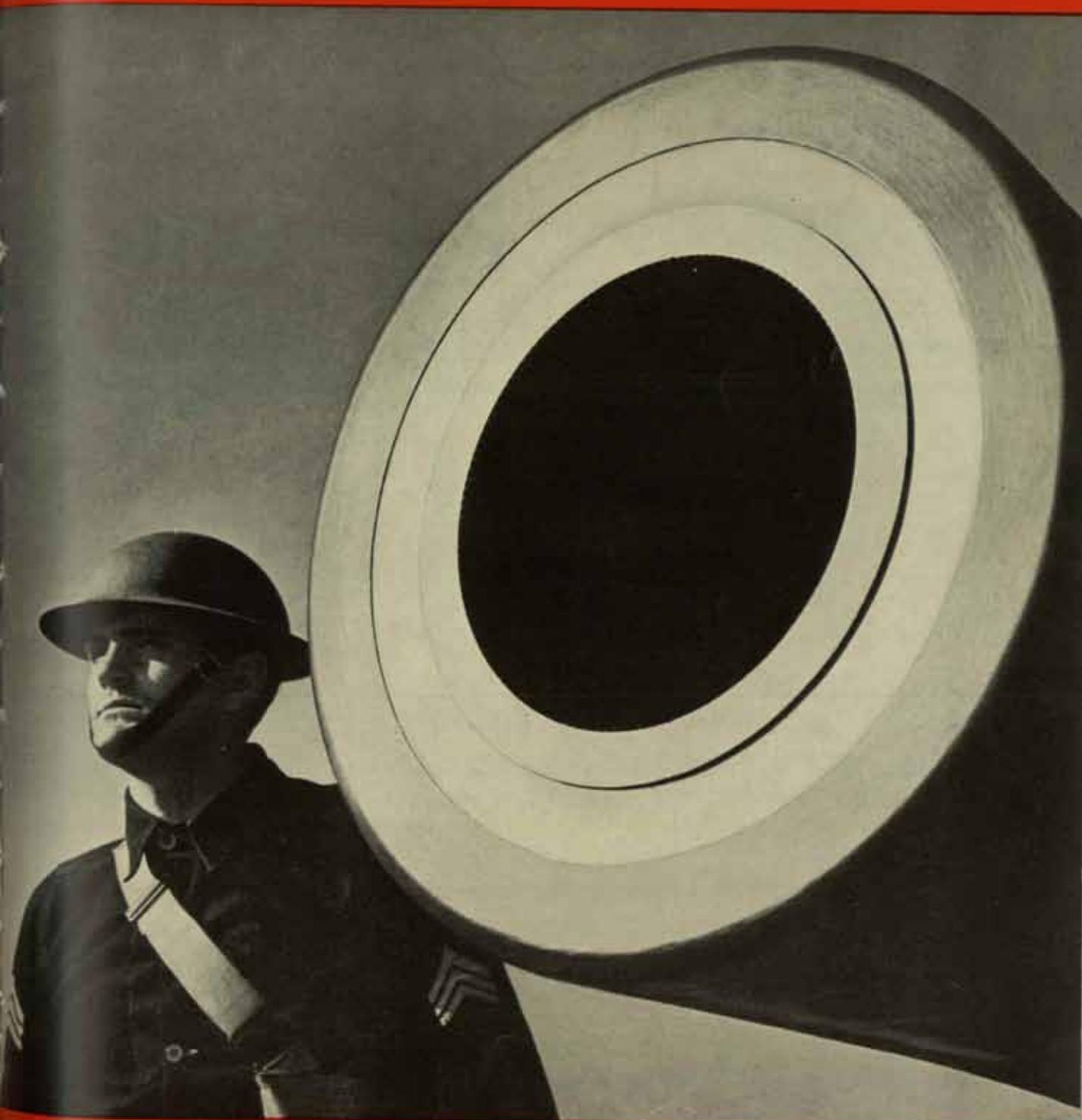


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The Church of the Centurion, Fort Monroe.

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## THE GERMAN AIR FORCE

The Air Force of Germany was not officially constituted until February 26, 1935. And while it was then composed of only a few formations consisting of units trained in secret and in a most elementary manner during the period of demobilization, it became in the span of just four short years a powerful instrument of attack . . . more powerful, in fact, than the combined strength of France, England, and Poland at the outbreak of the second World War.

This expansion of German airpower was not, however, undertaken in any haphazard fashion, utilizing any planes of any make or design. Rather, it was realized in a methodical and highly efficient fashion, after the *Luftwaffe* was at last officially organized by Hitler on March 1, 1935.

While the German Air Force was in the formative state, it is true that civil aircraft were converted to military types, and the first war pilots were drawn from the *Deutsche Lufthansa* airline company and from pilot and ex-pilot organizations whose members had been trained for transport flying by *Lufthansa* or had been given regular refresher courses. At the same time, hundreds of sport and sailplane clubs, with memberships of several hundred thousand, formed a tremendous reservoir from which future aircrews and ground personnel could be drawn. From this, then, it is apparent that the



# WAR PLANES

so-called "mushroom" growth of German airpower was not, as far as pilots were concerned, a military miracle, but actually a well-planned scheme whereby flyers were trained to some extent for war duties through the use of peacetime sailplane clubs which were, on the surface, organized for sport purposes.

By the same token, the aircraft situation is by no means a miracle as far as numbers are concerned. While our country was building a possible fifty-three machines of a certain design, the German experimental models were given thorough testing and, if found suitable, their designs were "locked." The ships were then put into production on a mass scale, with several factories in some cases building the same type.

Too, the aircraft factories from which the thousands of warplanes rolled were well-planned, years in advance in some instances. To quote from Major Al Williams' remarkable book, *Airpower*, page 171: "I was taken to a building in Berlin which appeared to be completely

filled with file cabinets of blueprints. It was explained to me that in the days before the rebirth of the German aircraft industry each set of plans was laid aside as soon as it was completed, and a more modern and more efficient factory planned on the drafting board, down to the last bolt and nut." This explains how such modern factories were built in only five or six months.

Because of the Nazi conception of state government, Field Marshal Herman Goering had an almost free hand in developing and expanding the German Air Force. Huge sums of money were expended, completely without interference, for the mighty air armada that had been envisioned. Therein is probably the main reason for the amazing growth of the *Luftwaffe* into the most powerful air arm the world had ever seen. Indeed, when the English Sir John Simon and Anthony Eden visited Berlin in 1934, Hitler told them that the German Air Force was as strong as, if not stronger than, Britain's Royal Air Force.

By joining General Francisco Franco's Spanish forces in 1936 the *Luftwaffe* was able to utilize an actual war proving ground for testing the military versatility of German aircraft. The Nazis did not participate in that war merely out of love for Franco; they had to know if their planes were as good as they believed, if the tactics their military strategists had worked out were really effective, and if airpower was really a potent factor in modern warfare—as potent a factor as they had believed, that is. Barcelona and other Spanish cities, towns, and

service in Spain, thus gaining valuable experience which pilots of other countries had not. When that war came to an end, the Nazis had a well-seasoned air army, planes, and tactics which had been proved in actual combat.

When the Battle of Poland began on September 1, 1939, the Germans threw an estimated 5,000 planes, or approximately 75 per cent of their total airpower, into combat against some 800 Polish machines. With perfect cooperation between the *Luftwaffe* and other units of the *Wehrmacht*, Germany was able to dominate Poland in four weeks. Dive bombing was specialized to a greater degree than before, and it was discovered that attacks against fleeing civilians were also highly effective. According to the German plan, modern warfare is not necessarily a battle merely between armed forces; any means to achieve complete victory was and is not only permissible but necessary.

The part German aviation played in the Battle of France is well known by all who have followed newspaper accounts of the war. Aircraft were sent in droves to bomb, strafe and destroy all military objectives, even though they left the majority of villages and towns untouched. And it is usually said that airpower was a major factor in the defeat of France. In this connection, Pierre Cot, who was the French Air Minister from 1933 to 1934 and from 1936 to 1937, stated the following:

"At the beginning of May, 1940, the Germans had

# OF THE AXIS\*

villages were bombed by German forces during that war, not so much to show their strength against defenseless civilian positions as to determine once and for all whether dive-bombing and pattern-bombing could be done with devastating effectiveness. They could—and the lessons of Warsaw, Coventry, and Rotterdam proved that the German line of reasoning had been correct. It is estimated that more than 50,000 German airmen saw

about 7,000 first-line planes. They concentrated for the battle over France and the Low Countries practically all their forces and reserves, leaving in Norway and along their extended eastern frontiers only effectives of small importance. A total of approximately 6,000 planes were actually used in the attack on Holland, Belgium, and France. Thanks to Germany's supply of reserve crews and machines, the number did not decrease throughout May and June.

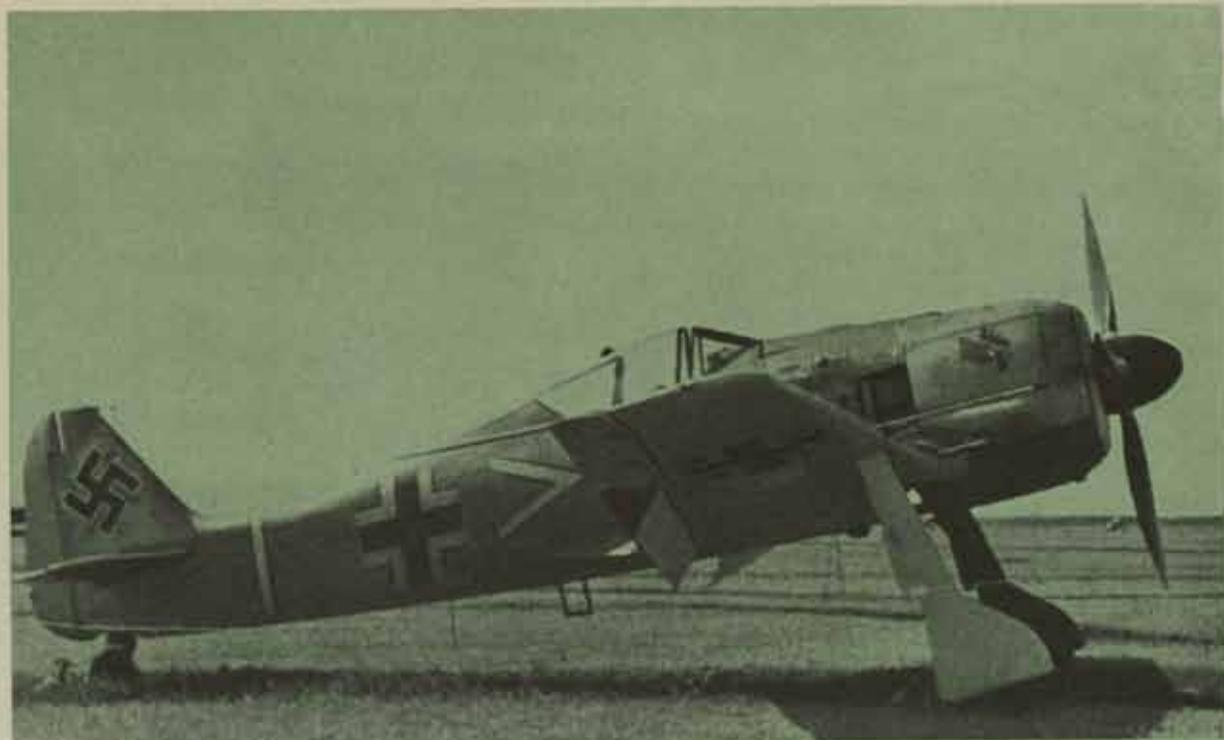
"France did the opposite. The French Air Force remained dispersed and strung out. A thousand planes were left on the Mediterranean (approximately 600 in North Africa at the disposal of the land forces and 350 at the disposal of the Navy) and 400 planes were left in the Alps, facing Italy, not yet a belligerent. Germany attacked us with 80 per cent of her total Air Force. We opposed it with only 40 per cent of an already insuffi-

\*From *War Planes of the Axis*, by David C. Cooke. Reproduced by permission of Robert M. McBride and Company.

By David C. Cooke

Photos by Army Air Forces

PART ONE



Focke Wulf 190, new German fighter.

cient Air Force. The bad strategy produced a real catastrophe. The Vichy Government declares that, on June 12, only 500 modern planes were left in France to oppose 5,000 planes. This may be true, for thanks to the lack of provision of the French General Staff our aviators had to fight one to five and sometimes one to seven against the Germans, when it ought to have been possible for them to fight one against two.

"To the 6,000 airplanes which Germany threw into the Battle of France, the French and British could easily have opposed 3,000 airplanes. The British experience at Dunkirk in June and in their own isles in September proved that a proportion of one to two is sufficient for a good General Staff to organize an effective resistance. We all know that the defensive needs fewer forces than the offensive. But what the British General Staff achieved by careful concentration and skillful utilization of their units, the French General Staff was incapable of doing. Comment is superfluous on their decision to leave in North Africa one-third of their Air Forces at a moment when the Nazis were attacking our metropolitan area with all their might."

As even Prime Minister Winston Churchill admitted, the biggest mistake that Hitler made in prosecuting a final end to the war was the lapse of time between the fall of France and the aerial offensive against England, for the first large-scale attacks against Britain were not made for nearly two months after the defeat of France. In that period, after the evacuation of Dunkirk, the British had reorganized their beaten forces

and were thus able to offer effective resistance. Too, it is admitted by the British that, had the Nazi attacks continued, despite heavy losses, the Germans would have been able to beat the English to their knees because of the overwhelming quantity of airplanes at the disposal of the *Luftwaffe*. Such, however, was not the case, and the British were able, through American help, to reequip their almost depleted Royal Air Force and turn defense into offense. Further the British strength grew to such an extent that they were able to ship 9,000 military planes abroad in 1941.

The German *Luftwaffe*, at this writing, is made up of some 1,500,000 men, and, according to T. P. Wright of the War Production Board, more than 40,000 airplanes. (In a German-language short-wave radio broadcast of recent date, the Nazis stated that they have more than 50,000 war planes in service and that new machines are being built at the rate of 2,500 per week. While this production rate may sound too incredibly high to be plausible, it must be remembered that even at the beginning of the war German factories were said to have been turning out between 2,000 and 2,500 planes per month. With factories now operating in all occupied countries, it seems logical, if this earlier figure was correct, that production could have been stepped up to 2,500 machines per week. Germany has been geared for war production much longer than the United States and our country's plan calls for 60,000 planes in 1942 and 125,000 in 1943, meaning a ship every eight minutes during 1942 and one every four

minutes during 1943. If we are able to do this, it is entirely possible, and even probable that the Germans can complete a plane every four minutes to make the 2,500 per week figure a reality. Also remember that at the end of the last war Germany turned over to the Allies approximately 16,000 aircraft and was building at the rate of 2,100 per month. And that was before the days of pre-fabrication, mass production, or machine-made parts.

From the latest available information, the German Air Force is divided into five Fleets. They were located (March, 1942) as follows: Fleet One—before Leningrad; Fleet Two—behind Smolensk; Fleet Three—facing Britain; Fleet Four—in the Ukraine; Fleet Five—in Finland and Northern Norway. Leningrad, Libya, and the Balkans are named as battle points of the three independent Richthofen Stuka Corps. Each Fleet consists of two Divisions, reinforced by an independent air corps. Each Division is made up of a number of bomber groups, usually three, a fighter group, and a reconnaissance Wing. A Corps consists of at least two fighter groups and one reconnaissance-bomber group. One or two Divisions of Naval Aviation are added to the front-line units.

In most countries aluminum and aluminum alloys are used to a great extent in the fabrication of airplanes, but in Germany that metal is very scarce. Because of this fact, many people could not understand how the Nazis were and are able to build so many airplanes. The answer is magnesium. While metallurgists in other countries had been experimenting with magnesium, but only sparingly because of its highly corrosive

properties, the Germans developed a magnesium alloy that was highly successful for aircraft use. Magnesium salts are plentiful in Germany and, under the German system, their utilization is very simple. This metal is only about two-thirds the weight of aluminum, so it was only logical that the Germans turned to its use for aircraft production, where weight is important. After France was defeated, of course, the country's aluminum deposits were exploited by the conquerors, because magnesium has its drawbacks and is not as adaptable as aluminum for many installations.

Finally, another secret of the astounding German successes in operations against France and other countries is the first law of military strategy: decentralization. There are more than 1,000 military air fields and landing areas within the boundaries of pre-war Germany alone, and this figure has been greatly increased by existing or newly-built fields in occupied countries, especially in Holland, Belgium, Denmark, France, Norway, and Poland. Squadrons change their bases frequently in order to make enemy reconnaissance and attack more difficult. Because of this, it is not surprising that many *Luftwaffe* pilots shot down over Britain were found to be carrying suitcases; they had received orders to land at new bases instead of returning to the old ones.

Under no circumstances should we in this country underestimate the strength of the German Air Force or the ability of Nazi pilots. While it is true that the Germans lost very heavily in operations against Britain, that was only because they were on the offensive. Now that the Royal Air Force has taken to offensive missions over Germany, the list of English casualties has been



He 112, older type of German fighter.



Ju 87 (Stuka).

almost double the losses of the defending Germans, as revealed by British Air Ministry figures. Combat records prove that German men and machines are good—probably as good as any to be found elsewhere—and we must constantly remember that now that we are in this war to the end.

#### GERMAN FIGHTERS

As with the fighters of other countries, Germany's fighters were built with an eye to speed, maneuverability, fire-power and strength. And while the maneuverability factor was not stressed as much as it possibly should have been, as lessons against RAF craft of similar types have proved, the question of speed was and is of utmost importance. Since the entire *Wehrmacht* is based on speed, this view is entirely understandable. The Germans also realized that aerial fighting in this new war would be far different from that of the first World War, that it would be not so much a matter of dueling as of punching with a lethal hook and running. Even so, the fighter types were selected carefully before being put into mass production, and thoroughness instead of speed was the keynote at that time.

Initially, fighter squadrons of the *Luftwaffe* were equipped with Heinkel He. 51 and Arado Ar. 68 bi-planes which were definitely unspectacular in performance. For some time there was much conjecture as to the planes which would be selected from a number

of prototypes on test to replace these obsolescent models. It was at the Zurich International Meeting in July, 1937, that the chosen successors were introduced; they were the Heinkel He. 112, and the Messerschmitt Me. 109. At that time the planes gave some indication of their performance in competitive events, the Me. 109 being particularly successful. One Messerschmitt, flown by Major Seidmann, won the Alpine Circuit Race at an average speed of 240.9 m.p.h. (This, of course, did not represent anything like the top speed, for on April 26, 1939, Fritz Wendel reached 469.225 m.p.h. in a somewhat similar machine. This figure now stands as the world's official absolute speed record, even though many other planes have since turned in speeds of more than 500 m.p.h.) Another, flown by Karl Franke, climbed to 9,842 feet and dived back to 985 feet in 2 minutes 6 seconds.

Both the Me. 109 and the He. 112, like other first-line German fighters, were cleaned up considerably before being put into production on a large scale. They were fitted with heavy armament, armor, leak-proof fuel tanks and more powerful engines.

#### DAS STURZKAMPFFLUGZEUG

Military air tactics have gone through a great revolution since the days of the first World War. Then, air fighting was directed almost entirely against other

flying machines and the most potent of all war craft was the fighter. All of this has now been changed, however, by the strategy employed by the Axis in the current war.

The now famous "workhorse" of the German *Luftwaffe* is the dreaded Stuka (Stuka, as you have probably gathered from the chapter heading, is a contraction of the word *Sturzkampfflugzeug* which simply means fighter dive bomber). The battle operations of these craft are to cooperate with infantry troops in destroying ground objectives, to penetrate where other and heavier bombers cannot reach, and to demoralize civilians and troops by use of their hideously screaming bombs. And it can never be said that these ships were not utterly effective in Poland, Norway, Holland, Belgium, and France. In Rotterdam, for instance, Stuka planes destroyed 26,000 buildings and killed 25,000 civilians in an attack which lasted only two and one-half hours. Those figures constitute the greatest mass destruction ever witnessed in warfare.

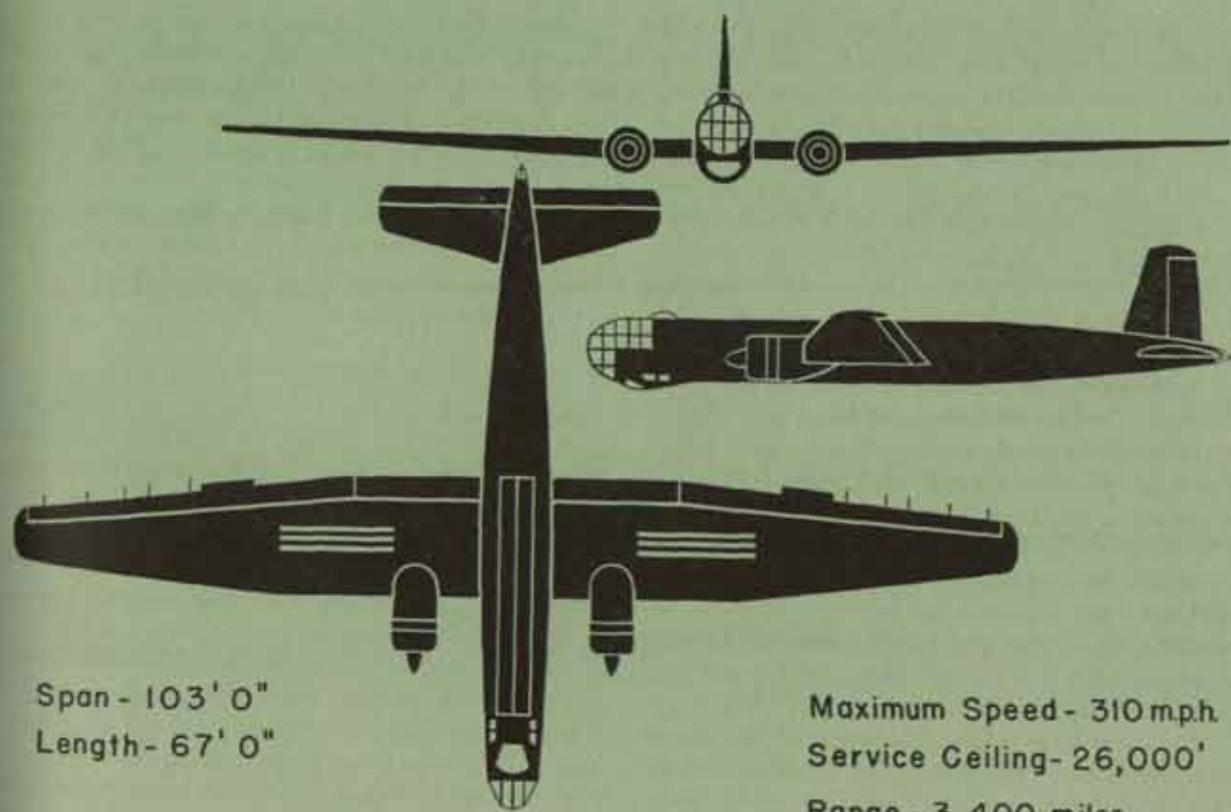
Stukas are not only effective against land objectives, but they have proved to a skeptical world that they can also be used with great success against merchant marine and seapower as a whole. In the rôle of commerce raiders, however, dive bombers are not as effective in one way as submarines, because their aim with heavy bombs must be accurate on the first dive, and because they cannot shell surface vessels as U-boats can; in

another way, they are better suited to this duty than submarines, because they are inexpensive in comparison, because they can attack swiftly and elude attack on themselves, and because they can return to bases for more bombs if necessary.

In dive bombing the bombs are released as the machine is pulled out of a dive and not, as is commonly believed, while it is being aimed directly at the target. The reason for this is the fact that the bomb does not travel in a straight line after release. Penetration is as great as that of a bomb dropped from a machine flying straight and level at a greater height, since the dive gives additional velocity to the projectile. This, of course, does not hold true for heights above which the terminal velocity of the bomb is attained.

As far as is known, German dive-bombing tactics are generally the same as those of the other Powers. When an individual machine is attacking on its own, the usual system, if conditions are suitable, is to dive out of the sun to handicap the aim and visibility of anti-aircraft gunners who are likely to be concentrated around the military objectives which are the targets of the dive bombers. The element of surprise may also be possible in cloudy or poor flying weather. Specialized dive-bomber squadrons practice converging attacks in order to confuse ground defenses.

Attacks are usually started from a considerable height—about 10,000 feet—and the pilot may "corkscrew" his



Span - 103' 0"  
Length - 67' 0"

Maximum Speed - 310 m.p.h.  
Service Ceiling - 26,000'  
Range - 3,400 miles

German long range bomber (He 177).



Do 18, German Seaplane.

machine on its ailerons on the way down to baffle further the gunners on the ground. The final aiming dive is made at an angle of 60 to 90 degrees and the bomb is released at a height of from 1,000 to 3,000 feet, after which the pilot makes his plane as inconspicuous as possible to evade ground fire.

Since the introduction of monoplanes as dive bombers, it has been found necessary to fit some form of air brake to limit the diving speed (and consequently the pull-out stresses on machine and pilot) and to permit a closer approach to the target. The diving speed may also be limited by the use of a reversible-pitch propeller of the type which has been developed in Germany by the V.D.M. concern. Before these devices became available, it is said that German dive-bombing pilots used to tuck their heads between their knees to minimize the effect of gravity during the pull out. A special transparent port, at that time, was fitted in the floor of the cockpit for sighting purposes.

The most widely employed and effective dive bombers in service with the *Luftwaffe* are the Junkers Ju. 87 (pronounced *Yoonkers*) two seaters. A standard single seater is the Henschel Hs. 123 biplane. In addition, the single-seat Blohm and Voss Ha. 137 and the two-seat Heinkel machines are used extensively.

According to a statement issued from the Junkers works late in June, 1939: "It is no longer a secret that Germany had taken up the construction of military aircraft quite some time before she recovered her liberty of armament, and in this connection we should mention the activities of Junkers *Flugzeug-und-Motorenwerke* (Junkers airplane and motor works) which had never neglected the development of such craft (dive

bombers) in their Swedish branch works before 1933." The Swedish machine referred to was the K-47, a two seater with a 600-h.p. B.M.W. engine. Bombing trials conducted with this craft by the Swedish government are said to have given results which have not been surpassed up to the present.

The Ju. 87, which is a direct descendant of the K-47, is exceptionally easy to recognize because of its sharply cranked wing and fixed undercarriage. It was first seen in public at Nuremberg in September, 1938, and was used effectively in the Spanish Civil War. It saw much service in Poland, Norway, Holland, Belgium, France, Greece and all other countries in which German operations were carried on. Currently, this craft is being operated against Russian and English land objectives and shipping.

#### MEDIUM AND HEAVY BOMBERS

According to reports from Royal Air Force flyers, Germany's bombing planes, as a whole, are under-gunned and somewhat blind, and are thus more vulnerable than similar American and British machines. These reports are confirmed by the fact that the Germans so far have shown little faith in multigunned power-operated turrets and usually have their weapons mounted on free-swivel mounts with no more than one light weapon at any particular station. The only obvious reason for this is that under the so-called *blitzkrieg* tactics the bombers have the way cleared for them, so there is little opposition, or are accompanied by such a large number of fighter types that interception is unlikely. This point of view, of course, proved erroneous where Britain was concerned. For while the skies had

generally been cleared by fighters when the Germans were attacking other countries, and the escort had always been sufficient if the opposing force was not knocked out entirely, the British flyers always roared in regardless of "clearing" attacks or defending forces and made the bombers pay a heavy price. Present indications show that the Germans are trying to alter this situation by adding more guns to their bombers and by using light fighter bombers for bombardier duties.

Bombardment is the long arm of the Nazi *Luftwaffe*. Its main purpose is to go ahead of infantry Panzerdivisions of the *Wehrmacht* and strike at centers of enemy resistance or possible resistance. Too, its additional purpose is to demoralize civilians by bombing towns and cities and to send refugees scurrying to civilian centers farther behind the lines. The main idea back of this tactic, of course, is to clog roads with fleeing and demoralized refugees so that it will be impossible or at least difficult for the enemy to move up supplies and troops.

The easiest and most conclusive way to describe German bombardment machines and their purpose is to call them flying field guns, or artillery. For they are used for the most part against centers which are too far removed from front lines to be within range of artillery fire.

#### FLYING BOATS AND SEAPLANES

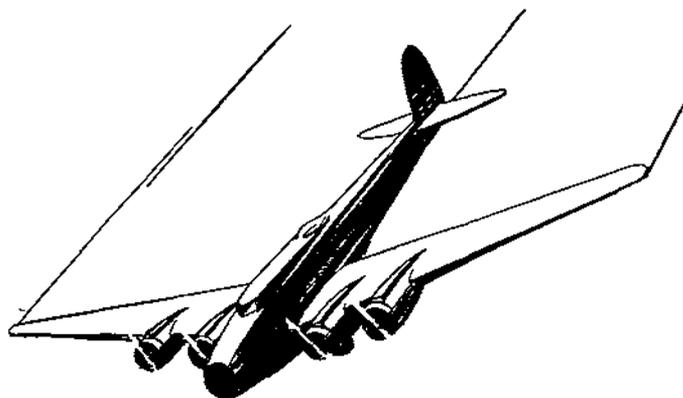
The German naval air arm is not developed to the extent of those of America and Great Britain, yet Germany does require marine aircraft for coastal defense duties, overwater reconnaissance, mine laying, catapult operations, and for attack on Allied shipping. Some of these duties are now being carried out by landplanes,

because flying boats and seaplanes as a rule are slower and less maneuverable than enemy types they would meet.

Even though the Germans probably realize as well as anyone else the value of large flying boats for wartime purposes, they have developed the floatplane to a greater extent. This can be attributed not only to the relatively small coast line of that country in its pre-war state, but also to the mass-production system under which the *Luftwaffe* was built up in such a few years. Floatplanes can be better adapted to mass production not only because of their complete lack of hull, but also because there is no necessity to provide watertight surfaces, which naturally require more labor and time to be designed for seagoing duties—are structurally similar to landplanes and can have their undercarriage interchangeable for wheels instead of floats in case of necessity.

The most successful use of seagoing planes so far in this war was in operations against Holland during the drive to the west. Even before the fast-moving *Wehrmacht* had reached South Holland, air-borne troops, carried by large seaplanes, were landed off The Hague and Rotterdam to attack military establishments in those cities and to make it more difficult to send all available troops to the east to face the main German forces. Also, during the early hours of Friday, May 10, as an introductory phase of their attack, the Germans began to lay magnetic mines in the mouths of large rivers and harbor entrances in the Netherlands.

(Part II will appear in the November-December issue. It will describe Italian and Japanese planes.)



# "Give Us Leaders...."

By Lieutenant G. H. Dresser, Coast Artillery Corps

Corregidor's big guns still roar defiantly. Not in the ears of the treacherous Japanese perhaps, but in the hearts of Coast Artillerymen in Iceland, Panama, Hawaii, New Caledonia, and—yes, in the Philippines, too. To no other officers and men do the blasts of the Rock's giant cannon carry more meaning than to those who manned them, now prisoners of war.

"Give us fighters the likes of those who fought here; give us leaders the likes of those who led here; and America will have victories greater than the world has ever seen." That's the message the guns of Corregidor roar to the American people today.

And in reply, the Coast Artillery proudly points to its hourly increasing numbers, its hourly more effective firing batteries, and says grimly, "There are your fighters, Corregidor."

But the leaders—where are they?

The Antiaircraft Officer Candidate School at Camp Davis, North Carolina, was described in a previous issue of the JOURNAL. It is one of a number of officer candidate schools in the United States; it is one of the most effective answers to that question, "Where are the leaders?" In the officer candidate schools, the Army of the United States is successfully handling the Herculean task of turning out young, enthusiastic, and competent officers for every branch of the service.

And in the Coast Artillery's oldest and most historic fort, Fort Monroe, Virginia, the soldiers of the youngest officer candidate school of them all snapped to attention on a balmy spring morning in April, 1942. No more appropriate place could have been chosen, because it has been at Monroe's Coast Artillery School that thousands of good seacoast artillerymen have mastered the ABC's of trajectories and ballistics. Now historic old Fort Monroe is giving to the nation not only the artillerymen, but also the present and future seacoast leaders.

Suppose we choose three fictitious soldiers at random and follow them through the Coast Artillery Officer Candidate School (CAOCS)—from enlisted men to seacoast second lieutenants. The pace will be stiff. But come along and see us make leaders for America's armies.

## Typical officer candidate number 1:

Name —STANLEY PAZOREK  
Rank —Tech Sergeant  
Prior Service —12 years, Regular Army  
Education —High school graduate  
Age —31

## Typical officer candidate number 2:

Name —ARNOLD MORGAN  
Rank —Private

Prior Service —4 months, Selective Service  
Education —College graduate, Engineering  
Age —26

## Typical officer candidate number 3:

Name —HARRY DRUMMOND  
Rank —Corporal  
Prior Service —1 year, National Guard  
Education —College graduate, Journalism  
Age —22

Besides wearing khaki or olive drab, what do Pazorek, Morgan, and Drummond have in common that we should name them as typical officer candidates? It is certainly not education nor background nor personal ambition. No, but more important, they do have the ability to lead other men in battle with firmness, fairness, courage, and wisdom.

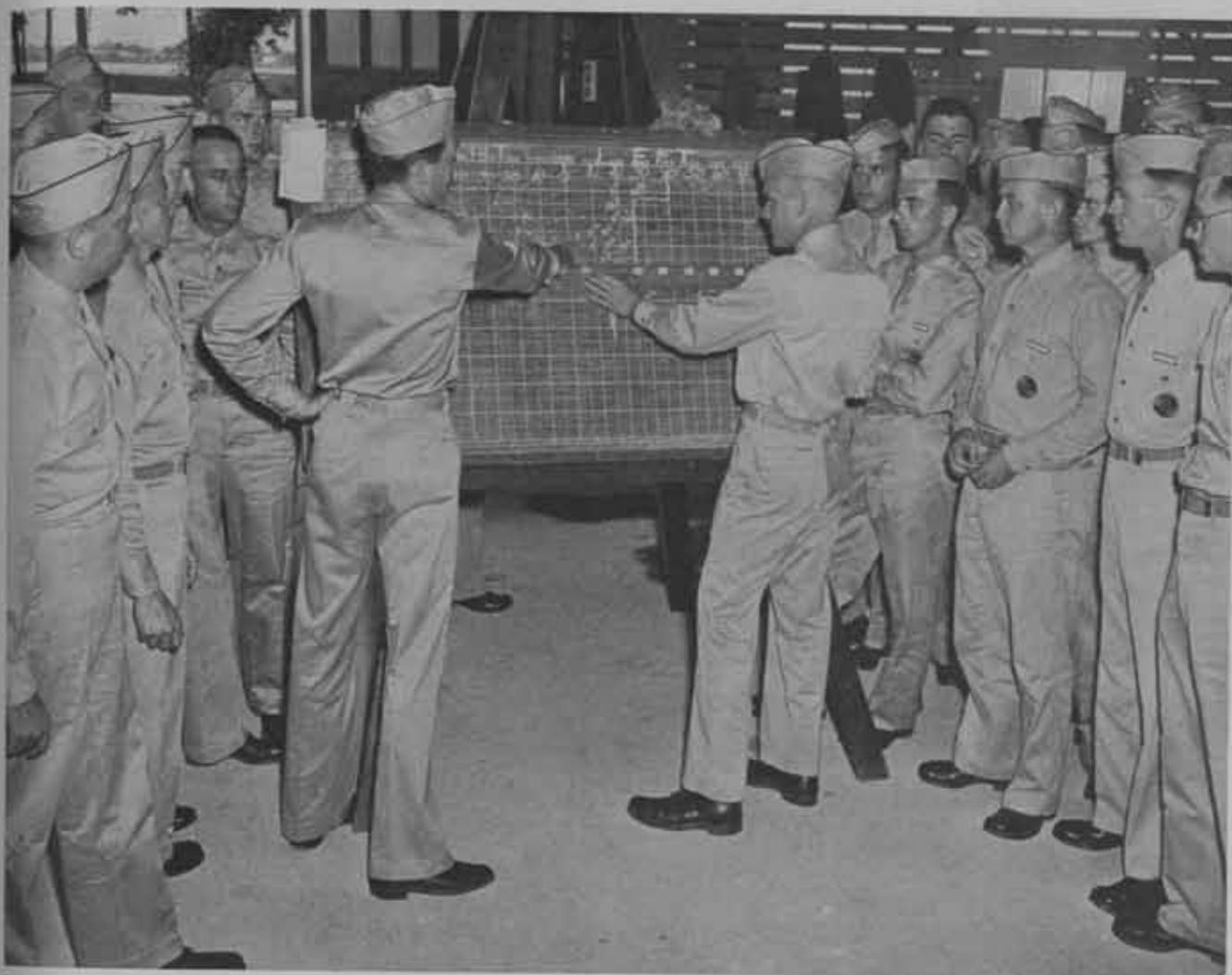
How do we know they have such ability? Frankly, we are really not sure yet. But before they were chosen as possible officer candidates, their own battery and battalion officers studied them very closely, and it was upon those officers' judgment that Pazorek, Morgan, and Drummond were sent before high ranking boards for final decisions. After the most careful consideration, these three, along with more than a hundred others, were selected. Will they become creditable officers?

From the North, South, East, and West, the candidates pour into Fort Monroe—privates, corporals, sergeants; Regular Army, National Guard, Selectees; engineers, writers, bank clerks; Pazorek, Morgan, Drummond—all of them with one common trait—the something that makes each candidate a reply to "Give us leaders the likes of those who led here."

And suddenly like the bursts of a salvo, they are no longer men of different Army backgrounds, for shortly after the registration process is completed, they must remove their chevrons and regimental insignia. Sergeant Pazorek, Private Morgan, and Corporal Drummond are now "Misters" to the officers in charge. Upon reporting, they will state very smartly, "Sir, Candidates Pazorek, Morgan, and Drummond reporting as directed."

Barracks are assigned, bunks are chosen by the men. One officer is in charge of each platoon, consisting of approximately fifty men. A CAOCS battery is made up of two platoons. On the very first day, the officers in charge lay down the Officer Candidate's Ten Commands:

1. You will be a self-disciplined soldier.
2. You will maintain a meticulous appearance.



Learning fire adjustment.

Photo by Sergeant Trimble.

3. You will perform your duties with exactness and with spirit.
4. You will march at a strict attention in every formation.
5. You will wear the uniform prescribed.
6. You will cooperate with fellow candidates to the fullest extent.
7. You will care for your equipment to the best of your ability.
8. You will walk with excellent posture at all times.
9. You will strive to be superior, not just satisfactory.
10. You will hold as your goal, PERFECTION!

Phew! A rough road lies before candidates Pazorek, Morgan, and Drummond. Strenuous physical activities as well as brain-twisting classes are ahead. For military life, a sound mind must have a sound body beneath it. During the first two weeks, an hour each day is devoted to infantry drill. During the remaining weeks, candidates will tackle the Butts' Manual, bayonet training, calisthenics, extended-order drill, and the obstacle course as well as additional close-order drill.

Classes are regularly scheduled from 8 A.M. to 5 P.M., study sessions each evening from 6:30 P.M. to 8:30 P.M.

Saturday afternoons belong to the men—just enough time for PX purchases, extra cramming, and possibly a week-end siesta. Saturday mornings are highlighted by a "Rooster Reveille" at 5:30 A.M. in order that the candidates may be subjected to one of the most exacting inspections Army personnel have ever endured. This eye-opener is held at 7:30 A.M. so that the men are able to reach their classes by 9 A.M. Under a recently-revised schedule, final academic examinations are given on Friday afternoons, and the Saturday morning 9-12 period is devoted to small-arms instruction and further infantry drill.

In addition, candidate officers are appointed weekly. In the first week, for example, all three of our friends have been selected for various duties. Mr. Pazorek has been named Battery Commander; Mr. Morgan, Section Leader (he is responsible for cleanliness and orderliness of one floor of a two-story barracks); and Mr. Drummond, Platoon Leader. During the twelve-week course, all candidates will serve in two or more positions of authority.

Battery Commander Pazorek will shout commands many times during his week at this particular job, be-

cause candidates march to all classes and activities in formation.

And now, classes have begun.

"Mr. Drummond, what does an officer do when he arrives at his new post?"

"Can you identify the warship whose silhouette is shown here, Mr. Morgan?"

