snappiest, nattiest, best turned out member of the Guard. During the first 24 days of March, Battery "C," in competition against nine other crack organizations, landed the much-coveted orderly selection 19 times.

Battery "C" has a long, honorable and enviable history. It was organized in 1812 as "Smith's Company, Second Regiment of United States Artillery." Its progenitors have participated in every war in which the United States has engaged from the Revolution to the present. With such a glorious history, it is only natural that the battery should add new laurels to those garnered by the gallant soldiers who have filled its ranks since the beginning of United States history.

And now to other things. The outdoor training season has everything at Fort Totten going full speed. Garrison reviews, battalion and regimental parades, daily infantry and artillery drill are being taken in stride. The Inspector General has just finished the annual inspection of the post and awarded—for the second consecutive time, mind you—the highest commendation given a post in the Second Coast Artillery District. Not one skin concerning the training and appearance of the Gypsies!

The construction and renovation of barracks and quarters is progressing in a satisfactory manner; the work is being done by WPA personnel under the supervision of officers and noncommissioned officers of the 62nd. The gun emplacements near the Old Fort are being demolished and the terrain graded to provide space for new quarters. The Quartermaster Stable is being remodeled into a barracks for the Quartermaster Detachment. Fire control stations formerly used for seacoast artillery have been demolished and the material salvaged. A new incinerator and a new sewage disposal plant are being constructed. New construction and improvements to old buildings will place the motor park in excellent shape. The old Quartermaster Barracks is being remodeled into apartments for noncommissioned officers. Noncommissioned staff quarters are being renovated and equipped with electric ranges for cooking. All officers' quarters have been thoroughly overhauled. Headquarters building has been equipped with a new lighting system. Even the parade ground came in for its share of attention and with the aid of a steam roller loaned by the City of New York it has been brought into perfect condition.

In combat training, the Gypsies are carrying on as usual. Daily motor convoys keep the drivers at the highest peak of efficiency. Miniature combat set-ups, with distances reduced to fit the parade ground, are a daily feature of artillery drill and keep gun crews and message center personnel on the alert. Close order drill, with the band in attendance, provides a fit opening for the usual busy day. As this goes to press there are only 15 members of the regiment on sick report and only two in arrest or confinement.

On May 2nd there was a demonstration and display of antiaircraft equipment witnessed by more than 50 reserve officers as guests of the regiment. Later the visitors

assembled at the Officers' Club for a discussion of training activities of Coast Artillery Reserve officers.

On May 9th, by special invitation of the New York Police Department, a detachment of motor vehicles from the regiment participated in the New York Safety Parade as a featured part of the Bayside display. As usual when the Gypsies roll, they were the hit of the parade. The detachment consisted of a searchlight with sound locator, a station wagon, a prime mover with a 3" anti-aircraft gun, a 2½ ton Federal truck on which was mounted a caliber .50 antiaircraft machine gun, and a QMC Cargo truck displaying large signs provided by the Police Department proclaiming the friendship of the New York Police for the "Queens Own."

On May 9th the annual reunion of members of the old 58th Artillery of World War fame was held at Fort Totten, with about 150 in attendance. The afternoon was spent in sports and "do you remember." At 6:00 P.M. an elaborate dinner was served in the mess hall of the Service Battery. The 58th had in its ranks several organizations which served at Fort Totten during the early part of the World War; the return of the veterans to their old station was a joyous occasion. During the dinner Colonel Fergusson delivered an address of welcome.

Memorial Day at Fort Totten is a gala occasion when the regiment entertains its civilian friends. No special ceremony is held at the post, but detachments from the regiment participate in ceremonies in various cities on Long Island. This Memorial Day will see the 62nd Coast Artillery Band leading a parade in Flushing. The Fort Totten Drum and Bugle Corps, with a platoon from one of the batteries, will head another spectacular parade in Bayside. A platoon will go to College Point. Another platoon will go to Manhasset, and the annual celebration at Forest Hills will be participated in by a picked detachment. More than thirty applications were received from Long Island cities for troops from the 62nd to spend Memorial Day with them.

On June 14th the Flag Day Celebration of the American Legion and the Veterans of Foreign Wars of Queens County will be held on the Fort Totten parade ground. This is one of the most spectacular features of the Fort Totten summer season. Dozens of bands, drum and bugle corps and marching organizations representing veterans' organizations compete for prizes. It is estimated that there will be more than 5,000 visitors to witness these exercises, in which more than 1,000 participate.

The selection of the outstanding soldier of the 62nd Coast Artillery, to whom will be presented the John H. Tyson Gold Medal for 1936, has been under way for the past two months. Each year this much sought after prize is presented to the "best private in the 62nd Coast Artillery" by the Woman's Relief Corps, Auxiliary to the Grand Army of the Republic, Department of New York, in honor of John H. Tyson, who claims to be the "only surviving private of the Union Army." The competition for this medal is keen and the soldier who wins it





*The Gypsy Motorcycle Squad.*

is marked for quick promotion; with it goes the admiration of all his comrades.

Does all of the foregoing take up a lot of time? Certainly it does, but the Gypsies do not slight combat training for less serious things—side issues are taken "in stride" and are not permitted to interfere with more serious matters. A few of these may be mentioned. The track team is appearing in many New York City competitions against schools and colleges and is making quite a name for itself. The Fort Totten baseball team is entered in the fastest semi-pro league on Long Island and is in third place. The tennis squad is swinging into its season and has not lost a match to date. Ballroom dancing is taught at the YMCA.

### THE MOTORCYCLE SQUAD

While the innate modesty of the 62nd forbids the claim that its spectacular squad of motorcycle riders is the best in the world, it does contend that it is the only organization of its kind in the United States Army and that it is the absolute "tops" in military police organizations.

In addition to the exacting duties required of the members of this squad in the carrying of messages and the performance of military police duties in civilian communities near Fort Totten, they act as traffic police when detachments of the fast-moving motor vehicles of the Gypsies sally forth from Fort Totten for a roll down Long Island and return. In addition, they act as motorcycle police in controlling the two-mile-long motor column when the regiment travels as a unit—which it does quite often—through the congested traffic areas of metropolitan New York.

It is the outstanding unit of an outstanding regiment, and the one unanswerable argument to those who contend that motorcycles can be dispensed with in motorized units. Each member of the squad is specially selected. His training starts under the supervision of Staff Sergeant Werner Boehme, who is in charge of the Squad. One of the basic principles is, "there will be no clowning, and trick riding is for rodeos only." After Staff Sergeant Boehme pronounces a rider ready for duty, Captain O. A. Nelson, M.T.O., gives him a test that leaves nothing to the imagination. If the rider passes this test he has only progressed two steps along the hard road which leads to entrance into the ranks of the Motorcycle Police. He must then take a course of instruction under the super-

vision of the Motorcycle Squad of the New York Police Department. He must learn to control traffic as it is controlled by this most efficient of traffic organizations, and to lead the fast-moving juggernauts of the Gypsies through any kind of traffic under any and all conditions. When the New York Police Department says the rider is ready for duty he is issued his equipment, including spectacular "full dress" outfit, and he then becomes a member of that exclusive unit—the Motorcycle Squad.

Members of this squad are in great demand in New York City and nearby counties to participate in parades and other similar affairs. There is hardly a parade along upper Fifth Avenue in which these white-belted riders do not appear. Whenever the motor equipment of the Gypsy Artillery takes a part in any demonstration or function, the flashing white gloves of the Motorcycle Police are to be seen controlling the Army traffic and smoothing out civilian traffic tangles. They have earned many glowing letters of commendation from public officials of the City of New York.

The less spectacular part of their duties find them two or three hundred yards ahead of the fast moving motor columns, taking charge of cross streets and cross roads—preventing possible accidents between Army and civilian motor vehicles. Their efficient performance of duty is known and respected by all Long Island residents who have seen them in action.

♦ ♦ ♦

### Fort Monroe News Letter

BRIGADIER GENERAL JOS. P. TRACY, *U. S. Army,*  
*Commanding*

*By Major O. B. Bucher, C.A.C.*

WITH deep regret the garrison witnessed the departure of Colonel and Mrs. Russell P. Reeder on April 1st, en route to Cincinnati where the Colonel will spend his retirement leave. We hope the Reeders will soon return to their beautiful new home in Phoebus.

Honorable George H. Dern, Secretary of War, accompanied by Mrs. Dern and Miss Betty Dern were the overnight guests of General and Mrs. Tracy on April 19th. The following morning the Secretary and his party boarded the U. S. Engineer boat *Falcon* for a trip through the inland waterway to Florida. The guard of honor composed of units from the 51st Coast Artillery,

under command of Major R. E. Hill, was complimented by the Secretary for its splendid appearance.

The machine-gun tests, conducted by Battery "C," 2d Coast Artillery, under the supervision of the Coast Artillery Board, have been completed. The return of the battery to its home station the latter part of April was a welcome event to the entire garrison.

Early in May the Coast Artillery School established a camp at Fort Story where the student officers will remain until after the battle practice on June 5th.

The 51st Coast Artillery, manning 155 mm. guns, and the 52d Coast Artillery, manning railway guns and mortars, moved to Story during the early part of May preparatory to firing the battle practice for the student officers. Upon completion of the School firing both regiments will remain at Fort Story to conduct their annual target practices.

The curtain will be rung up on summer training

activities on June 12th when the R.O.T.C. units arrive; from that time until September 5th the performance will be continuous, terminating with the encampment of 74 officers from the 917th C.A. (AA). The first class of Cadets, U.S.M.A., are scheduled to arrive on August 17th. The annual visit of the Cadets has become the high light of the summer social season of the Peninsula and is eagerly anticipated by the entire garrison. The Cadets are very appreciative guests, and judging by their attendance at the swimming pool, the Beach Club and social functions, they enjoy the time spent at Monroe.

The Bachelor's Club of the USMA Class of 1935 lost another member on April 13th, when Lieutenant John Morgan was married to Miss Margaret Haupt of Shamokin, Pennsylvania. After a honeymoon in the mountains of Virginia the happy couple arrived the latter part of April to make their home in the 100 Building. It is rumored that several more vacancies in the Club are expected in the near future.

## Corregidor News Letter

BRIGADIER GENERAL JOHN W. GULICK, *Commanding*

*59th Coast Artillery*  
COLONEL PAUL D. BUNKER  
*60th Coast Artillery (AA)*  
COLONEL ALLEN KIMBERLY

*91st Coast Artillery (PS)*  
LIEUTENANT COLONEL CLAIR W. BAIRD  
*92d Coast Artillery (PS)*  
MAJOR REINOLD MELBERG

BY LIEUTENANT COLONEL OSCAR WARNER

MAJOR GENERAL LUCIUS HOLBROOK assumed command of the Philippine Department on February 12. Early in March he paid an official visit to Corregidor and inspected the entire harbor defense and all of the installations including Forts Hughes, Drum and Frank. He expressed himself as being much pleased with the general appearance of the post and the high state of training and efficiency of the personnel. During his visit a review of the entire garrison was staged on the "top side" parade ground.

Shortly after his arrival the department commander announced a change in policy effecting extensions beyond the normal two-year tour of foreign service. Under the new policy no extensions will be approved except for the most cogent reasons. Within recent years extensions of the foreign service tour in the far east have become quite popular, many desiring to extend in order to take terminal leave at a favorable time of the year or to regulate their arrival in the United States so that children would not lose too much time out of school or any number of other personal reasons. The announcement of the new policy brought consternation to many. At a recent "over the hump party" at the Army and Navy Club only two expressed themselves as desiring to return to the States without an extension, therefore the necessity for revamping plans to visit China, Japan, Indo-China or a return to the States via the Suez route is quite evident. A resi-

dence of 22 months in the Department (exclusive of leave) is required.

### TARGET PRACTICE

The arrival of February ushered in the beginning of the target practice season. The opening gun was fired by Battery "F," 91st C.A. while the curtain was rung down on March 2nd, by Battery "A" of the 92nd C.A. Seven of the seacoast practices were fired at high-speed targets and some remarkable scores resulted. Battery "F" of the 59th C.A. (HD), Captain Victor Schmidt command-



HOMeward Bound!  
"Corregidor is paused."

ing, made the phenomenal score of 509.6. An account of this practice will be made the subject of a separate article. The nearest approach to that record-breaking score was 392.0 made by Battery "A" of the 59th C.A., Captain L. D. Vichules commanding. All the other batteries of the regiment made exceptionally fine scores but naturally they could not hope to equal such phenomenal shooting as was done by Batteries "A" and "F," however, the tentatively calculated average of all seven firing batteries is 227. Notice has been received that the 59th was awarded the U. S. Coast Artillery Association trophy for the target year 1935 based on the highest percentage of batteries rated excellent. Last year the trophy was won with an average score of approximately 132. With the average for 1936 almost twice this score it looks as if the 59th is due to receive the 1936 award. Time will tell and there is no way of knowing what the record will look like when it emerges from the critical analysis of the Coast Artillery Board, however, an improvement of 72% in the score from 1935 to 1936 is in itself an outstanding accomplishment.