"Which is the deadliest of the poison gases, Mr. Pazorek?"

The first week introduces a general group of military subjects including Administration, Mess Management, Court Martial Procedure, Antimechanized Defense, and Military Discipline. Candidates are subjected to some 600 hours of instruction and supervised study. Several of the courses, with the number of hours devoted to them, are listed below:

Seacoast Artillery (Matériel, Pointing, etc.)	233 hours
Tactics	43 hours
Orientation	38 hours
Review of Mathematics	28 hours
Administration	24 hours
Seacoast Searchlights	12 hours

A test follows the completion of lecture material on each subject. The test marks are weighed according to the number of hours devoted to the course, and then are combined to make up the scholastic mark—50% of the total final average.

Messrs. Pazorek, Morgan, Drummond, and the majority of their classmates, have little difficulty with the first and second weeks' general courses. They have listened to the lectures intently and have studied conscientiously. The "buddy system" of answering worksheets has helped them considerably. Worksheets are really cooperative tests, because the student is allowed to search for the answers in his notes or in his textbooks. Still more important, he is permitted and encouraged to discuss the questions with other candidates. Via the buddy system, those men who need help can be aided by those men who can help. The latest and best training films are another source of knowledge for the candidates.

Mathematics is the one course which could aptly be termed "student-destroyer." Why? Well, along with 20% of his class, Mr. Pazorek failed at least one of the



Are they officer material?

Photo by Sergeant Bell.



Just part of a day's work for an officer candidate.

*Photo by Sergeant Bellis.*

three math examinations given. Mr. Morgan, with an engineering background, received excellent math grades. (He didn't know his marks, for they are never published.) Mr. Drummond passed also. Although his math background had not been extensive, he had really boned hard on right triangles and logarithms before applying for the school.

As Mr. Pazorek sadly learned, if a man fails a course, he is invited to a private discussion with the Commanding Officer of the CAOCS, Lieutenant Colonel William L. McNamee. On one subject is the colonel especially firm: "A basic knowledge of trigonometry and logarithms is the primary equipment of an efficient coast artilleryman. By far, the majority of candidates who fail to win commissions here are men who are not prepared to tackle mathematics. There is no reason for so many candidates to fail mathematics. If a soldier is not fortunate enough to have had courses in math, let him obtain texts and begin to study before he applies for the school, or at least, before he reaches the school. Our review in mathematics is just what the name implies—review!"

Naturally, Mr. Pazorek feels a bit downhearted, but his failure is a tangible warning that he must bear down in order to pass other subjects which require a basic understanding of trigonometry and logarithms—for example, Orientation.

But the powers-that-be specify that academic work shall count only 50%. Where does the other 50% enter the picture? Leadership!

At the end of each week, the officers in command of the various platoons gather up their detailed notes on every man in their units, and then submit an efficiency report on each candidate to the Commanding Officer. The following example is the report filed on Mr. Morgan after his first week:

#### INDIVIDUAL EFFICIENCY REPORT

NAME—Morgan, Arnold

WEEK—1st.

Physical Activity and Endurance	Very Satisfactory
Military Bearing	Satisfactory
Neatness	Very Satisfactory
Attention to Duty	Excellent
Cooperation	Excellent
Force	Satisfactory
Judgment and Common Sense	Very Satisfactory
Leadership	Very Satisfactory

REMARKS—Mr. Morgan proved a very efficient Section Leader. Posture is his weakest point. He seems to lack force in manner of speaking, but he did his job well.

Mr. Morgan's bearing will have to improve. The Faculty Board is sure that eleven more weeks of marching will provide the corrective measures. Besides that, his four months of Army service is viewed comparatively with Mr. Pazorek's twelve years of service. It is naturally expected that the latter will have far superior bearing. (Which he does.)

The efficiency report is based on two main factors:

1. Personal observation of the candidate while in every phase of his daily activities. (Marching, at mess, during classes, etc.)
2. The "gig sheet"—a daily reminder of personal barracks sins. For example, on April 29, all three of our chums were giggered as follows.

Mr. Pazorek—Shoes under bed not polished.

Mr. Drummond—Top of wall locker dusty.

Mr. Morgan—Barracks floor in upper squad-room not swept clean. (As Section Leader, Morgan was responsible for police of his part of the barracks.)

The "gig sheet" is a source of eternal irritation for those lawbreakers whose names appear on it. Gigs are evaluated according to their seriousness with one, two or three demerits. The candidate who receives twice the number of the platoon's average demerits is restricted on Saturday afternoon. Commendations carry weight in the opposite direction, offsetting gigs. What fierce joy when one can say, "I haven't been giggered all week."

But why is such serious attention given to these seemingly unimportant details? Because, by trying to win commendations and eliminate gigs, a candidate learns the meaning of personal responsibility. He learns to be alert and exact, to be on his guard constantly. And he

must possess those qualities to be one of "the likes who led here."

Hours melt into days, and days melt into weeks. Men are being molded into hardened, well-disciplined, superior soldiers. Attitudes are changing. Responsibilities were first accepted and are now anticipated. Subject material is growing increasingly more complicated.

"What are the functions of the recuperator system, Mr. Drummond? Describe one method of orienting the Cloke plotting board, Mr. Pazorek. Explain the rule, 'Right, raise; Left, lower,' Mr. Morgan."

Physical activities continue unabated.

"By the left flank . . . MARCH," commands Mr. Drummond. "In cadence . . . EXERCISE," commands Mr. Morgan.

On a Saturday afternoon, Morgan helps Pazorek to master his logarithms and trigonometry. Drummond has a tough time with Orientation, but he manages to pull through. Morgan's bearing has definitely improved.

The class loses four or five men along about the fifth week. Most of the losses are due to scholastic deficiencies. No candidate is ever dismissed by the Faculty Board of the CAOCS without the most thorough review of his individual case.

Candidates are walking straighter, thinking more clearly, throwing their chests out a little further.

"Certainly, Mr. Drummond, your officer's uniform will be altered in time for graduation. And how many sets of gold bars?"

Nerves are beginning to tingle.

"Did I pass that writ on gun pointing?" "Two gigs to-day; how did that happen?"

New groups of students who have already begun the course stare with healthy respect and admiration at the veteran OCS marching units.

On July 10, 1942, the first Seacoast class was graduated. Let us assume it included our three fictitious friends. Battalion and regimental commanders in all parts of the world look forward to having OCS graduates, trusting in the ability of the school to turn out officers who are ready, willing, and able. That is the trademark of OCS men—ability.

Their training is not out-dated. They have been taught the newest methods. They have seen and operated some of the most modern weapons and instruments. They have absorbed a tremendous amount of artillery knowledge. At the end of classroom artillery

instruction, seacoast firing is conducted by the prospective officers. They operate the instruments in the plotting room, orient the guns, adjust fire, and, under close supervision, conduct a target practice.

In twelve weeks, the candidates progress with amazing speed—they seem to grow in stature. Their minds are keen with fresh knowledge and new ideas. The days at Wilson Park, the firing point, are crowded with excitement, for within a very few weeks after the firing, it is gold braid, gold bars, and Lieutenant in front of each name.

Every candidate takes an active part in the firing, and one can see the confidence with which each future officer shoulders his responsibilities. It is true that they are in the comparative quiet of Wilson Park today, but tomorrow they may well be on another Corregidor. In the eyes of officers who were in charge of the candidates through the long weeks, there is a sparkle of pride, for they observed and aided the transformation.

There is sureness in each candidate's voice as he gives his first command on the firing line at Wilson Park. "Fire one ranging salvo. . . . Commence Firing!"

Brigadier General Lawrence B. Weeks, Commandant of the Coast Artillery School, personally congratulates each graduate officer of the Army's newest service school; he hands to each one of them a certificate of graduation and the document granting them commissions as temporary Second Lieutenants in the Army of the United States.

As the men of each class examine the contents of their orders and read their new assignments, it is not difficult to understand why young America is confident of victory. For, in the eyes of these new officers is a certain grim reminder to the enemy that America not only performs wonders quickly, but effectively.

In twelve weeks, men of varied ambitions, educations, backgrounds, and abilities are transformed into self-thinking capable Army officers, ready to take up where the men of Corregidor left off—ready to prove that the soldiers who died on Bataan did not die in vain.

If ever a prayer is being answered, it is the one which the big guns on the "Rock" cried out—"Give us leaders the likes of those who led here."

Pazorek, Morgan, Drummond, Smith, Jones . . . perhaps even another MacArthur . . . whatever the name, sir, the graduates of the Coast Artillery Officer Candidate School are not stopping as seacoast second looeyes—Corregidor, they are just beginning!



# Training the Automatic Weapons Fire Unit

By Major Herbert F. Mitchell, Coast Artillery Corps

## I

Probably the hardest-hitting artillery unit in the Army, for its size, the AW fire unit can successfully engage targets from the dive bomber to the tank, from the torpedo "mosquito" boat to the slow-moving truck, or even assist field artillery against fixed targets. It is highly mobile, and can operate independently for days at a time.

To provide the crew that can utilize these tremendous capabilities is a selection and training project requiring the most careful planning and execution. Not only must these men be expert in the technical use of their weapons and fire-control equipment, but they must know most of the tricks of the trade of the infantry soldier, have a fair knowledge of field engineering, be adept in anti-mechanized and antitorpedo-boat defense, and be able to recognize on sight some fifty or more types of planes, tanks, or torpedo boats. Since they work with the Air Corps, the Armored Forces, the Cavalry, and the Infantry, as well as in AA defense commands, they must know something of the tactics and technique of these arms.

Let us consider a training plan designed to take the fifteen soldiers who have completed their twelve weeks of basic training and weld them into the AW fire unit which is ready to take on any battle mission that may be assigned to it.

The hours given are to be taken as a guide only, as the sole criterion of the training of the unit must be its ability to deliver the goods.

The plan is divided into three phases: preparatory training phase, target practice training phase, and tactical training phase. The latter two phases may be reversed or intermingled, if desired, without serious detriment to the training.

The preparatory training phase includes all artillery training prior to target practice and the specialized training in the non-artillery subjects. The target practice training phase includes antiaircraft and horizontal fire target practice. The tactical training phase combines the non-artillery subjects and unites them with the artillery subjects to present to the soldier the relation of the many details to the actual field operations his unit may be called upon to execute. During this latter phase, also, should be developed the Standard Operating Pro-

cedure for the fire unit to meet all anticipated service conditions.

It should be emphasized that the purpose of military training is not merely to expose the soldier to the various military subjects he should master, but to develop in him the skill required to make his unit's fire effective and teach him how to meet the enemy under all battle conditions and come out on top. He should be convinced that shooting it out with the enemy is better and safer than seeking helpless shelter. He must be thoroughly imbued with the idea that his skill may not only preserve his own life and those of his companions, but also may save the lives of many times that number of his comrades and allies, may perhaps decide the issue at his particular corner of the war.

## II

Selection of personnel is often the key to the successful training program. It need not be repeated that a man can not be trained beyond his capabilities. Interest and physical attributes also play an important part in a man's training. The capabilities and missions of the AW fire unit require men of quick reactions, rapid and accurate thinking, and well developed initiative and sense of responsibility. There is no place for the slow-thinking, plodding type of man, nor for the indolent, careless individual. One such man may render the whole fire unit impotent, as would such a man on a varsity football team. The general physical requirements are: good eyesight, normal color perception, fairly robust physique, and quick and certain muscular control. The principal characteristics and capabilities required in the several positions of the fire unit are enumerated below:

*Chief of Section*—The Chief of Section must possess all the qualities normally required of a noncommissioned officer. In addition, he must be highly trained in recognition of aircraft, tanks, torpedo boats, and other possible targets. He must possess clear judgment, as he is sole judge of whether and on what target to fire. He must have a high degree of initiative as he must often change position without command, and may be required to operate independently during fast-moving operations. He must know thoroughly his equipment and the duties of his men, as he is responsible for the care of the former and the state of training of the men



"... tracking drill should be emphasized."

in the latter. He must have a good power of command, as he is usually the senior man present at the gun position. His duties in action correspond to those of a gun battery commander.

**Range Setter**—The range setter is the key man of the fire unit during the engaging of a target. He is in complete control of the firing and of the adjustment of fire. Hence, he must be cool and stable by nature, so that he will keep his head when under fire. He must be highly trained in estimating target ranges, and therefore must be thoroughly familiar with the size and appearance of enemy aircraft, tanks, or other targets. Since a plane has no background to aid in estimating its distance, the range setter must depend almost entirely on its apparent size as it appears to him. The range setter must understand his fire-control equipment thoroughly and be able to keep it in operative condition, if within his power to do so. He must thoroughly understand the fire-control problem as well as the variation of slant range for all types of target courses. In addition he is in command of the range section and is responsible for its state of training. He should be capable of assuming the duties of the chief of section.

**Director Trackers**—The director trackers must possess a highly refined "touch" in operating their tracking handwheels. They must be able to keep their respective

crosshairs steadily on the target. It is not sufficient that the crosshair be kept anywhere on the target. It must be maintained steadily on a particular point on the target. The trackers must be able to "track off," where necessary, to produce line shots. Since the telescope height is adjustable only by digging the director in, the trackers should be of equal height and preferably not less than five feet six inches tall. Each tracker should be capable of assuming the duties of the other or of the range setter, and should be trained as gun pointers.

**Power Plant Operator**—The power plant operator must be a qualified truck driver. In addition he must understand the operation, care, and maintenance of his power plant. He must be reliable and resourceful, as he is usually located two hundred feet or more from the gun position and the other crew members. He should be capable of acting as a lookout, and should be trained as an alternate tracker, and as a machine gunner.

**Telephone Operator**—In addition to his duties as a telephone operator, he should be trained as an alternate tracker. He should also be qualified as a lookout and as a machine gunner. He should be steady and reliable, as the principal source of an alert is from his telephone.

**Gunner**—The gunner should be a mechanically minded man, as he is responsible for the operation, care and maintenance of the gun and the local defense machine gun. He is likewise charged with the supervision of the ammunition, including its loading and inspection. Upon him rests the responsibility for the safety of the crew members and equipment in the dead area. He is in full charge of the gun during sight-control operation. Consequently, he must thoroughly understand the application of leads to the sights and the adjustment of fire during action. He should be capable of assuming the duties of the chief of section.

**Loader and Firer**—This man has a purely mechanical job in action, but one that requires precision and attention to the job. He must be trained to keep his eyes on the ammunition and not on the target. He should be the principal assistant of the gunner in caring for the gun and its equipment, and be capable of assuming the gunner's duties.

**Gun Pointers**—The gun pointers have a dual job requiring different abilities. As gun pointers they must be able to track the gun smoothly and accurately. They must understand the application of leads to their sights, and be able to adjust fire by the observation of tracer. As lookouts they must be highly trained in aircraft and tank recognition. They must be reliable and steady—men who can be depended upon to stay on the job for long periods of inactivity. They should be trained as loader and firer, as gunner and/or director trackers.

**Ammunition Relayers**—These men are directly charged with the loading and inspection of the ammunition. They must be reliable and thorough in that duty. They must be adept in moving about the gun carriage to supply ammunition from any direction and without pause. It is their responsibility that the am-

munition in the feed mechanism is always sufficient. In addition, one of the relayers is the prime mover chauffeur, and must be qualified in that duty. The ammunition relays should be trained as gun pointers, loader and firer, and/or machine gunners.

*Machine-gunners*—The machine-gunners are charged with the local protection of the fire unit. They must not watch the target engaged by the automatic cannon, but be alert for any target, aerial or ground, which presents a threat to the fire unit. In addition to being qualified as machine-gunners, they should be trained as director trackers and/or gun pointers.

It may be seen from the above that it is not sufficient that each man be qualified for one position in the fire unit. The isolated nature of the gun position makes it imperative that each key man have one or more understudies, ready at any time to replace a casualty, or to be alert while the principal rests. The well-trained fire unit can operate the gun with sight control with any four men, and has at least two trained substitutes for each other key position.

### III

#### PREPARATORY TRAINING PHASE

##### *Artillery Subjects*

##### *Hours of Instruction*

1. Matériel .....	36
2. Drill .....	48
3. Tracking and specialist training .....	48
4. Care and Maintenance .....	12
5. Theory .....	48

##### *Non-Artillery Subjects*

6. Identification of aircraft .....	36
7. Identification of tanks and other targets .....	12
8. Map and aerial photograph reading .....	12
9. Reconnaissance and selection of position .....	24
10. Field fortifications .....	24
11. Anti-gas measures .....	16
12. Camouflage and concealment .....	16
13. Local security measures .....	12
14. Field sanitation and first aid .....	16
15. Convoy operation .....	12
16. Small arms target practice .....	48
17. Marches .....	24
18. Communications .....	12
19. Alert and warning systems .....	12
20. Standard Operating Procedure .....	12
21. Field exercises .....	48
22. Tests and inspections .....	24
23. Infantry drill .....	24
24. Infantry tactics, small unit .....	48
25. Horizontal fire .....	24
26. Defense against air-borne attack .....	24
27. Garrison duties .....	48
28. Sickness and furlough .....	48

TOTAL—768 hours of instruction—16 48-hour weeks.

1. Matériel instruction should cover thoroughly the piece of equipment with which the individual soldier is concerned. He should know the proper name of every part, the functioning of that part, and the functioning of the mechanism by assemblies and as a whole. In addition, each soldier should know the major parts of the rest of the fire unit's equipment and the functioning of such major parts. Opportunities for drill and tests of the individual's knowledge, such as during cleaning, should be utilized to the full. Models showing the functioning of the more complicated parts should be made and used. Large charts showing the details of the major assemblies are quite helpful. Training films and film strips are invaluable aids in this training. A thorough understanding of the matériel goes a long way to insure its performance in battle.

2. The drill should be carefully taught, dividing the instruction into four stages. The first stage should emphasize what each man does at the several commands. The second stage should emphasize the manner of doing each part of the drill. Here, time can be very profitably spent showing each man the manner of execution which will ultimately work out as the fastest and surest way of accomplishing the task. Eliminate lost motion and extra steps. The third stage should emphasize accuracy. Practice until the movement or operation can be performed exactly as it should be, time after time without error. The final stage should develop speed. Only after the first three stages have been thoroughly mastered should any attempt to gain speed be permitted. Of course, as the operation becomes more familiar, the man will unconsciously gain speed. But care must be exercised that steadiness and accuracy are not sacrificed in an attempt to gain speed. If the proper groundwork has been laid in the first three stages, the development of speed will be rapid and satisfying. Competition should be encouraged and the breaking of a record time made the occasion for commendation. Speed should become habitual. Whenever the equipment is set up or taken down or used in any way, the crew should do the job at the double as quickly as possible. It is essential in the quest for speed that care be exercised in the leveling and orienting operations. No standard except the highest attainable should be accepted for the accuracy of these operations. Any attempt to sacrifice accuracy to gain speed should be dealt with severely. Accurate fire delivered a second or two later is far better than poorly-aimed fire delivered almost immediately. A hit in a few shots is much more effective than a hit with a lot of shots. When the crew has become proficient in their principal assignments, substitute position training should be initiated. The hours listed for this training subject are intended only for instruction in drill. The drill, of course, will be used in conjunction with all operations and training involving the use of the equipment.

3. Tracking and specialist training is the most important part of the preliminary artillery training. No

effort should be spared to provide every type of training aid possible. Tracking practice should be afforded to the director trackers, the gun pointers, and the machine gunners. Men designated as substitutes for these positions must be given the practice to qualify them as such. The chief of section, range setter, and gunner should keep themselves in practice so that they may take over one tracker's job in order to check on the other tracker. The tracking should begin with easy targets and work up to the more difficult courses, including at the end of the period such targets as high speed hedgehoppers, dive bombers, and the T-1 target. The standard of director tracking must be the ability to keep the crosshair steadily on the designated point on the target. It is not sufficient to keep the crosshair merely on the target in general. Any motion between target and crosshair introduces errors into the firing data and prevents effective fire. Likewise gun and machine gun tracking must be steady before effective tracer adjustment can be made. Since trackers rapidly become stale, tracking practice should be arranged for not less than weekly throughout the entire training course and into service assignments if at all possible. Full use should be made of accidental targets whenever the equipment is set up, even at the expense of the training at hand. Only thus can the degree of expertness required for effective operation of the equipment be obtained and maintained. Visits to neighboring air fields, identification and pick up and tracking drill should be emphasized.

Specialist training other than tracking should likewise be given careful attention. Many hours should be spent by the range setter and his understudies in estimating ranges. An indoor range with scale model planes is invaluable for this, as an immediate check on the estimate is always available. This should be combined with practice on actual targets and should be checked as often as possible with the best means available. Where targets fly at a known altitude, a range scale can be pasted right beside the angular height scale of the elevation telescope of the director. A range adjustment trainer, such as that described in paragraph 229, FM 4-113, January 20, 1942, should be constructed or procured. Training the gun pointers and machine gunners in the application of leads should be given its share of attention. Much valuable training can be obtained by the use of simple training devices such as check sights and prepared charts and curves. The use of a tracer wand, such as described in paragraph 228, in the above manual, lends itself to many training applications. Duplication of firing conditions, to include sound effects, is very desirable. Service speeds and courses should be emphasized over target practice speeds and courses.

4. Care and maintenance instruction and practice should begin the first day the equipment is used, and should become an integral part of each day's training. Frequent inspections at unannounced intervals should be made to insure that proper care is being taken. The

gun or fire-control device that fails to function in battle may cost the lives of some or all of the crew as well as cause the failure of the fire unit's mission. Ninety-nine per-cent of equipment failures can be traced to improper or careless maintenance. Such improper or careless maintenance cannot be tolerated in the successful fire unit.

5. The amount of theory to be presented will vary with the intelligence and background of the men. As complete a background of theory should be presented as is consistent with those factors. All men should have a general idea of the AW problem and how the director solves it. The director crew should understand the basic principles of fire control as used by the director. The gun pointers and machine gunners should likewise understand the basic principles of the fire control problem as applied to their types of fire control. Physical conditions should be emphasized with the average man rather than mathematical equations.

6. Identification of aircraft is a subject that must be fully stressed. Its importance can be appreciated when it is realized that someone in the fire unit, under battle conditions, must recognize an approaching plane within six seconds after it is first sighted, or one of two events, both quite undesirable, may take place. If the plane is friendly, it may, if unrecognized, be shot down. If the plane is hostile, it may not be engaged at all. Recognition is a better term than identification, as it implies a nearly instantaneous mental reaction to the sighting of the target. There is not time to catalog the principal features of the plane and attempt to identify it from a study of such features. It must be definitely recognized as hostile or friendly and preferably as to its type and model. Distinctive features are often not apparent at the presented angle of aspect, or may be made intentionally misleading by the enemy. Drill with accurate silhouettes of the front, side, and bottom views of planes has proved most effective. This drill should be supplemented by a study of all available statistics concerning the plane. Model making, and particularly model painting, are great aids in becoming "acquainted" with the particular plane. Principal friendly and hostile types should be recognized instantly, and all types likely to be encountered should be studied. Although the chief of section is charged with the decision as to whether an approaching plane is hostile or friendly, all men who might be employed as lookouts should be trained in aircraft recognition.

7. What was said concerning aircraft recognition is generally applied to recognition of other targets, such as tanks and torpedo boats. The time factor for these targets is not so pressing, however, so that instantaneous recognition, although desirable, is not mandatory.

8. Study of maps and aerial photographs should be made progressively during the training program. All NCO's and chauffeurs should be able to follow routes and recognize principal terrain features as shown on maps and aerial photographs. Use of standard maps



"... all men should be trained in aircraft recognition."



"Actual positions should be constructed."

should be supplemented by use of sketches, overlays, and road maps, as standard maps are not always available in a theater of operations.

9. The principles and techniques of reconnaissance and selection of positions should be thoroughly covered in the classroom. Practical training in the field should follow, gradually combining the other related subjects until all considerations can be weighed and balanced, and sound decisions reached by the NCO's of the fire unit as to the choice of positions.

10. The study of field fortifications should emphasize (a) Use of materials at hand; (b) Careful preparations prior to and during occupation of the position; (c) Design of the fortification for protection, rather than comfort; (d) Suiting the fortification to the mission and probable time of occupancy. Actual positions should be constructed, and improvements made from time to time during the program. Aerial photographs before, during, and after construction and occupancy are valuable aids in showing what the enemy may be expected to know concerning the position.

11. Antigas measures include drill in use of mask, training with mask, gas-proof shelter construction, gas alarms, identification of gases, and decontamination. The field fortifications already constructed can be adapted to include a gas proof shelter and decontamination facilities. Drill in gas alerts and use of smoke and tear gas should be practiced.

12. Camouflage and concealment should likewise be linked with the field fortification work. The principle that fortification can be obtained only at the expense of concealment should be emphasized. Camouflage dis-

cipline before, during, and after construction and occupation should be rigidly enforced.

13. Local Security measures include obstacles such as barbed wire, land mines, tank traps, and other ground works designed to impede the progress of a land enemy. AW units assigned to the defense of air fields will find these measures essential to help prevent the seizure of the field by enemy air-borne troops as well as by enemy mechanized forces. Also included are measures taken to alert the fire unit in the event of imminent attack from the air or land.

14. Field sanitation and first aid measures are particularly important for the isolated fire unit. The chief of section must enforce all sanitary regulations and see that his men take care of their health. First aid is unusually important, due to the scattered nature of the battery's disposition. Medical Department men will rarely be available at the gun position, and first aid to the wounded must be rendered by his comrades.

15. Convoy operations as studied by the entire crew should emphasize defensive measures against aerial or ground attack while in convoy. The local defense machine gun should always be manned while on the march. Drivers should be trained to drive over little used roads, trails, or open country, rather than to follow main roads, as the latter are certain to be heavily attacked. The fire unit should be able to handle its own engineering problems in crossing streams, ditches, and steep grades.

16. Small arms target practice should cover all the small arms used in the fire unit, including the bayonet. Every man should be qualified at least as a marksman with the rifle. Each man must be made to feel that his rifle is as important to him as his gas mask or canteen. He cannot realize the value to him of a weapon he cannot use effectively. Yearly rifle practice cannot be expected to keep a man at his best in shooting. Like any skill, constant practice is needed to keep in form. Monthly qualification runs should be the minimum rifle practice permitted.

17. Marches are excellent means for conditioning men. Modern battle conditions demand practically unlimited endurance. The man whose strength gives out in battle may never have another chance to fight. Marches also offer opportunity for testing discipline and the ability of the lower commanders to take proper action under attack. Simulated attacks of various kinds should be arranged to bring home to the men the fact that the enemy will constantly oppose him in all operations, particularly movements. The soldier must be trained to the point where he instinctively expects enemy opposition and is always alert to meet it. He must develop the jungle creature's instinct of self preservation, as modern war is most certainly a case of survival of the fittest, in every sense.

19. Alert and warning systems are the means by which the fire unit is given that warning which will enable it to be ready for the enemy when he strikes-

The low flying plane depends on surprise and speed for its security. These factors can be neutralized or eliminated by efficient alert systems. Distinctive signals must be provided for the various alarms: air attack, mechanized attack, gas, fire, and others if used. The men must be trained to react instinctively and quickly to the particular alarms. Well-planned measures for the particular defense must be thoroughly understood by the men or they are worthless.

20. A Standard Operating Procedure should be developed for the fire unit during the training in the subjects previously enumerated (9 to 19). Such an SOP should cover all routine operations and serve as a check list for the NCO's of the fire unit to insure that no important detail is overlooked. It should permit the necessary latitude to enable the NCO's to use their own initiative in meeting each situation as it arises. It will, of course, be based on the SOP of the next higher unit. The SOP should be maintained up to date, and changes brought to the attention of all members of the crew.

21. Field exercises provide the means of combining the various individual subjects considered in the training program, and also serve as a practical examination of the proficiency of the fire unit in such subjects. Such exercises should be simple at first, considering but two or three subjects at a time. The first exercise may treat the several subjects relating to occupation of positions. Each fire unit should act independently. The second exercise should cover movement, reconnaissance, selection of positions, occupation, fortification, and evacuation. This should include the platoons as the independent unit and take two to three days. The final exercise should be participated in by the entire battery, and include all subjects including infantry tactics and cover a period of three to four days. Full criticism of the operation should be made, favorable as well as unfavorable. Initiative should be encouraged but guided. Actions of the enemy should always be simulated, but never permitted to take a stereotyped form. Where possible the two sides of the problem can be carried on simultaneously, pitting one group against another. Care must be taken, however, to see that the exercise is under proper control. These exercises should emphasize technique of handling equipment and personnel, and should stress independent operation of the unit concerned.

22. Tests and inspections are the means of determining the progress of the training. They should be conducted often enough to insure that mistakes and incorrect practices are corrected. Both matériel and training inspections should be thorough and unexpected. The enemy seldom gives warning and allows little time for preparation. The commander wants to know how good his troops are, not how good they can be.

23. Infantry drill is an excellent disciplinary training aid and should not be neglected. Artillery work is usually informal to the degree that discipline may de-

cline if not maintained by other means. One of the earmarks of a trained soldier is his ability to exhibit snap and precision in infantry drill. The general public often judges the efficiency of a military unit by its appearance in a parade.

24. Small unit infantry tactics should be taught, both the offensive and the defensive, as occasions may be expected in battle when the fire unit crew will have to meet and overcome small groups of enemy infantry, paratroops, or grounded armored force personnel. The crew might have to fight to gain a desired position and then fight again to hold it. Guarded road blocks may have to be passed, and the enemy guard reduced. Skill in such tactics will greatly reduce casualties as well as increase the effectiveness of the fire unit.

25. Horizontal fire is fire directed at any ground or water target, such as tanks, torpedo boats, trucks, marching troops or strong points. The technique of such fire is generally simpler than AA fire but differs in detail. Practice in firing at simulated ground targets should be afforded during the next phase of the training.

26. Air-borne attack depends for its success on surprise and speed. It attempts to overwhelm the enemy before he can organize to meet it. Successful defense against such attack therefore requires that the organization be effected before the attack occurs. Hence, up-to-date plans of defense should be prepared and practiced, which will insure that determined resistance will be offered to any likely air-borne attack. The training should cover the forms of attack likely to be attempted and the proper measures to take against each of those several forms.

27. As long as the line soldier is to be called on to perform fatigue duties, garrison guard, kitchen police, and other routine administrative work, he must be given the opportunity to make up instruction lost while performing such duties. By assigning the fire unit as a whole to fatigue or guard duty as often as required, and allowing for such time in the training program, the individual soldier may be assured that he will not miss any important instruction. He cannot be expected to make up at odd moments the instruction his comrades were receiving while he was performing such duties. Since the fire unit is a closely knit team, the weakness of one member will impair the efficiency of the whole team.

28. Sickness and furloughs are unavoidable even during important training periods, and should be planned for. When an absence occurs due to such causes, the man should be replaced by an outstanding man of similar training from a less advanced fire unit. Upon the return to duty of the absent soldier he should then take his place in the less advanced unit. Transfers between batteries should be undertaken, if necessary, to accomplish this. Only in this way can the training of the fire units be maintained at the highest attainable level.

The order of presentation of the subjects above

enumerated will depend upon local facilities, availability of instructors and equipment, and the state of training of the men in such subjects. The training program should be varied to maintain interest, but should integrate the subjects, as they are mastered, into the every day activity of the soldier. Each subject should be considered first in its elementary form, combined with related subjects, tested in field exercises, and then covered more thoroughly, repeating the cycle until the subject is not only understood in itself, but its relation to the other subjects clearly understood.

Training aids, such as training films, film strips, charts, diagrams, models, miniature target ranges, training devices, etc., should be utilized to the greatest practicable extent. Trips to air fields, factories, prepared emplacements, and other points of interest should be arranged whenever advantageous. Interest and proficiency should be meticulously rewarded, and indolence and indifference treated severely. Men should be kept on their toes. The AW fire unit member must develop lightning-like reactions, and every effort to stimulate this development should be practiced.

Approximately sixteen weeks will be required for this preparatory training phase.

#### IV

### TARGET PRACTICE PHASE

The target practice phase of the training plan includes all firing of the automatic cannon and local defense machine gun. This firing should include all types of fire control expected to be used in service and should afford opportunity for alternates as well as principals to become proficient in the fire control duties of each position.

The target practice phase may, for convenience, be divided into four stages.

The first or preliminary stage should be devoted to the development of fire discipline, interpretation of tracer observations, development of steadiness under the distraction of firing, and overcoming gun shyness. Proper procedures for misfires and stoppages should be stressed during this stage.

The second stage should be devoted to the technique of adjusting fire on simple crossing courses. The elevation tracker should be taught to track off if necessary to obtain line of sight shots. Gun pointers should develop skill in their particular type of fire control. Machine gunners should learn to estimate and apply the proper leads and correct same by tracer observation. The percentage of hits should gradually increase during this stage. Average slant ranges should not exceed 1,000 yards for director control, 800 yards for gun sight control, and 400 yards for machine gun firing. Flag targets should be used, if obtainable. If possible, provision to visually indicate and identify hits should be made, either through the use of high explosive, or through the use of painted shells.

The third stage should cover coming courses, both

horizontal and diving, if the latter can be arranged for. The azimuth tracker should be taught to track off, when necessary, to obtain line of sight shots. Gun pointers and machine gunners should master the technique of fire control on coming targets. Altitudes should be kept as low as possible. Concentrate on obtaining a few hits quickly rather than a larger number of hits over the whole course. Avoid the tendency to open fire when the target is still beyond effective range.

The fourth stage should cover maneuvering and diving targets, such as radio-controlled target planes and the T-1 target. Service conditions should be simulated as nearly as possible. Battle sounds should be provided, as by firecrackers or phonographs. Casualty replacement should be practiced. Some firing using gas masks should be required. Firing from actual field positions should be practiced if firing range permits. Hedgehopping targets approaching at high speed from any direction would give ideal training for combating such targets in battle. Safety precautions might advantageously be relaxed to some extent if a real gain in battle realism can be obtained.

Horizontal fire on antimchanized target range or on water targets should be arranged for, and satisfactory technique developed for such fire.

The results of the target practice should not be measured by the number of rounds fired, but by the degree of proficiency attained. The fire unit which enters battle with insufficient firing experience will waste far more ammunition than was "saved" by denying it sufficient target practice, and *will be ineffective as well*. Certainly peacetime allotments are grossly insufficient now and should not be the basis of ammunition requirements for training in time of war.

From ten days to two weeks will be required for the target practice training phase.

#### V

### TACTICAL TRAINING PHASE

The tactical training phase is designed to amalgamate all the subjects covered in the preliminary training phase into an ordered and systematic plan of military operations. This process of amalgamation should be started with the field exercises of the first training phase. The logical conclusion of such process would be the actual entry into battle, where the training program will receive its final and decisive test in the crucible of war. Between those two limits should be given a series of progressive field problems and exercises designed to duplicate, to as complete a detail as possible, the various operations which the fire unit will be expected to perform in battle.

Classroom instruction for this phase should include the tactics of the AW fire unit in detail, and the general principles of the tactics of the AW platoon, battery, and battalion in both rear and forward area defense. Outlines of AW employment with the supported arms (Air Force, Armored Force, Infantry, Cavalry) should

be given, supplemented if possible by examples and training films.

Each exercise should be planned with a definite training objective in mind. The exercises should be held in strange territory. The troops should be subjected to preliminary operations which will produce the state of physical and mental fatigue inseparable with battle conditions. The presence of friendly troops should be real or simulated. Priorities for right-of-way, selection of positions, supplies, and replacements should be set up, as would be the case in actual operations. The actions of the enemy in disrupting communications, raiding, destruction of supplies and equipment, and other conditions existing in actual operations, should be painstakingly simulated. Enemy reconnaissance agencies should be duplicated and the information so obtained shown to the fire unit members at the critique. Every effort should be made to develop initiative in the men, but impossible or ridiculous situations should be avoided.

Preparation of field exercises involves the following principal phases:

- a. Outline of general situation.
- b. Outline of special situation, to include terrain, troops participating, special mission of unit.
- c. The sequence of events, or scenario, to include orders, alerts, intelligence messages, etc.
- d. Duration of the exercise.
- e. Ground area and equipment to be used.
- f. The general tactical principles to be illustrated and demonstrated.
- g. The general scheme of Director or Umpire Control and representation of hostile forces.

Further information is contained in Section VIII, FM 21-5, July 16, 1941.

Obviously these exercises will be participated in by many organizations. The AW platoon, battery, and battalion should be employed in successively larger scale exercises. Maneuvers with troops of other arms should culminate the series of exercises, so that the AA soldiers can learn at first hand how these arms function in battle.

Realism must be striven for, even to the extent of using live ammunition in some cases, both by ground troops and by planes. Troops must be impressed with

the feeling that war is grim business, and not a game with umpires and various colored flags.

Obviously the use of live ammunition will produce casualties. The decision as to how far to go in this direction will be answered by the answer to the question, "Will the increase in effectiveness and decrease in casualties of these troops when they enter battle greatly offset the casualties suffered in training?" The shoulders of higher commanders must be broad enough to bear the responsibility for the mistakes of subordinates. The experiences of the British in their Commando training should be a clear guide as to the extent of using live ammunition in our training.

Throughout these exercises, commanders of all units should be alert to commend outstanding performances as well as to correct tactical and technical errors. Competent observers from strange units can be used with advantage to report on the activities of each unit. Time should be provided between exercises to permit careful critiques of the previous exercise, so that mistakes can be remedied and successful methods passed on to others.

Care should be taken by battalion and higher commanders that some fire units are not continuously employed in a single type of operation. Each fire unit should, as far as possible, engage in every type of operation to be covered.

Personnel weaknesses will undoubtedly show up in the course of these exercises. The man who can't produce in maneuvers certainly won't do so in battle. The NCO or officer who fails to make the grade should be reassigned after being given a fair chance to make good. An ample supply of new material will be discovered to replace these ineffectives. The old military criterion of "Results" must be adhered to if an effective fighting machine is to be obtained.

Our soldiers will have to meet the veterans of many years of modern and brutal warfare. The Japanese and German soldiers have proved their thorough training and know how to fight modern war. Unless we provide the same thorough training for our men, we are asking many of them to throw away their lives uselessly. Our men are the finest in the world. They can learn more quickly than any other soldier. But they must be trained. Let us see that they are!



The Post Office Department and the Army Postal Service cooperate with the JOURNAL to bring you your magazine on time. Won't you cooperate by informing us of changes of address, *promptly?*

# Deflection Board M1<sup>\*</sup>

By Captain John T. Kelton, Coast Artillery Corps

The deflection board, M1, is the present standard direction correction device for guns in seacoast artillery. It can also be used with mortars. This board is designed for use with either Case II or Case III pointing and can be used for calculation of direction data in mils as well as degrees.

## I. DESCRIPTION OF BOARD<sup>1</sup>

### a. Azimuth mechanism.

As issued, the board is set up for use in degrees. (See figure 1.) The board can be converted for use in mils by substitution of the alternate set of gears and reversal of the main and auxiliary azimuth scales and the adjustment correction scale. The method by which this is accomplished is explained in Section VII, *Conversion to Operation in Mils*. The following discussion assumes a board set up for operation in degrees.

The main azimuth plate is rotatably mounted at the pintle of the board. It carries the main azimuth scale which is divided into four quadrants; each quadrant being graduated from 0° to 10° with least graduations of .05°. Small changes are made by means of the azimuth knob. The auxiliary azimuth scales are on the base plates of the wind-resolving mechanism and the displacement corrector. An index is associated with each auxiliary scale. The auxiliary scales are graduated from 0° to 360° with a least graduation of 10°. Hundreds and tens of degrees are read on the auxiliary scale while degrees and decimal parts of degrees are read on the main azimuth scale. For operation in degrees, the main azimuth scale is geared to the auxiliary azimuth scales in a ratio of 9 to 1.

Two alternate set indexes are provided, the second 4° clockwise from the first and the third 10° clockwise from the first. They may be of use under certain conditions. A main read index is provided at the output side of the board. (See figure 2.)

### b. Wind-resolving mechanism.

The wind-resolving mechanism is carried on a spindle mounted on the wind bar which is geared to the main azimuth plate. The operation of the wind-resolving mechanism is similar to the wind-component instrument except for two features. Two wind-azimuth pointers are provided instead of one as on the wind-component indicator. The pointer farthest from the wind-speed scale is used by batteries oriented from

South, and the one nearest the wind-speed scale by batteries oriented from North. The other feature is that once the wind arm is set to the azimuth of the ballistic wind, it rotates with the auxiliary azimuth scale, and automatically maintains the correct relation between the azimuth of the target and the wind azimuth.

### c. Ballistic correction mechanism.

Corrections for wind and drift and rotation are set into the board by means of the ballistic-correction mechanism. It consists of a ballistic-correction chart, wind pointer, wind handwheel, rotation pointer, rotation knob, auxiliary arc, azimuth read index, and two lock knobs.

The ballistic-correction chart is mounted on the rollers to allow setting the proper range arc under the wind and rotation pointers. Each chart is prepared for a particular combination of gun and ammunition. Wind and drift curves are drawn representing the combined lateral effects of wind and drift, with effects as abscissas and range as ordinates. On its left side, the chart bears similarly plotted curves for the lateral effects of rotation of the earth. Elevations or ranges are the ordinates on the chart and an elevation index is mounted at the upper right corner of the chart plate. On the newer charts a time-of-flight scale is included.

The wind pointer is pivoted at the pintle; thus moving in an arc across the chart when it is actuated by means of the wind handwheel. Both the wind handwheel and chart knob arc provided with hinged shafts and knurled sleeves to allow them to be swung in for placing the cover on the board.

Engagement of the wind lock knob communicates movement of the wind pointer to the adjustment correction index. Engagement of the adjustment lock knob locks this index to the plate bearing the adjustment correction scale and main azimuth read index. Thus, with both lock knobs engaged, displacement of the wind pointer causes corresponding displacement of the main azimuth read index. Since the main azimuth read index plate is connected to the arm bearing the displacement corrector spindle, a similar correction is introduced into the azimuth reading for the displaced gun.

Rotation corrections are put in by turning the rotation knob to position the rotation pointer.<sup>2</sup> This displaces the main set indexes and the azimuth must be reset in order to introduce the rotation correction.

<sup>\*</sup>This article is condensed from a forthcoming training bulletin of the Coast Artillery School. For Standard Nomenclature List M1 Deflection Board, see SNL F-19.

<sup>1</sup>It may be found helpful occasionally to refer to the pertinent parts of Section V while studying the board.

<sup>2</sup>Ballistic charts for some 6-inch and 155mm guns do not have rotation curves because of the negligible rotation corrections at the ranges fired.

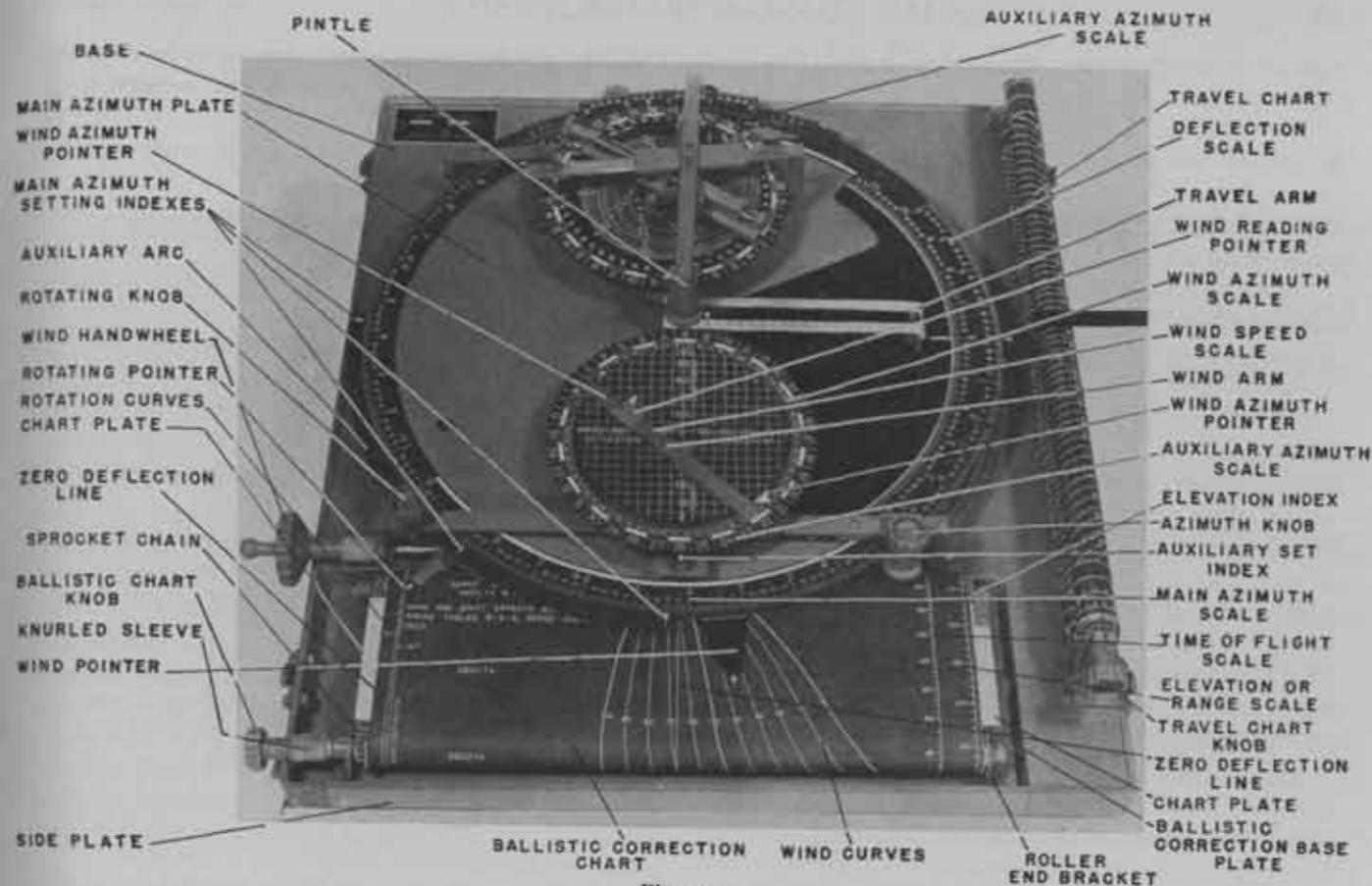


Figure 1

d. Lateral adjustment corrections.

Corrections for lateral adjustment are made by displacing the azimuth read index independently of the wind correction pointer. An adjustment correction scale is fixed to the plate bearing the azimuth-read index. When the adjustment lock knob is loosened, the adjustment correction scale and azimuth-read index may be moved along the main azimuth scale to effect the adjustment correction indicated by the intersection of adjustment correction index with the adjustment correction scale. During such movement the adjustment correction index remains locked to the wind pointer. Thus the lateral adjustment correction is algebraically added to the ballistic corrections. The adjustment correction scale being connected with the displacement corrector, the adjustment correction is applied to the data for the displaced gun.

e. Displacement corrector.

The M1 deflection board is provided with a device for determining parallax correction for a displaced gun up to 500 yards linear displacement and a parallax correction of  $2^\circ$ . The displacement corrector operates through computation of an approximate graphical solution. For discussion of the theory see FM 4-15, paragraph 107 g.

The displacement corrector consists of a base plate geared to the main azimuth plate in the same ratio as the base plate on the wind-resolving mechanism, 9 to 1. The read auxiliary azimuth scale is engraved on this base plate. The gun arm is mounted on a vertical shaft

attached to an arm pivoted at the pintle and may be held fixed to the shaft by tightening the gun arm set-screw. The gun arm is provided with an index so that it may be set to the azimuth of the displaced gun using the auxiliary azimuth scale.

The curve disk is mounted between the base plate and the gun arm. The disk carries a series of target range curves. Linear displacements are engraved on the periphery of the disk and, the gun arm having been set at the azimuth of the displaced gun and locked, the curve disk may be rotated to bring the proper linear displacement under the displacement pointer on the gun arm. Thereafter the disk will revolve with the base plate and gun arm and is thus kept properly oriented in azimuth. The target range must be set into the corrector by keeping the range pointer on the gun arm positioned on the proper range curve. This is accomplished by turning the range knob. The setting of these values positions the pin on the top slide which causes the parallax arm to rotate about its pivot at the pintle of the board. The corrected azimuth for the displaced gun may be read from the main azimuth scale at the lower index of the parallax arm in conjunction with the auxiliary azimuth scale and index.

As issued, the displacement correction device is adapted solely for use in degrees for the reason that the curve disk is engraved for operation in degrees only. For adaptation to mil operation, see Section VII.

f. Angular travel computing mechanism.

The angular travel computing mechanism (figure 3)

consists of the travel arm, travel scale, travel chart, and deflection arm. The travel arm is pivoted at the pintle of the board and is attached to the main azimuth plate by means of a slip-friction device allowing movement of the travel arm independently of the main azimuth plate but causing the arm to move with the main azimuth plate within the limits of movement of the arm.

The travel scale is marked on the travel arm plate, which is fixed to the base of the board. The travel scale is graduated in travel reference numbers with a normal of 6.00. The travel arm, in conjunction with the travel scale, acts as a subtraction device which takes the difference between successive azimuth readings. The main azimuth circle having once been set to the uncorrected target azimuth and the travel arm set to normal on the travel scale, the next uncorrected target azimuth is set. The travel arm moves with the main azimuth plate and will be displaced an amount equal to the angular travel of the target during the observing interval. This angular travel is read on the travel scale. The travel arm is then reset at normal in preparation for the next angular travel reading.

Angular travel during the observing interval, as read from the travel scale, must be converted into angular travel during time of flight in order to compute deflection. This is accomplished by means of the travel chart and deflection arm. The travel chart is carried on two rollers, one being a drive roller and the other a spring roller. The chart has two time-of-flight scales plotted near the left edge. One time-of-flight scale presumes a 20-second observation interval and the other a different observation interval. If a 20-second observation interval is being used, the chart may be positioned by rolling it

until the proper time of flight (obtained by reference to the ballistic chart) on the 20-second scale is under the cross-wire.

The travel chart also bears travel curves plotted either side of the straight 6-normal line. These curves are marked in the same reference-number system found on the travel scale.

The travel chart having been rolled, as described, to the time of flight for the corrected range or elevation, the deflection arm is moved so its reading edge (beveled edge) falls over the point of intersection of the cross-wire with the travel curve bearing the same reference number as that previously read from the travel scale.

#### g. Deflection-computing mechanism.

With the wind lock knob and adjustment lock knob engaged, movement of the wind pointer is communicated to the deflection scale. Thus scale displacement introduces the correction for wind and drift.

The correction for travel of the target is algebraically added to the correction for wind and drift by displacement of the deflection index on the deflection arm, the arm having been displaced by setting it to the proper travel curve. The algebraic addition of corrections for wind, drift, and travel is thus accomplished to allow reading of the deflection as indicated by the deflection index on the deflection scale.

Four deflection scales are provided for use on the board. For operation in degrees, scales having normals of 3.00, 6.00, and 10.00 are provided. The scale to use is that having the same normal as the sighting equipment on the gun. One deflection scale with a normal of 200 is for use when the board is set up for operation in mils.

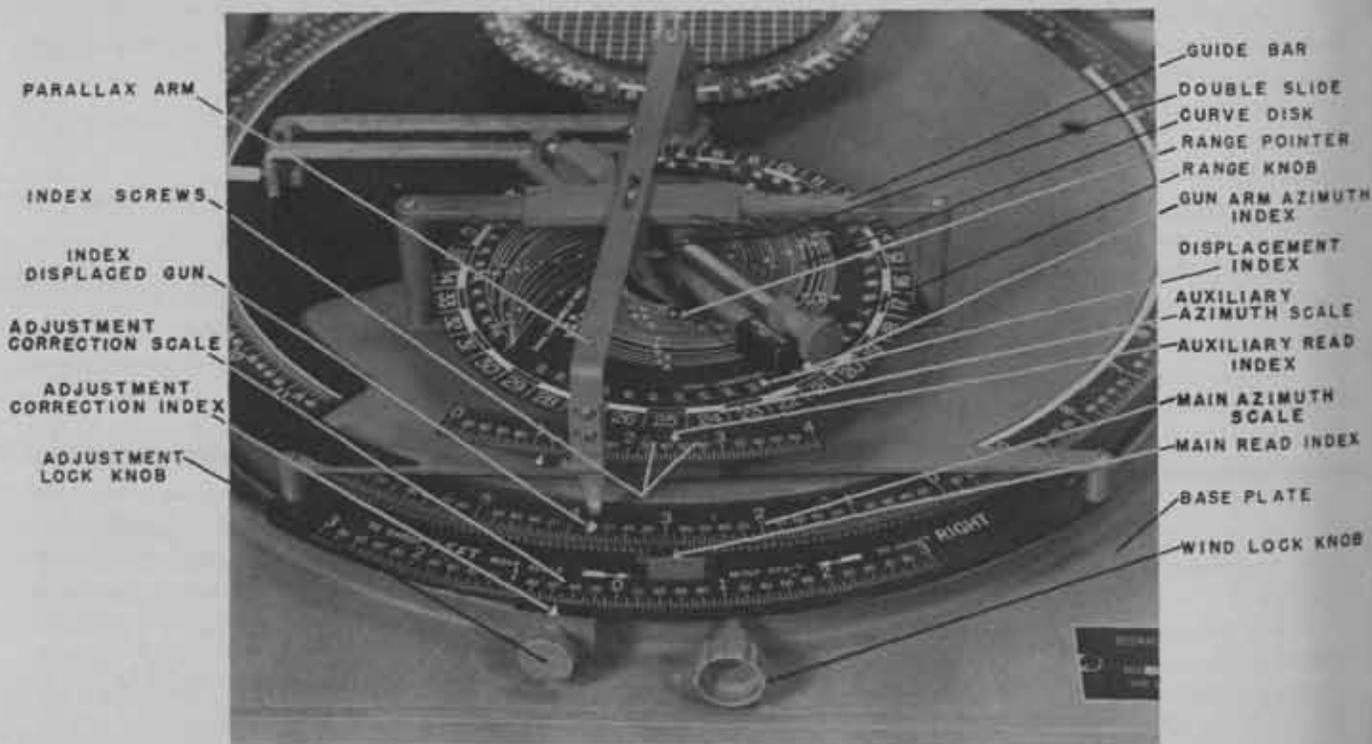


Figure 2



Figure 3

## II. CHECKING ASSEMBLY AND CORRECTIVE MEASURES.

The assembly of each board must be checked when issued to the using organization. In the past, a considerable number of incorrectly assembled boards have been issued.

The methods of checking and the corresponding corrective measures are shown in chart form below:

CHECK	CORRECTIVE MEASURES
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### 1. Assembly of Azimuth Mechanism.

a. Auxiliary indexes on 10° line when main indexes are at zero.

b. Move main azimuth plate until auxiliary set index is at zero; loosen wind lock knob and place read index at zero. Both auxiliary set and read indexes should indicate zero.

c. Rotate main auxiliary

a. Loosen auxiliary index screws; move indexes to 10° line and tighten screws.

b. Disassemble wind-resolving mechanism and displacement corrector and check gears. Auxiliary spur and pinion gear should bear mark "for deg. only." Displacement corrector gears should be meshed, arrowed tooth to arrowed slot. Wind-resolving mechanism gears should be meshed, starred tooth to starred slot. Reassemble displacement corrector and wind-resolving mechanism, positioning base plates so auxiliary scales read zero.

c. Follow measures in

1 b. plate through one complete revolution and check that both auxiliary azimuth scales rotate exactly 40°.

### 2. Wind Arm.

Note reading of wind azimuth pointer; rotate main azimuth plate. Reading of wind azimuth pointer should remain the same.

### 3. Travel Arm.

Turn main azimuth plate through at least 2° in both directions; travel arm should move exactly the same amount as measured on travel scale.

### 4. Ballistic Correction Chart Assembly.

Outer edge of roller brackets on left should be flush with chart assembly base plate. On right, roller brackets should be set in approximately 7/16-inches.

2. Observe whether wind read pointer slide binds on top plate. If so, remove top of wind arm and bend slightly convex; replace. Otherwise, remove top plate and bend clip spring slightly to increase friction; replace.

3. Slide travel arm over pintle and bend inner end of arm upward slightly.

4. Remove side plate; loosen chart assembly base plate screws; remove chart assembly; remove roller bracket screws; remove rollers; remove spacer screws in bottom of base plate; remove chart plate and spacers; turn base plate 180° so that roller brackets will be set in on right side and reassemble in inverse order of disassembly.

### III. MOUNTING THE CHARTS

#### a. General.

Suitable charts for use on the M1 deflection board may be obtained from the Coast Artillery Board, Fort Monroe, Virginia. In ordering charts, give the caliber and model of gun, the type and model of carriage, the projectiles, powder charges, and standard muzzle velocity for which charts are desired. State also whether the charts are desired for operation in mils or degrees. Each chart is designed only for a particular combination of gun and ammunition and must be used only with that particular combination.

The newer ballistic correction charts have a time-of-flight scale plotted parallel to the range or elevation scale. For Case II pointing, a time-of-flight scale should be plotted on any charts lacking such a scale. This can easily be done locally by bleaching a column on the chart slightly to the left of the range or elevation scale and plotting the times of flight corresponding to the range or elevation scale as determined by reference to the proper firing table. In Case II pointing, such a scale prevents the confusion incident to the range correction board operator calling the time of flight corresponding to the corrected range or elevation.

Where the guns are equipped with range drums and utilize range-range relations on the percentage corrector tape, considerable inaccuracy may result if the corrected range as read from the percentage corrector is set on the range scale of the ballistic correction chart. In such case a new range scale involving the proper range-range relation should be plotted on the ballistic correction chart.

#### b. The ballistic correction chart.

Before mounting the ballistic correction chart, cut it along the side trim lines so as to give the chart the same width as the distance between the shoulders of the rollers. This allows a close fit between the chart and the roller edges, thus preventing creeping of the chart.

Remove the side plate of the board by taking out the side plate screws. Remove the two ballistic correction chart base plate screws and slide out the ballistic correction chart assembly. Lay the chart across the two rollers so that the lower edge coincides with the axis of the drive roller. Fix the lower edge of the chart to the roller, using scotch tape or similar adhesive tape. Maintain a slight tension on the upper edge of the chart at its center and roll the chart onto the drive roller until the upper edge of the chart coincides with the axis of the spring roller. Roll the spring roller back against the tension of its spring and mount the chart on the roller in a manner similar to that followed with the drive roller.

Mount the ballistic chart roller assembly on the instrument and test the positioning of the chart by setting

\*The zero deflection lines are straight lines passing downward on the chart.

the wind and rotation pointers on their lines of zero deflection\* and rolling the chart a considerable distance. The wind and rotation pointers should remain on the lines at all times. If this test results satisfactorily, roll the chart until the arc of zero range intersects the wind pointer, and move the wind pointer through the complete arc, using the wind handwheel. The pointer ought to follow the arc closely, except perhaps toward the outer limits of the arc. If results of this test are satisfactory, replace the side plate. To set the elevation index at zero range or elevation, roll the chart to place the zero range or elevation arc at the reading edge of the wind pointer and loosen the index adjusting screws. Now, move the index to zero and tighten the screws.

If the wind and rotation pointers fail to remain on their zero deflection lines, or the reading edge of the wind pointer fails to follow the arc, loosen the base plate screws and, by trial and error, attempt to find a position in which the chart will check. If this cannot be done, the chart must be remounted.

Considerable care must be used in positioning all charts on the M1 deflection boards. Data is put into the board through the medium of these charts, and the performance of the board is dependent upon the charts being correctly positioned.

#### c. The travel chart.

Before mounting the travel chart, cut it along the trim lines if necessary. Slip the top of the chart under the horizontal wire and mount the top edge of the chart squarely on the drive roller by means of scotch tape or other adhesive material.

Roll the chart on the drive roller until the bottom of the chart reaches the center of the outer side of the spring roller. Roll the spring roller back against its spring and, holding it in this position, fasten the bottom of the chart to it with scotch tape.

Sometimes it is desired to have the same zero setting for the board for both Case III and Case II, in order to accomplish a quick change from one case to the other. To accomplish this, zero the board for Case III (see V b) and set the deflection index to the normal on the deflection scale. Slide the travel chart laterally on the drive roller until the 6 normal line falls under the reading edge, and fasten the chart to the rollers in this position in the manner previously described.

In any case, the mounted travel chart should be tested by placing the reading edge of the deflection arm so it cuts the 6 normal line and then rolling the chart through the limits of its movement to make sure that the line remains on the reading edge of the deflection arm. If the chart does not respond to this test, it must be remounted.

### IV. THE LATERAL ADJUSTMENT SCALE

As furnished on the board, the adjustment scales for both degrees and mils are engraved with a zero normal which necessitates the use of "left" and "right" correc-

tions.' This may cause confusion. In some batteries, the adjustment scale in degrees has been revised to a 300 normal system. This revision has been accomplished by pasting tabs bearing the numbers in the new system over the 0 and 1, 2, and 3 each side of the normal, reference numbers 2, 1 and 0 to the left, and 4, 5 and 6 to the right of normal. The decimal numbers to the left of 3 must also be renumbered by use of tabs. The new reference number system is the same as that used to read lateral corrections on the azimuth instrument M1901A1 and on the M3 spotting board.

As graduated, the adjustment correction scale in mils is not suitable for use on a board otherwise set up for operation in degrees, nor can the degree adjustment scale be used on a board set up for operation in mils. This is due to the fact that the degree adjustment scale is constructed for a ratio of 9 to 1 while that for mils is constructed for a ratio of 8 to 1. The factor of error would therefore be of the order of 8 to 9. While new mil and degree scales could be constructed for use with a board operating in the other units, the simplest way to solve the problem is to make the conversion from mils to degrees or vice versa on the lateral adjustment board.<sup>6</sup>

## V. OPERATION<sup>6</sup>

### a. General.

Operation of the M1 deflection board requires two men. The input operator sits facing the wind and drift curves for both cases of pointing. The output operator is equipped with a telephone allowing him to transmit corrected azimuths or deflections to the azimuth setters or gun pointers at the guns. When operating with Case III pointing, the output operator sits facing the azimuth read index while with Case II pointing, he sits facing the travel chart and deflection scale. When the displacement corrector is used, a second output operator is required to read and transmit corrected azimuths for the displaced gun.

### b. Case III Pointing.

(1) *General.* When the battery is firing Case III, the board solves the problem of computation of a corrected azimuth from the directing point to the target and a corrected azimuth for use at a point displaced from the directing point. In computing the corrected azimuth, corrections to the uncorrected azimuth to the set-forward point may be applied on the M1 board for the following conditions:

- (a) Wind
- (b) Drift
- (c) Rotation of the earth
- (d) Azimuth difference due to parallax

Provision is also made for the application of lateral adjustment corrections to the data for the directing point and for the displaced point alike.

When firing Case III, the input operator sits facing the wind and drift curves. The output operator sits facing the opposite side of the board.

(2) *Initial Adjustment.* The input operator sets the wind pointer to its zero deflection line. This is the straight line downward from the origin of the wind curves which is marked "zero deflection" on the newer charts. He also sets the rotation pointer to its zero deflection line, which is the straight line down the left side of the chart and is also marked "zero deflection" on the newer charts. The output operator loosens the adjustment lock knob and moves the adjustment scale to read zero correction, and tightens the adjustment lock knob. If the reading at the azimuth read index is not the same as that at the azimuth set index, the output operator loosens the wind lock knob. He then moves the plate bearing the reading index left or right until the azimuth read index indicates the same azimuth as the azimuth set index. Then he tightens the wind lock knob. All corrections and constants of construction have been eliminated. This preliminary adjustment is commonly called "zeroing the board." As a rule, the board will require readjustment when changing from one case of firing to another. This initial adjustment, or zeroing, should be accomplished for the case of pointing to be used each time the range section is posted.

(3) *Checking the board.* Check data are entered upon each ballistic correction chart issued by the Coast Artillery Board. These consist of settings marked by circles for the wind and rotation pointers on an arc at about mid-range. A firing elevation or range, an uncorrected azimuth, and the proper corrected azimuth are also given.

To make the check, first zero the board, then set the ballistic chart to the indicated elevation or range, next set the wind and rotation pointers to their respective points as marked by the circles and then set the uncorrected azimuth at the set indexes on the main and auxiliary azimuth scales. The corrected azimuth recorded on the chart should appear at the auxiliary and main read indexes. If it does not, then try to check the board on check data for other ammunition which is given in another section of the same chart. If the board checks on this other data, then prior failure to check was due to inaccuracies in the check data on the other chart and the board may be considered as functioning properly.

<sup>6</sup>Since preparation of this article, deflection boards have been issued with an adjustment correction scale having a normal of 300 and a reference number system as explained in this section.

<sup>7</sup>For description of this method, see COAST ARTILLERY JOURNAL, Vol. LXXXV, No. 4 (July-August, 1942), pp. 43-44, or Information Topic No. 26, Coast Artillery School, Department of Artillery (1942), pp. 3-5.

<sup>8</sup>The directions for use of the board contained in TM 9-463, Gun, 8-in., Mk. VI, Mod. 3A2 and Mount, Railway, Gun, 8-in., M1A1 (Jan. 26, 1942), paragraph 114; TM 9-1570, Plotting Boards for Seacoast Artillery (May 8, 1942), paragraph 15 and in other Ordnance publications are incomplete and unsatisfactory for seacoast artillery. For example, no mention is made of the necessity of initially adjusting or "zeroing" both for Case II and Case III.

<sup>9</sup>If there are no rotation curves on the chart used, run the rotation pointer against its stop and fasten it, maintaining it in this position throughout.

However, if upon the second attempt with other data, there is still any substantial discrepancy, the assembly of the board and proper operation of all its parts should be closely examined and the source of the error eliminated. The procedure outlined in Section II should be used.

Should the using organization, after diligent study, be unable to discover the cause of malfunctioning, the board should be turned in to the Ordnance for repair.

Once a board has been ascertained to function correctly, the range officer should cause frequent periodic checks to be made to insure that the board continues so to function.

(4) *Operation, Input Operator.* The input operator operates the wind-resolving mechanism and sets the rotation pointer, the wind pointer, and the uncorrected azimuth.

The wind-resolving mechanism resolves the wind into two components, the range component and the deflection component. From the meteorological message, the direction and speed of the ballistic wind for the maximum ordinate attained is extracted. The direction of the wind in the meteorological message is always in hundreds of mils, clockwise from North, and is set in that form regardless of the azimuth reference line used by the battery. When the battery is oriented from South, the operator sets the wind azimuth pointer farthest from the wind-speed scale to the wind azimuth in hundreds of mils on the wind azimuth scale. If the battery is oriented from North, the pointer nearest the wind-speed scale is used. The operator then slides the wind read pointer along the wind arm to the graduation corresponding to the speed of the ballistic wind as extracted from the meteorological message. The wind arm will thereafter be carried around as the azimuth settings are changed, maintaining the proper relation of wind and target azimuths, and indicating on the grid scales the range and deflection components of the wind.

The uncorrected azimuth is set by rotating the main azimuth plate either by the azimuth knob or by pulling the plate around for large, rapid changes. The azimuth setting is indicated by two scales and indexes. The setting to the nearest ten degrees is indicated on the auxiliary azimuth scale on the base plate of the wind-resolving mechanism by the auxiliary set index. The units and decimal parts of a degree are indicated on the main azimuth plate by the main azimuth set index. For convenience in reading, each ten degrees of both scales are marked with alternate black and white segments. When the main azimuth set index is in a black sector, the proper reading on the auxiliary scale is in the nearest black sector. On a correctly assembled board, the colored sectors are useful when the reading is very close to a multiple of  $10^\circ$ .

The next step is the reading of the range and deflection wind components. The range component is given to the operator of the range correction board, and the

deflection component is noted for setting by means of the wind arm.

The wind and drift chart is then positioned, using the corrected range or elevation, by rolling the chart until the elevation index points to the proper range or elevation. The wind pointer is then moved, by turning the wind handwheel, until the pointer is on the curve corresponding to the deflection wind component. Interpolated settings must be chosen between the ten unit lines. The movement of the pointer introduces a correction for wind and drift by moving the azimuth reading index.

Correction for the effect of the earth's rotation is made by setting the rotation pointer to the curve corresponding to the uncorrected azimuth of the target by means of the rotation knob. When this correction is applied, the azimuth setting index is displaced, so the operator must readjust the setting of the uncorrected azimuth after the rotation pointer is set. In this way the correction is introduced into the output reading by algebraically adding it to the input.

The input operator sets the new uncorrected azimuth when it is furnished. Changes in corrected range or elevation are applied by rolling the wind and drift chart. Changes in range or elevation will require small changes in the setting of the wind and rotation pointers. The operator will observe the wind read pointer. When the range component changes, he will announce it to the range correction board. When the deflection component changes, he will reset the wind pointer to the new value.

The setting of approximate data enables less movement and quicker setting when data comes through on the first set-forward point.

In order to insure smoother data, the input operator should be trained not to disturb the setting of the range-correction chart in range or elevation, or the wind and rotation pointers until a perceptible change is required. The habit of touching each knob when changes in elevation or range are so small as not to warrant any change is to be discouraged. Unwarranted adjustment results in erratic corrected azimuths.

(5) *The Output Operator.* The output operator reads corrected azimuths, operates the displacement corrector, and applies any adjustment corrections ordered.

The azimuth reading scales are similar to those used by the input operator, and consist of an auxiliary scale and index for reading hundreds and tens of degrees, and the main azimuth plate and index for units and decimal parts of a degree. The black and white segments on the scales indicate the reading on the auxiliary scale to combine with the reading from the main azimuth scale. However, if the auxiliary azimuth pointers have been correctly adjusted, there should be no need for recourse to this method except where the reading is very close to a multiple of  $10^\circ$ .

The output operator also applies adjustment corrections by loosening the adjustment lock knob and moving the adjustment correction scale until the ordered correction is set. He then tightens the adjustment lock knob. This movement of the adjustment scale accomplishes a corresponding movement of the azimuth reading index and the displacement corrector, thus algebraically adding the adjustment correction to the corrected azimuth for the D.P. and the corrected azimuth read from the parallax arm for the displaced point.

The displacement corrector is very useful in a two-gun battery when the displacement does not exceed 500 yards and the parallax does not exceed  $2^\circ$ .

In operating the displacement corrector, the output operator requires the following data:

(a) The distance in yards between the directing point and the point for which the displaced data is to be computed. This is called the displacement, and must not exceed 500 yards.

(b) The azimuth of the above displacement, measured from the directing point to the offset point.

(c) The uncorrected range to the set-forward point.

The first two elements of the above data are fixed by the orientation of the battery; the third must be re-adjusted constantly while tracking. The azimuth of the displacement is used to position the gun arm in direction. The operator loosens the setscrew at the pivot of the gun arm and turns the arm until the azimuth of the displacement is indicated at the index under the range-adjusting screw and then tightens the setscrew. The gun arm will thereafter rotate with the base plate of the corrector. The displacement in yards is used to position the curve disk. Grasping the curve disk and the auxiliary azimuth plate between the thumb and fingers, the operator rotates the curve disk until the displacement in yards is indicated under the displacement pointer. A friction clamp will then carry the curve disk with the auxiliary scale and the gun arm as the azimuth changes. When tracking, the operator turns the range-adjusting screw, keeping the range pointer on the curve corresponding to the uncorrected range to the set-forward point.

The gun arm, through a double slide, causes the parallax arm to swing in an arc corresponding to the necessary parallax correction. When this correction is zero, the index on the end of the parallax arm coincides with the azimuth reading index. The corrected azimuth for the offset point is read on the main azimuth plate at the index on the lower end of the parallax arm.

#### c. Case II Pointing.

(1) *General.* When the battery is firing Case II, the board enables corrections to be made for the following conditions:

(a) Wind

(b) Drift

(c) Travel during time of flight

The board algebraically adds these corrections, resulting in the output of deflection. The board also has a provision for introducing a lateral adjustment correction into this deflection. A correction for rotation of the earth cannot be made for Case II. It will be recalled also that parallax corrections are not made when firing Case II; therefore the displacement corrector is not used with Case II.

Since no correction can be made for rotation of the earth when operating the board for Case II pointing, the rotation pointer should be run back against its stop and fastened to the rotation knob. In this way the main azimuth set index is held fixed.

(2) *Initial Adjustment.* The input operator sets the wind pointer to the zero deflection line on the wind and drift chart. The output operator loosens the adjustment lock knob and sets the adjustment correction scale to zero and tightens the adjustment lock knob. He then sets the reading edge of the deflection arm on the 6.00 normal line of the travel chart. If the deflection read index is not already at the normal of the deflection scale, he loosens the wind lock knob and moves the deflection scale until the normal is at the deflection reading index. He then tightens the wind lock knob, completing the initial adjustment for Case II. Usually this will not mean that the board is also adjusted for Case III.

(3) *Checking the Board.* Charts supplied by the Coast Artillery Board for use on the M1 deflection board do not have check data for Case II firing. While some check may be made by following the check procedure given above for Case III pointing and additionally checking the operation of the travel arm, this does not enable an overall check for Case II.

A much more satisfactory procedure is to calculate Case II check data from the firing table and plot the data on the ballistic correction chart and the travel chart. The range or elevation and the calculated deflection should be marked on the ballistic correction chart and the position for the wind pointer should be marked. No rotation correction should be calculated or entered, inasmuch as no correction for rotation may be made on the board in computation of deflections for Case II pointing. An assumed travel should be plotted on the travel chart. Care must be taken that the Case II check data can be readily distinguished from the check data for Case III.

Having plotted Case II check data on the charts, and having previously zeroed the board for Case II as described above, the input operator rolls the ballistic correction chart to the elevation or range of the check data. He then sets the wind pointer to its indicated position. The output operator then reads the time of flight indicated on the ballistic correction chart by the elevation index and rolls the travel chart until that time of flight in the column for the proper observation

interval appears under the cross-wire. The output operator then sets the deflection arm to the indicated travel reference number and reads the deflection indicated by the deflection reading index on the deflection scale. The deflection read should be the same as that calculated from the check data; otherwise, the malfunctioning of the board must be remedied.

(4) *Operation, Input Operator.* The input operator operates the wind-resolving mechanism and the wind and drift mechanism, and sets the uncorrected azimuths as called from the plotting board.

Operation of the wind-resolving mechanism is the same as that for Case III pointing described above. The input operator calls the range wind component to the range correction board operator and notes the deflection component for the subsequent setting of the wind pointer.

The input operator next sets the target azimuth, as called from the plotting board, on the auxiliary and main azimuth scales by rotation of the main azimuth plate. When the corrected range or elevation is called by the percentage corrector operator, the input operator rolls the ballistic chart to set this range or elevation at the elevation index. Next, he turns the wind hand-wheel to set the wind pointer on the curve for the deflection wind component indicated on the wind-resolving mechanism. Interpolation will be necessary, for the curves are drawn on the chart only for each ten units in the reference-number scale.

Setting of data for subsequent points as announced from the plotting board is done in a similar manner. Changes in settings should be avoided when the changes are within the accidental error in setting.

(5) *Operation, Output Operator.* When the input operator has set the target azimuth, the output operator moves the travel arm so that its reading edge cuts the travel scale at 6.00, its normal. Then, as soon as the ballistic correction chart has been positioned in range or elevation, the output operator notes the time of flight indicated by the elevation pointer and rolls the travel chart until this time of flight on the column for the proper observation interval falls under the cross wire.

When the main azimuth plate is rotated to set the next azimuth, the travel arm follows the movement of the main azimuth plate and measures the azimuth difference between the two points in terms of travel reference numbers. The output operator then notes the travel reference number and resets the travel arm to normal. After the input operator has positioned the ballistic correction chart for the new range or elevation, the output operator sets the travel chart to the proper time of flight as before. Then he brings the reading edge of the deflection arm over the intersection of the cross wire with the travel curve corresponding to the reference number previously read on the travel scale. He transmits to the gun pointers the deflection indicated on the deflection scale by the deflection reading

index. This procedure is continued as data for new points are determined.

It must be remembered that the travel reference number indicated on the travel scale represents azimuth difference between successive points. Thus the travel reference number determined between two successive set-forward points or two successive plotted points is reliable. However, when the data for the first set-forward point is determined, it cannot be utilized with the previous data on a plotted point, for the azimuth difference between a plotted point and a set-forward point is no indication of travel of the target as computed on the board.

## VII. CONVERSION TO OPERATION IN MILS

When the board is to be operated in mils, the following changes must be made:

1. Completely disassemble all parts above the main azimuth plate.
2. Remove the screws holding the main azimuth scale; reverse the scale to place the mil scale on top.
3. Reassemble, replacing the auxiliary pinion gears and auxiliary spur gears with those marked "for mils only."
4. In reassembling the wind-resolving mechanism and the displacement corrector, be sure to reverse the base plates on each so that the auxiliary mil scales (64 divisions) are on the upper side.
5. Remove the screws holding the adjustment scale, reverse the scale to bring the mil side up, and replace the screws.
6. Replace ballistic correction chart with one constructed for operation in mils.
7. Replace the deflection scale with the scale having a normal of 200 which is supplied with the board for operation in mils.

The travel scale and travel chart are suitable for operation in either mils or degrees. Consequently these are not changed for conversion to operation in mils.

The curve disk on the displacement corrector is graduated only for operation in degrees. However, correct parallax will be indicated in mil operation if the setting in yards, used to position the curve disk, is taken as the actual displacement multiplied by the factor 8/9. Otherwise, operation of the board in mils is the same as for degrees.

## ADDENDUM

Since preparation of the article, the M1 Deflection Board has been modified to substitute a new parallax scale (on the plate which carries the auxiliary read index). The parallax scale previously on the board with a normal of two was not of use to the Coast Artillery. However, this new scale has a normal of zero and is marked in the same reference number system as that used on parallax scale of data transmitter. Thus, where a data transmitter is used, the parallax on this scale at the point indicated by the upper index on the parallax arm may be directly set into the data transmitter.

# BARRAGE BALLOONS\*

By Lieutenant Colonel William H. Kendall and Captain  
Ralph H. Redford, Coast Artillery Corps

Barrage balloons are an important defense against hostile aircraft; their purpose is to protect relatively small areas from destruction—power plants, bridges, railroad yards, ship yards, and factories. They have no fire power, no armor, little mobility; they carry no crew. Their effectiveness lies in their ability to force pilots to fly at an altitude favorable to our own antiaircraft guns, and in the positive destructive action of their cables against hostile aircraft. Bomber pilots have become aware that a series of barrage balloons is a most formidable obstacle when they are out to bomb a specific target; hence they have a tremendous morale value (1) by throwing the hostile pilot into a state of high nervous tension—the fear of the unknown—in that he cannot see the cable, and when skies are overcast, he never knows that he has seen *all* of the balloons; and (2) by instilling into our own troops and civilians a justifiable feeling of security which allows them to pursue their normal tasks unhampered by a constant dread of air attack.

During the First World War, the French used barrage balloons to protect important buildings—army headquarters at Chalons-sur-Seine and steel mills at Nancy. The English experimented with a steel net suspended by three balloons about five hundred yards apart. This network of steel cable was designed to enmesh enemy planes and bring them down. The balloons were sent up in series, holding one huge network of steel. This proved unsuccessful. The Italians used barrage balloons in a manner similar to the present system to protect Venice and its shipping. The Americans used balloons solely for observation, utilizing the Caquot French balloon. At the end of the war, we had seventeen balloons of our own manufacture at the front. We had one hundred ninety balloon companies in service, of which about ninety were at the front.

Our modern balloon is flown separately and is equipped with only one cable, which is attached to the balloon by means of rigging and is paid out from a winch. The various ropes that dangle from the present-day balloon are mainly for the purpose of ground handling—they form the rigging by which the balloon may be ground-maneuvered and bedded down. The damage to aircraft is done by the anchoring cable and any lethal devices which may be attached.

## CLASSIFICATION

Barrage balloons may be classified into three general types: high altitude balloons, low altitude balloons, and

very low altitude balloons. The three different classifications of balloons may be either of the dilatible or the ballonnet type. The dilatible type balloon envelope is a single cell. The envelope is of a four or more lobe design held in this shape by a series of elastic cords, known as expansion cords, which tie across opposite grooves for practically the entire length of the envelope. As the balloon ascends, the lifting gas expands, the cords elongate, and there is an increase in volume of the envelope. On descending, the lifting gas contracts, the tension of the elastic cords is reduced, and the volume of the envelope is reduced. In construction of the envelope, the panels are joined to form gores which are subsequently joined to form the envelope.