The Navy coöperated in a wholehearted manner by furnishing destroyers from the Asiatic fleet to tow the

high-speed target at speeds in excess of 22 miles per hour. At least four of the firings were designated "advanced practices." The organizations designated to fire these were:

- Battery "F," 59th C.A.
- Battery "E," 59th C.A.
- Battery "C," 91st C.A. (PS)
- Battery "B," 92d C.A. (PS)

One of the unusual features of the advanced practice fired by Battery "E," 59th, required the shifting of the gun crew from one turret to the other in the middle of the practice, no time out being allowed for this shift.

After allowing a reasonable length of time for the preparation of service target practice reports a five-day war condition period was prescribed. Destroyers from the Asiatic fleet and airplanes from the 4th Composite Group coöperated and staged a number of simulated attacks against Corregidor. These attacks were varied both as to time and formation and added realism to the show. Valuable instruction and training resulted which would have been impossible without the coöperation of the Navy and the Air Corps. War plans were given a thorough test.

## Panama Canal Department News Letter

*Department Artillery Officer*  
COLONEL LEWIS TURTLE, C.A.C.

*Fort Amador*  
COLONEL EARLE D'A. PEARCE  
4th C.A. (AA).

*Fort Sherman*  
COLONEL WILLIAM M. COLVIN  
1st C.A.

*Fort Randolph*  
COLONEL JAMES S. DUSENBURY  
1st C.A.

*By Lieutenant Colonel W. C. Foote, C.A.C.*

SINCE the last appearance of a Panama News Letter, the dry season has come and is now about over. The Department Commander's Trophy Competition, Sector and Department maneuvers, and Sector and Department baseball championships have been fought and decided. A new target practice season has opened, and (for antiaircraft batteries) will be completed, *Deo volente* and Air Corps equipment surviving.

### MANEUVERS

The Atlantic Sector has no definitely prescribed maneuver period; in lieu of this the Sector Commander puts all troops through quarterly tests, appropriate to the arm and state of training. This system will be followed throughout the Department beginning with the new training year.

The first phase of the Pacific Sector maneuvers for the Harbor Defenses of Balboa (4th Coast Artillery) consisted of five days concentrated training on the harbor defense matériel, including provision for close protection

against landing parties and raids. Probably the most valuable feature of this training was the coöperation furnished by the commander of the Special Service Squadron, Rear Admiral G. J. Meyers, U.S.N., who detailed the destroyer *Manley* to make a few runs at night with darkened ship in order to test the ability of the harbor defenses to locate, illuminate and track high-speed targets.

Battery "G" fired its regular service practice with the 14-inch railway guns on February 18, during the harbor defense phase.

For the second phase of the Sector Maneuvers, the 4th C.A. operated as infantry for four days and three nights.

The Department maneuvers were strictly Coast Artillery training. The 1st Coast Artillery, Colonel Colvin commanding, was moved to Fort Amador by rail on March 13. For the duration of the maneuvers the harbor defense battalion of the 1st C.A. was attached to the 4th C.A. and the antiaircraft battalion of the 4th C.A. was attached to the 1st C.A. making the 1st an antiaircraft



Top: How Fort Randolph welcomes a new bride. Lieut. and Mrs. P. W. Guiney, 1st C.A., being escorted to their quarters, under the safe conduct of Colonel James S. Dusenbury, 1st C.A.  
 Bottom: Señora Amador presenting the Amador Cup to Colonel Earl D'A. Pearce at a post review at Fort Amador.

regiment and the 4th a harbor defense regiment. Harbor boats and airplanes of the 19th Composite Wing represented enemy forces attacking at night and at dawn; hours calculated to make an enemy doubly obnoxious and thereby arouse the fighting spirit of an otherwise peaceful garrison. On March 28th Amador was host to the 14th Infantry, but the best accommodations we could give our guests was a camp site on the golf course.

On April 2nd a Department review was held at Albrook Field in honor of the Assistant Secretary of War, Mr. Woodring. The President of Panama and most of the diplomatic corps were present. The Coast Artillery troops formed a brigade commanded by Colonel Earle D'A. Pearce and presented an appearance second to none.

Immediately after the review the Atlantic Side troops entrained for their home station and the 1936 Department maneuvers became history. From our point of view, the most significant event was the statement, at the critique of the Department Commander, Major General Lytle Brown, that, except for close order drills sufficient for ceremonies and for the infantry training required for the close-in and immediate defense of their positions, the Coast Artillery troops would confine their training to their own normal functions. This was confirmed in the

department training directive in which it was stated that the Coast Artillery . . . "must be expert at its guns, fire control and observation equipment, and with mines. All equipment must be kept in prime condition. No other training will take precedence over these requirements. It must be prepared to defend its batteries against attack by infantry"—most welcome news for the true Coast Artilleryman.

#### DEPARTMENT COMMANDER'S TROPHY COMPETITION

The competition was narrowed down to four batteries—one from the harbor defense and antiaircraft battalions of each regiment. The 1st C.A. was represented by Battery "A" (AA) and Battery "C" (12-inch guns); the 4th C.A. by Battery "B" (AA) and Battery "D" (mines). All honors were won by the First. Captain Arthur E. Wilson commands Battery "C" and 1st Lieutenant Paul B. Nelson commands Battery "A," the winning organizations, from Forts Sherman and Randolph respectively. However, it should be noted that the antiaircraft batteries were tested only in administration, infantry and similar subjects, no planes being available for the conduct of either a preliminary or record antiaircraft gun shoot. In the case of the harbor defense batteries, Battery "D" fired its annual record practice with 155 mm. guns, and Battery "C" fired an ex-caliber practice as their tests of Coast Artillery training. Battery "D," Captain Walbridge commanding, obtained the remarkably high score of 166.1.

At the Department review trophies were presented by the Assistant Secretary of War to all winning organizations.

#### DEPARTMENT SMALL ARMS COMPETITION

The 1936 Department small arms competition opened at Fort Clayton on April 13th. Firing was completed on April 18th, enabling all Atlantic side entrants to return on the Mine Planter *Graham* that afternoon. One officer and two enlisted men were entered in the pistol matches from both Coast Artillery regiments. In the rifle matches, the 4th was represented by one officer and six enlisted men; the 1st was not represented.

Major Harry R. Pierce, 4th C.A., won a silver medal in the pistol matches and Corporal Joseph B. Royal, Battery "I," 4th C.A., a bronze medal in the rifle matches.

#### ATHLETICS

The Sector baseball leagues completed their schedules in February. On each side of the Isthmus the Coast Artillery dominated the baseball situation, Fort Sherman winning the Atlantic Sector championship and Fort Amador the Pacific Sector championship. For the Department championship series, the Atlantic Sector entered an "all-star" team selected from the Atlantic Side posts. The Amador team represented the Pacific sector. The series went to five games, the Amador team, weakened by injuries to two of its star players, finally emerging second best.



This year the Panama Canal Department Golf Championship matches will be played on the Amador course. This should place Amador in an excellent position to clean up, both in the officer and enlisted men's groups. The handsome prizes offered are a decided incentive to enter. The Atlantic Sector recently concluded its Golf Championship series and representatives from the several posts in the Pacific Sector are now "fighting it out."

#### AMADOR NOTES

On February 15, 1936, Mrs. Amador (Senora Maria de la Ossa viuda de Amador), widow of the late Dr.

Amador Guerrero, the first president of the Republic of Panama and the person for whom Fort Amador is named, presented a beautiful silver loving cup to the 4th C.A. This is a roving trophy to be presented each year to the battery making the best artillery record.

At a review on March 10th this cup was presented by Colonel Pearce to Battery "I" as the winning battery for 1935. This battery won third place in the Knox Trophy Award (1935) and was the only organization in the

Panama Canal Department rated "Excellent" on its 1935 service practice. Major James L. Craig, who commanded the battery when it fired an air-controlled long range advanced practice, received the cup from Colonel Pearce and in turn passed it over to Captain Jack Gamber, the present battery commander. It remains to be seen if "I" Battery can retain it for the 1936 season.

The Amador Officers' Club, as reorganized, is proving most successful. Monthly dances, with an orchestra from the regimental band, are a regular and attractive feature. A special affair was the Monte Carlo party where all Artillerymen, their wives and guests, had a chance to test the laws of probability.

The Miramar Club is making a bid for Army and Navy trade by offering membership without dues and by staging parties for the Services.

It is now possible to travel in comfort on the causeway to the Fortified Islands. The Department Engineer has resurfaced the road from the Mine Dock to Flamenco while the Post Quartermaster has resurfaced and extended the road from the Mine Dock to Amador and the post utility area.

The garrison at Amador is looking forward to the arrival of the Fleet for its three weeks' visit (May 8-27), this is an important event and things happen "when the fleet is in."

#### SHERMAN AND RANDOLPH NOTES

A special allotment of funds permitted repainting the exteriors of most of the buildings at Sherman, greatly improving the appearance of this beautiful, but isolated, tropical post.

On January 22, Lieutenant P. W. Guiney returned from leave in the U. S. with his bride and resumed his duties at Randolph. Mrs. Guiney is an Army girl, the daughter of Major Joseph H. Hickey, U.S.A. Retired. The bride and groom were met at the entrance to the reservation by a one-mule powered buckboard, the bugle corps and a Battalion of the 1st C.A. After being escorted around the post, they were safely deposited at their quarters.

Colonel Dusenbury relinquishes command of Fort Randolph in August to go to Organized Reserve duty at Lansing, Michigan. Major Coburn L. Berry returns to the U. S. from Randolph in July, Barrancas bound. Captain Arthur E. Wilson leaves Fort Sherman this summer to go to the 61st at Sheridan. Lieutenant T. B. McNair has already left Sherman to go to Fort Hancock.

The Mine Planter *Graham* has returned after several months' absence in Hampton Roads for repairs, during which its commanding officer, Lieutenant Virgil Kimm, found time to capture a \$100 prize in an advertising puzzle contest. More power to him.

The 2nd Battalion, 11th Engineers, put in a heavy month of road and trail work on the Atlantic side much to the joy of the Coast Artillery. Their labors are much appreciated as they will make it easier to get to some of the antiaircraft positions and outlying stations.

#### FINALE

The Coast Artillery on both sides of the Isthmus are concentrating on their annual service target practices, hoping to get them finished before Jupiter Pluvius again goes into action in a big way. The (AA) searchlight batteries are concentrating on their preliminary and record searchlight practices while the skies are clear. It is regrettable that no towed target missions, suitable for firing, have been flown since last October, though it is fervently hoped and expected that this condition will shortly be remedied. We would like to have some really fast bombers to tow targets for the antiaircraft gun practices.



BATTLES WILL BE FAR LESS BLOODY if soldiers have had many bloodless battles or field exercises.—WISCONSIN NATIONAL GUARD REVIEW.



# Hawaiian Separate Coast Artillery Brigade

## News Letter

BRIGADE COMMANDER, BRIGADIER GENERAL ROBERT S. ABERNETHY

CHIEF OF STAFF, COLONEL BENJAMIN H. L. WILLIAMS, C.A.C.

S-1, LIEUTENANT COLONEL E. S. DESOBRY, A. G. D.  
S-2, MAJOR W. F. LAFRENZ, C.A.C.

S-3, LIEUTENANT COLONEL RALPH E. HAINES, C.A.C.  
S-4, LIEUTENANT COLONEL B. S. DUBOIS, C.A.C.

*Harbor Defenses of Honolulu.*  
16th C.A.

COLONEL G. L. WERTENBAKER, *Commanding*

*Harbor Defenses of Pearl Harbor*  
15th C.A.

COLONEL EARL BISCOE, *Commanding*

*Sixty-Fourth Coast Artillery*

COLONEL WILLIS G. PEACE, *Commanding*

*By Lieutenant William M. Vestal*

### GENERAL MOSES ARRIVES

MAJOR GENERAL ANDREW MOSES, the new commander of the Hawaiian Division, arrived on March 11, 1936. Headquarters, "A" and "C" Batteries, 16th Coast Artillery, furnished the guard of honor when General Moses officially called on the Commanding General of the Hawaiian Department. The excellent appearance of the Guard was commented upon by General Moses, although the ceremonies were attended by intermittent showers.