The ballonnet type balloon is divided into two chambers, gas and air, separated by a diaphragm. The diaphragm forms the partition between the gas and air chambers of the balloon and is attached to the envelope proper at approximately one-half the distance between the equator of the balloon and the bottom of the envelope. It is so designed that when the ballonnet compartment is full of air, the diaphragm at its uppermost point will reach the equator line and when the compartment is empty it will lie along the floor of the envelope. In the envelope construction, the panels are joined to form rings which are subsequently joined to form the envelope. As the balloon ascends, the lifting gas expands and depresses the ballonnet diaphragm, forcing the air from the ballonnet out through the air valves in the bottom of the envelope. On descending, the lifting gas contracts, and when the pressure of the wind exceeds the pressure in the ballonnet, the air enters through the ballonnet air scoop, maintaining the external shape of the balloon. During ascent, the expansion of the lifting gas forces the air from the ballonnet until it is empty, and the diaphragm lies against the envelope. If ascent continues after the ballonnet is empty, expansion of the lifting gas continues, increasing the internal pressure in the gas compartment. To prevent the pressure from becoming dangerously high, an automatic gas valve is provided on the side of the envelope to permit the escape of the gas.

The envelope of the very low altitude balloon is approximately thirty to thirty-three feet in length and ten to twelve feet in diameter, as compared with the low altitude balloon which is approximately seventy-five to eighty-five feet in length and thirty to thirty-five feet in diameter, and the high altitude balloon which is approximately 110 to 120 feet in length and thirty-five to forty-five feet in diameter. All three types of balloons are constructed of two-ply bias, neo-prene coated, long-

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1—Dilatable type balloon, bedded down. 2—Elastic shock cords inside dilatable balloon. 3—Ballonet balloon being walked to the winch. 4—Ballonet balloon with air-inflated fins, flown close-hauled. 5—Ballonet balloon bedded down with fins furled.

#### ORGANIZATION

The basic tactical unit for barrage balloons is a separate battalion. This separate battalion consists of forty-three officers and 1,106 enlisted men. It operates both tactically and administratively. The separate battalion is made up of four batteries: a headquarters battery, containing a service platoon which furnishes weather data, operates the inflation gas service section, and maintains the balloon repair section; and three lettered batteries A, B, and C. A lettered battery consists of an operations platoon and two balloon platoons, each platoon containing nine balloon squads. A battery is organized to operate eighteen balloons. Thus a battalion has control of fifty-four balloons. These balloons may all be bedded down, or all or any part may be flying at whatever altitude is desired.

Each battalion has its own weather section which furnishes the weather forecast to all batteries. It is important that this section be highly trained because it is the weather data received which determines whether or not the balloons fly and at what altitude it is safe to fly them. A battalion maintains and operates its own hydrogen generating plant. It is the responsibility of this section to see that inflation gas in sufficient quantities

staple cotton fabric. At present, experiments are being conducted in an effort to produce a more durable, lighter fabric so as to give the balloon more lifting power.

A smaller ballonet balloon than the one first issued to barrage balloon organizations is now in production. It is an improvement over the earlier ballonet in that the fins are air inflated and are not dependent on gas pressure to give them the stiffness necessary to provide aerodynamic stability to the balloon. This balloon may be bedded down with a smaller crew and is less vulnerable to ground storms than either the earlier type ballonet or dilatable balloons. Its fins may be furled while on the ground. In normal weather it may be flown close-hauled while moored to the bed, so that its nose will head into the wind at all times.

is always present at the balloon sites. Each battalion maintains and operates a rigging and fabric repair section. If a balloon is shot down or damaged, this section repairs the balloon, if possible, and places it back into service. The battalion supply section must at all times have balloons on hand that can be placed in service.

A balloon squad is required to prepare and maintain the site upon which the balloon is located. This site is the area which contains the balloon bed, winch position, the ascension point, and the balloon maneuvering area. It is desirable that a balloon site have an area at least a hundred yards in diameter and clear of all obstructions above the ground which might damage the balloon. Within this area is constructed the balloon bed, the dimensions of which depend upon the type of bed constructed. The balloon squad must be able to keep its balloon flying at the required altitude at all times. This means that if the balloon is lost or destroyed, a spare balloon must be placed in flight without delay.

#### TACTICS

A balloon barrage consists of the personnel and equipment necessary to fly a given number of balloons in one area for the protection of that area. The size, location, and presence or absence of natural obstacles to avenues of hostile air attack, as well as the presence or absence of anti-aircraft gun defenses, will determine how many and what types of balloons will be required. As a rule, however, the desired minimum number of balloons in a barrage to protect a small objective is thirty-six. The defense of a large area may call for a hundred or more balloons.

For defense against dive bombers, barrage balloons must be clustered closely about the defended area, leaving, however, sufficient spacing between balloons to avoid entanglement of the cables in shifting winds.

During air raids, each balloon squad at each site in a barrage must be able to fly its balloons at the required altitude, or to quickly close-haul or bed down its balloon in order to give precedence to other weapons or methods of defense, or to allow friendly airplanes to enter the area.

The next higher command, when more than one battalion is required to defend an area, is the group. The group is set up mainly as a tactical organization and consists of thirteen officers and ninety-three enlisted men but has no balloons organically. The geographical location will to a great extent determine the requirements, responsibilities, and functions of the group.

Each balloon site is connected by telephone to the Battalion Command Post. The Battalion Command Post may be connected to Group Command Post or directly to the Anti-aircraft Control Headquarters. This communications net makes it possible to pass commands from the Anti-aircraft Control Headquarters direct to the balloon site with the least possible confusion and delay.

Situations at port of embarkation and other locations along the coast line require that balloons be flown from boats, barges, or piling platforms. Here the matter of communications becomes more difficult and requires the use of two-way radio from site to shore.

There is at present under consideration a mobile barrage balloon battalion which would handle the very low altitude balloon. This battalion could be used to protect troop and supply columns, defiles, river crossings, and similar hostile bombing objectives against strafing by enemy aircraft.

#### CONCLUSION

The maintenance and operation of barrage balloons is new to the armed forces of the United States. We have received from the British a great deal of advice as a result of their recent experiences. Barrage Balloon work is now emerging from its embryonic stage, and though there is still a great amount of development yet to be made before reaching perfection, serviceable, usable, and effective balloons and related equipment are now in the hands of well-trained organizations. Experience has proved that barrage balloons can be and have been effective against hostile aircraft. By further research and actual experience, American ingenuity will prove that the barrage balloon is an important weapon against hostile aircraft.



Defensive fortifications and potential resources are not enough. Wars are won by carrying the fight to the enemy.—HON. ROBERT P. PATTERSON.



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↑ Convoy under an umbrella of kite balloons, a midsize variety of the barrage balloon. Kite balloons have accounted for at least six enemy aircraft, and have saved an estimated 200 ships.

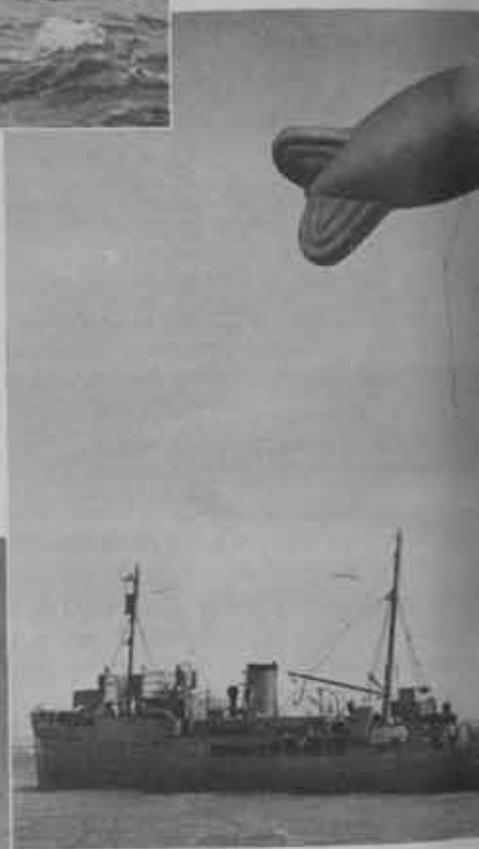
*Photo: British Combine*

→ This one is a regular barrage balloon, protecting a vessel from dive bombers.

*Photo: British Combine*

↓ Kite balloons being transferred from the balloon launch to deeply-laden merchant ships.

*Photo: British Official*



# ARRAGE BALLOONS AT SEA

## Britain Protects Merchant Ships



↑ Kite balloons in a depot barge of the Kite Balloon Section of the Royal Navy. A naval lighter stands by to take a balloon to a merchant vessel.

*Photo: British Combine*

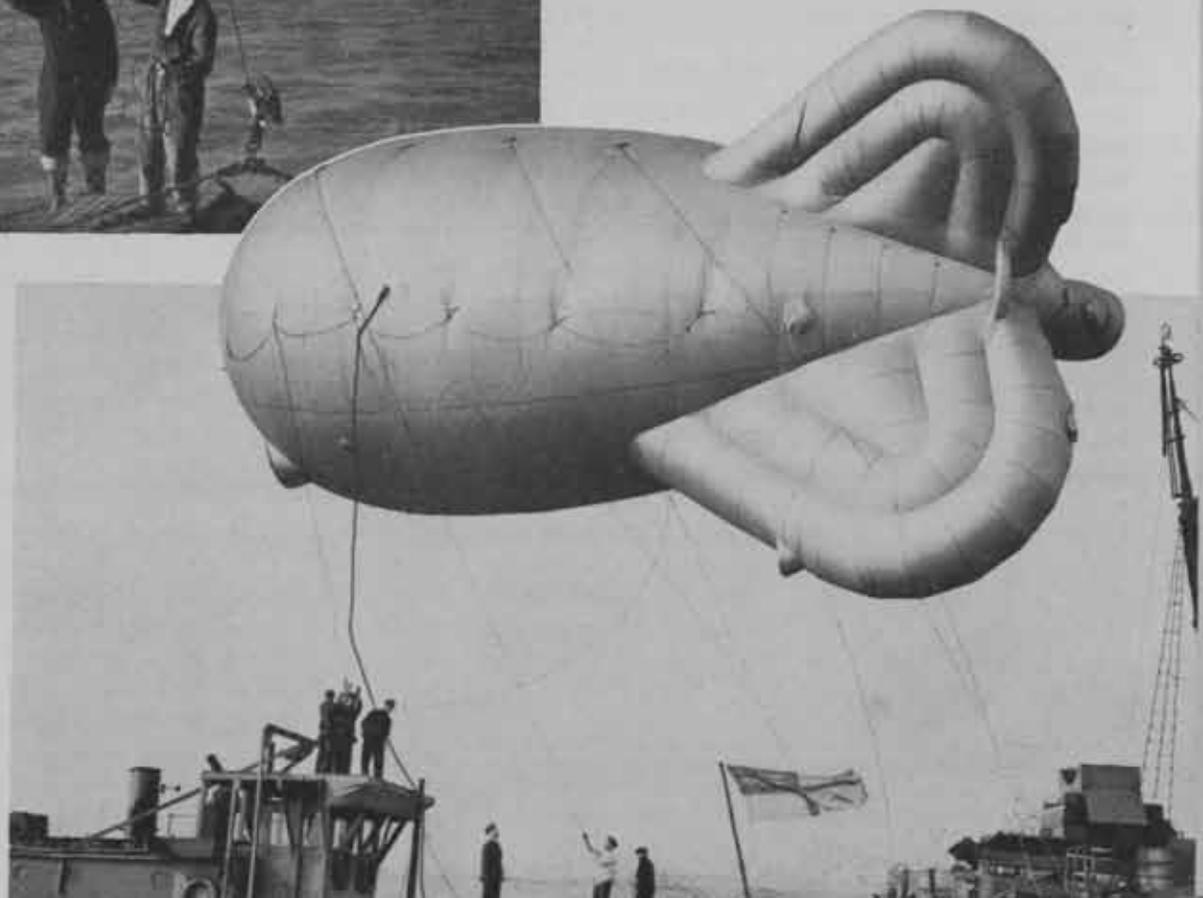


↑ Handling a balloon cable as the convoy sets sail.

*Photo: British Official*

→ Raising up — the merchant sailor's guardian.

*Photo: British Combine*



# THE TASK AHEAD\*

By Major General Joseph A. Green

I appreciate the honor of being here this morning and welcome the opportunity to talk to you young officers for a few moments at a time when you are on the point of joining your first commands. But first of all, I want to congratulate you on having successfully completed the course at this school. You would not be here today to receive your commissions if there was any doubt in the mind of General Spiller or of the school faculty as to your ability to command men with firmness and justness and to instruct them properly in the use of antiaircraft weapons. The school has decided that you possess the initiative, the intelligence, the energy, and the alertness of mind that must be possessed by the successful antiaircraft officer. The course is a hard one, but it also is an excellent one, for commanders everywhere are enthusiastic regarding the type of young officers turned out by this school. I believe that its product is so highly regarded because those responsible for its operation keep constantly in mind that its sole purpose is to turn out officers qualified to command antiaircraft units, and that carries with it physical fitness, a sound knowledge of gunnery, and a capacity for leadership. The school in the limited time available has done all it can to equip you professionally, but it is only a beginning, and it will be necessary for you constantly by your own efforts to further your professional knowledge.

By a capacity for leadership I mean the courage and the evident high purpose that commands the respect and loyalty of the men serving in your command. Many of the outstanding soldiers of today and of days gone by, realizing the importance of leadership, have written on that subject. You can greatly increase your own capacity for leadership by reading or studying some of these writings. The earliest treatise on this subject of which I have knowledge was by General James Wolfe, who in 1759, with his few thousand men, scaled the Heights of Abraham at Quebec and there, by his victory, added half a continent to the British Empire. There is in the library at Fort Monroe a very small volume entitled *General Wolfe's Advice to His Young Officers*.<sup>1</sup> I discovered that book there years ago. General Wolfe was telling his officers how to lead, instruct, and inspire their men. He recognized the value of leadership. One of the best essays on leadership that I have read recently and that is available to all of you was written by General E. L. Gruber who, until

his untimely death about a year ago, was Commandant of the Command and General Staff School. This essay was published in the *Command and General Staff Quarterly* and reprinted in the *COAST ARTILLERY JOURNAL*. You must remember that when you take your places in the units to which you are being assigned you will be called upon to instruct, to train, and to look after the well being of others who fill lesser places in the units. Those are definite leadership responsibilities. All of you have had at least three months' service in our replacement centers or elsewhere so know the kind of young man of which our Army is made up today. I am sure you will agree with me that by and large they are splendid, intelligent, patriotic young Americans. They are eager to come to battle with the enemy, lick him completely, and get the job done, but that requires understanding leadership. We look to the graduates of this school to provide that kind of leadership.

We all know that up to the present time the war has not been going as we would like to have it. I am very much afraid in fact that if a warrior from Mars were afforded an opportunity to make a quick survey of the military situation on this battered old earth of ours and were told of the long string of enemy victories he would almost surely place his bets on the final outcome of the war on the Axis powers. But if he had knowledge of the enormous industrial resources of this country and of the determination of its people and knew that we are today training an army, ever increasing in size, just as rapidly as it can be equipped, he surely would cover his bets. The expansion that this Officer Candidate School has undergone in the past year is, I think, symbolic of the expansion of the army as a whole, and of the increased rate of production of essential war materials—guns, ammunition, planes, tanks, ships, transportation, communication equipment, and of a thousand other items.

I have no doubt, and I am sure that you have none, that complete victory ultimately will be ours, but we are fighting resourceful enemies, and herculean efforts on our part are necessary. Our troops on the battlefield have got to be better trained and better led than our enemies. We can not afford to make the mistake of underestimating their fighting qualities. A mistake of that kind would surely result in lost battles, lost campaigns, and possibly a lost war. You and I as soldiers must do all we can to see that the American Army is the best army in the world. I know that you first as platoon leaders and later as battery, battalion, and higher commanders will do your part to see that your troops are so well trained that Nipponese or Nazi fliers

\*General Green, President of our Association and Commanding General, Antiaircraft Command, Army Ground Forces, delivered this address to a class graduating from the Officer Candidate School at Camp Davis, North Carolina.

<sup>1</sup>Abstract on page 42.

once having experienced the fire of your guns will have no desire to undergo that experience a second time.

The successes that our enemies have attained on the far flung battlefields of the world prior to our entrance into the war and subsequent to that time have in nearly all cases been due to the fact that in each particular theater they managed to have air superiority. At first glance it might seem that this business of air superiority is merely one of being able to manufacture more planes and train more pilots than can the Germans and the Japs. We can do that, and we are doing it, but you must remember that although our bombers can get overseas under their own power our smaller planes—pursuit, attack, and observation—must be transported by ship. It is evident, therefore, that we must take every possible measure to conserve our aircraft for air combat and for attack on enemy positions. There is a great deal that the ground components of our Army can do to assist in maintaining this air superiority. None of these components is in a better position to aid in this than is the antiaircraft artillery, for if we are really good, we can defend our multitude of airdromes, and we are expected to do that, and so prevent the wanton destruction of our planes on the ground; and we can make the air over our own front line divisions and corps so untenable for the enemy that our troops if on the defensive will be able to hold their positions, and if on the offensive will be able to advance. Again if we know how to use our weapons, we will be able to defend our ports of debarkation, our depots, and our lines of communication. If we can successfully accomplish these missions, it means that we will be able to release a large part of our air force from purely defensive missions and to leave them free to cripple the enemy by attacks on his troop concentrations and other critical areas. Battles can not be won by purely defensive measures. Don't worry about guns and equipment. You can take my word for it that they are now coming off the line in ever increasing quantities. The thing to remember though is that to accomplish our mission we must know how to use the excellent guns and fire control equipment placed in our hands and have our antiaircraft combat teams well trained and well led.

A short time ago there was held at Fort Benning a three-day demonstration that was witnessed by practically every corps and division commander in this country and by many other officers of high rank. General Spiller, Colonel Jackson, and I were among those who were fortunate enough to be present. On the final day there was staged an attack by a war strength infantry division reinforced by strong air and tank support. The attack was made against a simulated enemy division. Live ammunition was used during the seven-hour period the attack lasted. It was all very realistic, and I

wish each of you could have seen it. As the problem was staged, the enemy was assumed to have established two very strong centers of resistance on dominating points of land that could be seen from our point of observation. These centers of resistance, prior to the advance of the infantry and tank forces, were softened by artillery fire and air attack. I don't know the number of planes involved, but numerous flights came over during a two-hour period. These dominating points were literally chewed to pieces largely by bombs from diving and low-level flight planes. It didn't seem to those of us who witnessed this attack that any one in those centers of resistance could have survived. The positions were finally assumed to have been sufficiently softened, and they certainly were, to permit the infantry to advance to attack, but your Commandant and I both agreed that if the defending forces had been real forces reinforced by two or even one automatic weapons battalion the enemy air attacks could have been broken up, and the machine gun and 40mm crews of the automatic weapons battalion, if well trained and led, could have exacted a terrible toll of enemy planes. Divisions and corps in battle must have automatic weapons protection. Some of you later on will be commanding or serving in antiaircraft battalions that are attached to front line divisions.

Keep in mind always the ultimate and, in fact, the sole reason for organizing, equipping, schooling, and training antiaircraft batteries. That purpose is to shoot down enemy aircraft—not merely to shoot at them, but to bring them down. To do that the guns must be so effectively manned that when the fleeting opportunity does come each man in every one of your gun crews will know just what he is to do and how to do it. In other words, when the critical moment arrives, there must be perfect timing and perfect teamwork. It won't work out that way unless you as their leaders have developed a very smoothly functioning team—to do that you yourself have got to know the job of every man in your gun and fire control crew. That is going to require continuous and diligent work on your part.

I am afraid that I have painted a pretty gloomy picture for you on your graduation day after three months of the hardest kind of work on your part, for I have been telling you that your work has just begun; that as leaders of men you have taken on your shoulders a most serious responsibility; and that with you and those who have preceded you from this school and those who will follow you rests the responsibility for manning effectively the thousands of antiaircraft guns that almost surely will be employed in this war before complete victory finally is ours. You have a hard job ahead, but I have confidence in your ability to deliver the goods.



# Instructions for Young Officers

By GENERAL WOLFE

When a young gentleman betakes himself to the profession of arms, he should seriously reflect upon the nature and duties of the way of life he has entered into, and consider, that it is not as the generality of people vainly imagine, learning a little of the exercise, saluting gracefully, firing his platoon in turn, mounting a few guards (generally carelessly enough) and finally, exposing his person bravely in the day of battle; which will deservedly, and in the opinion of judges, acquire him the character of a good officer: no, he must learn cheerfully to obey his superiors, and that their orders and his own be punctually executed.

As there must of necessity be in a new battalion many young and uninformed officers, I shall, as briefly as I am capable, inform them what I think their duty, and what consequently is expected from them.

They are, without loss of time, to make themselves perfect masters of the exercises of the firelock, that they may be able to assist in training the young soldiers in arms.

They are constantly to be present at roll-calling; and so soon as they can make themselves acquainted with the names and persons of the men in the companies they belong to; and so soon as possible with their characters, that they may know the proper subjects to encourage, and point out as examples, as well as those whom it will be necessary to keep a strict hand over.

They are to observe that the men are dressed in a soldier-like manner, and conformable to the orders of the regiment.

They are to get exact lists of the mens necessaries, and as well as the captains, of the arms, accoutrements, and stores.

They under the captains are to be answerable that the proportion of the soldiers pay, ordered by the commanding officer, (*viz*) two shillings and four pence per week, be laid out in good and wholesome provisions.

They are to visit their companies quarters at least thrice a week, see that they are kept clean, well aired, and beds made; and that if the landlords have any just cause of complaint against the soldiers, or the soldiers against the landlords, the aggrieved may, by application through the proper channel, find redress.

They should frequently chuse the hour of the soldiers dining for their visitation, that they may judge whether their victuals are comfortably cooked; they should particularly at that hour inspect the quarters of those men who are billeted upon houses of the lowest class, as they are most likely to be prevailed upon, by the disobedient soldier, to give him liquor for his meat.

They must now-and-then occasionally go round the quarters between nine and eleven at night, to see that the men keep regular hours conformable to orders, not always trusting to the reports of the sergeants.

A young officer should never think he does too much; they are to attend to the looks of the men, and if they are any thinner or paler than usual, the reasons of their falling off may be enquired into, and proper means used to restore them to their former vigour.



For the immediate present, the all-important issue is that of winning the war—winning it as soon as possible and winning it decisively. Into that we must put our utmost effort—now and every day until victory is won.

A bitter armed attack on human freedom has aroused mankind to new heights of courage, determination, and moral strength. It has evoked a spirit of work, sacrifice, and coöperative effort. With that strength and with that spirit we shall win.—HON. CORDELL HULL.

# The German 88mm Gun

By Colonel James C. Crockett, General Staff Corps

The German 88mm antiaircraft gun has lately been proclaimed by many commentators and news analysts as the weapon which brings success to German armored operations. The same groups once proclaimed blitzkrieg and later the Stuka dive bomber as the source of that success. The source, however, could better be sought in the tactical training of the battle leaders.

The German 88mm antiaircraft gun is a highly developed modern gun—probably not as good as our 90mm antiaircraft gun, but nevertheless an excellent weapon.

In the fall of 1935 the writer visited an antiaircraft battery stationed near Furstenwalde, outside Berlin. The personnel of the battery belonged to the *Luftwaffe*, the German Air Force, which is charged with all antiaircraft operations. The battery consisted of four 88mm guns as pictured below. These guns were towed by heavy cross-country half-track vehicles in each of which rode about twelve men of the gun crew. Four other similar vehicles, interchangeable for towing the guns, carried ammunition for the battery. Accompanying the battery was a large electrically-operated range finder. Four mechanical hand-operated range finders were also with the battery as auxiliary means. As explained by the Germans, the gun was primarily an antiaircraft weapon. It could be traversed 360 degrees and could be elevated to almost eighty-seven degrees. It could be depressed to a minus three degrees which made it suitable for secondary use as an antitank gun. The Germans at that time did not stress the antitank characteristics of the gun, nor is it likely that they then fully realized its value as an antitank weapon.

The approximate characteristics of the 88mm guns of the battery visited were as follows:

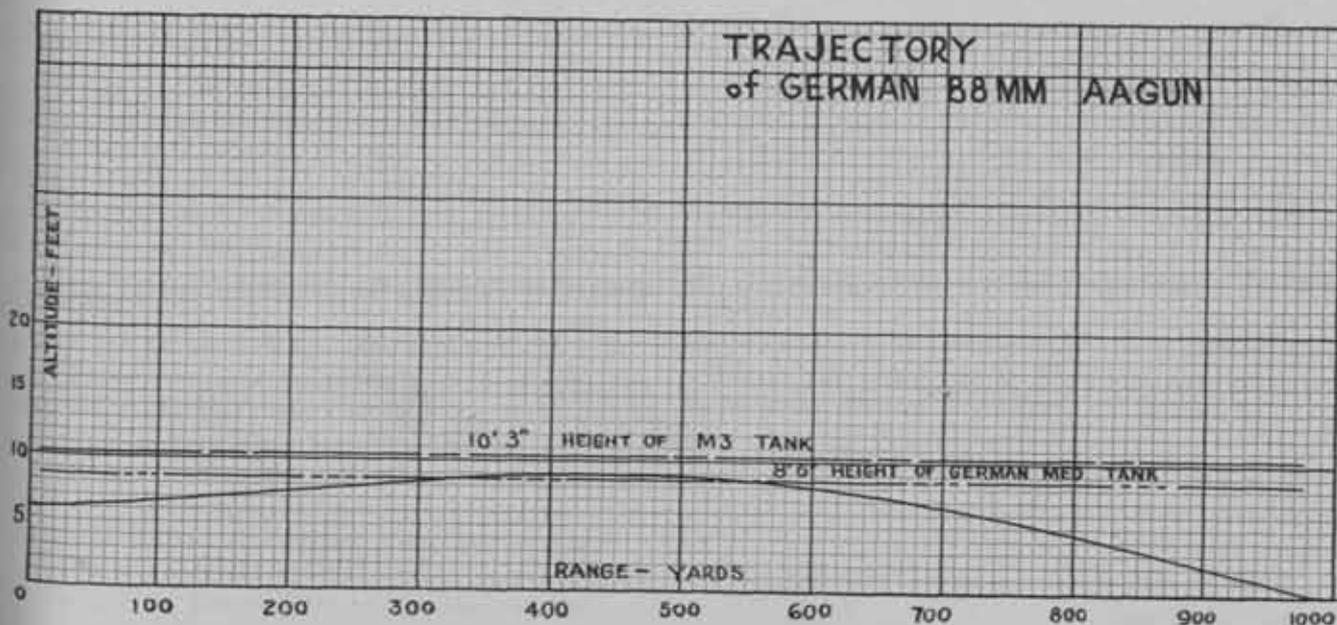
Length of barrel	16 feet
Elevation	+87, -3 degrees
Muzzle velocity	2,900 feet per second
Maximum range	16,000 yards (9 miles)
Weight in firing position	11,000 pounds
Weight of projectile	19.8 pounds
Rate of fire	about 12 rounds per minute

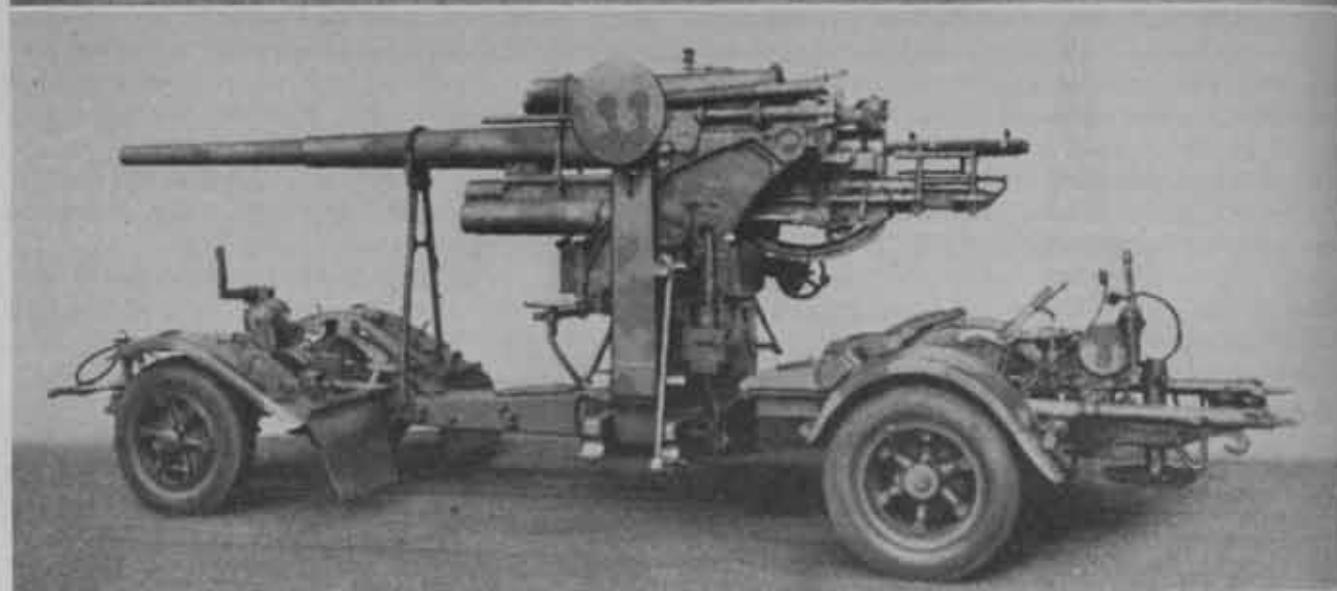
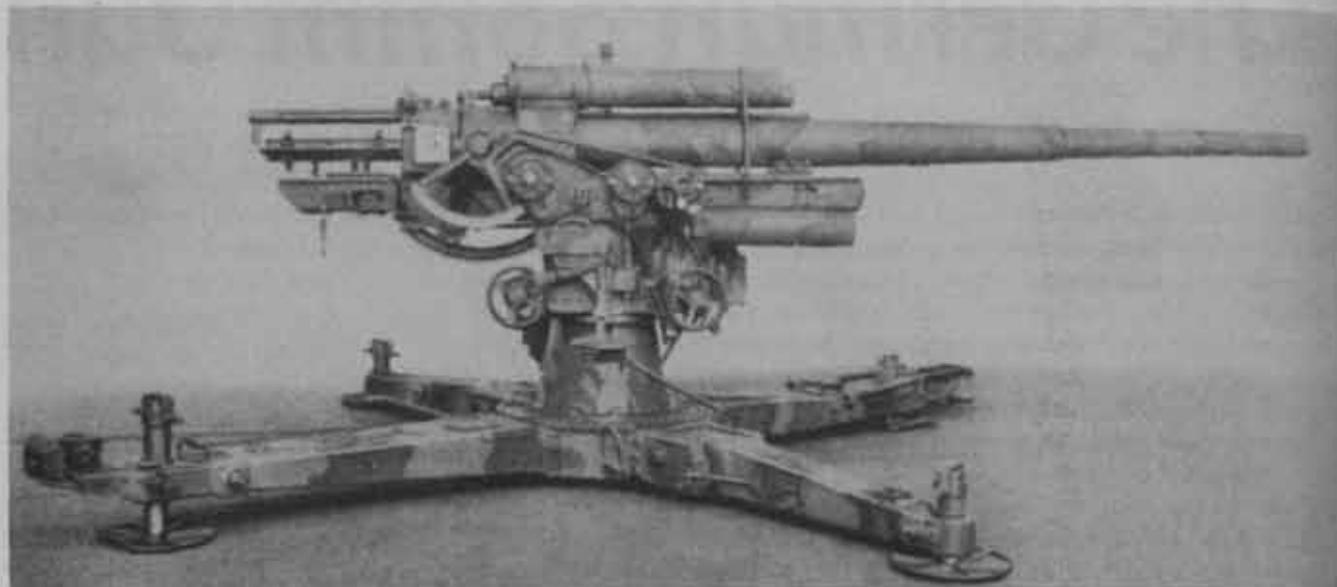
The Germans undoubtedly learned a great deal concerning the tactical handling of these guns in the campaign on the western front. There they had great success using it to fire into the apertures of fortified positions. Because of the high velocity, approximately 2,900 feet per second, the projectile would penetrate the armor of the French and Belgian fortifications and jam the revolving cupolas. It is easy to see how the Germans drew the conclusion that the gun would be a good weapon against tanks.

Having found the antiaircraft gun suitable for secondary use as an antitank defense weapon, the Germans use it for this purpose when the tactical situation permits.

The guns of the battery visited and the guns used by the Germans in Libya were on the same model.

The antiaircraft gun with its high velocity and flat trajectory is especially suitable for accurate, direct fire against tanks. The diagram shows the approximate trajectory of the 88mm gun, and indicates clearly the danger space of a tank when under fire from this gun. The Germans have several other antiaircraft guns





which they use as antitank guns when the tactical situation demands. For instance, in their Armored Army troops a battalion of thirty-six AA guns is available for antitank use in addition to the regular antitank battalion of forty-two guns. In their armored divisions there is usually an antiaircraft battalion consisting of about thirty-three AA guns which may be used for antitank defense in addition to the antitank battalion of forty-eight AT guns. But all of these antiaircraft and antitank weapons are without armor protection. If given such protection, they would for all practical purposes become tanks. Consequently the personnel which serve the pieces are highly vulnerable to rifle, machine-gun and artillery fire. It is the proper rôle of tactics of opposing forces to locate these guns by reconnaissance, then to neutralize them by infantry and artillery fire and finally when neutralized to destroy their organization by tank action.

There are three prerequisites for successful armored attack. These are:

1. Surprise
2. Suitable terrain
3. The absence of enemy massed antitank defense.

The third of these prerequisites is assured for an armored unit by the use of its superior mobility in avoiding areas of massed antitank defense, or if this is impossible by neutralizing these areas by weapons most suitable for attack against these antitank means. The selection of the proper weapons and their combined employment utilizing suitable terrain features is again the rôle of tactics.

The 88mm gun, like all other successful weapons of the German Army, is under constant development, and we may expect to find an improved model in the next battle. In fact an improved model on a self-propelled mount can already be found as part of the XXXIX Armored Army troops on the Russian front.

Similarly any other weapon, the special characteristics of which make it highly suitable for a particular use, will be employed by the Germans for that use.

The ever increasing technical development of special weapons makes these weapons more and more effective when used under *proper conditions*, i.e., when proper tactics are applied.

However, this technical specialization continually narrows the field of tactical employment. In other words the higher the technical specialization, the more specialized becomes the tactics of employment. The experience of the present war shows clearly that as the technical development progresses so must the tactical training be more thorough. Today's battles can not be won by tactically untrained leaders.

Modern technical development has brought us specialized weapons never dreamed of in earlier wars. But by the very nature of these weapons, they are useless unless employed in combination with the proper auxiliary and supporting special weapons.

The art of combining the proper weapons—the art of employment of the proper weapons—in a given situation is the art of modern battle tactics. This the German has long recognized and long stressed in his teaching of tactics at the *Kriegsakademie* (War College).

To criticize the American tank because it can be knocked out by the German 88mm gun is stupid. The tank—any tank—can be knocked out by a gun of sufficient caliber, for instance by a five-inch or larger naval gun or a six-inch or larger field gun. By proper tactics the tank is not thrown against such guns. The tank like every other highly-specialized weapon represents a compromise to achieve its definite characteristics. If the armor is extremely thick in order to obtain maximum protection and the gun within the tank is extremely large in order to obtain maximum fire power, then the power plant must be large, heavy and powerful. Such a tank also requires added weight in ammunition and uses more fuel. We thus end with a monster so heavy it has lost its mobility. By compromise we have a tank which has sufficient armor for normal protection, we have a tank gun which will penetrate any armor at reasonable fighting ranges and the tank still has sufficient mobility to maneuver speedily.

No matter how thick and tough the armor of a tank

is made, there will always be a gun which can knock it out, for the simple reason that the tank must have mobility while the defending gun can be emplaced in a stationary position. But the great power of this emplaced gun is in turn neutralized by the mobility of the tank, and so on and on. It does not follow that the tank is no good or that the gun is no good. It does follow that to conquer either, advantage must be taken of its weaker or limiting characteristics and again this is the very essence of tactics.

The fighting crew of the German 88mm AA gun is extremely vulnerable as can be seen. The crew is not protected against rifle or MG fire by armor. If it is, such armor is only a small shield and affords protection only in one direction. The gunners have very little or no protection. Thus one or two lone infantrymen with rifles taking advantage of cover which can be found even in the desert could infiltrate within rifle range and quickly kill the gun crew and render useless the 88mm gun. Or to give another example, an artillery howitzer under cover at 3,000 yards range could kill the 88mm gun crew by a few bursts of high explosive over its position.

To attack frontally the 88mm gun with a weapon which the gun was designed to combat or with a weapon which the gun can most easily hit does not prove the gun will defeat all armored operations or that the tank has outlived its usefulness. It does prove, however, that the commander is using poor tactics.

We have seen the day in which the blitzkrieg was considered the magic key to victory, and then the day in which the Stuka dive bomber held the same place. Now we are passing through the days when the magic key is the 88mm gun. Let us remember that sound tactics have always been the key to battle success, and that victory lies in skillful, educated leadership and in the fighting qualities of troops.

EDITOR'S NOTE: *The success of the German 88mm gun against Allied tanks appears to have resulted largely from the nature of its camouflaged emplacement half-buried in desert sand when used against Allied tanks lured within punishing artillery range.*



# Buy War Bonds!

# MORALE? It's Wonderful!

By Major Roger W. Chickering, Coast Artillery Corps

The morning is foggy again. That makes five days in a row. The three men look out of their small, not too warm concrete observing station, and remark: "Well! Here we go again! Another day shot before it ever starts!"

"They didn't bring up any new reading material on that last truck, did they?" the corporal in charge asks hopefully, knowing perfectly well that he has read every book and magazine at least three times.

"No luck there," remarks Mike, the No. 1 Observer. "And besides that, the checkerboard is broken and so is the radio. I'll go nuts if anybody suggests another game of cribbage."

"Even the local jack rabbits hole up in this kind of weather," glumly observes Eddie, the Spotter. "Why don't we join a Lonely Hearts Club? Then at least we'd get more mail."

This, or something very much like it, is a situation common to the Seacoast Artillery. These men have gone through a stiff course of training and have been assigned to remote base-end stations, or searchlights, or gun batteries. The opportunities for recreation and entertainment are extremely limited. And after a certain point, a man's ingenuity in thinking up new ways to pass the time between hours of duty becomes sterile. After this process has been extended over the many months of constant field duty since Pearl Harbor, it frays a man's nerves. Quite understandably, morale takes a nose dive.

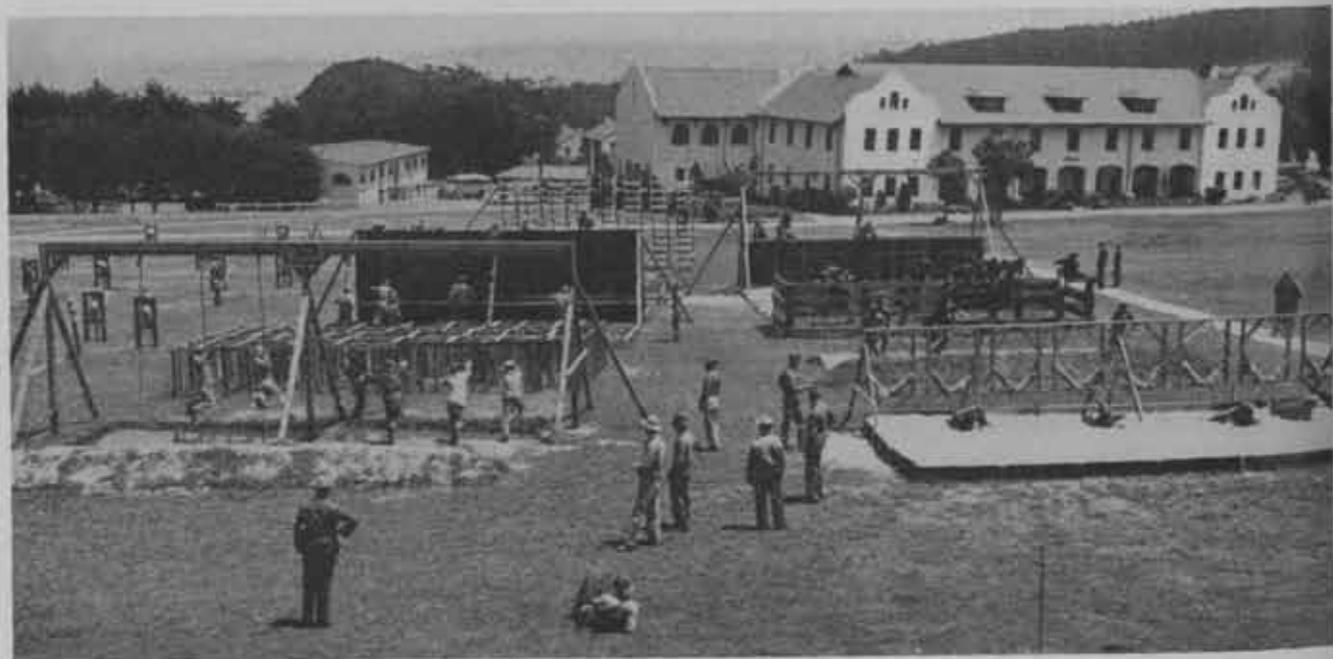
In an attempt to bolster morale and give the troops

from the outposts a complete change of scene, a Special Training Program has been set up at Fort Winfield Scott. Troops from sub-posts are brought into this special training area for periods of one week, in groups of approximately two batteries per week. All batteries have now completed the first round of the program, so it is possible to get a good sample reaction to the scheme from the troops. In a word, that reaction has been "Solid!"