At a luncheon given on Army Day (April 6th) by the Honolulu Chamber of Commerce in the beautiful new Roof Garden of the Young Hotel, General Moses recalled his previous service in Hawaii and expressed his pleasure in again being able to serve in the Pearl of the Pacific. The Coast Artillery Brigade extends a sincere Aloha to him.

### TARGET PRACTICE, 64TH C. A.

The last unit of the 64th Coast Artillery (AA) returned to Fort Shafter from the target practice range at Waiamanalo on April 4. During the six weeks encampment all gun batteries completed annual target practices. Battery "B" fired two advanced practices, one at a diving target (altitude of plane above 3,000 feet), and the other a low altitude practice (altitude of plane below 2,000 feet). These practices constituted a service test for the T8E3 Sperry director. Due to the fact that all gun batteries were present at Waiamanalo, the lessons learned from these advanced practices provided excellent training for officers and men. In the other batteries one day practice was fired using a stereoscopic height finder, and one day and night practice each were fired using altimeters for determination of the height of target. With all batteries training together it was possible to conserve the flying missions; also whenever any one battery was conducting its preliminary or service practices, the other batteries were able to obtain valuable instruction. The resulting scores were as follows:

### TARGET PRACTICE SCORES (APPROXIMATE)

GUN BATTERIES (CAMERA OBSERVATION)			
Battery "B" Advanced Practices. Score omitted.			
		Score	Average
Battery "C"	1st Day (Stereoscopic)	90	70
	2nd Day (Stereoscopic)	81	
	3rd Night	40	
Battery "F"	1st Night	112	109
	2nd Day (Stereoscopic)	148	
	3rd Day (Stereoscopic)	68	
Battery "G"	1st Day (Stereoscopic)	95	74
	2nd Night	81	
	3rd Day (Stereoscopic)	47	
Battery "K"	1st Day (Stereoscopic)	174	105
	2nd Day (Stereoscopic)	50	
	3rd Night	85	
Battery "L"	1st Day (Stereoscopic)	64	75
	2nd Day (Stereoscopic)	87	
	3rd Night	75	

The 64th Coast Artillery will wind up its training season with searchlight target practices using the new GMC Searchlight units Model 1934, manned by Batteries "A" and "E", and machine-gun practices conducted by Battery "I" and a composite battery composed of the machine-gun sections of each gun battery. The searchlight practices will be held in July and August in the vicinity of Pearl Harbor, the batteries camping at Fort Weaver, while the machine-gun practices will be conducted during September.

### TARGET PRACTICE, HARBOR DEFENSES OF HONOLULU

Four batteries of the Harbor Defenses of Honolulu fired their annual seacoast target practice on March 25th and 26th, with the following scores:

Battery "D", 55th C.A.	80.1
Battery "E", 55th C.A.	93.3
Battery "F", 55th C.A.	112.8
Battery "D", 16th C.A.	106.0

This completes the firings for the year with the exception of Battery "A," 16th C. A. which will fire two ex-caliber practices with 155 mm. GPF's.

## ARMY DAY EXHIBIT

On Army Day a military exhibit depicting the activities of the Hawaiian Department was displayed in the Capitol grounds. The exhibit of Battery "B," 55th C.A. brought forth much favorable comment because of its completeness and excellence of appearance. Concise and attractive signs labeled the principal parts of the gun and its large family of accessories. One of the exhibits which occasioned much praise was a model mobile plotting car with standard equipment, telephones and accessories inclosed in neat cabinets.

## ATHLETICS

Lieutenant Gilbert N. Adams, who for three years has been head coach of the King's Post cagers, deserves much credit for piloting the Kam team to the Sector-Navy league championship. To this team belongs the distinction of winning fourteen consecutive games. In the Hawaiian Department title series Kam disposed of the 3rd Engineers, Hawaiian Division Champs of Schofield Barracks, in two straight games by very comfortable margins. This was the first time in four years that a Sector team had won the Department Basketball trophy, and the first time in the same number of years that a Coast Artillery post represented the Sector in the play-off.

The padded-glove tossers representing the Sector came through with two more championships than they won in 1935. The featherweight title going to "Jimmie" Josephs of Kam, the lightweight title to "Don" Rogers of Fort Shafter, the light-heavyweight title to "Red" Farmer of Fort Ruger, and the heavyweight crown to "Tex" MacDonald of Fort Ruger—not a bad harvest for the Hawaiian Separate Coast Artillery Brigade.

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## Fort Barrancas Notes

COLONEL ROBERT ARTHUR, *Commanding*

OLD timers at Fort Barrancas undoubtedly will be interested in knowing some of the changes affecting the general appearance of the post. The Post Exchange has constructed an attractive gasoline filling station near the north end of the main road. Just south of the Post Exchange a new Post Office building is rapidly nearing completion. A fill, with a brick retaining wall, has improved the appearance of the ground in the vicinity of the saluting battery. Many trees and shrubs have been set out while the area around the flagpole came in for some special attention; it is now one of the beauty spots of the post.

Continuing efforts combined with earnest pleading and a number of small fires resulting from chimney sparks finally have made available sufficient funds to replace nearly all of the old shingle roofs with fireproof material. Other improvements are contemplated as soon as additional funds can be made available.



*Battery Langdon in service practice.*

The regular target-practice season for the year 1936 is over. Battery "A," commanded by Captain Granger Anderson, fired Battery Langdon (12" BC) with a resulting score of 132.8. Battery "B," commanded by Captain Clarence Rothgeb, fired 155 GPF's with a score of 87. During the past month the post has been honored by visits from Major General George Van Horn Moseley, commanding the 4th Corps Area, and Rear Admiral Ernest J. King, Chief, Bureau of Aeronautics, U. S. Navy. Both of these dignitaries were received with appropriate military honors.

The garrison has been saddened by the untimely death of Major George W. Hovey. Our deepest sympathy to the bereaved family.

Great credit is due Corporal Jack Chancey for producing two outstanding boxers who successfully went through the Southern Golden Gloves Championships at Nashville, Tennessee, and gave excellent accounts of themselves in the finals held in Chicago. It was there that Barney Brock, a fistic luminary of the first order, received the only setback of his career. He has since purchased his discharge from the service and has won his first four encounters as a professional.

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## Notes from Fort MacArthur

LIEUTENANT COLONEL HOMER R. OLDFIELD,  
*Commanding*

*By Captain John W. Davis, C.A.C.*

IN the previous issue of the COAST ARTILLERY JOURNAL it was announced that the 63d C.A. (AA) had the second highest average score, based on the results of target practice, for the year 1935. This year the 63rd is determined not to be surpassed. Other organizations please note that we are after the trophy.

The 63rd continues to maintain the most cordial relations and the closest possible contact with Reserve regiments of Southern California. In order that the greatest number of Reserve officers may receive valuable training it is our practice to make the monthly overnight marches on week-ends, thus enabling Reserve officers to participate in this valuable field training. During one overnight march in January, forty officers of the 975th C.A. (AA) accompanied the regiment to March Field.

In February another large group accompanied us on the march to the same place. In April, 35 members of the 976th C.A. (AA) were attached to the regiment for the march to San Clemente and return. This is excellent training for the Reserves and further cements the "relations cordiales" existing between the several components of the Army.

As a result of the recently authorized increase in the enlisted personnel, Headquarters Battery of the 3rd C.A. is no longer in a caretaking status but is able to man and fire seacoast batteries. The 3rd C.A. (which has not fired a record practice for many years) will, on June 3, move the 14-inch railway guns to Carlsbad and fire a target practice. Thirty-one rounds have been allotted for this purpose. A large group of Reserve officers from the 624th C.A. (RY) will accompany Headquarters Battery for their two weeks active duty training.

With the influx of recruits and the resulting increased strength of all organizations, athletic competitions have assumed a position of major importance. The handsome Athletic Supremacy Trophy presented to the post by the Los Angeles Chamber of Commerce, to be awarded annually to the organization having the highest athletic rating, provides an added incentive for the development of individuals and teams. This is a rotating trophy held by a battery for one year or as long as it can maintain athletic supremacy. Headquarters Battery, 63rd C.A. was the initial winner for the year 1935. The same organization is in the lead for the 1936 award, having topped the list for both basketball and bowling in the inter-battery league without the loss of a single game. Boxing has been introduced to the post and the opening fistic encounters were held on April 8. Former world's champion James J. Jeffries was in attendance and consented to referee one of the bouts.

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## Notes from the Harbor Defenses of Sandy Hook

COLONEL L. B. MAGRUDER, C.A.C., Commanding

By Lieutenant Colonel S. B. Dennis

ACTIVITIES at Fort Hancock, the guardian of New York Harbor, keep up their fast tempo. The normal garrison duties are sufficient to keep all fully occupied but additional duties add interest and zest to what otherwise might become a humdrum existence. Army Day, April 6, was appropriately observed. The following day a review of the troops was held in honor of Major General Stanley H. Ford who visited the post to inspect the motor repair shops and the model C.C.C. Camp.

The return of good weather has resulted in reestablishing the regular parades. Also more favorable weather conditions have enabled the utilities officer, Captain W. E. Shallene, to speed up the work on construction projects. Among the numerous improvements to be made on the post none will be more welcome than the completion of the nine-hole golf course and the combined

beach club and bathhouse. It is hoped that the latter will be finished before the outdoor bathing season opens. Fort Hancock has one of the best bathing beaches to be found along the Atlantic Coast and a new beach house will be a great convenience. Other improvements consist of widening the main road from the Post Hospital to the south guard house. Some obsolete structures will be demolished and the material salvaged; also, about ten miles of the Fort Hancock railroad will be repaired.

The Mine Planter "Ord" is in dry dock undergoing extensive repairs. This has resulted in curtailing water transportation between the post and New York City, necessitating the use of motor transportation for the shipment of supplies from the Army Base in Brooklyn. The sinking of the harbor boat *Barnett* made necessary the use of the *Ordnance* on the Fort Slocum run. As soon as repairs to the "Ord" have been completed this boat will be used by the mine command for submarine-mine training which will terminate in mine practice.

The garrison at Fort Hancock will be called upon to handle an unusually heavy summer training schedule. This will include training of units from all of the civilian components beginning with the 261st C.A. (HD) Del. N. G. on June 13. Other units to be trained at Fort Hancock are: the 619th C.A. (HD) from New York City, Colonel George Johnston commanding, during the period July 19 to August 1.

Personnel from the 514th C.A.-Res. will be in charge of the training of the C.M.T.C. enrollees during the period July 30 to August 29. It is expected that approximately 175 members of the C.M.T.C. will be at Hancock during this period. As an innovation, about 40 newly commissioned second lieutenants, Coast Artillery Reserve, will be ordered to Fort Hancock for a two-weeks period of active duty training. In addition to this we are expecting to receive at least eight of the Coast Artillery Reserve second lieutenants who will be placed on active duty for one year beginning July 1. R.O.T.C. units from the University of Delaware and Fordham University will assemble at Hancock for a period of six weeks training beginning on June 12. Major Donald L. Dutton, P.M.S.&T., Univ. of Delaware, will be the Executive officer for the R.O.T.C.

It is understood that the Shrewsbury River, which bounds the Fort Hancock reservation on the west, will be deepened. This River has long been a haven for yachtsmen and during the summer season its waters are well filled with small pleasure craft. The improvements to this waterway will provide additional inducements to sportsmen to visit the northern part of New Jersey and it may increase the influx of visitors to Fort Hancock. The work will be done under the supervision of the U. S. Engineers.

Regular monthly dances and dinner parties continue to hold the center of the social stage. Several rooms in the club house have been renovated and new furniture installed.

# THE FOREIGN MILITARY PRESS

*Reviewed by Major Alexander L. P. Johnson, Infantry*

CANADA: *Canadian Defence Quarterly*, January, 1936.

THE MEMEL CRISIS, by An Observer.

When the World War and the collapse of Tsarist Russia restored to Lithuania her long-lost independence, Memel, pre-war Germany's Baltic seaport, became the new republic's outlet to the sea. In view of its predominantly German character, the allied powers conferred upon Memel a status similar to that of Danzig. This arrangement, like many other features of the Treaty of Versailles, seemed sound enough in theory but proved most troublesome in practice. Subsequent developments further aggravated the situation.

It is symptomatic of post-war Europe that Lithuania protested vociferously against Poland's seizure of Vilna, claimed by the Lithuanians as part of their patrimony, although they had no scruple in doing the same thing in Memel. It is never difficult to see the other fellow's violation of treaty obligations.

Lithuania mollified the indignant League of Nations by conferring upon Memel a formal constitution of local autonomy, but this system of government proved a failure. Coöperation between the Lithuanian governor and the Diet, which had 24 German members out of a total of 29, was impossible. On the other hand, Lithuanians, like other liberated nations of post-war Europe, have little patience with obstreperous minorities that insist upon their traditional rights and prerogatives. The Lithuanian government imprisoned five German members of the Diet. This simple expedient prevented a constitutional quorum, thereby giving the governor a free hand in the administration of the province.

Hitlerite Germany, conveniently ignoring its own treatment of Jews, promptly demanded justice for the oppressed Germans in Lithuania. In order to take the wind out of the German sails, the Lithuanian government called a general election in September, 1935. Although held in an atmosphere surcharged with excitement, the elections passed off without serious complications. The Germans again carried 24 seats, which is in proportion to the size of its population in the province of Memel. The success of the Germans silenced the charge of oppression and, for the time being, alleviated the tension between the two interested countries. But it did not solve the problem permanently. The danger still remains and bodes ill for the future. In the opinion of the reviewer, it is highly probably that Memel will invite Hitler's next act of nullification.

FRANCE: *Revue Militaire Française*, January, 1936.

THE NEW GERMAN ARMY—Military Intelligence.

The new German army, which came into being on

November 1, 1935, consists of ten army corps totaling 24 infantry divisions, two cavalry divisions and one separate cavalry brigade. The entire force is grouped in three armies with headquarters at Berlin, Cassel and Dresden, respectively. Army corps consist of two or three divisions. The composition of motorized-mechanized forces is still to be determined. Corps headquarters are located at Königsberg, Stettin, Berlin, Dresden, Stuttgart, Münster, Munich, Breslau, Cassel and Hamburg.

*Revue Militaire Française*, February, 1936.

EMPLOYMENT OF DOGS IN THE JAPANESE ARMY—Military Intelligence.

The Japanese general staff, patterning after Germany, is planning to use dogs in war. Present plans contemplate the use of dogs for infantry liaison only. Pure-blooded German sheep dogs are preferred for this purpose. These animals are trained at the infantry school at Chiba. The course requires about nine months. The results so far obtained indicate that it has passed beyond the experimental stage. During the Manchurian campaign the Japanese employed a number of these trained dogs with conspicuous success. They are convinced that these animals are valuable auxiliaries on the battlefield.

GERMANY: *Militär-Wochenblatt*, December 25, 1935.

THE NEW RANK AND PROMOTION REGULATIONS OF THE SOVIET ARMY, by No. 40.

Regulations recently promulgated by the Soviet government recognize military rank and titles discarded at the inauguration of the Bolshevik régime. Although they still avoid such "capitalistic, bourgeois" terms as "officer" and "general," officers of the Red army may nevertheless use a real military handle to their names and display the corresponding insignia of rank. This concession apparently fulfills a wish of long standing, and the "officers" promptly voiced their profound gratitude and pledged their loyal support to the Soviet régime. It goes to show that even the staunchest Communist is not immune to the appeal of those trappings of rank that distinguish him from his fellows.

The new regulations divide the corps of "military leaders" into two categories: commanders and military superiors. Commanders are military leaders in actual command of troops, while the other group embraces all and sundry classes of personnel of the services or on special assignment away from troops. The lowest grade is "lieutenant" instead of the traditional equivalent employed by the Tsarist army. Perhaps it symbolizes the break with the past as well as the international character of Communism. This rank is attained upon graduation

from the military academy. Service in grade is for three years, as is that of first lieutenant. Captains and majors serve four years in their respective grades. The major, after a total of fourteen years of service, becomes eligible for promotion to the grade of colonel. The lieutenant colonel is omitted. That is one way of liquidating an embarrassing grade. Colonels must serve eight years before they can be promoted to higher rank.

Promotion is by seniority upon qualification for the next higher grade. The People's Commissar for War has the discretionary power to depart from the rule of seniority in exceptional cases. Military commanders of higher rank are labeled by their respective commands. Promotion to these grades is by selection. Officers who fail to qualify for promotion may serve two additional years, but upon a second failure they are transferred to the reserve or to some other vocation. Demotion in grade may be decreed by the commissar of war except in the case of division and higher commanders. These require the action of the highest Soviet authority. Military rank adheres to the possessor for life unless terminated by sentence of court. Inactive officers may wear their uniform without rank insignia. When they use their military title it must bear the qualifying label "at disposal" or "in reserve."

*Militär-Wochenblatt*, January 11, 1936.

YOUTHFUL GENERAL STAFF OFFICERS IN WAR, COMMANDERS AND TROOPS, by General von Reinicke, a.D.

Battlefield attrition necessitated mass production of general staff officers. Occasional errors in the selections were inevitable, yet, on the whole, these hastily trained general staff officers acquitted themselves creditably. The strenuous nature of general staff duty necessarily put a premium on youth. Although the majority of these youthful officers were modest, tactful individuals, there are instances of inordinate ambition and desire to get into the limelight.

It is imperative that capable, vigorous and alert regimental commanders be given an opportunity to reach high command at an early age. The revolution of 1918 clearly demonstrated that superannuated officers are of little value in positions of great responsibility even in the zone of the interior.

Division commanders should be young, vigorous and active. They must have stamina to endure the hardships of strenuous service. They must remain in close touch with their troops. It is not enough to send out general staff officers; that practice will soon destroy the prestige of a general officer.

General staff officers must cultivate courtesy and diplomacy in dealing with officers and troops. Overbearing conduct will produce friction and destroy morale. It will fan the antipathy usually felt by the rank and file against the brass hats who fight the war on maps. For this reason selective promotion of general staff officers over their

seniors in the line is most undesirable. It places a premium on staff duty to the detriment of troop officers at the front. Under any circumstances, promotion by selection should be applied with caution. Even in war it is justified only in the case of officers who have conspicuously proved themselves fit for high command.

High commanders and general staff officers should never lose sight of the physical and mental strain of front-line troops, and of the psychological effect upon them of the life of comparative safety and ease they behold in rear areas. It is, therefore, of great importance that commanders, general staff officers and other command-post personnel visit the front line at frequent intervals. These visits should not, however, become a burden to the troops. Visitors must always guard against exposing themselves to hostile observation. That invariably invites hostile artillery fire, and as a rule it comes down after the visitors have departed, leaving the troops to pay the price. High commanders should be liberal with praise and chary with criticism. Troops are highly sensitive to both.

*Berliner Monatshefte*, January, 1936.

MOBILIZATION OF EUROPEAN POWERS IN 1914, by Edward Czegka.

Unique in its field, the *Berliner Monatshefte*, edited by Dr. Alfred von Wegerer, is primarily devoted to researching the causes and events leading to the World War. The question of German war guilt supplied the inspiration that brought this periodical into existence thirteen years ago. Its contributors represent the entire civilized world.

This number begins the publication of a series of monographs on the mobilization of European powers in 1914. The first instalment, by Edward Czegka, State Archivist of Austria, deals with the mobilization of Serbia and Montenegro. After a brief summary of the strength and organization of the military establishments of these countries and of their war plans, the author traces the now more or less well known events leading to the order of general mobilization and concentration of the man-power of these two nations. The study is based upon original documents and other source material. Thus, Russian documents disclose the fact that on June 30, 1914, a few days after the assassination of the Austro-Hungarian heir, Tsar Nicholas approved the shipment of 120,000 rifles and 120,000,000 rounds of rifle ammunition that had been requested by the Serbian government during the previous winter. On July 3, in anticipation of war, the Serb minister of war, General Stefanovic, without consulting the Premier, ordered 50% of the officers stationed in southern Serbia to report to their mobilization stations. When the Austro-Hungarian minister presented the ultimatum of his government to the Serbian foreign office on July 23, the Serbian general staff had already taken preliminary steps preparatory to a general mobilization. This was ordered two days later, in fact before the Serbian government handed its reply to the Austrian minister.



which indicates that Serbia did not expect Austria-Hungary to accept it.

Serbia mobilized a quarter of a million men against Austria-Hungary. An additional 150,000 men provided security on the Bulgarian and Albanian frontiers, and took charge of the training of replacements. Montenegro mobilized 60,000 men but only 40,000 were effectively armed and equipped for field service.

*Artilleristische Rundschau*, February, 1936.

THE NEW ITALIAN TRENCH MORTAR, by M. Bl.

The Italian infantry received a new trench mortar capable of effective fire against masked targets at ranges from 100 to 150 meters. The weapon is light and highly mobile. With trained personnel it can fire 25 rounds per minute. Each infantry battalion now includes a trench mortar platoon equipped with three of these guns.

GREAT BRITAIN: *Journal of the Royal United Service Institution*, May, 1935.

JAPAN AND THE MANDATED ISLANDS. (Navy Notes).

The London *Times* quotes an article published in the Japanese *Nichi Nichi* by Admiral Suyetsugu, late commander in chief of the Japanese Combined Fleet, in substance as follows:

The mandated islands are Japan's first line of marine defense . . . As long as Japan is able to hold these isles her national safety is secured. Although constituting a protection to Japan, the islands are too remote to threaten any power. On the other hand, should they be seized or occupied by some enemy nation, Japan herself would be at once opened to any hostile fleet based on these islands. By the same token, these scraps of land would furnish excellent air bases for an enemy's air squadrons. Thus it appears that these islands are made to order for Japan; unless she holds them, the Pacific equilibrium goes by the board. Such is the Japanese point of view, as expressed by Admiral Suyetsugu.

Now it makes little difference what nation holds the mandate for these one-time German island possessions in the northern Pacific, if that mandate is merely employed for purposes of peaceful administration. However, when these islands are transformed into the first line of Japanese defense in direct contravention of the stipulated terms of the mandate, then, in the humble opinion of this reviewer, they become a threat indeed and one to be considered. For instance, the Marshall Islands, part of the mandated possessions, are within 1,000 miles of Hawaii. The reef-enclosed lagoons of the Marshall and Caroline Islands afford ideal bases for aircraft and could be used as refueling points for naval craft.

Despite the late Admiral Suyetsugu's pronouncement, the equilibrium of the Pacific *cannot* be maintained, unless the mandate over these islands is transferred to some uninterested power which can administer them without selfish motive.

HUNGARY: *Pesti Napló*, February, 1935.

FLAMES IN THE FAR EAST, by Major Kálmán Rátz, M. P.

Much has been written in recent years about the imminence of a Russo-Japanese war. Activities of Japanese troops on the Asiatic mainland furnished much of the material for this war talk. The press of the world vigorously condemned Japan for her aggressive imperialism but somehow it overlooked similar activities on the part of Soviet Russia. As far as territorial expansion is concerned, the Soviets did almost as well as Japan.

While the Japanese gathered up Manchuria and Inner Mongolia, the Bolsheviki absorbed Sinkiang (or Chinese Turkestan) the westernmost province of China which embraces 1,426,000 square kilometers and boasts a population of about a quarter of a million, mostly Mongols, Chinese and mixed Turk-Tartar tribes. This acquisition is of vast economical, political and strategical importance. It places Soviet Russia on the borders of Tibet where the ruling powers are definitely sympathetic, in marked contrast to the Anglophile leanings of the late Dalai Lama.

Although clashes frequently occur between Japanese and Soviet troops along the troubled frontiers of the Far East, war between these countries is unlikely in the near future. Such a war would necessitate the employment of large bodies of troops on an extremely difficult country and at a considerable distance from the homeland and natural bases. The objectives are not commensurate with the sacrifices that would have to be made. Indeed, such a war would be suicidal to both Russia and Japan. Only Great Britain and the United States would profit from the discomfiture of their potential enemies.

A Russo-Japanese conflict would inevitably have serious repercussions in Europe. It would weaken the French system of alliances and correspondingly enhance the power and prestige of the German-Polish entente.

JUGOSLAVIA: *Voyne Vestnik*, August-September, 1933.

THE CHARACTER AND MORAL WORTH OF OFFICERS, by General George Radosavlyevitch.