Here is how it works:

Two batteries are notified that they are to move to the Special Training Area on a certain date. They are at first luke-warm, due to the fuss of moving; but when it dawns on them that the barracks they will use at Scott have all bunks, lockers, and mess gear in them, and that they will not be called on for any guard or fatigue details during this week, they perk up some. So leaving a minimum maintenance and security detail at their field positions, they move off, still rather skeptical.

On arrival at Scott, they find that one hour is enough to get set in their new home. After a quick checking over by the Medical Corps, they begin to look around and see what this business is all about. Looking out of the window, they see an athletic field, a gymnasium, a chapel, a theater, a bayonet course, AND an obstacle course. "Looks pretty good," is the commonest comment. For the first time in months, they can eat off china, take a good hot shower, buck up their equipment, and have full use of a complete day room. "Nor



Little David.

Signal Corps Photo

bad at all." But the clincher is Passes. There are lots of passes of sufficient length to allow everybody to go to town several times during the week.

So now they begin to like the whole idea. The first day of the special program might catch them a bit unawares, for the emphasis is on physical exercise and general toughening up. Many of the men have callouses in the wrong places, and muscles in storage. That condition is soon under control. An hour of good stiff close-order drill with a brisk band makes the feet move. Then an hour of bayonet drill on the prescribed course unkinks shoulder and back muscles. Follow this closely with a long athletic period, during which races are held for distances up to a mile; a six-foot push ball is man-handled; push-ups, sit-ups, and pull-ups executed; and various ball games organized.

Then to the obstacle course. Due to limitations of space, the course is short. But as that song writer has it, "Little David Is Small But! Oh My!" In about 150 yards, there are fifteen obstacles, including rope swings, rope climbs, a ten-foot wall, a seven-foot wall, mazes, hurdles, ladders, railwalks, dive throughs and water hazards. Of the several thousand men who have negotiated the course so far, only about ten per cent do it under a minute. The record so far is forty-four seconds, but there are very few men who have challenged this mark.

The average time is about seventy seconds. This time might seem almost too short but, when the course is properly negotiated, a great deal of exercise for all parts of the body is packed into those few seconds. The gasping and panting at the finish line attests to the rigor of the course.

That the course is not too rugged is evidenced by the fact that very few casualties have resulted, and all of these hurts have been minor ones. A splinter here or there, or a chafed knuckle here are the usual injuries.

Any claim that the American soldier hasn't got plenty of vigor, and to spare, will be loudly disputed by this post. When, after a full day's exercise, a large percentage of the troops will have another go at Little David, just to see if they can't make better time. These troops can never be called lethargic or willing to sit down just because nobody gave them something to do.

Then on another day, the program calls for drill in Infantry tactics. Included in this drill are extended-order, counter-infiltration, and counter-paratroop tactics. All of these exercises are carried on at a brisk rate, involving plenty of running and dropping into the prone position for riflemen. Follow this drill with another run at the bayonet course, more athletics, and the obstacle course once again and it is no wonder that chow time is even more popular than usual.

Saturday morning, the troops are taken on a ten-mile hike. For the most part this hike is varied by the batteries so that the troops can be taken over routes and terrain new to them, serving to acquaint the troops better with the locality. For the first program, this



Ooops. Slipped.

Signal Corps Photo

hike has been made without packs, but as the individual batteries return for their next Special Training Periods, it is planned to make the hike with packs.

Following a complete lay-off on Saturday afternoon and Sunday, the program provides more close-order and extended-order drill, more bayonet instruction, and much more athletics, including that obstacle course. Then a full field inspection is held by a representative of regimental or HD Headquarters. The Seacoast Artilleryman, living as he does, near more or less permanent installations, is not often called on to pitch his tent and display his equipment. This formation was included in the program not only as a fine way for higher headquarters to check on the completeness, the condition, and the cleanliness of equipment, but also to instruct the troops against the time when they might be called on to make extensive use of this field equipment. On the whole, it has been highly successful on both counts.

The program also provides several hours during the week to be filled at the direction of the battery commanders. These periods are designed to give the battery commanders an opportunity to give his battery such training as is not readily adaptable to the field situation. With the more complete facilities at Fort Scott, the battery commanders are able to expand their field training, to point up observed weaknesses in their



Nothing stale about these men.

*Signal Corps Photo*

batteries, and to observe their troops under semi-garrison conditions for the first time in months. The battery commanders have been enthusiastic over the opportunity for training this afforded.

All during the weekly program, firing of the cal. .22 rifle has been conducted at the indoor small-bore range. Careful rifle instruction has been given to hundreds of men who were eligible to fire this training weapon.

Formal retreat parades are held four times each week. Here again it has been possible for higher headquarters to keep in close touch with the state of training. The progress made in the course of this program is most readily seen in a comparison between the first retreat parade, when the troops are rusty on parade ground formations, and the last one, after a week of hard training.

The practice of awarding the Colors to the battery conducting the best program during each day has added a keen spirit of competition between the batteries. Wherever possible, this spirit has been fostered by inter-battery athletics of all kinds. Frequently there are races over "Little David," the obstacle course, to settle all

bets as to the battery champions. The eagerness to best the rival battery has pointed up the value of this training program. And the Color Battery really sparkles!

Recently a review and presentation was held in honor of a class of thirty-five officers and men who had completed an advance course in first aid conducted by the American Red Cross. The troops reviewed were two of the training batteries, the vast majority of whom had never seen this formation before. They performed famously, both for the deservedly honored first-aid graduates, and in honor of Brigadier General E. A. Stockton, Jr., the commanding general, who was soon to leave on a permanent change of station. The troops enjoyed this formation so much that there have been numerous requests for a repeat performance, should another worthy occasion arise.

Especial emphasis has been laid on giving the non-commissioned officers a large part in this program. These men have carried on a large part of the instruction of all phases of the training. The battery commanders have thus been able to see which of their non-commissioned officers are leaders, which are instructors,

SPECIAL TRAINING PERIOD  
SCHEDULE "A"

Time	Subject	Place	Text	Instructor
<b>THURSDAY</b>				
8:00-11:30 AM	Prepare for movement	Home station		Battery officers and NCO's
1:00- 2:00 PM	Arrival at Fort Scott	Barracks		Battery officers and NCO's
2:00- 3:15 PM	Organization, clean up and physical inspection	Barracks		Battery officers and medical officers
3:15- 4:00 PM	Inspection in ranks, followed by retreat parade	Parade ground	FM 22-5	Battery commander
<b>FRIDAY, MONDAY, TUESDAY</b>				
8:00- 9:00 AM	Infantry drill	Athletic field	FM 22-5	Battery officers and NCO's
9:00-10:00 AM	Infantry tactics	Fort Scott Reser.	See Par. 4e	Battery officers and NCO's
10:00-11:30 AM	Reserved for BC	As directed by BC		BC
1:00- 2:00 PM	Bayonet drill	Bayonet course	FM 23-25	Battery officers and NCO's
2:00- 3:30 PM	Supervised athletics	Athletic field		Battery officers and NCO's and SSO
4:00 PM	Retreat parade	Parade ground	FM 22-5	BC
<b>SATURDAY</b>				
8:00-11:30 AM	Hike, without packs	As directed by BC		Battery officers
1:00- 4:00 PM	Voluntary athletics	Athletic field		None
<b>WEDNESDAY</b>				
8:00-10:00 AM	Full field inspection	Athletic field		Provisional battalion commander and BC
10:00-11:30 AM	Inspection in barracks	Barracks		Provisional battalion commander and BC
1:00- 2:00 PM	Bayonet drill	Bayonet course	FM 23-25	Battery officers and NCO's
2:00- 3:30 PM	Supervised athletics	Athletic field		Battery officers and NCO's and SSO.
4:00 PM	Retreat parade	Parade ground	FM 22-5	BC
<b>THURSDAY</b>				
8:00- 9:00 AM	Inspection in ranks	Parade ground	FM 22-5	Provisional battalion commander and BC
9:00-11:00 AM	Prepare for movement	Barracks		Battery officers and NCO's
11:00 AM	Dinner			
12:00- 1:00 PM	Departure for home station			

NOTE: Fort Scott Small-Bore Range will be available to Schedule "A" batteries from 1:00 to 3:30 PM daily.

and which are drill masters. It has given the non-commissioned officers more self-confidence and the troops respect them more for it. All in all, it has been a fine opportunity for all concerned to get pep and vigor as units, rather than as widely separated detachments.

One of the major benefits of this program has been to bring together the dispersed elements of batteries; to have the battery forget its tactical assignment for a whole week; and to get in and work all together for the first time in months. It, in short, has served to remind Mike and his pals out there in B4S4 that they are still a part of Battery A, who are a darned fine bunch of men to be teamed up with after all.

So now after the week is over, the troops go back into the field feeling fitter, looking forward to the next chance at "Little David."

So the second round of the program is not received skeptically, but with enthusiasm. Morale and its "poor state" are completely forgotten as a "problem."

For this round, the emphasis remains on sound bodies and sound minds. Athletics, bayonet drill, and infantry drill continue. But there will be new features too: instruction in use of hand grenades with plenty of accuracy throwing, gas chamber and incendiary drill, decontamination; and individual protection. And passes, plenty of them!

# Antiaircraft Communications

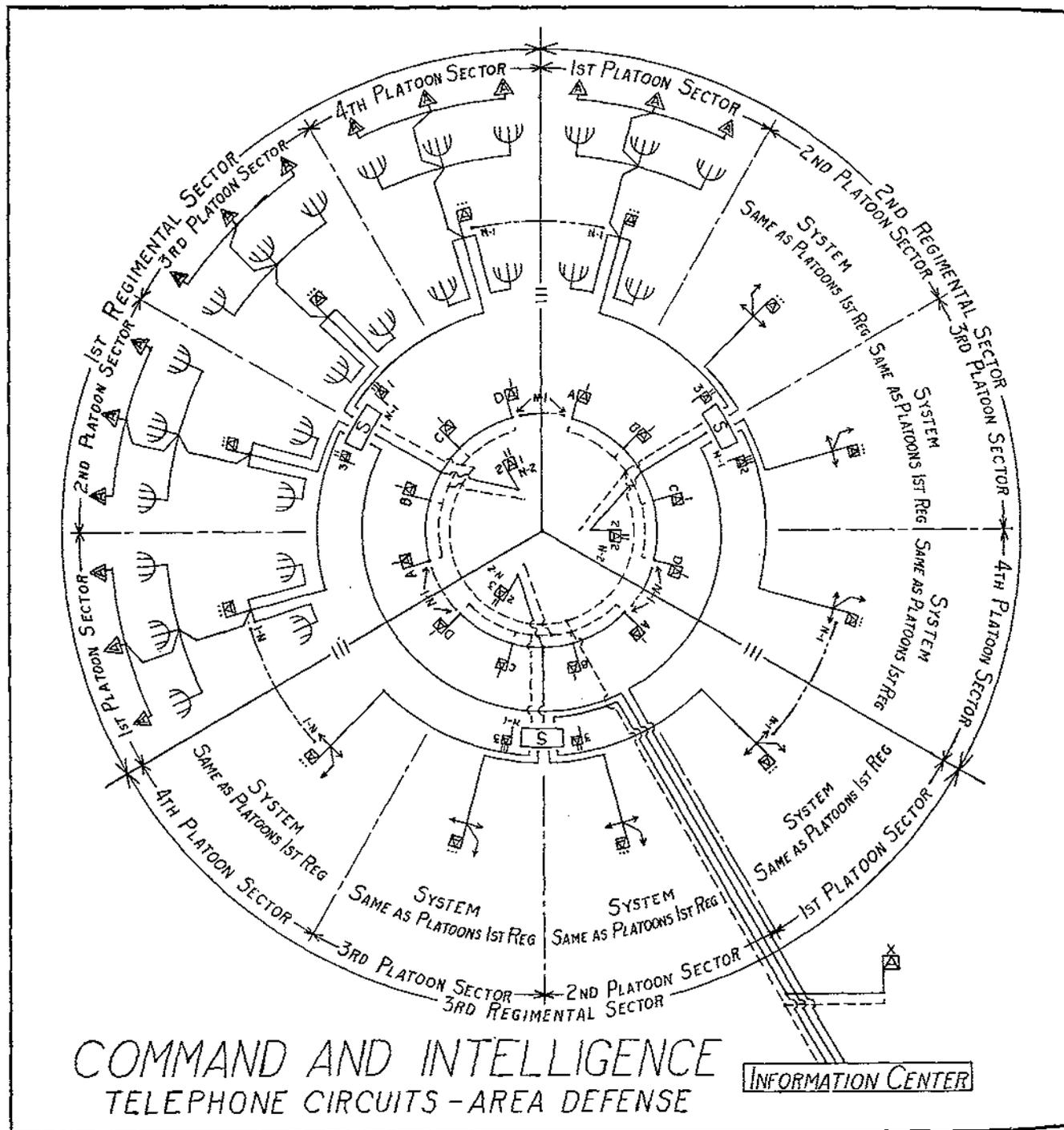
## A Suggested System for a Regional AA Defense Command

By Lieutenant Colonel Peter J. Stevenson, Coast Artillery Corps

The problem of administrative circuits in a large regional AA defense command may be solved readily by following normal patterns. That of intelligence communications, however, is more difficult. The systems described in various AA field manuals need some modification. Hence the two-wire army field system, with its

associated switchboards, is often out of the question. Too much time, obviously, is consumed in switching.

In the search for an alternative, the "farmers' party line" idea has been proposed. Aren't these rural lines famous as disseminators of information? Therefore, it is recommended that the loop-circuit system, linking



all operators at the various positions be installed to save vital time in antiaircraft communications.

It is borne in mind, of course, that there are limits to the number of operators who can use one loop, and likewise limits in terms of message traffic and line transmission. Furthermore, while it is essential that intelligence get through with a minimum of delay, control points where the information can be filtered are clearly needed, both to obviate superfluous messages and to allow evaluation of the data received. Finally, it is only natural that both OP and searchlight positions should be on common circuits terminating at these control points.

The control points are designated as sector filter centers. The searchlight platoon as a tactical organization may be selected as the unit in which all operators would use a common circuit terminating at the sector filter board.

There is also the problem of transmitting this filter intelligence to the gun batteries and remote automatic weapons units outside the gun defense area. This problem may be solved by placing all firing units within a sector on a common loop, which in turn terminates at the sector or regimental filter board. From each sector filter board, a separate circuit may be run to the brigade operations board and control center. Information can be transmitted through the sector board by verbal repeat.

The command circuit set-up is a virtual duplicate of the inner intelligence or gun circuit. All fire units, as well as the sector filter centers, may be linked in a common circuit terminating at the operations board. Here there are a number of key circuits, embracing a number of various positions. The purpose of this arrangement is to permit the instantaneous transmission of firing orders to all firing units. The schematic arrangement of these circuits is shown in the accompanying drawing.

To provide liaison between adjacent gun batteries and searchlight platoon command posts, separate circuits terminating in phones may be established. These are ringing circuits, and are manned only in case of alert.

Where possible, circuits are leased from commercial telephone companies; a minimum amount of field wire is used. The circuits should be the four-wire type, permitting the use of straight amplifiers rather than the complicated repeat amplifiers. These four-wire systems, known as "hot-loops," permit one-way transmission, and terminate at field positions in field telephones. Some commercial lines have developed an auxiliary unit which, when connected to our field phones, increases their effectiveness for this hook-up.

To supplement wire communications, a complete radio system of frequency modulated transmission may be planned in the ultra-high frequency bands. Standard fifty-watt police-type transmitters could be used, with a frequency assignment for each sector and a centralized control system on a fourth frequency. The arrangement could be such that the control transmitter at the brigade operations board could communicate with any particular sector, or all sectors simultaneously. This radio system would not be for general use, but would stand by in case of wire communication failure or alerts. The equipment should be regional, not organizational; it should remain in a given sector and not be moved around when the AA regiments move.

As for administrative circuits, a complete communications system would extend from the Command down to the lower units, and here again a minimum of field wire would be employed. Commercial facilities should be used when possible down to regiments, and in many cases, battalions might lease commercial switchboards and phones.

Generally speaking, from battalions down, leased lines and army field equipment should be used.

Thus it is possible, granted fairly good transmission, for the Command to reach any gun battery through administrative circuits. Moreover, leased PBX switchboards at regiments make it possible for any metropolitan number in one AA region to be connected with any metropolitan number in another AA region through a PBX switchboard at the AAA Command.

Further plans should call for mobile automotive radio installations in the various AA regions which can be connected through wire lines to the administrative telephone network. When such installations are complete, a staff car within thirty or forty miles of an AA region command post should be able to communicate with another staff car in any other AA region.

Supplementing the radio and telephone networks may be a complete leased private-line system of teletype communication. A net in each AA region should link all regiments and similar units with the brigade or region command post. These nets may be in turn connected through private lines to the AAA Command, so that all regions and regiments can be reached by teletype from central headquarters.

For the sake of secrecy, installations should be given code designations which can be easily memorized by the operating personnel.

It is believed that such a system of communications ought to work and put through intelligence on time. This is said with full realization that AA information to a gun battery may be worthless if it is more than twenty seconds old.



# SIGHT DISPLACEMENT And Its Correction

By Captain Earle D. Button, C.A.C.

Firing at a bow-on target demands accurate gun pointing. Because of small lateral probable error and narrow danger space, a pointing error of only one mil in direction will cause a 16-inch gun to be ineffective when fired at a battleship bow-on, at a range of 16,000 yards. Consequently, any known error in lateral pointing greater than  $\frac{1}{2}$  mil or .03 degree must be considered and steps taken to eliminate it. Sight displacement alone may cause errors far in excess of these maximum values.

Errors due to sight displacement will occur only in the case of mobile artillery using a panoramic telescope and aiming point (see fig. 1) in Case III pointing

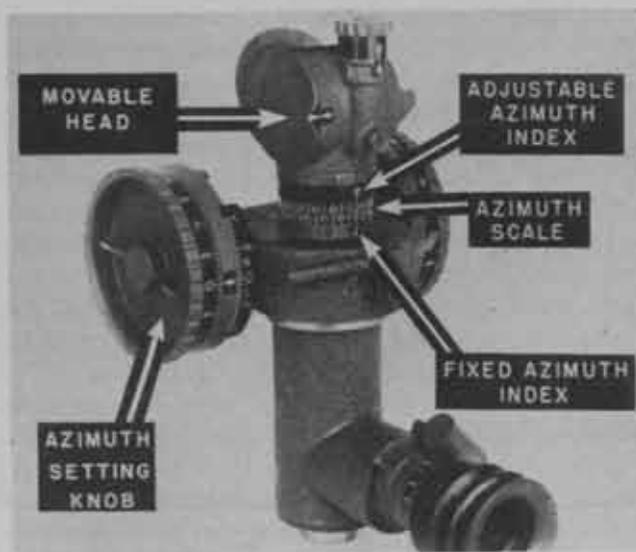


Figure 1.—The M8 sight.

(target not visible from the guns). To orient the sight for this method of firing, the azimuth at which the gun is pointed (found by boresighting, see FM 4-15, par. 176) is set on the azimuth scale of the telescope when the telescope is sighted at the aiming point. In order to point the gun at the proper azimuth for firing, the movable head of the sight is turned until its scale indicates the desired azimuth (taken from the display board); then without changing the sight, the gun and carriage are traversed until the sight is again pointed at the aiming point.

Assume that the sight is mounted on the barrel of the gun directly above the pivot, called the pintle center,

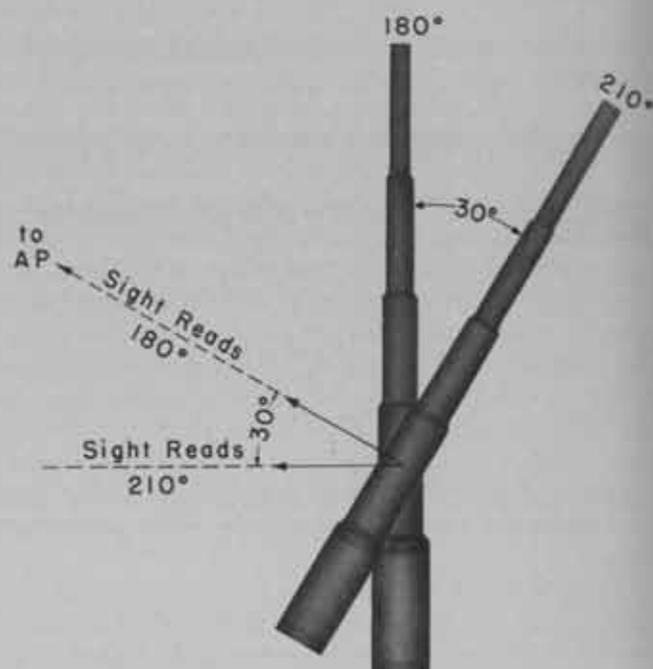


Figure 2.—

on which the gun and carriage are traversed. Let the small arrow (see fig. 2) represent the panoramic telescope which is mounted above the pintle center and pointed at the aiming point (AP). This is the position for orientation in this particular case. Further assume that the gun is pointing due north. To orient the sight, merely point it at the aiming point and slip the sight scale (see fig. 2) until it reads 180° (zero south) which is the azimuth at which the gun is pointing. Now suppose it is desired to fire at an azimuth of 210°. First, turn the movable sight head to the left until the sight scale reads 210°. (Notice that as the sight head is turned to the left, azimuths increase on the scale.) Its line of sight is then in position and the gun is still pointing due north. Now traverse gun and carriage to the right until the line of sight is again directed at the aiming point, and the gun will be pointed at the desired azimuth, 210°. In this case there is no error in pointing because the sight is mounted directly above the gun pivot (pintle center). After the sight has been turned 30° to the left of the aiming point and until it reads 210°, the gun must be traversed the full 30° back to the right in order to put the line of sight again on the aiming point. This points the gun at 210° azimuth. Notice that the line of sight is now parallel to,



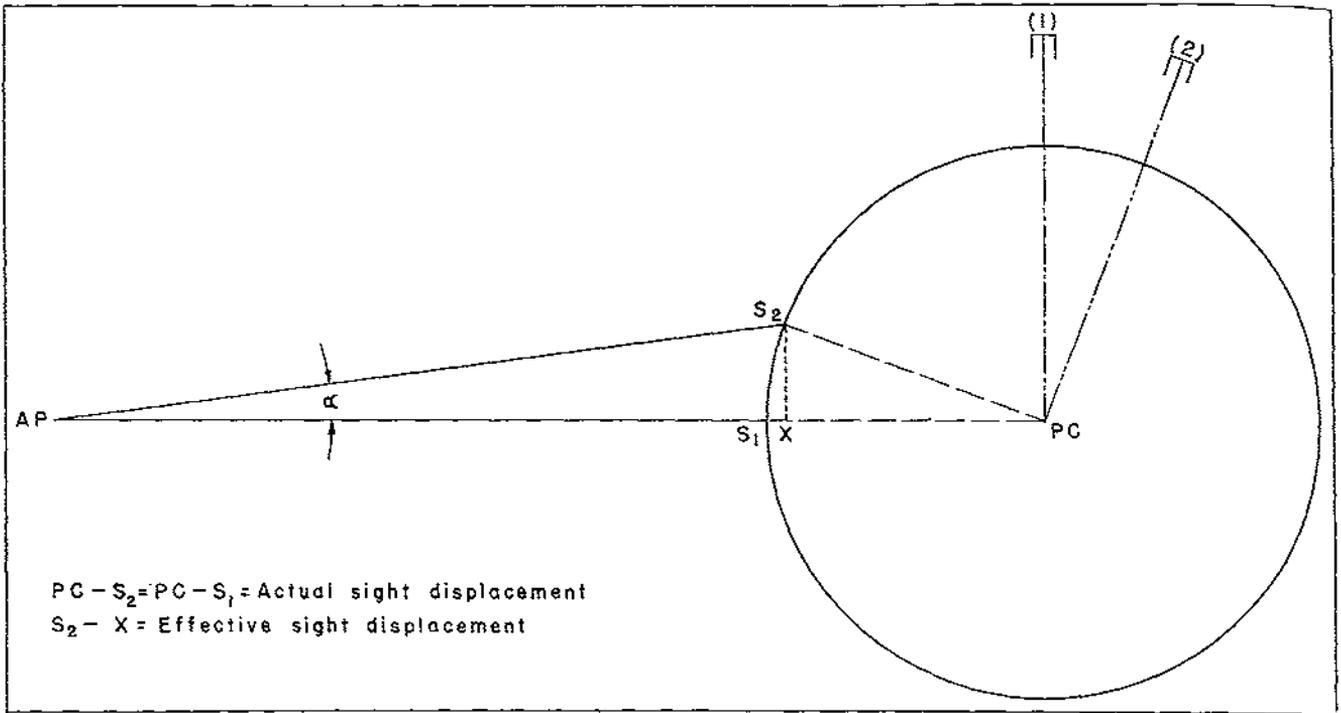


Figure 5.—Effective sight displacement.

spectively, with corresponding positions of the gun  $G_3$  and  $G_2$ . The error is the difference in azimuth between  $G_2$  and  $G_3$  or the angle  $G_2-PC-G_3$ . It can be proved that the angle  $S_2-AP-PC$  (marked  $\alpha$  in the diagram) is equal to the error in pointing, angle  $G_2-PC-G_3$ .

In order to determine the size of the parallax angle  $\alpha$ , a new element called effective sight displacement is used. Effective sight displacement (ESD) is shown in figs. 4 and 5, as the distance  $S_2X$ . It is always the perpendicular distance from the sight axis to a line joining the aiming point and the pintle center.

Under the conditions of orientation illustrated in fig. 4, the error due to sight displacement is the parallax angle  $\alpha$ . This angle can be found by using the relation:

$$\tan \alpha = \frac{\text{ESD}}{\text{distance PC to AP}}$$

This is not an exact solution, since the distance from PC to AP is slightly greater than the distance AP-X which should be used in the above relation. However, the error thus caused is always negligible.

In the field, the distance to the aiming point will normally be several hundred yards, while the actual sight displacement is normally less than  $1\frac{1}{2}$  yards. The angle  $\alpha$ , then, will always be a very small angle. The tangent of a small angle is approximately equal to the angle in radians, and since a radian is about 57 degrees, the above relation can be rewritten:

$$\frac{\alpha \text{ (degrees)}}{57} = \frac{\text{ESD}}{\text{distance AP-PC}}$$

OR

$$\alpha \text{ (degrees)} = \frac{\text{ESD} \times 57}{\text{distance AP-PC}}$$

Or since one degree = approximately 18 mils:

$$\alpha \text{ (mils)} = \frac{\text{ESD} \times 57 \times 18}{\text{distance AP-PC}} \text{ or } \frac{\text{ESD} \times 1,000}{\text{distance AP-PC}}$$

The results obtained by the use of this formula are within the necessary limits of accuracy. From this formula it can be seen that for a given sight displacement and aiming point distance, the parallax angle ( $\alpha$ ) is directly proportional to the effective sight displacement.

The fact that a parallax angle exists does not necessarily mean that a sight displacement error is present. It is true that when the aiming point is on a prolongation of the line joining the pintle center and the sight axis in the orienting position, the error in pointing is equal to the parallax angle. But, if the aiming point is at right angles to the line joining the pintle center and the sight in the orienting position, the parallax angle in the orienting position will be maximum, but the error is zero, because the sight is sighted on the aiming point and indicates the actual azimuth of the bore. As this fact is important it is emphasized.

The position of the sight is  $S_{op}$ , in the orienting position (see fig. 6), and  $S_1$ ,  $S_2$ , and  $S_3$ , are successive positions of the sight as the gun is traversed right. The effective sight displacement in the orienting position is zero, but as the piece is traversed right the effective sight displacement, the parallax angle ( $\alpha$ ), and in this case, the error due to sight displacement, all increase.

Suppose, however, the aiming point is chosen at right angles to the line PC- $S_{op}$  (see fig. 7). In this case, the effective sight displacement in the orienting position  $S_{op}$  is maximum and is equal to the actual sight displacement. But there is no error, since this is the

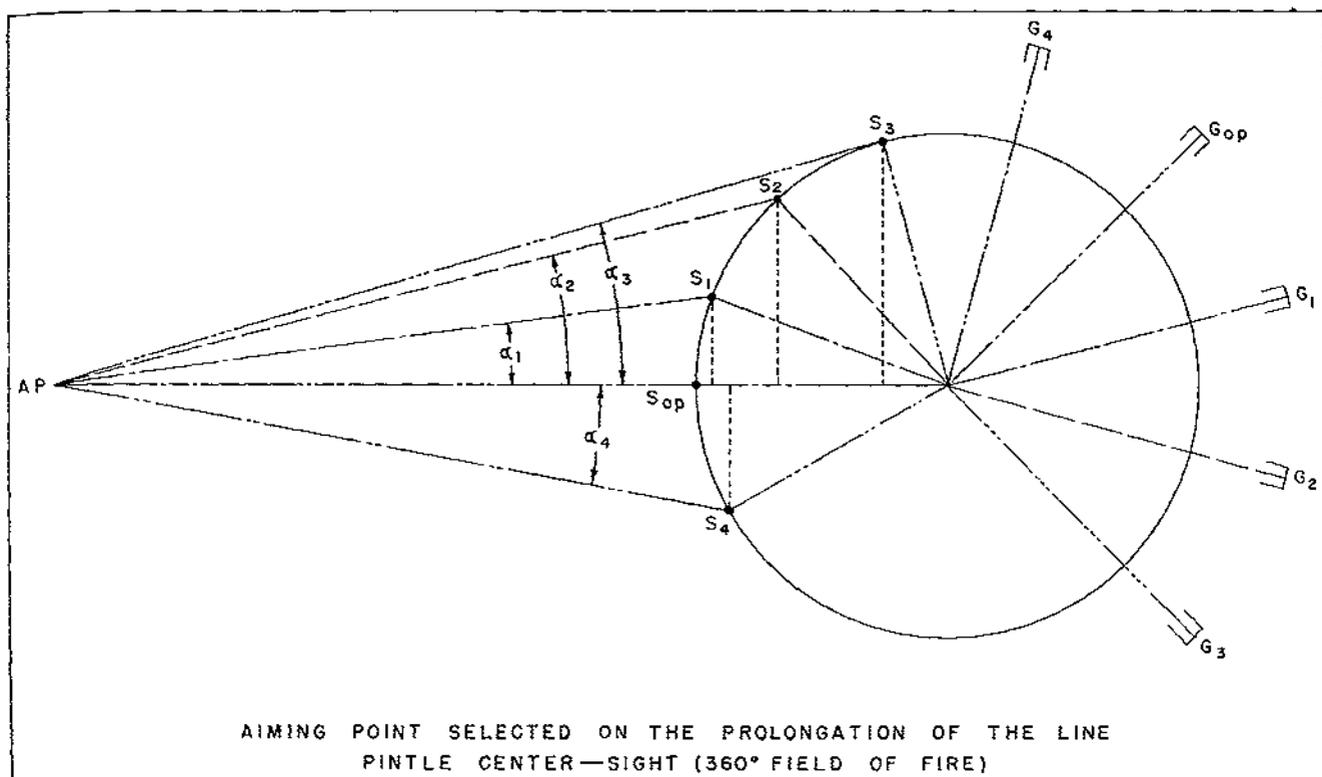


Figure 6.—

orienting position, and the sight is pointed at the aiming point and reads the actual azimuth of the bore. As the piece is traversed left, notice that the effective sight displacement (and therefore the parallax angle,  $\alpha$ ) decreases, but the error *increases*. This last statement may be more apparent if it is remembered that in order to have zero error in any position of the gun and sight, the new line of sight must be parallel to the line of sight in the orienting position. It is apparent from figs. 6 and 7 that as the piece is traversed away from the orienting position, the line of sight continually diverges from a line parallel to the line of sight in the orienting position.

The size of the error at any one position is therefore determined by the change in the parallax angle, and not by the parallax angle itself at the particular position. The change is always determined by comparing the parallax angles at the given position and the orienting position. We can therefore write the relation:

$$\text{error} = \alpha_1 \pm \alpha_{op}$$

where  $\alpha_1$  and  $\alpha_{op}$  denote the parallax angles at the given position and the orienting position respectively. Notice that this expression says  $\alpha_1$  plus or minus  $\alpha_{op}$  (see fig. 7). Remember that the error is equal to the change in the parallax angle. If we consider the error in position  $S_2$ , the change in the parallax angle is  $\alpha_2$  minus  $\alpha_{op}$ . But if we consider the error at position  $S_3$ , the change in parallax angle is  $\alpha_3$  plus  $\alpha_{op}$ . For the condition of orientation illustrated in fig. 6,  $\alpha_{op}$  is zero, and the error is then equal to the parallax angle at the particular position ( $\alpha_1$ ), minus zero ( $\alpha_{op}$ ), or simply

This is a special case, however.

It has been shown that the parallax angle at any position of the sight is equal to the effective sight displacement (ESD) at the position multiplied by 57 and divided by the distance from the pintle center to the aiming point. In other words:

$$\alpha_1 = \frac{\text{ESD}_1 \times 57}{\text{distance AP-PC}}$$

$$\alpha_2 = \frac{\text{ESD}_2 \times 57}{\text{distance AP-PC}}$$

$$\alpha_{op} = \frac{\text{ESD}_{op} \times 57}{\text{distance AP-PC}}$$

We can write for the error:

$$\text{Error (p)} = \frac{\text{ESD}_{op} \times 57}{\text{distance AP-PC}} + \frac{\text{ESD}_p \times 57}{\text{distance AP-PC}}$$

where  $\left\{ \begin{array}{l} \text{error}_p = \text{error at present position of sight} \\ \text{ESD}_p = \text{ESD in present position of sight} \\ \text{ESD}_{op} = \text{ESD in orienting position of sight} \end{array} \right.$

$$\text{Error}_p = \frac{(\text{ESD}_{op} \pm \text{ESD}_p) 57}{\text{distance AP-PC}}$$

This is a general formula for use in finding the amount of sight displacement error at any particular position of the sight under any particular condition of orientation and aiming-point location. Whether to use plus or minus in the above formula should be determined by inspection of a simple sketch. If the present position of the sight and the orienting position of the sight are on the same side of the line AP-PC, use the *minus* sign. If the present position of the sight and the orienting position of the sight are on opposite sides of the AP-PC line, use the *plus* sign.

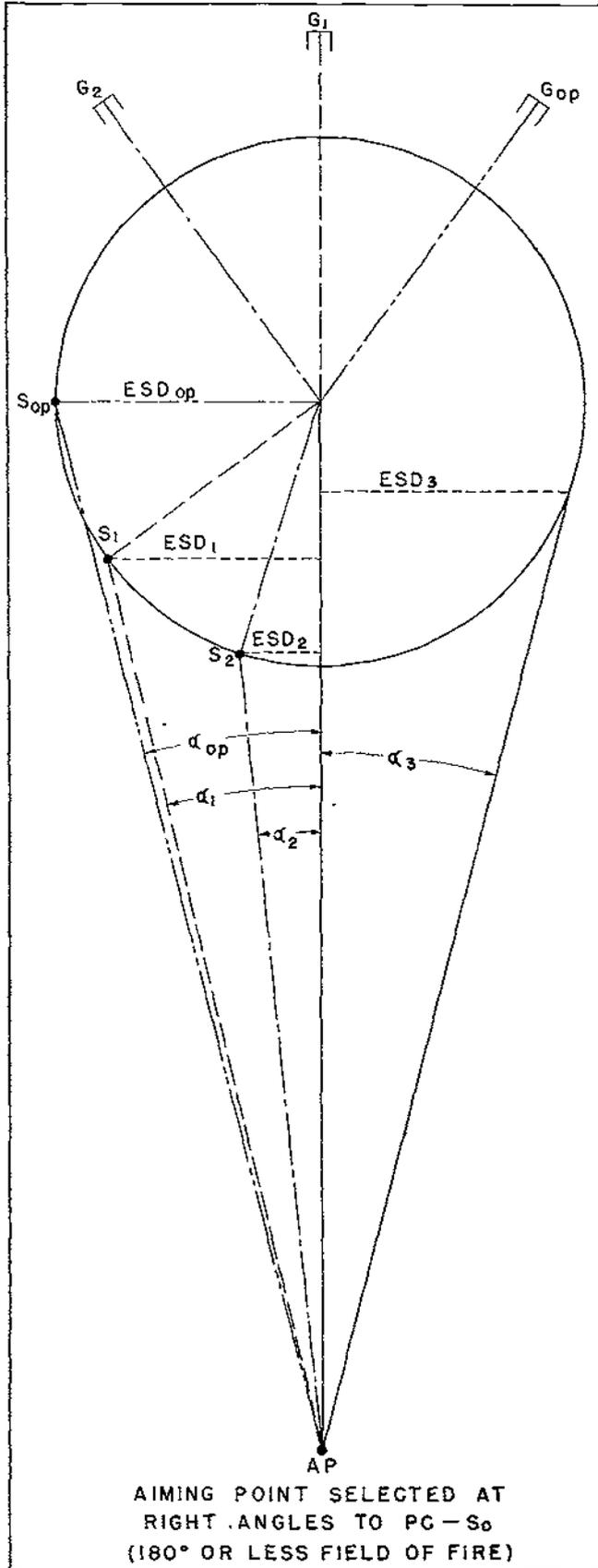


Figure 7.—

The above relation can be used to find the size of the error. The direction of the error, that is, right or left, can be found from an inspection of a simple sketch of

the situation. In speaking of the direction of the error, we mean the location of the resultant splash with respect to the target, whether right or left. Assuming that without the error the splash would be on the gun-target line, we say that the error is left if the splash falls to the left of the target, and right if the splash falls to the right of the target. A very simple rule of thumb says that if the present line of sight is to the left of a line from the sight and parallel to the line of sight in the orienting position, then the error is left. A right error exists when the present line of sight is right of the line parallel to the orienting line of sight. Referring to figure 6, the direction of the errors at position  $S_1, S_2, S_3$ , is LEFT; while the error at  $S_4$  is RIGHT. The capital letters R and L are used to designate the direction of error.

There are, of course, two considerations in the selection of an aiming point; direction and distance from the battery. The direction depends upon the extent of the field of fire of the guns. For armament having a  $360^\circ$  field of fire, the aiming point should be selected along the prolongation of the line joining the pintle center and the sight when in the orienting position, as in figure 6. But when the field of fire is  $180^\circ$  or less (particularly when  $90^\circ$  or less), select the aiming point at right angles to the line joining the pintle center and the sight in the orienting position, as in figure 7.

With the aiming point selected as in figure 6, the change in effective sight displacement and therefore the error, increases rather rapidly for about  $45^\circ$  to either side of the orienting position. It will then continue to increase, but much less rapidly, to  $90^\circ$  from the orienting position, at which point the effective sight displacement is maximum and equal to the actual sight displacement. Continued traversing results in a decreasing of the effective sight displacement, until it is again zero when  $180^\circ$  away from the orienting position. Note that in this case the maximum error corresponds to an effective sight displacement which is equal to the actual sight displacement; and that for approximately  $45^\circ$  to either side of the orienting position, the change in the effective sight displacement is rather rapid.

Now, with the aiming point selected as in figure 7, the change in the effective sight displacement, and therefore the error, is not appreciable until the piece is traversed about  $45^\circ$  to either side of the orienting position. The error then increases rapidly, reaching the value corresponding to the actual sight displacement  $90^\circ$  on either side of the orienting position, and increasing to twice this error  $180^\circ$  from the orienting position. Note particularly that the maximum error corresponds to a displacement which is twice the actual sight displacement, and that for approximately  $45^\circ$  to either side of the orienting position the change in effective sight displacement is not appreciable. For limited fields of fire ( $180^\circ$  or less) select the aiming point at right angles to the line  $PC - S_{op}$ ; and for all-around fire

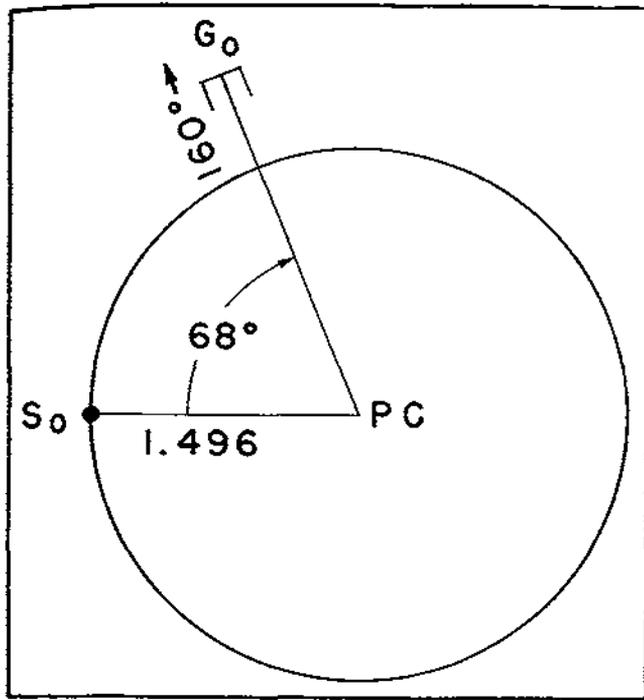


Figure 8.—

(360°) select the aiming point on the prolongation of the PC-S<sub>0</sub> line.

The distance to the aiming point is easily determined. Errors due to sight displacement should not exceed 0.03 degree or 0.5 mils. Knowing the maximum effective sight displacement obtainable, the minimum distance to the aiming point is determined from the relation:

$$\text{Error} = \frac{\text{ESD} \times 57}{\text{distance AP-PC}}$$

Transposing:

$$\begin{aligned} \text{Distance AP-PC} &= \frac{\text{ESD} \times 57}{0.03} \text{ (degrees)} \\ &= \frac{\text{ESD} \times 1,000}{0.5} \text{ (mils)} \end{aligned}$$

The effective sight displacement used must be the maximum effective sight displacement possible for the particular conditions of orientation, aiming point direction, and field of fire.

Illustrative example—I

An 8-inch railway gun is emplaced for 360° field of fire and is pointed at an azimuth of 160° for orienting. The angle formed by the sight, pintle center, and muzzle is 68° to the left, and the sight displacement is 53.85 inches.

Q. In what direction (or at what azimuth) should the aiming point be located?

A. The first step is to draw a simple sketch of the situation, putting in all the known elements. Such a sketch is shown in figure 8. First draw the circle (with PC as the center) to represent the path of the sight as the gun is traversed through 360°. Then put in the line PC-G<sub>0</sub> (with a cap on the end to represent the muzzle) at an azimuth of 160° (from south). This line then represents the gun in the orienting position. The angle G-PC-S<sub>0</sub> is given as 68° to the left, so put in the sight S<sub>0</sub> so that PC-S<sub>0</sub> is 68° to the left of the gun barrel. S<sub>0</sub> is then the orienting position of the sight. Since the gun is pointed at 160° and the sight is to the left 68°, the azimuth of the line PC-S<sub>0</sub> is 160 - 68, or 92°. Because the field of fire is 360°, the aiming point should be selected in prolongation of the line PC-S<sub>0</sub>. Therefore, locate the aiming point at an azimuth of about 92° from the gun, say between 87° and 97°.

Q. What is the minimum distance to the aiming point so that the errors will be less than .03 degree?

A. Assume the aiming point is in prolongation of the line PC-S<sub>0</sub>. Therefore, extend PC-S<sub>0</sub> on the sketch as in figure 9. Locate AP. To find the distance to the aiming point, find the maximum effective sight displacement and substitute in the formula:

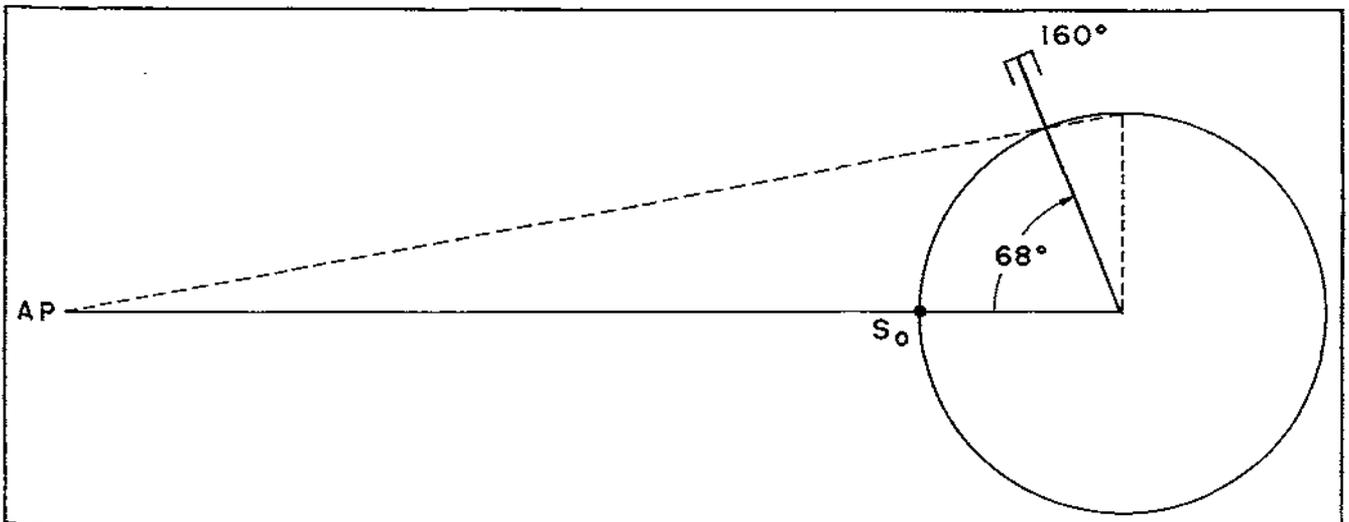


Figure 9.—



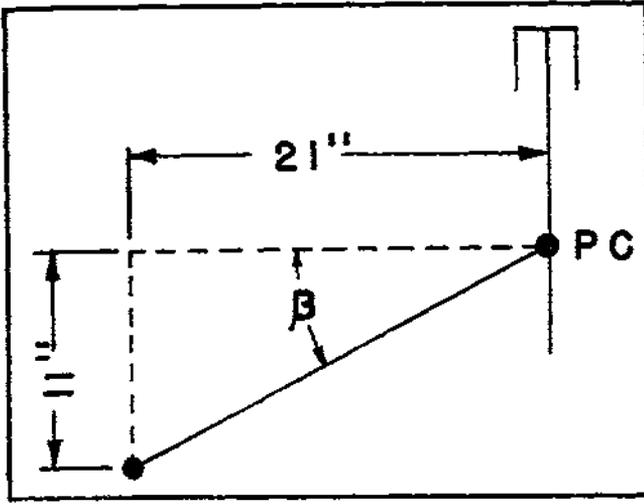


Figure 11a.—

The angle  $G_0$ -PC- $S_0$ , shown as angle A, is  $= 90^\circ + B$ , and:

$$\tan B = \frac{11}{21} = .52380$$

$$B = 27.65^\circ$$

$$PC-S = 11/\sin B. \text{ Angle } A = 90 + B = 90 + 27.65 = 117.65^\circ$$

$$11/\sin 27.65^\circ = 11/.46407 = 23.7 \text{ inches} = .658 \text{ yds.}$$

$$\text{Azimuth } PC-S_0 = 270.00^\circ - 117.65^\circ = 152.35^\circ$$

$$\text{Azimuth to aiming point} = 152.35^\circ - 90^\circ = 62.35^\circ$$

The aiming point should be located within a few degrees of this azimuth, let us say between  $57^\circ$  and  $67^\circ$ .

Since the orienting azimuth ( $270^\circ$ ) is in the center of the field of fire, the effective sight displacement at the right limit of the field of fire is equal to the effective sight displacement at the left limit, and at either limit the change in effective sight displacement is maximum. (See figure 12.) Thus:

$$ESD_{op} = \text{actual sight displacement} = .658 \text{ yards}$$

To find ESD, use triangle PC- $S_1$ -D.

$$\text{The angle } D\text{-PC-}S_1 = 90^\circ - 30^\circ = 60^\circ.$$

$$\begin{aligned} \text{Then } S_1D &= .658 \sin 60^\circ \\ &= .658 \times .86603 \\ &= .570 \text{ yards} \end{aligned}$$

Substituting in the general formula:

$$AP-PC = \frac{(ESD_{op} \pm ESD_p) 57}{.03}, \text{ and using the minus}$$

sign because  $S_0$  and  $S_1$  are on the same side of the line AP-PC, we have

$$AP-PC = \frac{(.658 - .570) 57}{.03} = \frac{.088 \times 57}{.03} = 167, \text{ or}$$

170 yards minimum distance to aiming point, for errors less than .03 degree.

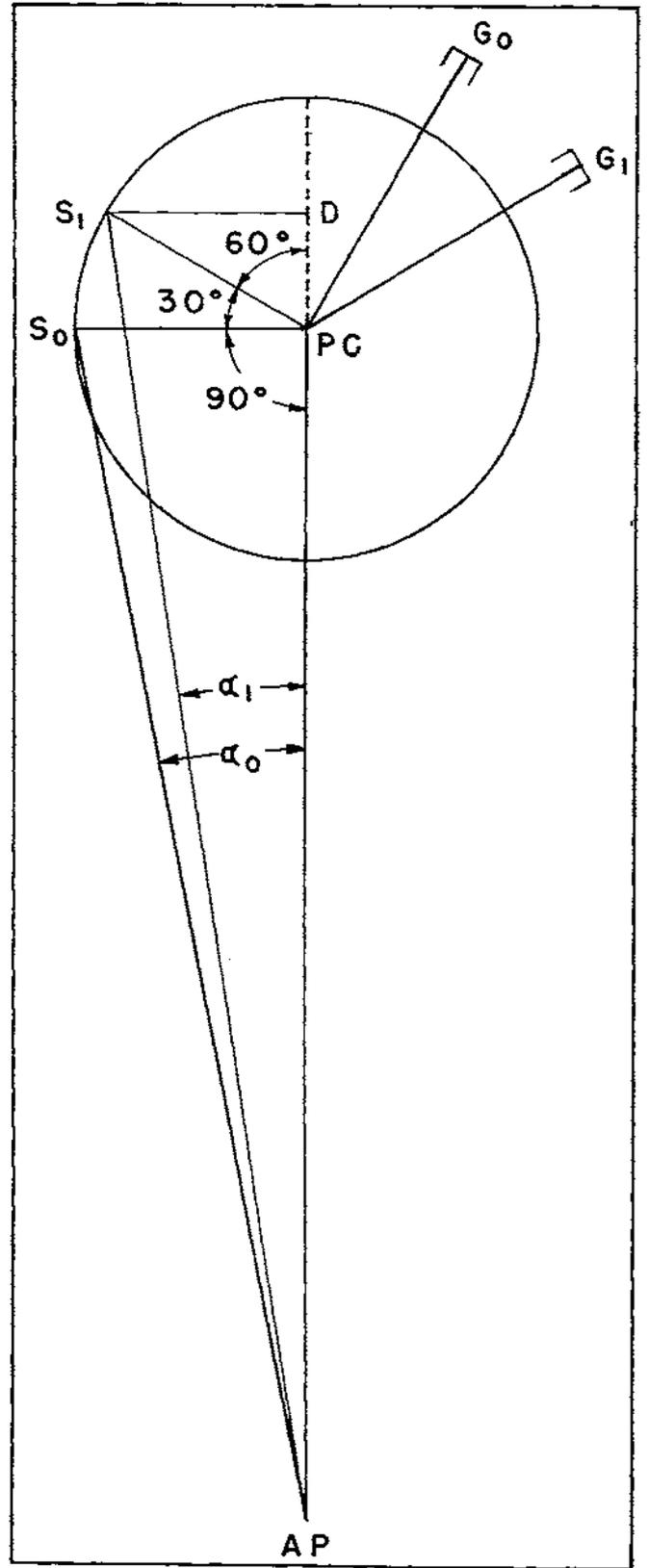


Figure 12.—



# SENDING ADOLF A WIRE

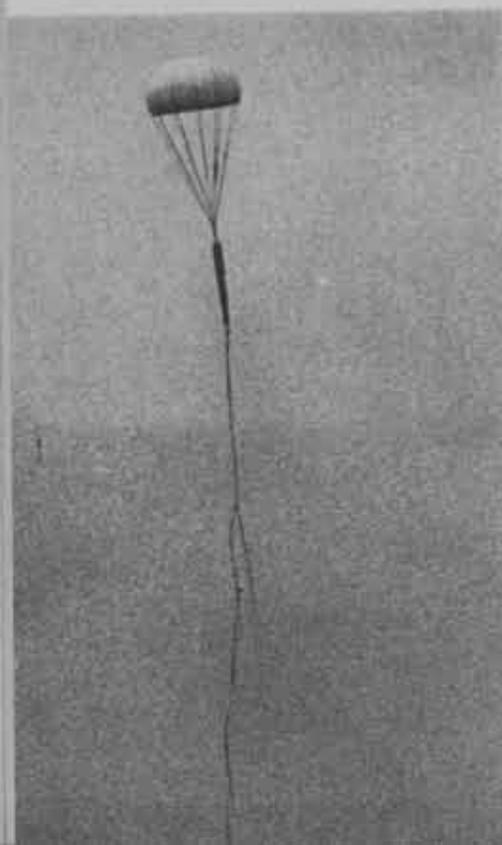
BRITISH AA ROCKETS SNARE STUKAS



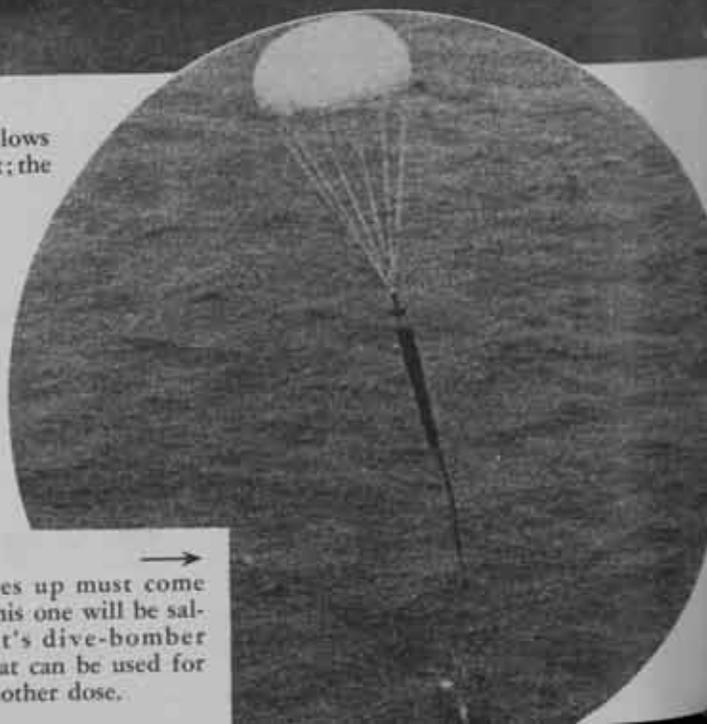
↑ British merchant seamen attach wires to a rocket.



Up she goes! The rocket is aimed to intercept the dive bomber's path.



← The parachute slows the wire's descent; the wire spoils the Stuka's aim — or the Stuka.



→ What goes up must come down. This one will be salvaged; it's dive-bomber poison that can be used for another dose.

# The German Soldier\*

EDITOR'S NOTE: *Any fighting machine, in the last analysis, is as good as its front and rear ranks. The manner of men that constitute these ranks and the nature of their training mold the character and ability of their Army. This article gives an intimate sidelight on the kind of soldier American forces may meet on the European battlefield.*

*It is just as important in combat to know your enemy as it is to know yourself. Never belittle the ability of your antagonist, for ostrich mentality only invites disaster. Know your enemy and be forewarned. Give every one his due whether he be devil or saint. Study his weakness that you may lead up to it. Acknowledge his strength and finesse through if you cannot better it.*

After the last war, Germany founded an armed force, limited to 100,000 men, in accordance with the provisions of the Treaty of Versailles. This *Reichswehr* (Reich means Realm or State, Wehr means armed force) was comprised of volunteers who had to sign up for a period of twelve years. Only men with perfect health were selected, and they had to stay on probation for one year before they became full-fledged members of the organization. Therefore, in 1935 when Germany again introduced compulsory military service it had excellent noncom material for an army of about 800,000 men. Every one of these noncoms was a professional soldier with at least six to twelve years of service to his credit, who looked upon war as a science.

The lack of officers was solved by recalling at once many World War officers, most of whom had been idle during the period of the Republic and were only too glad to have a regular income again. During the last war many students who had not yet finished college went to the front, and a large proportion of these became officers. Some of them came back to find an entirely different Germany. Revolution raged all over the country, with the dark days of the inflation still to come. Jobs were scarce and those who adjusted themselves to the new conditions, and were lucky enough to find work, made just enough to pay for their room and board. Only a very few were able to go back to their studies and complete their education.

The new compulsory service was meant for everybody, rich or poor, young or middle aged. Exemption was hardly known. Only men highly necessary for the fast developing war industries, or those incurably sick were exempted. Dependency was no excuse, since the Government took care of the dependents.

\*By a corporal in a Coast Artillery organization. The corporal's name is withheld by request, since members of his family still live in Germany. This article was adapted from a lecture delivered by the soldier to the personnel of his post based on his own service in the German army.

After the German soldier has taken the oath and has been incorporated into his respective company or battery, his battery commander reminds him frequently about the duties of the soldier, which the German command expressed in eight articles promulgated originally in 1934 by Field Marshal Von Hindenburg, then President of the German Reich. In effect, these articles state that the highest honor a young man may attain is to serve in the army, which means serving his country. By learning how to make decisions, to become hardened and tough, to render complete obedience, he will gain the reward of serving his country in times of need.

Besides the explanation of these articles the soldier is told over and over again the definition of honor, loyalty, courage, obedience, and comradeship. Every German, even if poorly educated, has heard or read about Frederick the Great, the famous Prussian King, who fought Austria for seven years, from about 1756 to about 1763, and finally broke the power of the House of Habsburg, which used to rule over most of Southern Germany.

The battery commander quotes this historic idol of Prussian militarism, who once said: "It is not necessary for me to live, but it is of highest importance to do my duty."

Furthermore the German soldier learns that obedience is the foundation of the army. Disobedience, therefore, will be punished severely.

I remember a little incident which happened one day while my company was out in the field. We had our rifles stacked and our sidearms laid out in a straight line. Suddenly my corporal told me to straighten out my canteen which was attached to my sidearms belt. I looked down, but couldn't see anything wrong with it. He reminded me three times before I told him that I couldn't find anything wrong. Only too late I realized I was talking while at attention. Later I had to report to my sergeant. My punishment was supposed to be three days in the guard house, but I got away with being confined to quarters over the week-end. This still meant a lot to me, since these week-ends were the only time we were allowed to leave the post. Later during the day, my captain called me in and I learned that he and my sergeant had witnessed the incident. There was nothing wrong with my display, but I should have kept my mouth shut while at attention, especially since the captain was about to intervene on my behalf.

I would like to point out the difference between superiors in the new army and those in the old imperial army. The enlisted man isn't kicked around anymore by his noncoms or officers. However, superiors demand complete obedience. The relationship between men and superiors is that of comradeship and mutual understanding (my corporal was one of the few exceptions).

The soldier has the right to complain, if he feels he has been done a wrong. But he may do so only after twelve hours have elapsed from the time of the event. This way the complainant is given time to think things over, before he puts in his complaint. Every soldier is expected to have enough common sense to decide between a minor insult caused by the use of an improper word or being cursed during a time of intensive training, and really serious accusations.

If he still decides to push his charges and it is proven later on that his story is founded on untrue statements, he will be punished severely. I experienced the following incident which shows how the superior will help the enlisted man to receive just treatment in cases where a complaint is impossible.

One evening I had to get supper rations for my roommates. The German soldier receives one warm meal a day, usually around noon, and rations for breakfast and supper have to be drawn by each squad every other day. All the kitchen supplies for these meals is hot coffee. When I asked for our evening rations the corporal in charge of the small commissary gave me, besides other food, some bad eggs. I refused to take them. He became angry, told me to get out, and claimed he didn't have any better ones. I knew he was in a hurry to close up that night. I was well aware my roommates would demand that I make a complaint the following day. However, I knew I could never prove that there were not better eggs in stock. A complaint was therefore out of the question. We all agreed to get even somehow. As a rule one of our captains (we had two, a battery commander and an executive officer), would visit our room around supper time for a routine inspection. We waited with our supper, which we always took in our room, until the captain showed up. He, of course, showed interest in what we were eating and noticed the bad eggs. He inquired as to when we received them, and I told him the whole story. The next day the corporal was broken to private and put into solitary confinement for fourteen days on bread and water.

The German soldier is not entitled to any leaves or furloughs during the first twelve months he is in the service. Whenever the battery commander deems him worthy of a pass he has the authority to grant him one. When the soldier goes on leave over the week-end he always is reminded to behave himself and not to get drunk while in public. If he should break those rules he will receive harsh punishment. I don't remember ever having seen a drunken soldier on the streets at any time.

So far I have mentioned only things the German soldier learns during the very first few days after he has been put into a uniform. Now I would like to tell you something about his daily routine, as far as his duties are concerned. Even the very soft men soon become strong and tough from the training they receive. You will therefore understand how it was possible for the

German soldiers to survive those hardships and punishments they have received during the past year while fighting in the Libyan desert and in Russia.

The word "impossible" does not exist in the German soldiers' dictionary.

Field Marshal Rommel led his attack on Tobruk on a hot summer day, when many thought it was impossible to fight a large desert battle at that time of the year. Every soldier is always reminded that Germany's potential enemies are tough and well equipped, and a hard fighting group of soldiers. The only way to win glory is to get tougher and harder than they are.

While I was serving in the German Army a few years ago, we had reveille about 5:30 A.M. By seven we were ready to march off to our training ground. Our rooms had been cleaned and the doors locked, to be opened only after we got back. As I was serving with the Engineers our training was primarily technical. However, since we were equipped with rifles, we received at least four afternoons or mornings each week of thorough infantry training. For a short time we had close order drill, but soon we practiced skirmishes, learned the use of concealment, built foxholes, infantry positions, etc. We usually had one rest period during the morning to eat the lunch that each man had brought along.

Around noon we returned to our barracks to have our one warm meal. Our daily duties lasted until 6:00 P.M. From then on we were free until the next morning, but at least two hours every evening we were occupied with the cleaning of our equipment. For instance we had to shine two pairs of footgear every night since in the morning we wore boots and in the afternoons we had to change to high top shoes. This of course helped to keep our feet in good shape. Taps was at 9:00 and by that time everyone was usually ready to turn in. At that hour the C.Q. (noncom of the day who was a line sergeant or higher) used to check the beds and inspect everybody's locker, where the clothing was at all times displayed in uniform manner. This made other inspections unnecessary.

There were men of all trades and professions in our company as well as those who had been out of work for a long time, but it did not take long until every man had become used to this regular way of living. Men who had been undernourished gained weight, in spite of getting only one hot meal a day. Of course the variety of the food was poor (we had stew four times a week), but the quality must have been good. Usually on Saturday mornings we went out for a hike with full pack (weighing about fifty pounds). We marched between ten and fifteen miles at about four miles per hour. On our way back our captain usually set the pace up to about six miles for the last hour. At this point our officer would dismount (a captain rates a horse for his personal use) and march back with us. The idea, of course, was to harden us up, and we always tried to do our best, since the sooner we got back to camp the

sooner we were able to start out on the long awaited week-end leave.

Before we received our passes, however, the company had to line up in the company street and wait for the first sergeant to appear. He was not only our first sergeant, but also the highest rated noncommissioned officer, comparable with the master sergeant of the United States Army. Besides this he was also the sergeant major. He was the right hand of the commanding officer and had full authority over the enlisted men. He could not only be identified by the insignia he wore on his shoulder straps, but also by his privilege of keeping one button of his service blouse open for the purpose of keeping a memo book, just inside his coat, which everybody could see protruding. Usually Saturday was the only time the enlisted men would see him, when they were waiting to get their pass. The line sergeant would read off to him the list of names of the men who had applied for week-end leave, but before he would grant permission for them to have leave he would refer to his memo book to see if they had broken any rules or regulations during the past week.

Another time we had to line up and come into close contact with our first sergeant was on pay days. In those days the German private received twenty-five cents a day. Every tenth day we were paid two and one-half dollars or the German equivalent, five marks. Five marks were made in the form of a coin, and the first sergeant would walk down the line with a small sack in his hand and give each soldier one coin, making paying off very simple. This of course could be done in this manner because the German soldier had to clean and wash all of his own clothing and equipment, and he had no deductions coming out of his small pay.

As soon as we finished some dry firing practice with our rifles, we went about twice a week to the rifle range, for target practice. In contrast to the usual rough treatment we received, out on the firing range our noncoms had special instructions from the battery commander to handle us with gloves. No shouting or harsh talk was permitted while we were waiting for our turn to fire. We were allowed to smoke, which usually was permitted only during mealtimes and after retreat. Handling the men in this way the commanding officer got exactly what he was interested in—more or less excellent results when we fired for record.

I have tried to give a picture of the German soldier, about what he is told, taught, and how he is changed from a civilian into a soldier, within the shortest time possible. Now I would like to tell something, about his morale at the time I was wearing the German uniform.

When I was serving shortly after the introduction of the compulsory military service in Germany, Hitler had been in power for about three and one-half years. The army always used to favor the right or national wing of the government, but did not care for the brown and black clad troops of Hitler.

The American public still doesn't know or quite understand the meaning and the importance of these two different organizations.

In those days there existed about thirty-three political parties in Germany, of which around twenty-three were represented by one or more members in the State Senate and German Reichstag (Congress). The four most important of these parties were the Social Democrats, the Communists, the German Nationals and the Zentrum (Catholic Political party). Just before elections, these different groups would hold rallies, and march through the streets in order to advertise their ideas and gain new members.

It was not earlier than 1930 when the majority of the German people first heard about the fast growing National-Socialist German Labor Party (which is called in this country The Nazi Party), for it was about then that this young party furnished quite a number of representatives for the Prussian Congress. Already, a number of years before 1930, Hitler had founded the S.A. (Brown Shirts). S.A. is the abbreviation for the German word for Storm Trooper. The young party members who made up this group were Hitler's political army, who marched in the streets, and whose main purpose was to break up rallies of the opposing parties. That happened quite often when the Brown Shirts would come in contact with members of the Communist or Socialist parties while marching through the streets. Usually these meetings would end in bloody clashes. I can still remember the "Blood Sunday" when seven Nazis and three Communists were left dead in the streets after one of these clashes. Right after Hitler came into power, four Communists were executed for these killings.

The Black Shirts, or the S.S. (the German abbreviation for Safety Troops), originally were a very small force, and its main purpose was to act as bodyguards for Hitler and his closest associates. When the Brown Shirts became stronger in numbers after 1930, Hitler made a clever move on the advice of his friend and associate—Himmler. The Black Shirts were greatly reinforced in order to prevent possible uprising by the Brown Shirts who were eager to come into power as soon as possible. The famous Purge of 1934 proved only too well how important it was for Hitler to have such a strong personal force, for it was the Black Shirts who crushed the attempt of the Storm Troop Leaders to seize power in Germany. From then on Himmler became Commander-in-Chief of the Black Shirts, who later on established the secret police. Besides acting as a police force, members of this troop were military trained to become special task forces not connected with the German Army, and were sent to Spain in 1936 as shock or élite troops, in order to help General Franco to final victory.

Today the Black Shirts are doing police duties in the occupied countries, and by doing so they are relieving the German soldier for duty on the front lines. Of

course there were times when the Black and Brown Shirt leaders were secretly fighting each other out of pure jealousy, but since Hitler would favor neither group and was able to smooth out their difficulties he was able to avoid any open fights between them. Only recently I learned that the Brown Shirts have been dissolved.

The German Army didn't care much for these two groups, seeing in them naturally a menace to its position.

Quite a few of the unemployed who entered the service with me used to belong to the Communist and Democrat parties. Of course these parties had become illegal, but many of the former members had not climbed as yet on the band-wagon of the N.S.D.A.P. (National Socialists German Labor Party). As a matter of fact these men did not keep their feelings secret after they found out how independent the army still was in those days. Some of the recruits used to be leaders of the S.A. (Brown Shirts) and the S.S. (Black Shirts), but there was a law in effect that every member of the armed forces had to give up his membership in either of these organizations. Our sergeants who were brought up in the independent spirit of the Reichswehr, which once swore to defend the republic, put those fellows on more extra details than other soldiers. The former Socialists and Communists liked this exceedingly for in those days they still were possessed of the idea that the Army eventually would get rid of Hitler and his gang. Besides that, many of them received better food and clothing than they had been getting for several years. Naturally the morale was quite high.

When Germany invaded Poland in September of 1939 it had already a vast and well trained army, of which the youngest soldier had had at least one full year of hard training. They were not only trained to become a hard hitting force, but they also had learned to take punishment. They had been told again and again about their real enemies, Russia, England and France. There was never any doubt in their mind that the French soldier was a tough and courageous fighter, well trained and with excellent equipment. However, they also knew that their leaders did not fail to give them equipment just as good, maybe better and more modern.

The French Army was overrun within a short time. However, this does not prove the contrary of what I have just stated. Most of us have learned by now the true reasons for the tragedy of France.

Once the German war machine had started rolling, all efforts to stop it at the conference table would have been futile. As history proves, only a better army, comprised of soldiers of unexcelled fighting spirit, with more and better equipment, and with more butter to feed its men, will stop it in due time. Germany's slogan during recent years has been "guns instead of butter." But it was proven in the last war that unless a soldier was well fed it didn't matter how many guns he had to fight with. It is a well known fact that Germany has always blamed the lack of food as one of the reasons for losing the war of 1914-1918.

I believe we, ourselves, are all fully convinced that the United States armed forces will furnish this super army within the shortest time possible, and that it will then gain final victory over the Axis forces.



Dustproof cover for the 40mm antiaircraft gun, being developed by the Ordnance Department. Zipper-type fasteners aid in forming a tight-fitting cover, easy to put on and take off.

*Photo from Army Ordnance*

# When the Camera Fails

By Major C. H. Treat  
Coast Artillery Corps

EDITOR'S NOTE: The method outlined will give good results if the deviation of the unrecorded splash approximates the average deviations of the recorded splashes.

In analyzing seacoast target practices it is often necessary to determine the angle "target-vessel-splash" for one or more splashes that the camera failed to record. A graphical method of obtaining these angles from the range rake readings is illustrated below.

Assume that the last three columns of a Tug Officer's Report (Form 20) were as follows (length of towline 1,680 yards):

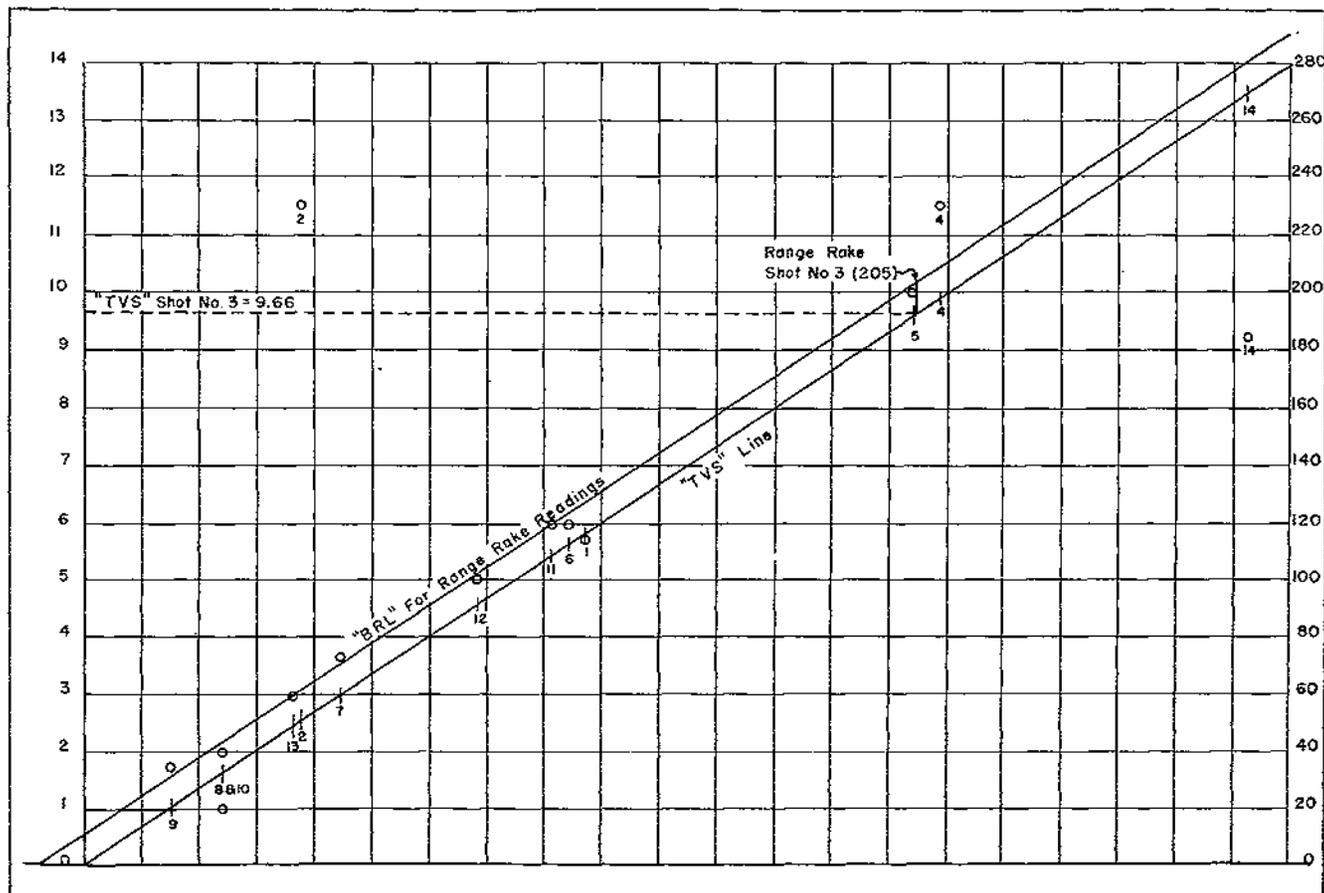
Shot No.	TVS	Yards	Range Rake	Shot No.	TVS	Yards	Range Rake
1	5.8	+ 170	115	8	1.6	- 47	20
2	2.5	+ 73	230	9	1.0	+ 29	35
3	...	...	205	10	1.6	- 47	40
4	9.9	+ 289	230	11	5.4	- 158	120
5	9.6	+ 280	200	12	4.5	- 132	100
6	5.6	+ 164	120	13	2.4	- 70	60
7	2.8	+ 82	70	14	13.4	- 389	185

On the accompanying drawing, the TVS Line was drawn at any convenient angle and the known values of the TVS angles were plotted on the line without regard to sign, using a convenient scale, as the one shown at the left. Each value thus plotted was labeled with its splash number. Another vertical scale was then assumed (at right of figure) so that the greatest and least range

rake readings could be plotted directly above or below the corresponding TVS plot. Using this second scale the range rake readings were then plotted above the corresponding TVS plots and a Best Representative Line was drawn through these points. Since the TVS line was straight, the range rake line should be straight. Its location is a matter of judgment. In this example range rake readings for shots number 2 and 14 were disregarded though they did cause me to check the corresponding TVS angles with great care.

Having established a Best Representative Line for the range rake readings, the range rake reading for shot number three was plotted on this line and a vertical line drawn down to intersect the TVS line. Opposite this intersection the angle TVS was read as 9.7 degrees. With a towline of 1,680 yards (such a towline was actually used) this angle represents a "camera deviation" of 283 yards. The correct figure for this deviation from the camera record was 272 yards.

The limitations of the range rake are clearly demonstrated by such a plot, but, unless the range rake reading for the splash desired was taken on a ricochet splash (probably true for shot number 2) or on a white cap (probably true for shot number 14) the resulting angle TVS will be a reasonable approximation of the true angle. It will certainly be more accurate than the angle as usually obtained by mere conversion of the range rake reading in mils to degrees.



# Railway Machine Shop Cars

By Major Franklin W. Reese, Infantry

Two long railroad cars of unusual design, the culmination of three years of experiments by U. S. Army Ordnance Department experts and the best brains of the American machine tool industry, were recently shunted upon a Fort Monroe railway siding.

When the seals on the cars were broken by the commander of the local Ordnance company to which the cars were consigned, it was disclosed that Uncle Sam's Army had pulled another one out of the hat and established undisputed leadership in one more field.

These railway machine shop cars—first of their kind

placed in service by the army—are self contained units housing their own power plants, thousands of precision instruments, tools, micrometers, a large milling machine, shaper, complete welding and blacksmith units, grinders, drill presses, lathes, fifty-ton jacks, and just about everything else needed to repair and service anything from a .45 calibre automatic pistol to the big coast defense guns that guard the shoreline against enemy invasion.

Although primarily designed to maintain and service railway artillery, these rolling machine shops are com-



The interior of the car is slightly over seventy feet and contains precision equipment and machinery enough to service anything from a .45 calibre pistol to huge coast defense guns.

—Photo by Sergeant Charles T. Dockerty



The new shop car.

—Photo by Sergeant Charles T. Dockarty

pletely adaptable to quick change-overs permitting handling of any type weapon used by the army.

The cars can be dispatched to any coastal or inland point where railway artillery is used. They constitute an important addition to the nation's coastal defense because of their wide versatility in the field of repair of weapons.

Each car is slightly more than seventy-four feet overall and weighs in excess of fifty tons. Construction details are withheld as military secrets. In one end of the cars are housed two gas driven generators, one having a

capacity of 15KW and the other a capacity of 5KW. Compactly arranged in the same section are a large welding outfit and an air compressor. Tanks for gas, water and other fuel are built into the top of the cars.

Ordnance officers disclosed that the two cars were assembled at the Baritan arsenal plant and that constant deviations from original plans of the Ordnance Department were necessitated as new information flowed in from far flung battlefields where railway and other heavy artillery was playing a major part in bitter conflict.



# JUNGLE WARFARE

## Part Three (Condensed from Field Manual 31-20)

Since the jungle fighter finds his observation and fields of fire quite limited by dense and rank growth, he must rely in the main on short-range weapons that he can manhandle over difficult terrain and keep supplied with ammunition. Our peacetime tropical training experience and the lessons of the present war have taught us that the only reliable ground transportation for either weapons or ammunition in a jungle is the soldier himself. He may perhaps be supplemented by carrying parties, or pack animals. But rarely if ever does the soldier in the jungle find roads suitable for other kinds of transportation.

He must rely chiefly on his rifle, automatic rifle, carbine, pistol, submachine gun, bayonet, hand grenade, and machete. The machete, the indispensable tool of the jungle soldier, is also an excellent weapon in a hand-to-hand fight.

The light machine gun and the 60mm mortar, though somewhat less maneuverable and less suited to instant use, are also indispensable. Their ammunition is difficult to transport, but that is true of virtually everything used in the jungle. Where water transport or plenty of pack animals can be used, the 81mm mortar and the heavy machine gun are valuable, both because of their fire power and because they can be manhandled for short distances.