Jugoslavia, like most European countries, selects army officers for advanced staff and command training by means of competitive examinations. This method may have some advantages over the system that flourishes here, and no doubt a great many officers would favor its adoption as the only hope of their ever making the Leavenworth list. There is, however, another side to the picture, and the author's views on the subject merit consideration. Competitive examinations for general staff school selections will give the coveted opportunity to those who take the time to prepare themselves for the ordeal. Unfortunately, the officer who conscientiously attends to his duties has little or no spare time for book learning. This simply means that an officer can make the grade only by neglecting his regular job. It does not

mean that the best and most desirable officers will get the detail.

The competitive system of selecting officers is fundamentally wrong because it over-emphasizes scholastic performance. Qualities of character and will-power are far more important than the acquisition of mere theoretical knowledge.

Apparently no attempt is being made anywhere to grade officers on a basis of character and moral worth, because it is thought that opportunities to observe them are lacking. Although the problem presents serious difficulties, it is not impossible to solve. It should not be difficult to classify those who give evidence of positive or negative qualities. Similarly it should be an easy matter to identify those above and below the average. Strength of character, frankness, will-power, discipline, devotion to duty, courage, ambition, initiative, independence of thought, zeal, perseverance, punctuality, dependability, sincerity, thoughtfulness, conscientiousness, pride, modesty, patriotism, loyalty, are aspects of character that might well be considered and recorded. The determination of these should not, however, be left to the judgment of a single individual who may lack the necessary ability to judge, or who may be actuated by prejudices. The task should be entrusted to special boards. Although the result may still fall short of the ideal, it will in the long run produce satisfactory results at least to the extent of preventing a weak character from reaching the top. The modesty of the general's expectations may justify his faith in boards.

SPAIN: *Revista de Estudios Militares*, December, 1935.

DIVERSE NOTES ON THE UNITED STATES ARMY, by Major José Vidal.

The Spanish military attaché in Washington presents an interesting estimate of the United States army and of the state of our national defense. He finds that the army enjoys a fine reputation throughout the country. The efficiency of officers is well attested by the frequency of assignments to important civil functions. Good organization and a splendid *esprit de corps* contribute materially to the state of efficiency. The remoteness of army posts from centers of population enables the army to devote its time to training, and at the same time helps to keep it free from contamination by subversive propaganda. "The state of discipline is perfect," Major Vidal observes, "yet it is not merely a form of outward discipline, but one that results from the mutual respect of officers and en-

listed personnel."

The author rates the Air Corps as the second best in the world, and has high praise for its matériel. In his opinion, the United States Army, with the National Guard and Organized Reserve, can readily expand into a formidable fighting machine.

*Memorial de Artilleria*, February, 1936.

EMPLOYMENT OF MODERN TANKS IN THE RED ARMY, by Major Francisco Marinas.

Soviet military writers believe that the modern tank and airplane can smash the enemy's front; hence these arms play an important part in the Red plan of attack. They use three types of tanks, each of which has a distinct function and mission.

Partial blindness is the tank's greatest weakness, and the hostile artillery its most effective foe. These two factors emphasize the importance of prompt neutralization of enemy batteries. On the other hand, Russians believe that a battery of field artillery protected by a mine field can offer effective resistance to a tank company. They believe that 200 mines (10 tons) will cover a front of one kilometer. Accordingly, Russian estimates as to the number of tanks required for an attack run high. They think that a front of six to eight kilometers will require two battalions of heavy tanks, one of medium tanks and three of light tanks.

Concentrated action, both in time and space, is essential to the success of an aerial attack. Soviet experts believe that one bombardment squadron is necessary to destroy a battalion of field artillery in position or a regiment of infantry in route column. The success of any attack depends upon careful coordination; hence each wave must start on a prearranged time schedule. Contrary to views generally held, Soviet experts still believe in artillery preparation to neutralize hostile centers of resistance.

If Soviet military writers have their way, the Red infantry regiment will become a miniature army. They advocate the inclusion in the regimental organization of a reconnaissance company with armored cars and tanks, and armored-car company, a chemical-warfare company and a motorized antitank battery. They believe that the infantry battalion should include armored cars with machine guns, a tank company, and a motorized battery consisting of antitank, anti-aircraft and trench-mortar platoons. They advocate motorization of the infantry regiment and would have all motor transportation carry protective armor.



THE FACT REMAINS that for the next quarter century, at least, this country would enter a war with the material of the 1918 standards.—MAJOR RAYMOND MARSH, ORDNANCE DEPARTMENT.

# COAST ARTILLERY BOARD NOTES

*Any individual, whether or not he is a member of the service, is invited to submit constructive suggestions relating to problems under study by the Coast Artillery Board, or to present any new problems that properly may be considered by the Board. Communications should be addressed to the President, Coast Artillery Board, Fort Monroe, Virginia.*

## THE COAST ARTILLERY BOARD

LIEUT. COL. FRED M. GREEN, C.A.C., *President*

MAJOR C. E. COTTER, C.A.C.  
MAJOR G. B. WELCH, Ord. Dept.  
MAJOR A. F. ENGLEHART, C.A.C.

MAJOR E. T. CONWAY, C.A.C.  
CAPTAIN L. L. DAVIS, C.A.C.  
CAPTAIN WALTER J. WOLFE, C.A.C.

## SECTION I

### Projects Completed Since Last Issue of the Journal

PROJECT NO. 1040—BLANKETS, WOOLEN, OD., M 1934.—This project has been closed by authority of the War Department. It is the present policy to employ the Coast Artillery Board, in so far as practicable, on projects pertaining primarily to Coast Artillery problems.

PROJECT NO. 1052—COAST ARTILLERY MEMORANDUM NO. 16.—The manuscript of this publication has been completed, and submitted to the Chief of Coast Artillery for action. It is hoped that its contents may prove helpful to battery officers by presenting a digest of the experiences of others in their own service practices. Bismarck said that most people had to learn from their own mistakes; he attributed his success to his practice of learning from the mistakes of others. During 1935 a considerable number of novel schemes were tried; those which have not been described in the JOURNAL have been outlined in the official memorandum.

PROJECT NO. 1061—OPTICAL FACEPIECE, E29R19.—The object of this test was to determine whether large, single-curvature lenses, without magnifying power, would be advantageous for use with the optical gas mask, the diaphragm mask, and the service mask. Tests showed that the proposed arrangement provided a more comfortable facepiece, and more than twice as great a field of vision, except when used with optical instruments. When used with the majority of existing optical fire-control instruments, however, the eye-distance was unsatisfactory; accordingly, the Board recommended a change in the inclination of the lenses, both to reduce the distance between the observer's eye and the eye-piece of the instrument, and to afford a more comfortable angle for continued close observation. It was the opinion of the Board that in its present form the Optical Facepiece E29R19 is less satisfactory for use with optical instruments than is the Facepiece E6R40, but that with certain changes, which were recommended, the E29R19 could be made the more suitable pattern.

## SECTION II

### Projects Under Consideration

PROJECT NO. 953—RADIO-CONTROLLED HIGH-SPEED TARGET.—Due to lack of personnel, and the pressure of other duties, all work on this project was suspended during the past two months. It is hoped to resume this work in May, and an endeavor will be made to construct a new control mechanism with gyroscopic course-stabilizer in time to take advantage of good weather for actual tests of the improved equipment.

PROJECT NO. 1038—STORAGE OF RUBBER-JACKETED SUBMARINE MINE CABLE.—This project is a "hardy perennial," which extends over a period of five years. No startling conclusions can be drawn from any of the reports received so far.

PROJECT NO. 1039—DATA TRANSMISSION SYSTEM, T-11.—In brief, this system may be described as an adaptation to seacoast fire-control problem of the same system of data transmission as is used with antiaircraft guns. All tests of this matériel at Fort Monroe have been completed; these included tests of accuracy of transmission, followed by use during subcaliber firing, and finally by test during the firing of service charges. Meanwhile, another data transmission system of the same type has been installed for service test at Fort Hancock, N. J. The Board is awaiting the outcome of the Fort Hancock tests before preparing its final report upon this data transmitting system. In general, it may be expected that data transmitters will be found as advantageous for the use of seacoast armament as they have been for antiaircraft guns.

PROJECT NO. 1046—ANTIAIRCRAFT MACHINE-GUN FIRE CONTROL, 1936.—These tests, held at Fort Story, extended over a period of more than six weeks. Exceptional difficulties from rainy and foggy weather, bad flying conditions, and the occasional loss of important targets were encountered, but the data that has been secured promise to be of considerable value.

The scope of the tests was fairly extensive. There were not only the routine day and night firings at a towed

sleeve, but also a considerable number of additional and unusual tests, such as tracking on targets diving out of the sun, on high-speed maneuvering targets, on unilluminated low-flying planes (seen partly through silhouetting against the sky, and partly by the flame of the airplane motor exhaust), on diving targets at dusk, and on targets illuminated only by miniature searchlights designed for use in beach defense. Several patterns of caliber .50 guns were tested, three patterns of tripods were used with them, and certain experimental lots of ammunition were tried. Firing was held using individual control, with computing sights, and using central control by flexible shafting; with the latter, the angular leads normally were determined by instruments devised and constructed by Coast Artillery Board personnel. All in all, it is fair to say that as a result of these tests, a considerable amount of useful information has been secured. Evaluation of the data will require at least a month; analysis has not yet progressed far enough to justify the drawing of conclusions.

PROJECT NO. 1048—DEVICE FOR GREASING GUNS (BROWN).—This project has been held in abeyance, awaiting the arrival of warm weather, when grease can be expected to flow more freely.

PROJECT NO. 1049—FIELD JACKETS.—The test of these garments (described in the March-April JOURNAL) has been completed, and the report of the Board is in preparation. As to the utility of this type of garment for field wear, there can be no question. Just where it would fit into the soldier's wardrobe is a more debatable question: should it be additive to present allowances, or substituted for some article? The field jacket is warmer than the blouse, but affords less protection than the overcoat or mackinaw. While the men are agreed on its excellence as a working garment, the field jacket, as its name implies, is not well adapted for what the British call a "walking-out uniform."

PROJECT NO. 1051—TIME-INTERVAL APPARATUS, EE-85-T5.—This equipment, described in the previous issue of the JOURNAL, is undergoing tests at every opportunity. By summer, fairly extensive data on its operation should have been collected. It is hoped that before long this problem (an acute one for more than ten years), may have been settled definitely.

PROJECT NO. 1054—TELEPHONE BOX, EE-91-T1.—Some of the accessory equipment, required for completing this test, was received in damaged condition. These components have been turned in to the Signal Corps for overhaul. As soon as this matériel has been returned, the Board will proceed with its tests. The tests so far completed indicate certain very satisfactory characteristics.

PROJECT NO. 1055—PAINT PRIMERS FOR SEACOAST MATÉRIEL.—The armament selected for test, and to which paint was applied over each of the subject primers, as yet has shown no signs of deteriorated surface. It would be premature to venture any opinion as to the relative merits of the various priming coats now under test.

PROJECT NO. 1056—SOUND-POWERED TELEPHONES.—The sets provided for test are being used at every opportunity and under every variety of circumstances. The Board is naturally reluctant to complicate the service communication equipment by the addition of any new type of telephone, and especially one that appears less rugged and more subject to derangement from rough handling than is the usual local-battery type. The probable durability of the sound-powered telephone is being scrutinized with especial care. However, there are obvious advantages to the use of a telephone not dependent upon the periodical field supply of a really fresh battery, and these advantages will not be sacrificed unless they prove to be accompanied by other more serious drawbacks.

PROJECT NO. 1057—EXPERIMENTAL FLANNEL SHIRTS.—These shirts were described in the January-February issue. Certain officers and enlisted men were detailed to wear them for a six-month period, ending June 1, 1936. At the end of that time the shirts will be examined for condition, appearance, and fit; also the wearers' opinions of their comfort and wearing qualities, as compared with shirts of the present issue type, will be of much value to the Board in preparing its report.

PROJECT NO. 1058—SPOTTER, T5.—This device was described in the COAST ARTILLERY JOURNAL for January-February, 1936. Ammunition for test purposes has been secured, and at the time of writing these notes, the troops which have executed the firings under Project 1046 have just returned from Fort Story. Their next task will be to execute antiaircraft gun firings for the Coast Artillery School; incident to this some tests on the T-5 Spotter will be conducted.

PROJECT NO. 1059—DEPRESSION ANGLE INDICATOR, 1936.—This equipment was described in the preceding issue of the COAST ARTILLERY JOURNAL. With the coming of more favorable weather, and as soon as the necessary cooperation from the Air Corps, Harbor Defenses, and harbor boat service can be obtained, tests of this equipment will be initiated.