All other types of weapons have a more limited use because they are difficult to transport, supply, and emplace, and because their effectiveness is restricted by the jungle growth. This is especially true of field artillery guns. Although pack howitzers are somewhat more suitable for jungle use, they too have their limitations—bulk and difficulty of ammunition supply. The density of the jungle almost always limits artillery fire to short ranges and ground observation is usually impossible and air observation extremely limited. But in some jungle regions the fighter will find savannas (open plains) where jungle growth may not be dense or may be lacking, and also villages and towns. In these areas and against the enemy in villages and towns he can find real use for artillery and other supporting ground weapons. Hence, in preparing for jungle fighting a leader ought first to study carefully the lay of the land in his probable area of operations. Not only will this help him materially in determining suitable weapons for his forces but it will also virtually tell him what armament he needs.

Combat aviation may substitute for artillery and mortars in dense jungle, even though observation from the air is limited and difficult. To give a measure of safety to his ground troops and insure efficient work

by his aviation, the commander must definitely locate the targets for his airmen. One way of doing this is by marking the location of his own troops by pyrotechnics, panels, or other visual means and then giving by radio the bearing and distance of the target.

Jungle fighting is mainly in the hands of the infantryman and it usually means savage, close-in fighting. He cannot expect much support from other arms, for this will often be impracticable or impossible. He must rely on himself and his own weapons.

As he studies his terrain the leader should decide just which of his different organic infantry weapons he can use in each part of the area of operations. This study and the mission he has will dictate the organization of the task forces he needs in order to give them maximum mobility and fighting effectiveness.

He will usually find that mechanized units cannot be used except on roads, fairly dry trails, and in savannas. Horse cavalry will usually be confined to trails and open areas but small cavalry detachments may be useful for reconnaissance. In the rainy season of jungle areas, however, even small cavalry units so churn up the trails as to bog down any troops—foot or mounted—that follow. Sometimes trails, streambeds, or roads can be used by cavalry for surprise flanking or enveloping attacks. Native ponies are usually the most suitable mounts for cavalry in the jungle, partly because they eat much less and are used to the feed obtainable locally.

Artillery also has its troubles in the jungle. Poor trails usually keep mechanized, motorized, or even animal-drawn guns from going along with jungle columns. Pack artillery is up against the same marching difficulties as horse cavalry. Also, it is seldom that anything but direct fire can be used and the effective area of burst is limited by the growth. But if it is expected to do much fighting in clearings, along river banks, or on beaches, then pack artillery will be useful—if it can be gotten through. Both animal-drawn and motorized artillery may be used if the roads or trails are in good shape.

The ratio of the different types of artillery ammunition carried should be modified to meet the conditions expected. Although caliber 75 shell is not economical for firing persistent chemicals and smoke in open terrain where heavier guns can be readily moved, its use is justified in the jungle where no bigger guns can go. Moreover, persistent chemicals and smokes dissipate far more slowly in the jungle than in the open.

The short ranges, and the general restriction of targets to those along relatively narrow trails and stream-



Filipino troops at work clearing a trail through the jungle on Bataan.

beds, will make battery or platoon artillery fire unusual. Each gun section usually forms a team with a small infantry group.

Chemical troops will usually find that only pack units will be practicable and that these will have the same limitations as pack artillery, except that chemical mortar ammunition is lighter, hence fewer animals are needed.

The ratio of smoke and of persistent to non-persistent chemicals for jungle use is based, as in more open terrain, on whether the mission is offensive or defensive. Incendiaries are useless except in the dry season and then only in sparse areas where the sun penetrates and dries out the undergrowth. Ordinarily the bulk of chemical ammunition to be used consists of chemical mines and smokepots placed by hand. When mines or cylinders are on hand, barriers of persistent chemicals may be placed along paths and trails, and across vital areas. In damp weather and in dense growth, persistent chemicals may stay effective for as long as two months, and nonpersistent chemicals will also last longer than in other climates.

There should be engineer troops with every jungle expedition. Their chief jobs, of course, are bridging, and preparing obstacles and demolitions (or clearing them away), trail cutting and maintenance, water purification, and siting small defensive works. With only pack transport usually available, engineer supplies must often be limited to explosives and tools. But the jungle itself will furnish the material for many jobs.

Mechanized or armored units have little fighting value in the thick jungle itself, but they can be effectively used on savannas or other open areas and against villages.

Antiaircraft artillery is ordinarily ineffectual owing to the density of the growth and the difficulty of moving the guns. For antiaircraft protection the troops will have to rely on concealment, and on weapons suitable for use against low-flying airplanes.

Air force operations are also difficult in and over jungle areas. Its observation aviation has only limited

usefulness, but it can sometimes identify and report the location of friendly columns or detachments and adjust fire for artillery. Heavy bombers find few favorable targets. But medium and light bombers give jungle fighters their best substitute for artillery support. Here the infantryman's main problem is to precisely describe to the airman the targets on which his bombs are needed. More often than not, available maps are inaccurate—or there won't be any. This means that the air-ground team must work out a method for designating target, say smoke shells fired from mortars upon the targets.

When conditions are suitable for them, parachute troops can be used to reinforce jungle columns or seize and hold critical ground in advance of those columns.

Before beginning a tropical jungle expedition the commander should hire natives as guides, carriers, scouts, and auxiliaries. When his mission is to protect the country against invasion, he can usually count on the help of the local authorities. Guides whose loyalty and integrity are unquestioned should be carefully selected and hired before the operations begin.

Carriers and scouts should also be hired beforehand. From among these it will be possible to pick out suitable men to form the nucleus of an organized force of native troops which will be of the greatest help in any operation in strange country. Such men are invaluable for scouting, raiding, and harassing the enemy communications. Their familiarity with the region and their knowledge of the people and the language will more than offset their limited training. And alliance with native troops strengthens our solidarity against a common enemy.

#### MARCHES AND CAMPS

Men must be hardened and conditioned for jungle warfare by marches and exercises through jungle country. Since the going is tough and units will often march in single file over steep, narrow, and often muddy trails, it can be seen that both men and animals must be thoroughly accustomed to such campaigning. More-

over, they must be well hardened to packing full loads along bad trails.

All leaders must keep a close eye on clothing, equipment, packs, saddles, and leather. Leather wears rapidly in the jungle, especially shoes. And if leather gear is old or worn it should be replaced before starting on a long march or on a period of extended jungle service.

The leader must prepare the details of his march beforehand, bearing in mind the size of his unit, the capacity and number of trails, the distance to go, the season, and the methods of supply and evacuation. He should try to move by daylight, for concealment and cover are ample and it is easier by day to avoid ambush. Night movements in the jungle are extremely difficult.

As a rule, there are no parallel trails and time and men cannot be afforded to cut new trails for a long march. Columns usually march in single file, with reduced distances, and on a time schedule. Animals should not be sent ahead of foot troops, especially on muddy trails.

Mule pack units should be supplied late in the afternoon or early in the morning while the troops are still in camp. This permits pack units to move while the trails are free and to keep their normal gaits, the walk and amble.

The leader must make or have made a thorough route reconnaissance before each march. If the tactical situation permits, a reconnaissance party of officers and men should go over the trail to check its condition and the time and distance of the march. They also look for new routes around bad places; mark trails and streams to be bridged; revise maps and mark camp sites, watering points, and rest areas on them. At the end of the reconnaissance they supply the leader with a trail report which will enable him to make his plans for the march of his force and any new trail cutting or construction necessary.

If the report shows the route to be practicable, he should send out parties to clear, widen, and mark the trails, and build bridges. If the report shows the route to be impracticable, then a new trail must be located and cut. And this, of course, requires additional organization and much more time.

Laying out a new trail calls for careful map study which should aim at finding the most direct route, bearing in mind existing trails, hills, streams, swamps, and so on. Year-around conditions of the terrain must be studied. A point to remember is that high ground has less vegetation to cut but it also has less water. Streams should be crossed where the fords can be used the year around or where bridging is easiest. Any low ground is usually dangerous except perhaps during the dry season. Before working on a trail, a reconnaissance party should follow the proposed route and definitely locate it on the ground because inaccuracies in the map will necessitate trail changes on the ground. In locating the trail, a few men of the reconnaissance party first blaze a small opening through the jungle along the

route picked out. This provides landmarks which the main construction party can easily follow.

The main party should be generally divided into four groups: the trail-breaking group, the trail-clearing group, the construction group, and the mess-and-supply group.

The trail-breaking group cuts and clears all light underbrush with machetes and opens the reconnaissance party's trail. The trail-clearing group, using heavier tools (axes, saws, and machetes), cuts and clears the heavier jungle growth. The construction group builds bridges, corduroys the trail, and makes earth cuts and fills. The mess-and-supply group, of course, feeds and supplies the party. The speed with which the trail can be constructed varies with the size of the party, the width of the trail, and the density of the jungle. Often a usable trail for foot and pack-animal elements can be made by machete parties alone.

During actual fighting it may often be necessary to cut temporary trails in order to gain connection between columns, help an attacking force in assaulting or enveloping the enemy, or give a defending force quick lateral communication. Here the leading cutters of the column break the trail while succeeding cutters widen and improve it. Speed and relief are gained by rotating men every few minutes. Since these trails must be cut swiftly, the route picked will largely depend on the ease with which the trail can be cut. Slight detours will often gain time. To make sure that the trail reaches the objective, a trail picker (with compass) should accompany the leading cutters.

Trail marking is important, for trails change on the ground owing to erosion, fallen trees, swollen streams, and the quick jungle growth. This means that the trail you see on a map several years old often isn't there at all or is shown incorrectly. Air photos often do not show an existing trail in jungle areas. Therefore plain markers will relieve a command of constant worry. The methods most often used for marking are blazing trees with machetes, nailing flattened cans on trees, or using wooden signs. For night marching, whitewashed trees or white signs are fine, but for immediate and temporary use a white string or cloth (bandage) can be tied on trees along the route.

How fast can you go? The rate of march largely depends on the condition of the trail. A well-cleared, marked, drained, and bridged trail offers an easy avenue for single file, column of twos, threes, or fours. But since the troops do usually have to march in single file, this naturally strings out the column as the men move up and down steep grades and clamber through streams and mud. Rests must be frequent where the trail is muddy or steep.

Leaders must enforce a stern march discipline particularly to prevent straggling and to keep their men from drinking unchlorinated water. During the march, trail maintenance must continue, for both men and animals may churn the routes until they become impass-

able for units in rear. Special details to cut new trails around bog holes, to repair bridges, or to corduroy muddy sections, should be dropped off. No march should be undertaken without adequate trail-maintenance equipment.

When possible, small detachments under an officer or NCO should go ahead of the column to select the camp site, lay it out, and partly clear it.

A good jungle camp site usually stands on high ground for natural protection, drainage, fresh air, and for the breezes that free it from insects. But sometimes lower ground is more desirable in facilitating such things as securing water for cooking, watering animals, and bathing. On ground high or low, cover and concealment are no difficult problem in the jungle.

When possible, marches should end in time to permit the men to prepare and occupy the camp area before dark. Unit bivouac areas are laid out well to the right and left of the trail, and clearing begins as soon as the troops arrive. Only the smaller trees and underbrush should be cut so that a canopy remains overhead. Usually battalions are allotted a large area, then sub-divided into company areas. The subdivision of areas goes down to include squads, so that units are kept together and control is easier. To avoid confusion and disorder, if it is necessary to move out of the camp quickly at night, each squad leader designates squad rallying points. Arrangements are likewise made for the orderly assembly and movement of the whole command.

#### RECONNAISSANCE

Reconnaissance in the jungle is far harder than in the open, for observation is often limited to a few feet. Since movement is largely confined to trails or roads, reconnaissance is chiefly along them. Although trained scouts and trackers, working along trails or roads may pass enemy troops concealed in the undergrowth, they will not miss signs left by the enemy, for all movement along a jungle route leaves a track easily read by trained men. The broken stems of bushes, dust on the foliage or brushed off the foliage, footprints, and hoofmarks—all point to the passage of men. The scout's nose also helps him, for cigarette smoke and the smell of burning tobacco linger much longer in the jungle than in more open areas. Broken or trampled brush may show that individuals or groups have left the trail to hide or relieve themselves. And the trained ear detects movements which can't be seen. Obviously this all calls for trained jungle scouts.

The reconnaissance elements of advanced guards, and what is even more important, flank guards, as well as dismounted and mounted patrols, are important means of ground reconnaissance and information.

Prompt transmission of information is one of the major difficulties of jungle war. This means that every useful method of communication must be in the hands of the reconnaissance elements. For to rely solely on foot messenger may mean costly delay—and disaster.

The radiotelephone is perhaps the most valuable piece of equipment, although the jungle growth may hamper transmission. A leader will therefore do well to pick out relay points at which he knows the radio reception and transmission are good.

Small patrols, if made up of trained scouts, are able to move through jungle areas, avoid enemy outposts, slip through hostile defenses, and penetrate into enemy rear areas. These patrols are often one of the most important means for gaining information.

Air reconnaissance is almost useless in areas covered by thick tropical growth, but aircraft can be used for distant reconnaissance to check the enemy's movements at entrances and exits from jungle areas. Untrained or careless troops—and even the Nazi or Jap is sometimes careless—may disclose their whereabouts to air observation by their cooking fires, or by failure to hide their mosquito bars or clothing which is being dried or aired. The vigilant eye will also spot troops who move across clearings, through thinly timbered spaces, or along broad trails.

The higher leaders should coordinate the reconnaissance measures of the lower units and provide for distant reconnaissance by aviation or by mechanized or horse cavalry.

#### SECURITY

Seldom if ever in jungle war will you find a definite line that separates an area under our control from that in the hands of the Nazi or Jap. There will be no "front" with its area of no man's land. Therefore it behooves every leader to provide all-around protection for his unit—whatever its size—when it is in movement through the jungles. In most instances the densest of vegetation crowds right up to the edge of the trail, blinding observation to the flanks. Moreover, most jungle paths follow the line of least resistance—they twist and wind, making it impossible to see any great distance to the front or rear. It follows that your every movement is always open to surprise attack from any direction. Troops accompanied by transportation are even more vulnerable. Security detachments must accordingly operate at short distances so that they will not lose contact with the troops they are protecting. All men must be schooled to react promptly in accordance with a plan to defend themselves against surprise attack while on the march.

The dense growth makes security difficult but it does lend itself to your own concealment and enables your troops to move unseen by ground or air enemy observers. If attacking, a unit can make a flanking or enveloping march without being discovered. If forced to withdraw it can do so with ease behind a thin screen of automatic weapons before the enemy is aware of it. Moreover, since movement is confined to roads or trails, the pursuing force may be greatly delayed by demolitions and obstacles—including mines and booby traps—which are placed across the route. The rank vegetation and winding trail net make it easy to delay and

harass the pursuer with small mobile groups, which tackle the heads of his columns and retire before the main enemy body comes up.

All units protect themselves against low-flying aircraft by using their own weapons, for AA artillery will seldom be on hand. But the concealment given by the jungle itself is often the main item of antiaircraft protection.

Security against mechanized units must also be taken into account. The operations of Nazi or Jap mechanized units will ordinarily be limited to areas along the outskirts of jungles, to large open areas or occasionally to trails or roads. You will find that in the jungle AT mines are more easily transported and used than AT guns. But where you expect the enemy to use mechanized units your force should include AT guns.

Every leader must work toward the defeat and destruction of the enemy's mechanized elements. As in other theaters of war, the general methods and weapons, including obstacles and demolitions, are useful in the jungle. In addition, the jungle itself is ordinarily a barrier to mechanized units, and it should be used as an ally in working out antimechanized security measures.

#### SECURITY ON THE MARCH

In considering the measures he will take to insure his column's safety on the march, a leader must remember that the enemy is in general confined to moving on the existing trails or roads. Therefore covering the trail or trails to the front and reconnoitering the lateral trails coming in from the flanks will ordinarily give protection against surprise from sizable groups of the enemy. But it is necessary to be constantly on the alert for surprise attack from small groups in ambush. Distances between elements on the march should be much less than in open country. Special measures must be taken to insure contact between elements.

All columns must always provide themselves with both advance and rear guards. Flank guards cover the lateral trails until the column has cleared. Ordinarily it will be impossible to have flank groups paralleling the column. But in crossing open places in the jungle the leading element must send patrols to the flanks and keep them there until the rear-most element has passed through the clearing. To avoid being cut off, all elements detached from the column should rejoin the tail of the column without delay.

In each element of the column the automatic weapons should be distributed so that they can throw their fire in all directions. In the event of an attack, designated units cover the front, rear, and flanks at once by observation and deliver their fire promptly and effectively as soon as the attacker's position has been located.

Surprise attacks or fires from ambushes in the jungle often come from extremely short ranges. Unless troops are trained to act promptly, they will suffer many casualties before the enemy is located. Most such attacks will be made by small parties and prompt action by the unit in whose area the attack occurs will generally result in driving off or destroying the enemy. But if the enemy is in force, the counterattack will at once disclose this and enable the column commander to take proper action.

To insure coordinated action within each unit, prior to the march, leaders of subordinate elements are assigned sectors or areas of responsibility. When fired into, troops leave the trail at once to gain concealment and cover, and each subordinate unit faces the sector for which it is responsible. The scouts of the unit covering the area from which the fire is received indicate where they think the hostile force is, and begin at once the movement against the enemy. The scouts of the other units move out into their sectors to feel them out and determine whether or not enemy units are there. When the attacking force is driven off or destroyed, the commander at once reorganizes his column, replaces his advance guard or reassigns sector responsibility, and again takes up the advance. Units which have been in contact with the enemy should remain between the column and the last-known location of the attackers until the column has cleared, and then withdraw and rejoin the rear guard. Care must be taken to avoid being drawn into full deployment at every surprise attack. But a commander who doesn't act energetically and promptly may be held up indefinitely and his troops rendered useless by the enemy's intelligent use of a few squads of aggressive infantrymen. At all halts the advance and rear guards stay out and post march outposts to cover the head and rear of the column. The main-body commander sends out flanking groups to both flanks to protect the column during every halt.

*(Part IV will appear in the November-December issue.)*



We had a wrong idea of total war. People thought of it as total danger. It isn't that exactly. It's total effort.—JONATHAN DANIELS, OCD.



*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

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*New Equipment.* New and revolutionary fire control equipment and new armament are now being furnished to the harbor defenses. Very substantial increases in accuracy as well as range and volume of fire are made possible. Training in both operation and maintenance of the new equipment are provided in special courses conducted by the Coast Artillery School. Questions concerning the new matériel will be answered if practicable by the Board. Questions concerning the special courses in the Coast Artillery School may be addressed to the Commandant.

*Plotting boards.* In the case of batteries using plotting boards of the M3 or M4 type, where one or more of the observation stations have not yet been constructed, it may be necessary to use an existing station pending the construction of the observation station for which the board is drilled. The accompanying sketch shows the details of a method of providing a special station center plug for such a station. One-eighth-inch stock was used for the connecting plate. In order to prevent the station arm from interfering with the gun arm the pivot pin permanently attached to the station arm must be shortened to three-fourths of an inch. On the sketch "A" indicates the accurate distance between two observation stations for which standard station centers are provided on the plotting board. The distance and azimuth of the line B to the temporary station must be accurately determined. The upper figure in the sketch illustrates a method to be used when the temporary station is very close to the position of the station for which the plotting board is drilled. When the temporary station is located between two drilled positions, the construction illustrated in the center of the sketch may be used.

A new coupler must be constructed for the station arm. The length of the coupler is equal to the distance from the temporary station to the directing point of the battery, reduced to the scale of the plotting board. In order to avoid the necessity of constructing a race for

the ball-bearing pivot at the end of the station arm, it is easier to remove the ball-bearing fixture and substitute the pivot shown on the sketch. The ball-bearing pivot is replaced whenever the standard coupler is used.

A good standard of precision is required in this work, as serious errors in both azimuth and range will result from even a small error in the location on the plotting board, of base-end stations.

Where M3 or M4 plotting boards have been issued but which lack station plates for fire control stations (as in the case of certain new single-station fire control instruments), the Ordnance Department plans to send out skilled machinists from the arsenal where the boards are manufactured, to bore the new station plates.

*Plotting room trailers.* Military characteristics for a plotting room trailer for 155mm gun batteries were submitted in 1940. A full trailer rather than a semitrailer was believed desirable. By letter of June 8, 1942, the Adjutant General's Office announced the standardization of wheeled motor vehicles chassis and trailers. Any full trailer with tandem axle must be suitable for towing behind a 2½-ton, 6 x 6 truck. If a larger truck is required, a semitrailer must be used.

In June, 1942, an expansible semitrailer was delivered to the Board for test. This trailer in the closed position is representative of a non-expansible type trailer and as far as the layout of equipment is concerned a comparison was made of the expansible and fixed size trailers. As a result of the test, the Board is of the opinion that no further development of the expansible type trailer is warranted. The only advantage of the expansible type of trailer is that it permits a better arrangement of equipment, which, however, is not essential to smooth operation. On the other hand, the expansible trailer has the disadvantage of increased over-all height and complexity, and its practicability in connection with field usage is questionable.

War Department action to discontinue development



of trailers for plotting rooms is based on the fact that the principal mission of seacoast artillery 155mm gun units is the defense of harbors and harbor facilities against water-borne targets. A high degree of mobility does not appear to be essential for the accomplishment of the mission. Shelter for the plotting room equipment in the operating position and transportation for the equipment are essential. Combination of the two requirements into a single vehicle is desirable but is not considered essential. Separate shelters in the operating position can be provided or improvised and present transportation, while not completely satisfactory, may be considered adequate. The demand for the 4- and 6-ton cargo trucks appears to preclude early availability for the purpose of towing a plotting room trailer.

*Seacoast searchlight matériel.* About 1931 the War Department approved the policy of providing seacoast searchlights of the portable type furnished for antiaircraft artillery use. The standard rubber-covered cables were furnished with the lights. The rubber-covered cable is not satisfactory for permanent or semipermanent installations. If heavy vehicles are driven over unarmored rubber cable it will be pinched and bruised; and for protection against damage by shell fire or bombing, trenching is essential. Armored cable is better suited to trenching. As the result of recent action the Army Ground Forces have decided that where local conditions warrant permanent installation of cable, armored cable will be supplied on special requisition. Otherwise standard rubber-covered power and control cable will be supplied.

The great majority of antiaircraft artillery searchlights issued for seacoast artillery use have not been supplied with azimuth scales either on the base of the searchlight or on the controller. A number of scales with mil graduations have been manufactured for the base of the searchlight; also a number of scales graduated in mils and degrees have been procured for installation on the controller tripod. The Board recommended that the Chief of Engineers be requested to furnish azimuth scales graduated in degrees for all portable type seacoast searchlights now in service and

that azimuth scales graduated in degrees be furnished all portable type seacoast searchlight control stations. Army Ground Forces have decided that existing portable seacoast artillery searchlights and those to be procured in the future (including controllers) should be equipped with azimuth circles graduated in degrees. In order to simplify procurement it has been proposed that all future antiaircraft artillery and seacoast artillery searchlights be equipped with azimuth circles graduated in degrees and hundredths of a degree.

*Radio-controlled targets.* The delivery of radio-controlled target boats to harbor defenses should begin within the next month. The boats are thirty-three feet in length and are capable of a speed of about forty knots. The Coast Artillery School is conducting a course to train marine engine mechanics and radio specialists in the operation and maintenance of the equipment. The new JR boats should prove to be an excellent training means, especially in simulating attack by a high-speed maneuvering motor torpedo boat. The boats may be operated by means of conventional controls when tracking drill is desired.

*Damage tables.* Work on the computation and construction of damage tables for all seacoast artillery major armament is about completed. These tables will be distributed to harbor defenses as soon as completed and reproduced.

*Training ammunition allowances.* Supplemental allowances of certain types of practice ammunition for 3-inch, 8-inch, 10-inch, 12-inch, and 14-inch seacoast artillery units have been announced. The allowance of target practice ammunition for 155mm batteries will be more than doubled in the near future. Instructions already issued are being modified so as to authorize record service practices not less than two months apart for 3-inch batteries and not less than four months apart for all other batteries.

Gun batteries receiving supplementary allowances will employ Case II pointing for not more than one record target practice except in the case of 3-inch batteries which should fire using Case II pointing for all practices.



Our strength grows out of our weakness. Not until we are pricked and stung and sorely shot at, awakens the indignation which arms itself with secret forces.—  
EMERSON.



# Antiaircraft Artillery Board



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The Antiaircraft Artillery Board, formerly an integral part of the Coast Artillery Board, was activated with the reorganization of the War Department in March of this year. In May the Antiaircraft Artillery Board was transferred for permanent station to Camp Davis, N. C., where it recently has moved into new buildings especially built for its use. In a future issue of the JOURNAL it is hoped to include pictures of the Board in its new setting.

Development of antiaircraft matériel is progressing at a rapid rate. It is not permissible to discuss most of the items under study and test because of their secret or confidential nature. However, the following items are selected from unclassified reports.

*Body Armor.* A set of body armor was recently sent to the Board for test and recommendation as to its adoption for use by personnel of antiaircraft units. The complete set consists of two "T" shaped plates with a cotton web harness. One "T" is held in an upright position in the front of the body over the lungs and stomach, and one "T" is held in an inverted position on the back of the wearer's body. Each "T" is of ¼-inch homogeneous bullet-proof steel, and consists of two pieces hinged together to provide flexibility. The dimensions of the two pieces of armor for each "T" are 9" x 4¼" for the horizontal part and 8" x 5½" for the vertical part of the "T." The total weight of the equipment is approximately fifteen pounds, while the body area given protection amounts to 84.5 square inches front and back when viewed directly from front or rear. The Board recommended against the adoption of the equipment because the body area covered by the armor is too small, the armor too thin to give much protection, and the additional weight of the proposed equipment tends to handicap the individual in the performance of his duties. It was believed much more desirable to provide armor shields on antiaircraft guns than to provide individual body armor of extremely limited value.

*Miniature Range for Training In The Use of Automatic Weapons.* The Board is constructing a miniature range for training gunners in firing automatic weapons at aerial targets. The range when built is to be tested to determine its usefulness as a training aid. The range is actually a small theatre in which an airplane model and

a movable mirror are installed. The airplane model and background are both reflected in the mirror. By changing the aspect of the model, and by rolling the mirror forward or backward, the image of the airplane model appears to fly in three dimensions on any desired course. It is possible to simulate tracers by drawing a light spot in front of or behind the model. In another method of using the trainer the student gunner is equipped with a combination forward area sight and colored light projector. The gunner is provided with glasses of the same color as used in the light projector. His point of aim can be observed by the instructor without the student seeing the spot. The miniature range is expected to be useful for the following phases of training:

- Use of forward area sights,
- Estimation of course angle,
- Estimation of deflections,
- Observation of tracer,
- Aircraft recognition.

*Open Type Emergency Sights for Antiaircraft Guns.* The Antiaircraft Artillery Board has investigated the use of standard antimechanized telescopic sights for 90mm and 3-inch antiaircraft guns for direct fire against dive bombers at short range. As a result of this investigation the following points were determined:

1. Within limits which are considered satisfactory, aerial targets can be picked up easily and tracked by means of the telescopic antimechanized sights which have been standardized for the 90mm and 3-inch antiaircraft guns.
2. Although the disturbance of firing and the dust and smoke incident thereto cause the trackers to lose the target occasionally on crossing courses, this interference is not serious enough to preclude the use of direct sights on such courses; and it is believed the effect will be negligible in the case of directly incoming targets, or targets diving directly toward the gun.
3. *a.* The azimuth tracker is required, while moving the gun in azimuth with the right hand, to use his left hand to adjust his tracking telescope to follow the target in elevation.
- b.* This operation was found to be practicable while following slow targets on crossing courses and even

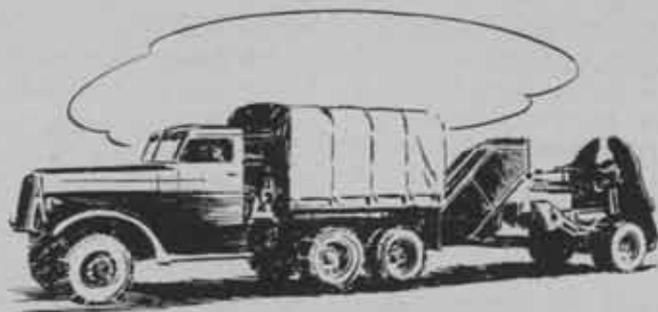
more practicable in the case of targets diving directly toward the gun, in which case no such adjustment would be required, except initially to pick up the target.

4. The telescope which is used by the elevation tracker remains aligned with the axis of the bore under all conditions and no serious complications are found here.

The Board concluded that the antimechanized sights (Elbow Telescopes M24 and M25 for the 3-inch Gun Mount M2A2 and the Elbow Telescopes M24 and M26 for the 90mm Gun Mount M1 and M1A1) together with the associated telescope mounts, provide a type of on-carriage, non-computing sight acceptable for employment against dive bombers at short range. The Board recommended that the Chief of Ordnance be requested to provide sun filters for the telescopes on the above sights.

*90mm Spring Rammer.* The Board recently tested the first production model of the spring rammer for the 90mm antiaircraft gun. Briefly, the rammer consists of a spring-driven arm mounted on the gun cradle in such a way that the rammer is retracted by recoil. In loading, the round is laid with the shell inserted in the breech,

and the base of the cartridge case is supported by the rammer arm which is swung down into position by the gunner. The relayer operates a lever which releases the rammer and permits it to be driven home by a spring. During the tests the rammer functioned satisfactorily. One of the chief difficulties encountered during previous tests of a rammer of similar type was the separation of ammunition rounds as a result of ramming. In these previous tests, the round was thrown into the breech with such force that the extractors, in many cases, jerked the case from the projectile as the round was being seated. No such malfunctions occurred during the subject tests. Separation of the rounds appears to have been avoided through the installation of a new type buffer which operates through almost the entire stroke of the rammer. The tendency of rounds to separate has been reduced also by double crimping of the cartridge case around the base of the projectile. Action to effect double crimping was initiated during the development of the spring rammer at the time the difficulty was experienced with separating rounds. The Board recommended that with slight modification the rammer be accepted.



# Coast Artillery Journal

Fifty-first Year of Publication

COLONEL FREDERIC A. PRICE, Editor  
MAJOR ARTHUR SYMONS, Associate Editor



The JOURNAL prints articles on subjects of professional and general interest to officers of all the components of the Coast Artillery Corps in order to stimulate thought and provoke discussion. However, opinions expressed and conclusions drawn in articles are in no sense official. They do not reflect the opinions or conclusions of any official or branch of the War Department.

The JOURNAL does not carry paid advertising. The JOURNAL pays for original articles upon publication. Manuscripts should be addressed to the Editor. The JOURNAL is not responsible for manuscripts unaccompanied by return postage.

## The United States Coast Artillery Association

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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 materiel and methods of training and by fostering mutual understanding, respect and cooperation among all arms, branches and components of the Regular Army, National Guard, Organized Reserves, and Reserve Officers' Training Corps.

## News and Comment

### Coast Artillerymen to Meet

There are a large number of Coast Artillery officers of all components on duty in and around Washington, D. C. Many of these are old friends who seldom have a chance to renew old friendships. Many others are lately in the service and have not yet made many friends among other Coast Artillerymen.

All such officers in and around Washington will have an opportunity to meet each other at a stag dutch-treat dinner at the Army and Navy Club in Washington on Friday, October 16, 1942. Plans will then be discussed concerning further dinners or dinner-dances during the winter. The gathering will be at 6:30—the dinner at 7:30 P.M.

All officers expecting to attend are requested to notify the Editor, COAST ARTILLERY JOURNAL, by phone or mail before noon on Tuesday, October 13, 1942. Phone: REpublic 7812. Address: 1115 Seventeenth Street, N.W., Washington, D. C.

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### Books for Enlisted Specialists

The Director of the Department of Enlisted Specialists, the Coast Artillery School, has prepared a list of texts recommended for study by applicants for admission to the school. The Department offers the following courses:

1. Master Gunner Course
2. Electrical Course
3. Radio Course
4. Automotive Course
5. Radio Detection Course.

Applicants for all courses will profit from study of *Practical Arithmetic, Part I*, by Palmer. *First Course in Algebra*, by Milne and Downey, is recommended for applicants for all courses except the Automotive Course. Prospective Master Gunner students will find *Plane Geometry*, by Palmer, Taylor, and Farnum, worth their study. *The Radio Handbook* and the *Radio Amateur's Handbook* are recommended for both radio courses.

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### Check Payment

Due to the present very large collection charges placed against all checks drawn on banks in Hawaii and other outlying bases, it is requested that all payments to the JOURNAL from such locations be made by money order. In such cases, the cost of the money order may be deducted from the original bill.

### Keeping Posted

(Things of interest from official publications)

*W.D. Bulletin No. 33, July 14, 1942*, contains a complete codification of rules and customs pertaining to the display and use of the flag of the United States of America.

*Section II, W.D. Circular No. 242, July 23, 1942*, details instructions pertaining to the use of chemical warfare ammunition during training, demonstrations, and tactical exercises.

*Section IV, W.D. Training Circular No. 44, July 24, 1942*, releases valuable information concerning night visibility.

*W.D. Training Circular No. 45, July 24, 1942*, presents general instructions for the preparation of small arms and artillery matériel for use in cold climates.

*Section II, W.D. Training Circular No. 48, August 6, 1942*, details safety precautions in loading and firing the 90mm AA gun.

*W.D. Training Circular No. 51, August 10, 1942*, announces that TM's 9-1655 and -2655, both dated January 26, 1942, do not supersede the Training Manuals on the same subject (Director M-1) dated July 18, 1940. The newer manuals contain essentially the same material, and differ only in the arrangement of the text.

*W.D. Training Circular No. 52, August 12, 1942*, describes the construction and use of infantry intrenchments and weapon emplacements.

*W.D. Training Circular No. 56, August 19, 1942*, discusses methods, equipment, and procedure of air-ground visual communication and identification.

*Changes No. 1, to TM 4-310, August 14, 1942*, revise the hand signals shown on pages 275-276.

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### JOURNAL Boosters Keep 'em Rolling

Your Editor is always deeply gratified by the number of group subscription orders that keep coming to the JOURNAL offices. The magazine makes no all-out effort to indoctrinate unit commanders with the idea of 100% subscription lists, but the commanders themselves are finding the publication of their arm important enough to sell it to their officers. The JOURNAL is edited with one dominating thought—to make it of the greatest possible value for the troops in the field.

Lieutenant Colonel William C. McFadden, of the 69th Coast Artillery, is one of many officers who typify the JOURNAL booster. Colonel McFadden has been sending in group subscriptions for many years, often without indication that they came from him. Only by comparing handwriting and postmarks has the Circulation Department been sure that many of the orders did come from Colonel McFadden. His latest contribution

is eighteen subscriptions to the JOURNAL. (Three more subscriptions came in from Colonel McFadden after this article was written originally.)

Lieutenant Colonel G. W. Whybark and the University of Alabama ROTC unit have also been ardent supporters of the JOURNAL. The latest communication from Colonel Whybark included sixteen subscriptions to the magazine of the CAC. Major Thomas A. Baker, of the 204th CA, sent in eight subscriptions to make the 2d Battalion of that regiment 100%.

Colonel Frank H. Barnwell, of the 263d Coast Artillery, sent along a list of twelve new subscribers; Lieutenant W. S. McCullum of Battery E, 70th CA, sent in five; and Captain Edward H. Hahn, Jr., of the 612th Coast Artillery, boosted our total by nine new subscribers.

Just as we go to press, Captain Peter P. Bruce, adjutant of the 422d Separate Coast Artillery Battalion, comes through with twelve Renew and Bill subscriptions, the kind of subscription order that requires the least paperwork at the JOURNAL office.

Major George A. Baldry, of the 601st Coast Artillery, and Captain Charles W. Ward, Adjutant of the 14th Coast Artillery, get in under the wire with twenty-five and eleven subscriptions, respectively.

Flash! Five more subscriptions from Colonel McFadden!

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### Note to JOURNAL Authors

The War Department Bureau of Public Relations has authorized the JOURNAL to quote from a letter dated September 19, 1942: "Contributors to the COAST ARTILLERY JOURNAL are not prohibited by the provisions of Section I, Circular 311, W.D. 1942, from submitting professional articles as heretofore."

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### Marines Adopt Barrage Balloons

The following is quoted from an article titled "Watchdogs of the Sky," by Lieutenant W. P. McCahill, USMC, in the July issue of *National Aeronautics*:

"As proved in the battle of Britain, barrage balloons, strategically located, force hostile planes to fly high for fear of shearing off a wing on the almost invisible cables which hold the hulking rubber bags to the ground. Filled with helium or hydrogen the balloon operates at heights above 6,000 and below 10,000 feet.

"Axis airmen have shown a healthy respect for the hidden steel cables. Hence the adoption by the Marine Corps of balloon barrage protection for the vital bases entrusted to them. Preventing strafing and low-altitude bombing, the balloons are the perfect defensive companions of antiaircraft batteries."

NOTE: The above excerpted article refers to the operation of Barrage Balloon Base One at Parris Island, South Carolina.

### Coast Artillery and Barrage Balloon Boards

AR 90-20, dated June 30, 1942, provides for the continuance of the Coast Artillery Board, the functions of which have been somewhat changed by the establishment of the Antiaircraft Artillery Board, which was mentioned in the last issue of the JOURNAL.

The Coast Artillery Board will be stationed at Fort Monroe, as heretofore, and will consider such subjects pertaining to seacoast artillery as may be referred to it by the Commanding General, Army Ground Forces. The Board will also originate and submit recommendations for improvement of the Coast Artillery Corps.

The Board will operate under the supervision and control of the Chief of the Requirements Division, Army Ground Forces.

AR 90-25, dated June 6, provides for the Barrage Balloon Board, stationed at Camp Tyson, Tennessee. This board will consist of a president and such Coast Artillery officers under his jurisdiction as may be designated by the Commanding General, Antiaircraft Command, and such officers of other arms and services as may be detailed by the Commanding General, Army Ground Forces. The board will consider subjects pertaining to barrage balloons and other subjects that may be referred to it by the Commanding General, Antiaircraft Command, under whose control and direction the Board will operate.

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### AA In Northern Ireland

By MARSHALL ANDREWS

*Washington Post Staff Writer*

NORTHERN IRELAND, July 16.—There's a touch of 1918 about what has happened to the artilleryman in the A.E.F. of 1942.

Like his father, he has left at home the guns on which he trained and has learned the science all over again on guns borrowed from his Allies. Along with their British guns they got British instructors, who lived with them in their gun parks and convinced them that in spite of his broad A's the British soldier is a right guy once you know him.

The reason for this is an excellent one. It has saved valuable shipping space which would have been required to bring over the guns and more shipping space to keep them supplied with ammunition.

Antiaircraft units, like the light field artillery, have taken over British weapons and have learned to handle them under British guidance. They found British sergeants a good deal tougher than the guns themselves, but by now they have come to appreciate the fine qualities of both and to get along with both as if they had met them in some replacement center back home.

For the artilleryman training is at best a tedious business. Once he has become acquainted with his weapon, what he does from then on is repetitious and

mechanical. For every shot he fires on the range he loads his gun a hundred times in drill and dry runs. Only when he finds himself in the thick of battle does all this monotonous labor suddenly bear fruit in speed, confidence and cool self-possession.

Artillerymen with the 1942 A.E.F. have been fortunate in varying the monotony of their training routine with new guns and new techniques. They have had added good fortune in being placed in a country new and strange and filled with difficulties which have called upon the deepest springs of their ingenuity.

These artillerymen have become experts on guns they like. A troublesome question of supply and transport has been solved. British and American amity has been broadened by close contact on a professional basis. Men have been trained in the sort of country in which they will fight.

It looks like a good job for everybody all around.

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### The WAAC's Mobilize

The first Officer Candidate School of the Women's Army Auxiliary Corps opened at Fort Des Moines, Iowa, on July 20. The enrollment of 440 was selected from more than 30,000 applicants and included women on volunteer duty with the Aircraft Warning Service.

Initial plans contemplate a WAAC strength of 13,000 by the end of 1942. The present authorized strength is 25,000, with plans pending for an authorized strength of 75,000.

Members of the WAAC will be assigned to two types of units:

*Aircraft Warning Service* will receive about 40%, organized into companies of approximately 11 officers and 250 auxiliaries. There will be two types of companies, Operations and Filter Companies. During the remainder of 1942, all companies of the Fighter Command on the eastern seaboard will be manned partially by members of the Corps, supplemented by volunteers. Thereafter it is contemplated that companies will consist entirely of members of the WAAC.