PROJECT NO. 1063—RADIO SET, SCR-194-T3.—These sets are compact, easily portable radio telephone units, which employ ultra high frequencies, ranging from 28 to 65 megacycles. This equipment is intended for ranges up to about five miles. The entire set, complete with batteries and a collapsible antenna rod over 13 feet long, weighs less than 25 pounds, and (collapsed) measures only 16 x 9 x 6 inches over all. A 9½-foot antenna for vehicular use accompanies the set.

To date, the operation of this set has proved satisfactory, but the tests have just begun. One of the principal problems is to determine the most useful applications of this set to Coast Artillery needs. A variety of purposes might be served: to link up OP's, listening posts, and searchlights in the antiaircraft regiment; for emergency communication with distant altimetric, spotting, or base end stations; for command purposes within the mobile battalion or regiment; during reconnaissance; for convoy control; during work on the water incident to the plant-

ing of submarine mines. Doubtless others can be suggested. The problem arises as to how extensively these sets could be used for the purposes indicated without mutual interference, and especially when operating in the vicinity of Field Artillery and Infantry units, of which the former are to use frequencies from 28 to 52 megacycles, and the latter from 52 to 65 megacycles. As to the value of these sets for peace-time purposes in Coast Artillery work, no one who has seen their operation can remain in doubt.

PROJECT NO. 1064—NIGHT GLASSES, T<sub>2</sub> AND T<sub>3</sub>.—The Binocular T<sub>2</sub> and the Binocular T<sub>3</sub> are both 8-power field glasses with 56 mm. objectives. Both admit a large amount of light with a correspondingly clear vision. They are designed for use at an antiaircraft searchlight control station to facilitate picking up the target. The T<sub>2</sub> glass provides an erect image by the use of prisms.

These prisms absorb light and thus reduce visibility. The T<sub>3</sub> glass omits the prisms, thus increasing the amount of light transmitted, but the image seen is inverted. This project is for the purpose of investigating and reporting upon the relative value of these two glasses.

### SECTION III

#### Miscellaneous

Four sample lots of lithographic ink, prepared by the Government Printing Office at the request of the Chief of Ordnance, were recently tested. This is for the purpose of marking antiaircraft machine-gun bullets for identification of hits on aerial towed targets. The inks were furnished in red, orange, green, and blue; all were found to be satisfactory, and recommendations are being made that they be standardized for issue to Coast Artillery troops.

## COAST ARTILLERY ORDERS

(Covering the Period March 1 to April 30, 1936)

Colonel W. T. Carpenter, from War Department General Staff, to Panama, sailing New York, August 14.

Colonel J. S. Dusenbury, from Panama, to Org. Res. 6th Corps Area, Lansing, Mich.

Colonel R. P. Reeder, from Ft. Monroe, to his home and await retirement. Previous orders revoked.

Colonel W. E. Shedd, Jr., from instructor, C.A. School, Ft. Monroe, to Coast Artillery Board, Ft. Monroe, July 1.

Colonel H. F. Spurgin, from 51st, Ft. Monroe, to 2d, Ft. Monroe, May 9.

Colonel A. H. Sunderland, appointed Chief of Coast Artillery with rank of Major General, April 1.

Colonel G. L. Wertenbaker, from Hawaii, to Hq. Eighth Corps Area, Ft. Sam Houston.

Lieutenant Colonel K. F. Baldwin, from student, Army War College, Washington, to Asst. P. M. S. & T., University of Kansas, Lawrence.

Lieutenant Colonel E. E. Bennett, from office Chief of Coast Artillery, to 62d, Ft. Totten, September 1.

Lieutenant Colonel K. T. Blood, from student, Army War College, to Hawaii, sailing New York, August 14.

Lieutenant Colonel B. N. Booth, retired physical disability, April 30.

Lieutenant Colonel J. H. Cunningham, from General Staff Corps, Washington, to the Philippines, sailing New York, September 16.

Lieutenant Colonel Frank Drake, from General Staff Corps, 7th Corps Area, to Asst. P.M.S.&T., University of San Francisco.

Lieutenant Colonel F. P. Hardaway, from student, Army War College, Washington, to Hawaii, sailing New York, August 14.

Lieutenant Colonel P. H. Herman, from Org. Res. 3d Corps Area, Ft. Monroe, to 10th, Ft. Adams, August 1.

Lieutenant Colonel J. L. Homer, from student, Army Industrial College, Washington, to office Chief of Coast Artillery.

Lieutenant Colonel J. H. Hood, from instructor, C.&G.S. School, Ft. Leavenworth, to 6th, Ft. Winfield Scott.

Lieutenant Colonel O. H. Longino, to member of General Staff Corps with troops, Panama, July 27.

Lieutenant Colonel J. D. McCain, from the Philippines, to 62d, Ft. Totten.

Lieutenant Colonel W. R. Nichols, from instructor, C. & G. S. School, Ft. Leavenworth, to 3d, C.A. District, Ft. Monroe, July 31.

Lieutenant Colonel R. T. Pendleton, from office Chief of Coast Artillery, to instructor, C.A. School, Ft. Monroe, August 1.

Lieutenant Colonel R. N. Perley, from Panama, to Inspector General's Department, 1st Corps Area, Boston.

Lieutenant Colonel E. K. Smith, from Athens High School, Athens, Ga., to Panama, sailing New York, July 3.

Lieutenant Colonel J. P. Smith, from War Department General Staff, Washington, to Hawaii, sailing New York, August 14.

Lieutenant Colonel J. S. Smylie, from First Corps Area, Boston, to Panama, sailing New York, November 12.

Lieutenant Colonel T. A. Terry, from War Department General Staff, Washington, to the Philippines, sailing New York, September 16.

Lieutenant Colonel C. M. Thiele, from War Department General Staff, Washington, to 63d, Ft. MacArthur.

Lieutenant Colonel E. W. Turner, from Org. Res. Third Corps Area, Pittsburgh, to the Philippines, sailing New York, June 2.

Major R. W. Argo, from instructor, C.A. School, Ft. Monroe, to Assistant P. M. S. & T., University of Delaware, Newark, August 1.

Major M. G. Armstrong, from instructor, R. I. N. G., Providence, to 61st, Ft. Sheridan.

Major C. L. Berry, from Panama, to Asst. P.M.S.&T., Univ. of Minnesota, Minneapolis.

Major A. H. Campbell, from student, C.&G.S. School, Ft. Leavenworth, to Org. Res. 3d Corps Area, Ft. Monroe.

Major J. T. Campbell, from instructor, C.A. School, Ft. Monroe, to 2d, Ft. Monroe, July 1.

Major W. M. Cravens, from Org. Res. 2d Corps Area, Wilmington, to Hawaii, sailing New York, Aug. 14.

Major Nelson Dingley, III, from student, C.&G.S. School, Ft. Leavenworth, to Asst. P.M.S.&T. Va. Polytechnic Institute, Blacksburg.

Major F. G. Epling, from Panama, to instructor, Air Corps Tactical School, Maxwell Field, Ala.

Major W. D. Evans, from student, C. & G. S. School, Ft. Leavenworth, to Georgia School of Technology, Atlanta.

Major L. D. Farnsworth, from instructor, Ore. N.G., to 62d, Ft. Totten.

Major E. H. Freehand, from Org. Res. 4th C.A. District, to Panama, sailing New York, June 2.

Major P. H. French, from Assistant P.M.S.&T., Georgia School of Technology, to 2d, Ft. Monroe.

Major J. H. Harrington, from Finance Department, to 13th, Ft. Barrancas, Sept. 1.

Major H. N. Herrick, from the Philippines, to student, Air Corps Tactical School, Maxwell Field, Aug. 25.

Major C. W. Higgins, from student, C.



&G.S. School, Ft. Leavenworth, to Assistant P.M.S.&T., University of Cincinnati.  
Major R. E. Hill, from 51st, Ft. Monroe, to Agric. and Mech. College of Texas, May 30.

Major H. B. Holmes, Jr., from student, Army War College, Washington, to office, Chief of Coast Artillery.

Major W. W. Irvine, from student, Army War College, Washington, to 6th, Ft. Winfield Scott.

Major W. F. Lafrenz, from Hawaii, to Assistant P.M.S.&T., University of San Francisco.

Major R. M. Levy, from 4th Corps Area, Atlanta, to Adjutant General's Department, Washington, D. C., August 1.

Major P. P. Lowry, from 3d, C.A. District, Org. Res., to instructor, C.A. School, Ft. Monroe, May 1.

Major H. C. Mabbott, from student, C.&G.S. School, Ft. Leavenworth, to Hawaii, sailing New York, August 14.

Major J. G. Murphy, from student, C.&G.S. School, Ft. Leavenworth, to Assistant P.M.S.&T., Fordham University.

Major A. V. Rincerson, Jr., from Hawaii, to P.M.S.&T., Athens High School, Athens, Ga.

Major J. L. Scott, transferred to Finance Department, March 21.

Major C. J. Smith, from P.M.S.&T., Reno High School, to Hawaii, sailing San Francisco, September 5.

Major L. H. Thompson, from instructor, Georgia N.G., to 3d, Ft. MacArthur.

Major W. H. Warren, from student, C.&G.S. School, Ft. Leavenworth, to office Chief of Coast Artillery, Washington, D. C.

Major Ellsworth Young, from Panama, to 52d, Ft. Hancock.

Captain C. M. Badger, from student, C.&G.S. School, Ft. Leavenworth, to Hawaii, sailing New York, October 27.

Captain H. C. Barnes, Jr., from student, C.&G.S. School, Ft. Leavenworth, to the Philippines, sailing New York, September 16.

Captain K. C. Bonney, from 52d, Ft. Hancock, to 13th, Ft. Barrancas.

Captain W. R. Carlson, from 11th, Ft. H. G. Wright, to Assistant P.M.S.&T., University of Alabama, University, July 20.

Captain A. K. Chambers, from Hawaii, to 3d, Ft. Stevens.

Captain G. A. Chester, from student, C.A. School, Ft. Monroe, to student, advanced technical course, C.A. School, August 25.

Captain W. L. Claxton, retired with rank of Major, upon his own application, March 31.

Captain L. D. Flory, from student, C.&G.S. School, Ft. Leavenworth, to Hawaii, sailing New York, August 14.

Captain J. H. Fonvielle, from student, C.A. School, Ft. Monroe, to 69th, Fort Crockett.

Captain G. A. Ford, from 69th, Tyler, Texas, to Panama, sailing New York, August 14.

Captain J. F. Gamber, from Panama, to student, C.A. School, Ft. Monroe, August 25.

Captain H. P. Gard, from student, C.A. School, to 2d, Ft. Monroe.

Captain J. L. Goff, from 14th, Ft. Worden, to 52d, Ft. Hancock.

Captain J. I. Hincke, from U. S. Military Academy, West Point, to Hawaii, sailing New York, August 14.

Captain Armand Hopkins, from student, C. A. School, to 51st, Ft. Monroe.

Captain R. H. Krueger, to the Philippines, sailing New York, June 2. Previous orders amended.

Captain D. D. Martin, from the Philippines, to Assistant P.M.S.&T., Michigan State College, East Lansing.

Captain W. J. McCarthy, from Panama, to 14th, Ft. Worden.

Captain R. B. Palmer, from student, C.A. School, Ft. Monroe, to Hawaii, sailing New York, August 1.

Captain R. B. Pape, from Japanese language detail, to 63d, Ft. MacArthur.

Captain W. H. Papenfoth, from Oakland Public High Schools, to 69th, Ft. Crockett, June 24.

Captain J. H. Rousseau, Jr., from University of Alabama, to 2d, Ft. Monroe, August 1.

Captain C. E. Shepherd, from 52d, Ft. Hancock, to student, C.A. School, Ft. Monroe, August 25.

Captain N. B. Simmonds, to 11th, Ft. H. G. Wright. Previous orders amended.

Captain J. H. Smith, from student, C.&G.S. School, Ft. Leavenworth, to P.M.S.&T., Reno High School, Reno.

Captain W. H. Steward, promoted Major, February 1.

Captain A. P. Sullivan, from student, C.&G.S. School, Ft. Leavenworth, to Org. Res., 4th Corps Area, Columbia, S. C.

Captain E. W. Timberlake, from student, C.&G.S. School, Ft. Leavenworth, to 61st, Ft. Sheridan.

Captain C. F. Tischbein, from student, C.A. School, Ft. Monroe, to Hawaii, sailing New York, August 1.

Captain D. C. Tredcnick, from Assistant P.M.S.&T., University of Pittsburgh, to 52d, Ft. Hancock, July 23.

Captain Vern Walbridge, from Panama, to 61st, Ft. Sheridan.

Captain A. E. Wilson, from Panama, to 61st, Ft. Sheridan.

Captain N. D. Young, from 61st, Ft. Sheridan, to 3d, Ft. Rosecrans.

First Lieutenant G. N. Adams, to 3d, Ft. Stevens. Previous orders amended.

First Lieutenant C. K. Allen, from student, Ordnance School, Aberdeen Proving Ground, to Watertown Arsenal, June 30.

First Lieutenant R. L. Anderson, from student, C.A. School, to 51st, Ft. Monroe.

First Lieutenant I. T. Barber, from student, C.A. School, Ft. Monroe, to Hawaii, sailing New York, September 5.

First Lieutenant C. R. Bard, to Superintendent, U. S. Military Academy, West Point, July 1. Previous orders amended.

First Lieutenant A. H. Bender, to the Philippines, sailing New York, June 2. Previous orders amended.

First Lieutenant F. A. Bogart, from 52d, Ft. Hancock, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant L. A. Bosworth, from Watertown Arsenal, to student, Ordnance School, Aberdeen Proving Ground.

First Lieutenant R. G. Butler, Jr., transferred to Ordnance Department, March 5.

First Lieutenant W. A. Call, from Watertown Arsenal, to student, Ordnance School, Aberdeen Proving Ground.

First Lieutenant E. W. Chamberlin, from student, C.A. School, to student advanced technical course, C.A. School, Ft. Monroe, August 25.

First Lieutenant W. V. Davis, from 62d, Ft. Totten, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant F. W. Ebev, from the Philippines, to 11th, Ft. H. G. Wright.

First Lieutenant D. D. Edison, from Hawaii, to 14th, Ft. Worden.

First Lieutenant Paul Elias, from student, C.A. School, Ft. Monroe, to Hawaii, sailing New York, August 14.

First Lieutenant C. H. Fernstrom, from 6th, Ft. Winfield Scott, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant R. D. Glassburn, from Panama, to 13th, Ft. Barrancas.

First Lieutenant A. D. Gough, from 6th, Ft. Baker, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant L. M. Guyer, to Superintendent, U. S. Military Academy, West Point, July 1. Previous orders amended.

First Lieutenant R. F. Haggerty (OD), from Watertown Arsenal, to student, Ordnance School, Watertown Arsenal.

First Lieutenant W. H. Harris, from 52d, Ft. Hancock, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant E. F. Heidland, to Hawaii, sailing August 1. Previous orders amended.

First Lieutenant J. J. Holst, from 13th, Ft. Barrancas, to Panama, sailing New York, June 2.

First Lieutenant Joseph Horridge, from Ordnance Department, Raritan Arsenal, Metuchen, to U. S. Military Academy, West Point. Previous orders revoked.

First Lieutenant M. M. Irvine, from 63d, Ft. MacArthur, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant R. K. Kauffman, from the Philippines, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant A. A. Koscielniak, from 51st, Ft. Monroe, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant A. M. Lazar, from 62d, Ft. Totten, to student, C.A. School, Ft. Monroe, August 20.

First Lieutenant O. J. Levin, retired for the convenience of the Government, May 31.

First Lieutenant H. duB. Lewis, from 14th, Ft. Worden, to Ordnance Department, student, Ordnance School, Watertown Arsenal.

First Lieutenant J. R. Lovell, from Hawaii, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant W. L. McCulla, from Watertown Arsenal, to student, Ordnance School, Aberdeen Proving Ground.

First Lieutenant W. F. McKee, from student, C.A. School, Ft. Monroe, to the Philippines, sailing New York, September 16.

First Lieutenant H. R. McKenzie, from student, Quartermaster Corps School, Philadelphia, to Assistant Quartermaster, Army Medical Center, Washington, June 30.

First Lieutenant M. J. McKinney, to the Philippines, sailing New York, June 2. Previous orders amended.

First Lieutenant E. G. Mitchell, from Watertown Arsenal, to student, Ordnance School, Aberdeen Proving Ground.

First Lieutenant B. L. Paige, from Hawaii, to Superintendent, U. S. Military Academy, West Point, July 1. Previous orders amended.

First Lieutenant H. C. Parks, from student, C. A. School, Ft. Monroe, to Panama, sailing New York, August 14.

First Lieutenant C. L. Partin, from student, C.A. School, to 2d, Ft. Monroe.

First Lieutenant P. F. Passarella, from 11th, Ft. H. G. Wright, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant C. L. Peterson, transferred to Corps of Engineers, February 14.

First Lieutenant M. G. Pohl, from student, C.A. School, to 2d, Ft. Monroe.

First Lieutenant G. F. Powell, from 6th, Ft. Winfield Scott, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant K. E. Rasmussen, from

student, C.A. School, Ft. Monroe, to language detail, Tokyo, Japan, sailing New York, September 16.

First Lieutenant M. B. Raymond, from Panama, to 62d, Ft. Totten.

First Lieutenant J. F. Rodenhauer (OD), from Aberdeen Proving Ground, to Watertown Arsenal.

First Lieutenant L. G. Ross, from student, C.A. School, Ft. Monroe, to Hawaii, sailing New York, August 14.

First Lieutenant J. A. Sawyer, from Hawaii, to 6th, Ft. Winfield Scott.

First Lieutenant Peter Schmick, from 63d, Ft. MacArthur, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant R. E. Schukraft, from 52d, Ft. Hancock, to Signal Corps, Ft. Monmouth, May 30.

First Lieutenant M. L. Skinner, from student, C. A. School, Ft. Monroe, to Hawaii, sailing New York, August 14.

First Lieutenant W. F. Spurgin, from 10th, Ft. Adams, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant A. P. Taber, from 14th, Ft. Worden, to student, C.A. School, Ft. Monroe, August 25.

First Lieutenant L. K. Tarrant, from student, C.A. School, to 51st, Ft. Monroe.

First Lieutenant H. N. Toftoy, from student, C.A. School, Ft. Monroe, to Panama, sailing New York, August 14.

First Lieutenant L. T. Vickers, from Hawaii, to 14th, Ft. Worden.

First Lieutenant D. B. Webber, from 61st, Ft. Sheridan, to U. S. Military Academy, West Point.

First Lieutenant K. J. Woodbury, from student, C.A. School, Ft. Monroe, to the Philippines, sailing New York, September 16.

Second Lieutenant J. O. Baker, from 14th, Ft. Worden, to student, Ordnance Department, Watertown Arsenal.

Second Lieutenant K. I. Curtis, from Air Corps Primary Flying School, Randolph Field, to 63d, Ft. MacArthur.

Second Lieutenant H. C. Donnelly, from Panama, to aide, Brig. Gen. P. P. Bishop, Ft. McPherson.

Second Lieutenant R. W. Hain, from Panama, to 62d, Ft. Totten.

Second Lieutenant H. R. Hale, from 51st, Ft. Monroe, to Air Corps training center, Randolph Field, July 1.

Second Lieutenant F. M. Humphries, from Watertown Arsenal, to student, Ordnance School, Aberdeen Proving Ground.

Second Lieutenant E. H. Kibler, Jr., from Panama, to 7th, Ft. Hancock.

Second Lieutenant F. M. McGoldrick, from 52d, Ft. Monroe, to Hawaii, sailing New York, August 14.

Second Lieutenant P. S. Peca, to the Philippines, sailing New York, June 2. Previous orders amended.

Second Lieutenant D. B. Routh, to the Philippines, sailing New York, September 16. Previous orders amended.

Second Lieutenant R. B. Warren, from Coast Artillery Corps to Corps of Engineers, March 5.

Second Lieutenant G. J. Weitzel, to the Philippines, sailing New York, June 2. Previous orders amended.

Master Sergeant John Brewer, 3d, Ft. MacArthur, retired, March 31.

Master Sergeant W. E. Tarpey, 62d, Ft. Totten, retired, April 30.

Master Sergeant, G. R. Taylor, 11th, Ft. H. G. Wright, retired, April 30.

First Sergeant Hector Buckley, 9th, Ft. Banks, retired, April 30.

First Sergeant Will Harper, 13th, Ft. Barrancas, retired, March 31.

First Sergeant I. C. Hopkins, C.A. School Detachment, retired, March 31.

First Sergeant J. J. Howard, 62d, Ft. Totten, retired, April 30.

First Sergeant Joe Kirkpatrick, 14th, Ft. Worden, retired, March 31.

First Sergeant C. L. Stout, 59th, Ft. Mills, retired, April 30.

Sergeant W. M. Clapp, 61st, Ft. Sheridan, retired, March 31.

Sergeant Adolph Hirschfield, 5th, Ft. Hamilton, retired, April 30.

Sergeant Lawrence Reilly, 41st, Ft. Kamehameha, retired, March 31.

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## BOOK REVIEWS

GEOGRAPHIC DISARMAMENT: A STUDY OF REGIONAL DEMILITARIZATION, By Major General J. H. Marshall-Cornwall, C.B.E., D.S.O., M.C. Oxford University Press. \$5.00.

*Reviewed by Major Gordon Welch, O.D.*

Forced to live on a spherical earth, from which there is no escape, and pressed by a population increase that always seems just a little ahead of the available food supply, men have frequently seen no way to solve the problem of obtaining the bare necessities of life except by hitting somebody. The somebody is nearly always a stranger, someone who speaks a different language, who eats different food, or worships a different God. But men have not generally actually wanted war, and they are usually ready to try many expedients to avoid it, and thus to prolong the periods of peace in which they prove and develop their particular corner of the earth.

One of these expedients has been the "zonal frontier," or buffer region, between possibly hostile groups. Sometimes these insulating zones were simply areas into which each was afraid to go unless he meant war; sometimes they were forced upon a vanquished State by the victor; and sometimes they were more formally agreed upon as places into which each promised not to send armed men. This practice, whatever the details of the arrangement and however arrived at, is known, in the modern language of international relations, as "regional demilitarization." In the security which such regional demilitarization has sometimes afforded, nations, large and small, have been better able to relax, and to go about their ordinary business without spending too much of their time and energy in watching the frontier.

Security, however, as pointed out by Major General Marshall-Cornwall, distinguished author of this recent study of geographic disarmament, ". . . is a mental state, not so much based on deductive reasoning as inspired by faith and confidence, and induced by psychological convictions rather than by physical factors. We sleep more securely in a country cottage surrounded by a garden than if that cottage gave directly onto the main road. The garden wall may be totally ineffective as an obstacle; possibly we do not even lock the gate at night, but we are surrounded by a zone of space, and that zone, though it cannot physically guarantee security, yet psychologically imparts it. Transpose the garden wall into a national frontier and the same effect is produced. National security is engendered. We have replaced the 'razor's edge' of sharp contact by a blunter insulating zone. In the future, we must think of frontiers, not as lines, but as zones, which, in effect, they really are."

However, if conditions arise, whether internal or external, to disturb this mental state that engenders the feeling of security, then the adjacent states may be expected to take such steps as each feels is necessary for its own safety, regardless of the treaties or agreements that may have been signed. Thus on March 7th, whether due to the pressure of internal affairs to feelings of outraged national honor, or, as stated, to violations by other signatories of the Locarno agreements, Chancellor Hitler moved troops into the Rhineland, which under these agreements constituted a demilitarized buffer region between France and Germany. As the diplomats moved and counter-moved following this German action, the news dispatches carried a report to the effect that Turkey proposed to remilitarize the Dardanelles if Germany were allowed to reoccupy the Rhineland without opposition.

In times marked by sudden crises like these, it is not easy to understand the forces that play back and forth on each day's events. For those who seek such an understanding, especially of the possibilities connected with this particular method of maintaining peace, and of the motives, methods, mistakes, and successes of the statesmen who apply them, General Marshall-Cornwall has assembled and analyzed the necessary background of historical facts. He traces the conception of a "zonal frontier" from the almost involuntary use of neutral zones by pre-historic tribes to the highly technical treaties of Locarno and Lausanne.

From this study, certain principles stand out as essential to the successful employment of regional demilitarization as a device for maintaining peace. First, the agreements constituting such zones should be mutually arrived at. If their terms are forced by one upon the other, then at the first auspicious occasion they are likely to be violated. Second, they should offer advantage to each of the adjacent states. This is the most ordinary rule of contracts; it is the "for value received" clause. Third, the boundaries of the zone should be accurately delimited and, where practicable, marked on the ground. Lastly, the agreements should require an approximately equal degree of self-sacrifice or self-denial on the part of each such state. This condition is especially difficult of achievement because of the different conditions that may exist on either side of the boundary. Among such differences are physical geographic characteristics, location of centers of population, amount of mineral and other natural resources near the boundary, character of the adjacent rail and road nets, and many others. A technical evaluation of these factors appears to be essential, however, to a proper balancing of the servitudes imposed upon the agreeing states.

Viewed in the light of the four principles thus deduced, recent events become more understandable. For example,

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For a more detailed description of this method of conducting examinations, please refer to the article beginning on page 53 of the January-February, 1936, issue of the JOURNAL.

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it can be seen that, in the Rhineland, they were fulfilled in hardly a single particular. In fact, ". . . France unfortunately places so little reliance in the efficacy of the Locarno guarantee that in the ten years that have elapsed since the signature of that instrument she has spent something like £50,000,000 in fortifying her eastern frontier, and, in addition, has persuaded Belgium to spend another £12,000,000 in prolonging that line to the northeast."

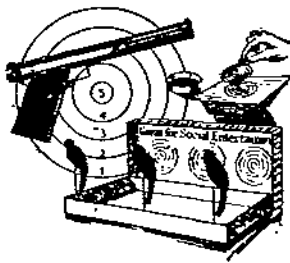
The question of what to do about it is, of course, not answered. ". . . No single process can be regarded as an infallible prophylaxis against the occurrence of hostilities. . . . Geographic disarmament, like other forms of armament limitation, is not an end in itself but a method of achieving it. Let us not be too ambitious about our objective. It will perhaps never be humanly possible to eliminate war absolutely from international relations, just as one can never discount altogether the possibility of accidents in coal mining, chemical factories, or railway travel. But by careful legislation, by the establishment of practical and appropriate rules, and by loyally observing them, we can reduce the risk of war to a minimum, instead of being perpetually haunted by its spectre."

Based upon his own background of experience and psychology, the reader will naturally form his own opinion as to the soundness of these conclusions.

GENERALSHIP, ITS DISEASES AND THEIR CURE, By Major General J. F. C. Fuller. 100 pages. \$1.00.

In this compact volume, General Fuller has mercilessly exposed the diseased state of generalship in modern armies and points out that senior officers should share the dangers and sacrifices of their men just as officers in the Navy do. A sense of equality of sacrifice is an essential cement in any fighting force. The mere presence of a senior officer will often prove to be the deciding factor in inspiring the men with confidence and the moral stamina which so many times has snatched victory from almost certain defeat.

The action of Grant at Fort Donelson illustrates this point. "He was not on the battlefield when his army was attacked, and upon returning to it, he found it half-routed; how did he act? . . . In his ordinary quiet voice he said . . . "Gentlemen, the position must be retaken . . ." ". . . What did he then do? Did he sit down and write an operation order? NO! he galloped down the line shouting to his men: "Fill your cartridge boxes quick, and get into line; the enemy is trying to escape, and he must not be permitted to do so . . ." "This, as he says himself, 'acted like a charm. The men only wanted someone to give them a command.'" "On yet another occasion, when supervising an attack, he dis-



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mounted and sat down on a fallen tree to write a message. While thus engaged a shell exploded directly in front of him. He looked up from the paper an instant, and then, without the slightest change of countenance, went on writing the message. Some of the Fifth Wisconsin wounded were being carried past him at the time, and Major E. R. Jones of that regiment says: . . . that one of his men made the remark: 'Ulysses don't scare worth a d--n.' It is such generals who can lead men, who can win victories and not merely machine them out."

Much has been written on the question of leadership. In its final analysis the most important factors entering into this God-given quality are personality and example. As an illustration of this the author cites the action of Lee at Spotsylvania when the Union troops broke through the apex of the Confederate works. Of this instance General Gordon wrote. "Lee looked a very God of war. Calmly and grandly, he rode to a point near the center of my line and turned his horse's head to the front, evidently resolved to lead in person the desperate charge, and drive Hancock back or perish in the effort. I knew what he meant . . . I resolved to arrest him in his effort, and thus save to the Confederacy the life of its great leader. I was at the center of that line when General Lee rode to it. With uncovered head, he turned his face towards Hancock's advancing column. Instantly I spurred my horse across old Traveller's (Lee's favorite charger) front, and grasping his bridle in my hand, I checked him. Then, in a voice which I hoped might reach the ears of my men and command their attention, I called out, 'General Lee, you shall not lead my men in a charge. No man can do that, sir. Another is here for that purpose. These men behind you are Georgians, Virginians and Carolinians. They have never failed you on any field. They will not fail you here. Will you, boys?'" The response came like a mighty anthem that must have stirred his emotions as no other music could have done . . . "No, no, no; we'll not fail him." . . . I shouted to General Lee, "You must go to the rear." The echo, "General Lee to the rear. General Lee to the rear!" rolled back with tremendous emphasis from the throats of my men.

"When in the World War did the men in the battle front order one of our generals back, let alone the general-in-chief? Never! No general-in-chief was to be found there, sometimes, perhaps, a brigadier, but as far as I have been able to ascertain, never a corps or a divisional commander."

The author of this admirable work then takes up a discussion of age and the physical condition of leaders, pointing out that with advancing age comes a reluctance to share the hardships and deprivations of war. Instinctively a General shuns discomfort. He keeps himself aloof and apart, well to the rear, protected, waited upon and catered to. No longer is he able to sleep under dripping hedges and his digestion suffers irreparably from dining on hard-tack served by the light of the stars. After the age of 50 or thereabouts, he is unable to endure the rigors



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of a strenuous campaign or to work hours upon end under the stress and strain of battle often without sleep. As a result he delegates many of his duties to his staff, while to his men he becomes a myth, if not something worse. Age alone is not the yardstick by which the ability of a General can be measured but it is a factor which should not be ignored. War demands almost super-human effort and the maximum exertion. The knowledge that the General has been seen at the point of greatest danger personally directing the activities of his men or looking after their welfare and comfort is the foundation upon which morale is built.

The conclusion is evident. The better equipped physically, mentally and morally the leader is the greater the chances of success. In nine cases out of ten the man with the physical stamina and driving force to carry him through periods of excessive activity will beat the man in whom these qualities have been dulled by the ravages of time aided by easy living. General Fuller emphasizes the advantage of youth in a commander. He charts too great Generals showing their ages at the time of their greatest achievements. The book is a masterly presentation of sound ideas which might well be given consideration in times of peace and certainly should not be overlooked in times of war.

**A MODERN MILITARY DICTIONARY.** By Colonel Max B. Garber, U. S. Army. Washington, D. C.: Published by the Author, 1936. 332 pages. \$2.50 cloth; \$2.75 leather.

We confess to a secret admiration for the courage and stamina of any person who writes a dictionary. It is no light task; the author of this work spent fourteen years in its compilation.

It has been asserted that our military language is in a state of confusion, that there is a plethora of unnecessary terms and at the same time a paucity of really useful and necessary words. On the other hand, it is claimed that our difficulties lie not in the inadequacy of our military language, but in the looseness with which it is used and the haziness of understanding.

Language is determined by usage, properly by *good* usage, but frequently by *general* usage, even when it is bad. Dictionaries serve to crystallize and standardize good usage. The lexicographer is not called upon to create new terms. His proper function is to set forth good usage as he finds it.

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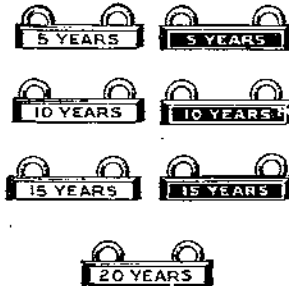
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work is largely devoted to our current military idiom, it includes many ancient terms, not in current use, but of value to the military student. Common terms of civil usage that have a special military meaning or importance, are included, as well as important foreign terms. Not even slang is neglected.

The succinct technical and historical sketches of important branches and weapons which appear throughout the text are accurate and well written.

This dictionary, notable for its large and readable print, contains approximately 10,000 terms. It is doubtful if the vocabulary of the most erudite military scholar comprises half that number. Accordingly this work can extend the horizon of any soldier.—C. L.

**MERCHANT SHIPS, 1936.** Compiled and edited by Lieutenant E. C. Talbot-Booth, R.N.R. Sampson, Low, Marston & Co., Ltd., London. Price \$10.50.

A compilation of the data contained in this book represents a stupendous amount of work. It contains a vast store of condensed, concise information pertaining to the merchant ships of 24 nations of the world, arranged in a convenient form for ready reference. The data, among other things, includes the distinguishing characteristics, the name, flag of registry, tonnage, dimensions, machinery, fuel capacity, builders, kind of cargo carried, the personnel complement of both passengers and crew and other pertinent data. This book is to the merchant marine service what *Jane's Fighting Ships* is to the Navy or *Jane's All the World's Aircraft* is to the Air Corps. The work has been produced as a compendium of information for the marine service. It answers all questions concerning the history of merchant ships including change of name and change of registry. Also there are a number of pages showing the flag and the funnel marking of all the principal maritime lines, done in colors. The book is a veritable storehouse of information that cannot be obtained elsewhere under one cover.

**THE WESTERN MILITARY FRONTIER: 1815-1846.** By Henry Putney Beers. Published by the University of Pennsylvania, 1935. 227 pages. Price \$2.00.

We often read about the westward march of our civilization across the continent, usually thinking of it in terms of the hardships, trials and triumphs of the heroic settlers. But few know (or recall) that the infant American Army was the pathfinder across the prairies, the mountains and the rivers of the great West. In *The Western Military Frontier: 1815-1846*, by Henry Putney Beers, the part the Army played in the western migration is clearly and concisely presented. Although this book was originally written as a Ph.D. dissertation its style differs from the usual laborious and weighty theses; it is both scholarly and readable.

The theme is the military frontier with its line of military posts from the Great Lakes to the Red River. The author deals with a part of American history that is

not often stressed, the period between the War of 1812 and the Mexican War. He opens the subject with an admirable introductory chapter on "The Army in the West, 1783-1815." Dr. Beers has carefully and thoughtfully selected historically interesting material and has presented it in an original, straightforward style. He has delved into little known historical facts usually ignored by most historians; these facts enliven the whole context of the narrative.

Much interesting data is given on the development and growth of the American Army during the period of 1783-1846. As horses greatly impressed the Indians it was necessary to institute Cavalry in the Army, this Corps being an outgrowth of the Dragoons. Owing to lack of funds Chaplains were dismissed in 1821 and the Army was compelled to get along without ordained members of the cloth until 1838; during this period services were conducted by any religiously inclined officer or soldier.

The young Army was the real pioneer: it was the vanguard to clear the way and protect the settler; it was a means of stabilizing the community life; it was a preserver of peace on the frontier and a peace-maker between the warring Indian tribes; it was the school in which a certain type of statesmanship was developed, such as the making and carrying out of treaties. Among the soldier-statesmen of that period are found the names of Generals Andrew Jackson, William Henry Harrison, Zachary Taylor, Winfield Scott and many others who later became prominent. The Western frontier was the training ground for many of the generals who served in the Civil War. The tactics of open warfare and of rapid movement influenced greatly the strategy of that war, especially in the raids of the Cavalry, striking as they did at unexpected times and places.

The development of the West is due in a large part to the Army engineers who surveyed the land, improved the rivers, built roads and defined boundaries. Dr. Beers discusses in detail the whole Indian situation and explains the methods used by the United States Government in dealing with them. It was during this period (1815-1846) that the Army with its many duties obtained valuable experience and training. The author has appended a fine bibliography and index which enhance the value of his work. Upon finishing this volume, the reader has the desire to seek further information about the service of the Army to our country.—B.B.T.

**PROBLEME DES LUFTKRIEGES** (Problems of the War in the Air), by Oberleutnant Georg W. Feuchter, a.D. Potsdam: Ludwig Vögelin Verlag, 1936. 63 pages; 8 illustrations. 1.80 Marks.

This pocket-sized pamphlet discusses, in highly condensed form, views of experts on tactics of the air, the probable development of aviation, and some of the problems that aerial warfare will present in a future war.—A.L.P.J.

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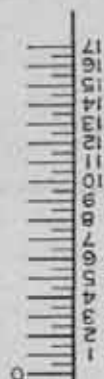
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