*Service Command* companies, with authorized strength of three officers, twenty leaders, and 127 auxiliaries, will be tailor-made to fit the duties at the post to which assigned.—*Adjutant General's School Bulletin*.

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### New Aircraft Markings

The most recent War Department instructions on the subject of marking of aircraft call for an insignia composed of a white five-pointed star within a circumscribed blue circle. The red, white and blue tail markings have been discontinued.

The star insignia will be applied to the upper left wing surface, the lower right wing surface, and the sides of the fuselage.

## AR 90-40

The War Department has released a revision of Army Regulations 90-40, dated June 25, 1942, governing the harbor defenses of the Coast Artillery Corps. The new pamphlet supersedes A.R. 90-40, October 2, 1937, including paragraph 4, section 4, of War Department Circular No. 35, 1938 series, and paragraph 1, section 5, of Circular No. 219, 1941 series. The new edition is composed of 10 paragraphs, as follows: 1, Definition and Composition; 2, Establishment; 3, Commander; 4, Visits and Courtesies; 5, Staff; 6, Channels of Correspondence; 7, Records; 8, Classification and Safekeeping of Military Records; 9, Photographs of Works of Defense, and 10, Damage to Army Submarine Cables by Passing Vessels.

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## FM 4-126

It is expected that the new Field Manual 4-126, *Service of the Piece, 90mm Gun*, will be distributed to units in the field in the very near future. Among the features of the new Field Manual will be a method of emplacing the gun, using the prime mover; and new designations of the members of the gun sections, bringing the designations into agreement with T/O 4-17, April 1, 1942.

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## Give 'em All a Chance

The following paragraph was abstracted from a letter written by Captain Carl W. Kruegel, commanding Battery D of the 420th Coast Artillery Battalion:

"Please enter our subscription for two more copies of the JOURNAL. We find that one copy is worn out through constant use before everyone has a chance to read it."

There are still some batteries that have not subscribed to the JOURNAL because the battery commanders must have the mistaken idea that "enlisted men don't read the JOURNAL." Enlisted men *do* read the professional magazine of the Coast Artillery Corps when they are given the opportunity, as Captain Kruegel's letter indicates.

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## 880,000 Trucks and Trailers

In one day recently the Army purchased 880,000 trucks and trailers of various types in sixty-four separate contracts with forty-one manufacturers. Contracts were signed with large and small manufacturers, representing most of the country's truck and vehicle industry. The total cost of these vehicles will exceed \$1,500,000,000.

The majority of the new trucks will have wood bodies, thus conserving critical metal. Steel-bodied cargo trucks are still required for some purposes. Steel is superior to wood for tropical usage because it resists insect and weather damage.

About one-fourth of the new cargo trucks to be delivered to the Army in August and at least half of the September and October deliveries will have bodies of wood. The conversion to wood bodies is expected to be complete after October this year.

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## Commandos at Dieppe

The Allied Commando forces which raided Dieppe on August 19 captured and destroyed a German coastal battery of six 6-inch howitzers sited on the main beach at Dieppe. More German coastal guns were knocked out further west.

At Varangeville the Commandos captured and destroyed a battery of 6-inch naval guns.

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## A Job To Do

The following article was written at his "task force" headquarters by a commanding officer of a coast artillery unit in an important overseas post:

"A few officers still come out to scenes of action, or possible action, imbued with the idea that the morale of men under them depends upon the entertainment, or distractions, that can be provided for them. Nothing could be further from the truth. The American soldier comes into the field with one sole idea uppermost, namely, to do the job thoroughly and as quickly as possible—so that he can get back home to the distractions of his personal choice.

"His morale depends entirely on his confidence in his leaders. He asks only two things:

"First, that the work assigned to him be essential to the main effort and that he be told clearly what is expected of him.

"Second, that all the creature comforts *practicable* in the situation be provided him.

"Perhaps, unconsciously, he asks a third, that his officers prepare themselves for the problem in hand and plan assiduously to insure that his efforts be not wasted. His greatest strength as a soldier lies in his capacity to see quickly what is needed, and in his willingness to do what he thinks right without regard for his personal welfare. It is that latter trait that makes heroes of men who will later quake with fear at what they have done—or may even quake in the doing, but go ahead. In his leaders, he expects the same insight and initiative but in a greater degree. If they have it, nothing will shake his morale.

"So, when your outfit is ordered overseas, don't be too concerned about how much post, camp and station equipment you can sneak aboard ship—unless it will help win battles. Don't let the men load up a lot of loot and luxury. Just be certain that you know what YOU are going to do when you get off the ship, and that you have prepared yourself to LEAD your troops without cajoling them. Morale won't worry you then."

### Transportation Corps

The insignia of the newly-created Transportation Corps will be of gold-colored metal, depicting a winged railroad-car wheel, symbolic of railway transportation, flanged on a rail and charged on a shield placed upon an eight-spoke ship's steering wheel. The shield fashioned after the country's Federal route markers, represents highway transportation and the ship's wheel, water transportation. The insignia will be worn by both officers and enlisted men, the officers' as a cut-out and the enlisted men's mounted on a disc.

The newly-adopted colors of the Transportation Corps are brick red piped with golden yellow.



### Steel Cartridge Cases

Substitution of steel for brass in the manufacture of artillery cartridge cases—a major development in the field of Army ordnance—has been announced. The program will result in the conservation of large amounts of copper, a principal component of brass.

The change-over from brass to pressed steel in the composition of cartridge cases is part of a broad Army conservation program, made necessary by huge war demands on critical materials. It was explained that concurrently with the substitution of steel for various more critical materials, the Army was converting steel components, formerly produced by forging, casting and automatic screw machine processes, to pressed steel. This is resulting in savings in critical machine hours, labor and expense.

The transformation of the method of making cartridge cases is the result of a year of experiment, the results of which are now announced as successful. On February 17, 1942, the War Department announced that "steel cartridge cases for artillery shells of various sizes are being produced on development orders by several manufacturing firms." These development orders were successful, and over the next few months, the change-over to steel for artillery cartridge cases will be made. Ordnance experts, after extensive tests, report that the new cases are as satisfactory as those made from brass.

Similar experiments, in initial phases, are being carried on in the field of small arms ammunition, with preliminary good results. Jackets for small arms ammunition, formerly composed in great part of copper, are now being converted to clad steel.

With the declaration of war last December, the United States had on hand one of the largest copper supplies in its history. This country still has access, domestically and from South America, to important supplies of copper. However, huge demands for copper for a variety of war purposes both by this country and by the United Nations occasioned the research on substitution by the relatively more plentiful steel.

The problem of a change in materials used in the cartridge case was a difficult one, because the substitute

had to have almost identical physical requirements to that of brass. When a gun is fired the explosive charge expands the gun barrel for a fraction of a second. Then the barrel contracts to its original size. The cartridge case, holding the gun-powder also expands and it, too, must return to its original size, so that the shell may be easily extracted. Brass has these physical requirements, which resulted in its universal use in case making. By the production of a successful steel cartridge case, the limits on ammunition production resulting from the many demands for copper have been removed. Over thirty manufacturers are now making the new steel cartridge cases.

The steel cartridge cases have been thoroughly tested for durability and reliability by Army ordnance. The Germans, whose supply of copper is appreciably smaller than ours, have been experimenting for some time with steel as a substitute for brass. Similarly, other countries of the United Nations have been looking for substitutes. It is believed that this country is in advance in this development.

Although details of the program are secret, it can be revealed, for example, that in the substitution of pressed steel for copper for one primer case, measuring less than one inch, the savings will be 11,000 tons of copper in 1942 and 1943. Pressed steel is also being substituted for other critical materials, such as aluminum and magnesium.

Substantial progress has been made in the manufacture of steel components, formerly produced by the more intricate and more expensive forging, casting and automatic screw machine processes. In effect, this development of pressed steel will bring the facilities of the automobile companies and manufacturers of consumer durable goods, into fuller play in the armament program.



### Qualification Badges for Vehicle Operators

A qualification badge for Army motor vehicle drivers and mechanics similar to the badges for qualification in arms has been authorized by the Army.

The basic badge will be a cross pattee of oxidized silver with the representation of a disk wheel with tire placed on the center. Bars of oxidized silver to be suspended from the basic badge will show the type of qualification of the individual. The qualified driver of wheeled vehicles will have a bar designating him as "Driver-W"; the qualified driver of track or half-track vehicles will be designated by "Driver-T"; the motorcyclist, "Driver-M"; and the mechanic for automotive or allied trades will be designated by "Mechanic."

In order to qualify for the Driver Award, soldiers must meet the following standards:

- (1) Pass an aptitude test and the standard driver's qualification tests as prescribed by the Army;
- (2) Perform duty for a minimum of three months as a driver or assistant driver of an Army vehicle

without traffic violations and with an accident-free record and a rating of excellent;

- (3) Be assigned to duty as a driver or an assistant driver of a vehicle; and
- (4) Have not had award revoked for cause during the previous six months.

Qualification for the Mechanic Award requires that the soldier:

- (1) Complete a standard vehicle mechanic's course with a rating of skilled or have sufficient previous experiences as automotive mechanic to justify a skilled rating;
- (2) Perform duty for a minimum of three months as an automotive mechanic, second echelon or higher, with a rating of excellent;
- (3) Be assigned to duty as an automotive mechanic, second echelon or higher; and
- (4) Have not had award revoked for cause during previous six months.

The Motor Vehicle Driver and Mechanic Award will be made by regimental, separate battalion, or separate organization commanders upon recommendation and certification as to qualifications by the immediate organization commander.

### British AA Gets Tough

On lonely gun sites around Britain's coast, in camps scattered over moorlands and plains, thousands of anti-aircraft men, longing for action, are today being toughened and trained into a formidable army of storm troops.

They are learning to scale cliffs under machine-gun fire, to swim rivers with rifle and full battle kit slung from their shoulders, to fight on the beaches, in the streets, in forests and jungles.

It is part of a new two-point plan:

1. To banish the word "defense" from the British Army vocabulary, switch emphasis to "attack."
2. To tune every man to commando fitness, inspire the commando spirit.

On a blackboard in a trestled room with a northwest sea view there is a notice: "Attack! Get them before they get you."

Officers and NCO's go to school there twelve hours a day, seven days a week, for the period of the course. Then they go back to their units to "preach the gospel."

The oldest pupil is 47-year-old gum-chewing Sergeant Herbert Clark, from Hull, soldier in World War No. 1, father of a Royal Marine, an anti-aircraft gunner, and an army physical training instructor.

Stripped to the waist, in a bleak wind blowing in off the sea, Sergeant Clark stood in a row with seven others. They tossed a 180-pound tree trunk into the air, caught it as it fell. In full battle kit, he squirmed along a rope slung sixteen feet above the ground between two trees.

He dived fully clothed into the swimming pool to

show how troops can ferry kit across rivers. And he scaled a twelve-foot tower, jumped over trenches, yelling, in a mock street battle.—*Daily Express*, London.

### AA Guns vs. Tanks

In the Soviet-German War the Red Army anti-aircraft artillery has learned to combat tanks as well as planes. Dual purpose anti-aircraft guns make good anti-tank guns because of their high muzzle velocity, high cyclic rate of fire, and 360° traverse.

In the first six months of the war Red Army anti-aircraft artillery fired in self defense at enemy tanks when they broke through to the battery positions. Gradually the anti-aircraft artillery became an organic part of the anti-tank defensive system. In numerous instances Soviet anti-aircraft guns successfully repulsed attacks of large German tank units.

The anti-aircraft units learned that most tactical operations seem to divide themselves into two phases. In the first, army artillery concentrates heavy fire on enemy tanks before they can jump off. It then lays down a screen of fire to prevent the enemy tanks approaching our forward line of defense and breaking up our infantry formations. At this time the anti-aircraft units are busily engaged in repelling the attacks of enemy aircraft, particularly dive bombers, which open the way for the tanks.

In the second phase, after enemy tanks have broken into the initial line of defense or deeper, the enemy aviation generally shifts its attack to counterattacking or reserve units. In this comparative lull anti-aircraft guns fire at the German tanks by direct laying; the more point blank the range, the more effective the fire.

It must always be remembered, however, that the prime function of anti-aircraft artillery is against planes. In areas where there is insufficient anti-tank artillery, anti-aircraft guns must be employed to drive off tanks which approach the battery positions or threaten to break up the battle formations of our troops.

In order to successfully combat enemy mechanized forces the anti-aircraft artillery must prepare its anti-tank defense in advance. When the guns go into position they must be ready to open fire against attacking tanks immediately. To establish such a system it is necessary to:

- (1) Make a complete study of the surrounding terrain, particularly as regards possible tank approaches;
- (2) Determine the sector of fire for each gun, including ranges to key reference points;
- (3) Build the minimum amount of field fortifications necessary;
- (4) Establish special anti-tank observation points.

All anti-aircraft personnel not working at the guns during a tank attack take up positions in the vicinity and use hand grenades, gasoline bottles, or armor-piercing bullets against the enemy tanks.—*Red Star*.

### One for Us—

LONDON, Aug. 11.—Britain took her Avro Lancaster off the secret list today and British aeronautics writers quickly hailed the battle-tested machine as the biggest and fastest heavy bomber in the world.

The newly-unveiled giant, like its famous teammate in raids on Germany—the Short Stirling—carries an eight-ton bomb load, but its pace of 300 miles per hour and up is better than the Stirling's. The Lancaster is armed with ten .303 caliber machine guns mounted in four power turrets.

It has a maximum range of 3,000 miles, a thousand more than the Stirling, and is thus the prime weapon for bold raids on selected targets deep in Germany. Its first officially disclosed operation was the daring daylight raid on Augsburg last April 17.

In July several Lancaster squadrons made the longest daylight attack flight of the European war—1,750 miles through bad weather to bomb the Danzig submarine yards.

The Lancaster's weight is thirty tons. It has a wing spread of 102 feet and a thirty-three-foot bomb compartment.

### And One for Them

BERLIN (from German broadcasts), Aug. 8.—German newspapers published for the first time today pictures and descriptions of a new Nazi warplane—the Dornier 217—said to be the last word in dive bombers.

From press descriptions the new plane appears to be a modification of the DO-215 and the later DO-17. Adolf Hitler's newspaper *Voelkischer Beobachter* declared, however, that the DO-217 had a bomb-carrying capacity "several times larger" than those planes and a much greater cruising capacity.

(The DO-215 and the DO-17 are twin-engined monoplanes with a maximum bomb capacity of 2,200 pounds, a range of 750 miles, top speed of 275 miles per hour and a ceiling of 26,000 feet.)

Full details of the DO-217—which is powered with two 14-cylinder 1,600 horsepower engines—were not given, but the German radio said it was "heavily armed and equipped with the most modern technical equipment, guaranteeing the highest performance under any weather conditions."—Associated Press.

### Now—Service Commands

Reorganization of the nine Corps Areas of the Army, and redesignation of them as "Service Commands," was

ordered on July 22 by the Commanding General, Services of Supply, with a twofold purpose as follows:

1. To decentralize further the operation of activities of the Services of Supply by increasing the authority of commanding generals in the field and by giving them proportionately increased responsibility.
2. To improve and streamline the field organizations by eliminating duplicating facilities.

The Service Commands supervise the Army camps and posts, service the troops with supplies and equipment, induct the new selectees, and generally handle the administrative details necessary to maintaining a large Army.

Comprehensive instructions have been issued to all commanding generals in the new Service Commands, redefining and redesignating duties, in order that their supply and administrative functions may be geared completely to wartime operation.

The administration and housekeeping of all troops in the respective areas is now centered in the new Service Commands. Under the new plan, money will be allotted in one lump sum to each Service Command. Formerly money was allotted to each of the units within the Corps Area by its parent unit in Washington. This change will result in extensive simplification of fiscal and accounting work.

There will be no change in the geographical boundaries, the new Service Commands covering the same territory as the old Corps Areas. The numerals used to designate the Corps Areas will also be continued, so that the First Corps Area will now be known as the First Service Command. Since October 8, 1940, Corps Area commanders have had no tactical responsibility. That responsibility continues to rest with the Ground Forces and Air Forces officers.

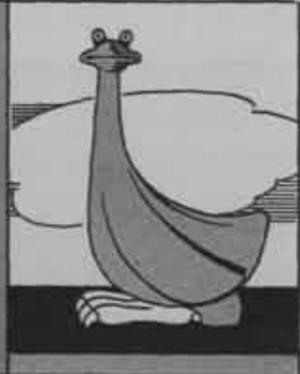
In effect, the reorganization creates nine autonomous Services of Supply in the field, each to function under the direction of the Commanding General, Services of Supply in Washington, but each a self-functioning unit responsible for servicing the troops of each area.

### Fortieth Renewal

There are few, if any, JOURNAL subscribers who can match the record of Major General William H. Wilson, U.S.A. (Ret.), who on September 19 sent your magazine his *fortieth* renewal of his subscription. General Wilson accepted appointment as a Second Lieutenant of Artillery on October 29, 1901, and subscribed to the JOURNAL at about the same time. His record as a subscriber has been unbroken during that period.



# Coast Artillery Activities



## Trinidad

*By Chaplain William M. Latta*

The Harbor Defense of Trinidad presents a varied problem. The terrain is mountainous at one end and flat on the other. Where one crew has great trouble getting their guns and equipment straight up into the air, another is down in the steaming jungle with the mosquitoes. While these animals are not as large as the bi-motor jobs which grow in the swamps of Georgia and swarm over Fort Screven and Camp Stewart, there are more of them and they are very persistent. Some of them are malaria-bearing and quite nasty. The control units are doing an excellent job and will improve conditions gradually. Everyone sleeps under mosquito bars. Head nets and gloves must be worn at night in some of the camps.

Along the northern edge of Trinidad the land rises sharply into mountains 500 to 3,100 feet high and falls directly into the sea. Excellent gun positions and observation stations can be obtained along the heights. The cover is good, and all positions may be easily concealed from observation by air or sea. A problem is the hit-and-run submarine, which steals in through the night, pops up out of the water, throws six or seven shells into what it hopes is a position, then drops out of sight, being on the surface about two minutes. Position finding by the old methods is too slow for this kind of attack. So new ones are developed to meet this menace. Beach defense for all possible landing places is organized.

Living quarters are adequate and comfortable. The food is good, and there is plenty of it. Picture shows, books, magazines and papers are provided in sufficient quantities, baseball and softball are difficult in many places, but one of our units won the softball championship of the sector in spite of it. Mail service is very good and is a great morale booster. Dances and parties are provided at regular intervals for the men. The men take a great deal of interest in their new homes. They collect stones to make walks. Small footbridges of bamboo adorn many of the camps. Mangoes, coconuts, pineapples, limes, and other tropical fruits grow in the camp areas in some places and the men have developed great liking for these fruits, mangoes especially.

Long hours of alert and stand-to make early to bed necessary. So for most of us, at night, it's eat, get the mail, write a letter, go to the picture show, bed and after two winks up for duty again. The nights are cool enough to be very comfortable. It's not as hot here as a Georgia summer, and the nights are much cooler. The rainy season is on now and everything gets mildewed overnight and brass tarnishes easily. The rains while



Coast Artillerymen where the going is tough.

*Photo by Signal Corps, U. S. Army*



Sunrise services in the jungle.

*Photo by Signal Corps, U. S. Army*

hard are of short duration and do not seem to impede travel or any other thing that must be done.

Monotony is the great enemy of morale. The sameness of climate and of duty make it hard on those who do not have sufficient imagination or talent to contrive new amusements to fill any spare moments. As time goes on, new hobbies and crafts will have to be encouraged among the men to replace old ones which cannot be carried on in this climate. Because of censorship in-

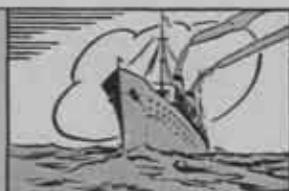
discriminate picture taking is, of course, out, and the heat makes developing and printing difficult if not impossible for the average soldier. Developing equipment cannot be carried about, nor is there space available to set up dark rooms. Films must be iced to be developed. The radio is very popular, and there are enough of them provided to add variety of program. And, except for not being in the States, these camps would compare favorably in comfort with any there.



Does the JOURNAL have your present address? It's up to you; your magazine does not receive copies of special orders.



## New York-Philadelphia Sector



BRIGADIER GENERAL RALPH E. HAINES, *Commanding*

*By Captain W. F. Madison*

Target practices have held the major part of the spotlight in the training activities of the New York-Philadelphia Sector for the past month. Competition between the Subsectors and among the units thus engaged has been especially high, with each organization not only working for a coveted Superior rating but also against each other for top honors. One battery with a score of 194.7 has the best record made within this Sector as this goes to press.

Incidentally, this particular organization will be seen by many Coast Artillerymen in the future since their battery was the location selected for a 12" BC training film recently made by the Training Film Production Unit.

The site of a new 8-inch railway rifle in this Sector was a setting for a nationwide radio broadcast on the Army Hour recently. This broadcast was a featured portion of the hour program which was sent by short wave to all foreign countries. Bill Stern, the sports announcer, described the entire action involved in the loading, laying and firing of this new type 8" rifle.

Numerous schools have been conducted within the Sector. However, the Chemical Warfare Schools—one in each Subsector—have been among the most successful. Units within the Subsectors sent officers and non-commissioned officers to these schools for qualification as gas officers, noncommissioned officers and gas sentries. Organizational instruction was also given for the units stationed at the forts where the schools were held.

A Nazi propaganda agency recently furnished an item of interest to this Sector. According to a Berlin broadcast, a Nazi sailor by the name of Zimmerman, who landed from a submarine, attacked and put out the Sandy Hook Lighthouse by throwing hand grenades at the 400-ft. tower, says a recent writeup in *Yank*, the Army newspaper. The Nazi agency, however, failed to reveal what Fort Hancock's twenty-four-hour alert batteries, beach patrols and lookouts were doing when the submarine popped up within range of their guns—an event to which more than one gunner has been looking forward for the past eight months. They also neglected to reveal how the ninety-foot structure known as the Sandy Hook Lighthouse had grown to a 400-foot tower and failed completely to explain how their Herr Zimmerman had managed to put out a light that had been extinguished some time before—in compliance with dimout regulations.

A release from Fort Hancock reveals several notes of interest concerning this structure.

"The famous Sandy Hook Lighthouse, oldest standing structure of its kind in the country, was blacked out for the first time in more than 166 years. The light has shone continuously from the time it was first lighted in 1764 until a few weeks ago—with one exception. That was a night in 1776, when Captain John Conover, a Revolutionary War patriot, climbed the 90-foot tower and smashed the light in an effort to hamper British ships making their way past Sandy Hook into New York Harbor."

This time, however, the light was blacked out for exactly the opposite reason—to comply with dimout regulations and assure the safe conduct of British ships (and all shipping) into New York Harbor.

A recent visitor within the Sector was Lieutenant General Hugh A. Drum, Commanding General of the Eastern Defense Command and the First Army. He was accompanied by the Sector Commander, Brigadier General Ralph E. Haines, on his inspection.

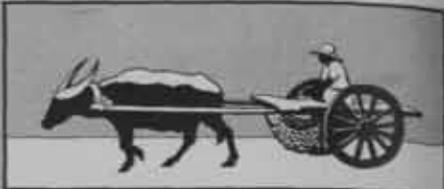
Another visitor recently was Miss Nancy Carroll, stage and screen star—but for an entirely different reason. Miss Carroll spent a week at Fort Hancock rehearsing for the Fort Hancock theater section presentation of the Broadway hit, *Mr. and Mrs. North* (needless to say, the show was quite a success). Evidently Miss Carroll made quite an impression on the soldiers stationed there as one battery named one of their favorite guns Nancy Carroll and the actress christened the gun in person.

A great deal of interest is being shown in boxing throughout the Sector. There have been some excellent boxing shows which included exhibitions by well known professionals at several posts and camps, and reports of the increased participation of soldiers in this sport have come into this headquarters. Recreation officers see this as a direct result of the emphasis being placed upon physical conditioning and the recognition of the need, not only for teamwork—so necessary to the Coast Artilleryman—but also for individual initiative and action in warfare as seen in other countries today.

The purchase of War Bonds by officers and enlisted personnel has taken a big jump since the pay raise became effective. Fort Hancock reports that almost \$32,000 each month is pledged for War Bonds and Stamps at that post.



Corregidor



**I SHALL RETURN!**  
**MACARTHUR**

# The Filipino Soldier in Bataan\*

By Major General Basilio J. Valdes, Philippine Army

Although nearly 36,000 Americans and Filipinos are today prisoners of the Japanese as the result of the invasion of the Philippines, the four months of fighting that preceded the fall of Corregidor did not, in my estimation, constitute a national defeat. To the contrary, in many respects the Filipino proved that he was a better man than his Japanese adversary.

I am convinced that, had the Philippine Army possessed adequate aircraft, we would still be fighting the Japanese in Luzon today.

A great deal has been written about the valor of the American troops in the Philippines. I want to take this opportunity to reiterate my admiration for the gallantry, the courage, and the dogged determination shown by the soldiers from the United States. Far from their own homes, they did a job that will live forever in history. Less has been published, however, about the Filipinos who comprised five-sixths of our forces in Luzon. Their work was no less exemplary.

The men of the Philippine Army showed some surprising points of strength, and some not-so-surprising weaknesses. For instance, our men developed into excellent artillery teams. They were quick to learn, they stood up well under fire, and their marksmanship was remarkable. Colonel Wm. C. Braly, the American officer in charge of anti-aircraft artillery on Bataan, told me he had two outstanding batteries. One was a National Guard unit from California and the other was from the Philippine Army.

Philippine coast artillery played an important part in our beach defenses. Batteries of the 21st Division under Brigadier General Mateo Capinpin were guarding the shores of Lingayen Gulf, north of Manila, when the Japanese made their first attempt to land there. To test the defenses, the Japanese warships fired a few rounds

at the beach. The artillery promptly replied so effectively that the fleet steamed on up the coast. The test was repeated again and again, and each time the convoy was met by a fire too hot to risk landing. Not until the warships reached the Ilocos coast were they able to put their troops ashore. We had run out of artillery and were unable to defend the Ilocos beach.

A similar situation occurred along the coastline south of Manila Bay. Brigadier General Vicente Lim, commanding general of the 41st Division, had sufficient artillery on the Batangas coast to prevent enemy landings there. The Japanese had to reroute their transports to an undefended bay farther south.

Long before the war started, many of us realized that the Philippine Army was deficient in two fields. The first was the serious shortage of sufficiently trained officers. The Philippine Military Academy, the West



\*Reprinted from *Philippines*, Washington, D. C., by permission of the editors.

Point of the Philippines, graduated about 100 officers a year, but this number was insufficient to meet the needs of a citizen army growing at the rate of 40,000 annually. We organized schools for reserve officers, but this was not entirely successful because those that should have attended were not always able to leave their jobs for the period of time necessary for proper training. In an effort to solve this problem, the President issued an Executive Order making it compulsory for college students to complete four years of R.O.T.C. training. Graduates were automatically appointed third lieutenants in the Philippine Army Reserve, and assigned to reserve units.

The overwhelming majority of our soldiers had only five and a half months of training. A few had served up to a year. All had been hurriedly called from civilian life. As a matter of fact the Philippine Army is essentially a citizen army. Inevitably, such men were easily confused—even panicked—in the early stages of the fighting. This was particularly true because they were called upon to engage in the hardest maneuver of modern warfare—a fighting withdrawal before overwhelming enemy superiority. It was a miracle that they were not disorganized completely in the first week of war.

I take a great deal of pride in saying that they were not disorganized. They never ceased to be an army able to deal out punishment. The Filipino recruit quickly developed into a tough, courageous fighter.

I am occasionally asked how the individual Filipino soldier measured up to his opponent. My answer is, "Very favorably."

We found we had to fight two types of Japanese. One was the man who had campaigned in China; he

was experienced, ruthless and seemingly fearless. Our young fighters were always at a disadvantage against this kind of opposition. Only the Philippine Scout soldiers, whose long years of training had made them just as tough and fearless, were a match for the long-term Japanese soldiers.

But there was another type in the Nipponese army. He was the recent conscript, the grocery clerk or fisherman hurriedly called into service. He had little advantage in point of training or experience. Man for man, our Filipino fighters generally had him beaten before the battle started.

The Filipino soldier was seldom over-awed by the juggernaut opposing him.

"Sir, please get us some planes," they begged me when I visited them on Bataan. "We'll lick those Japs."

I am quite convinced that had I been able to produce those planes, they would have done it.

For all its tragedy, the invasion of the Philippines has shown us the path we must take when peace returns to our homeland. Our program of national defense, planned by General MacArthur, approved by President Quezon, and successfully carried out by the United States Military Mission to the Philippines and the General Staff of the Philippine Army, has been sound. We must continue our system of universal military training, in which the wealthy boy serves side-by-side with the son of the farmer and of the common laborer. The air force must be enlarged, of course. Experience has proved the value of our coast artillery; we must expand that, too. With these alterations in our national defense program—and given time to build up the industrial plant that must support it—the Philippines will be able to defend its shores.



## New England Sector



MAJOR GENERAL K. T. BLOOD, *Commanding*

*By Captain Joseph R. McCormick*

New England Sector, like all other Sectors, has experienced many changes since its last appearance in the JOURNAL. Major General Thomas A. Terry left us to take over the Second Service Command (then the Second Corps Area) on April 30, 1942. During the interim between the departure of General Terry and the arrival of Brigadier General K. T. Blood, the Sector was under the temporary command of Brigadier General R. F. Cox of the Boston Subsector.

The formation of new Antiaircraft units found us furnishing officers experienced in AA to form the com-

missioned cadres. In their places we are now receiving graduates from the Officer Candidate Schools. The fact that we have been losing officers in the grade of Captain and higher has made it possible to promote junior officers to fill the vacancies. As a result, we have adopted the habit of carefully scrutinizing the shoulders of an individual before we address him, just to make sure that we don't make the fatal slip of "deranking" an officer.

This rapidly expanding army has also made itself felt in the enlisted ranks. Scores of candidates are dispatched

monthly to various Officer Candidate Schools. It is only natural that those holding noncommissioned rank, and who are in key positions, are the ones who seem to go. This constant shift has brought out many a gray hair in the heads of our officers who are attempting to maintain an efficient organization. No sooner is a man trained to a job than he is on his way to school. The nerve-racking circle of finding another replacement and training him goes on and on.

Since late June all Harbor Defenses have been conducting functional, calibration, and service firing. Many practices have been completed, and gratifying results in performance of personnel and matériel have been attained. Several recent installations have been fired for the first time since their emplacement, and have

provided the personnel with a wealth of experience. One interesting feature of such a firing was the total evacuation of civilians in the vicinity of a new battery. This measure was taken as a safety precaution to insure that the field of fire was safe, and that no civilians would be in danger of injury. All persons were moved in army vehicles, and invalids were moved to nearby hospitals by army ambulances. After the completion of the firing, these people were again returned to their homes. The whole move brought commendation from civil and military authorities for the thoughtfulness and efficiency of the move.

The batteries in the Sector which have not fired their service practice are trying to do so, and only await the proper weather in order to carry out their program.



## Southern California Sector

Colonel W. W. Hicks, Commanding Officer of HDLA, was one of the principal speakers at a huge MacArthur Day celebration held in Los Angeles in June. Famed Westlake Park was renamed during the ceremony and now bears the name MacArthur Park. Fort MacArthur is named after General Douglas MacArthur's fighting father, General Arthur MacArthur, and around this fact, Colonel Hicks built his talk.

Every qualified enlisted man in this command (HDLA) either has gone or is going to an Officer Candidate School. More than 250 enlisted men have already left this Command for Officer Training Schools in Seacoast Artillery, Antiaircraft, Armored Force, Quartermaster, Chemical Warfare, Signal Corps, Ordnance, Engineer, Infantry, Adjutant General, Field Artillery, and Cavalry. Unit commanders have been selling their men on the advantages of being commissioned officers, and Fort MacArthur men have been responding—wholeheartedly.

The Volunteer Army Canteen Service, which was organized soon after Pearl Harbor by a group of prominent Hollywood women, continues to render an invaluable service in maintaining its two canteens for the benefit of the enlisted men. Envious eyes are cast Fort MacArthur-ward, for almost every evening some celebrity is on hand to entertain the soldier as he sips the free coffee and dunks the donated doughnuts, so graciously furnished by the ladies. Among the celebrities to appear have been Lana Turner, Jack Benny, Tommy Dorsey, Claudette Colbert, Irving Berlin, Joan Bennett, Fifi D'Orsay, Charles Boyer, Red Skelton, Jerry Cooper, Gracie Allan, Basil Rathbone, Harry Fields, Cobina Wright, and many others. Besides this array of

talent, the two canteens (one on the Upper Reservation and one at Middleside) boast "The Most Beautiful K.P.'s in the World." Metro-Goldwyn-Mayer generously turned over all receipts from the premiere of its picture *Mrs. Miniver*, which was held at Los Angeles' Cathay Circle Theatre, to the VACS, for maintenance of the canteens. The premiere was quite military, for members of the garrison were on hand, acting both as escort guards and honor guards, and the show was opened with a ceremony featuring the Fort MacArthur color guard. General Maxwell Murray, commanding Southern California Sector, was guest of honor.

The *Yardbird Revue*, a mobile theater unit, run by and for the enlisted men, has been making the rounds of Southern California's Army and Navy outposts. Conceived by Sergeant Johnny Walker, the all-soldier cast gives a two-hour variety performance that is adjudged by all who see the show as "very professional." The Yardbirds, who are becoming regular troupers with their one-night stands, have played to more than 50,000 people in the few months they have been in existence. Some of the audiences range as high as 5,000, while at some of the outposts, the troupe entertains but fifteen men. And take it from Sergeant Walker, those fifteen men get a bigger "bang" out of it than the larger audiences.

War Bond sales boomed along at Fort MacArthur due, in part, to an active Bond Officer, and a clever cartoonist. Private Lou Goldberg, staff artist for the Fort MacArthur *Alert*, weekly publication of the post, was presented with a citation from Secretary of Treasury Morgenthau for his inspiring cartoons which run weekly in the *Alert* and daily in the *News Bulletin*.



# Southern Sector



BRIGADIER GENERAL HAROLD F. LOOMIS, *Commanding*

*By Major Robert L. Hood, Jr.*

Highlighting events in the Southern Sector during the summer months were intensive training programs, target practices, both small arms and seacoast armament, a tactical training inspection of all sector troops, varied recreational programs and events, the completion of extensive construction projects, and Field Artillery batteries using coast artillery methods firing at towed water targets.

An interesting phase of training at Fort Moultrie was seen recently when a harbor defense regiment paraded before a staff of noncommissioned officers. The officers of the regiment had turned the troops over to the noncommissioned officers for drill and parade and viewed the ceremony from the spectators row. This type of ceremony was designed to instill efficiency, leadership and initiative in those men who someday may be called upon for these requisites on the battlefield. Similar drills and ceremonies will be conducted frequently. The above ceremony was a result of the special training course for noncommissioned officers now in progress at Fort Moultrie. All phases of basic training are covered in these classes which meet four nights a week. In addition, schools in seacoast gunnery and fire control are underway at Forts Moultrie and Taylor for all battery officers.

A tactical training inspection was held during the month of July of Harbor Defense and Combat Team units within the Southern Sector for the purpose of testing thoroughness of training and alertness of the command. Alerts and exercises combined with spot questions asked of individual soldiers were used to test the readiness of the units for their mission. In general, units carried the alerts and exercises through to a successful conclusion but the problem of training the individual soldier was revived again. This inspection

emphasized the necessity for individual and small unit training.

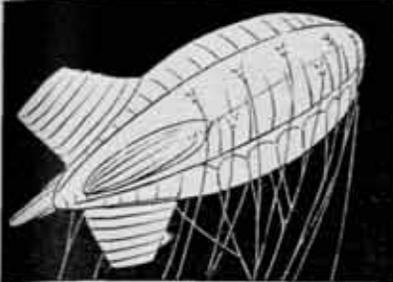
Members of Coast Artillery regiments at Fort Moultrie are now sleeping in barracks and eating in mess halls as a result of the construction program recently completed. Due to a shortage of housing and messing facilities a number of units had been forced to live in tents. Included in the program at Fort Taylor was an R B-1 type recreation building complete with movie-projection room, stage and dressing rooms. Personnel are anticipating eagerly the formal opening of this building as a post theater and also as a suitable place to stage future U.S.O. entertainment units.

"Get in the Scrap" is not a by-word for civilians only as was proved recently when four 9.2-inch British World War Howitzers, four 10-inch rifles, D.C., and 100 pre-Civil War cannon balls were scrapped for remelting purposes. The cannon balls and howitzers had been used for years as ornament pieces at Fort Moultrie, while the 10-inch rifles and cannon were removed from Fort Taylor.

A concerted effort is being made by all artillery officers at Fort Taylor to develop as many emergency fire control systems as possible. As a result of this, several radically new fire control systems have been developed. Each battery now has several emergency systems and each gun pit has at least one system which it can use without relying on anyone or anything outside the pit.

The adage "Something new every day" proved correct during July and August when two Field Artillery batteries attached to Southern Sector fired a portion of their annual target practice allowance at towed water targets. Excellent results were obtained by using a combination of coast and field artillery methods. A description of the methods used will appear in a separate article.





# Camp Tyson



BRIGADIER GENERAL JOHN B. MAYNARD, *Commanding  
Barrage Balloon Training Center*

*By Lieutenant Colonel James B. Mankin*

In July, General Maynard left Camp Tyson on an official tour of two weeks' duration. On this tour he observed the training of barrage balloon field units which had formerly been stationed at Camp Tyson. He was accompanied by Squadron Leader Frank L. Bradshaw of the British Royal Air Force. Since the barrage balloon is one of the newest arms, it is considered necessary that close contact, as to training procedure, be maintained between field units and the Barrage Balloon Training Center for the purpose of uniformity of training.

Squadron Leader Bradshaw, who has just recently left Camp Tyson, was stationed here for the past several weeks as an instructor and lecturer, showing how the barrage balloons were used in England under actual battle conditions. He went to France early in 1940 with the first barrage balloon unit to leave England. His squadron was isolated after the fall of Dunkirk and its personnel was forced to find their way through central France to St. Nazaire where they embarked for England. After returning to England his squadron was immediately assigned to guarding vital installations. It was the benefit of this wide experience that he brought to the Barrage Balloon Training Center.

Colonel John H. Cochran, Coast Artillery Corps was assigned to the Barrage Balloon Training Center as Executive Officer. He arrived and assumed his duties on July 17, coming here from Virginia Polytechnic Institute where he was professor of Military Science and Tactics and Commandant of Cadets for the past four years.

The excellent weather for the past few months has greatly facilitated the training of the command. In addition to the operational barrage balloon training, many long cross-country marches and night problems

have been conducted. The obstacle course, which was completed in the latter part of June, has been in constant use in toughening officers and men for field duty.

On the evening of August 16, the formal Dedicatory Program and opening dance of the new USO Club in Paris, Tennessee, were held in the USO Club rooms. General Maynard was the guest speaker and expressed appreciation for the new soldiers' recreational center and accepted the hospitality of the USO on behalf of the personnel of Camp Tyson.

The *Musical Salute from Camp Tyson* by the Post Band is now broadcast regularly each Wednesday evening from 7:30 P.M. to 8:00 P.M. over station WSM, Nashville, Tennessee. WSM is a clear-channel station and the program has been heard by persons in distant states. Also, on July 30, Camp Tyson went on the air over a nation-wide Mutual Broadcasting hook-up through the facilities of station WMPS, Memphis, Tennessee. This was in the form of a musical salute and a short interview by Colonel Parry W. Lewis, Commandant, Barrage Balloon School, on the use and purpose of barrage balloons.

Three USO outdoor camp shows have performed at Camp Tyson recently: the *Roxy Revue* on July 27; Jeannette MacDonald sang on August 3; and *Full Speed Ahead* on August 26. These shows have been greatly enjoyed and have attracted very large crowds. Inclement weather prevented Miss MacDonald from singing outdoors, so she very graciously volunteered to give two performances in the Post Theater in addition to a previous performance at the Post Hospital. The show *Full Speed Ahead* was produced in the newly-completed Amphitheater which was built in a natural depression and rushed to completion in time for this show.





Coast Artillery Crew in Newfoundland Regatta.

## Newfoundland

By Major Robert J. Wood

Those who characterized Newfoundland weather as "annoying" (and I was certainly one) have had to eat their words after a grand summer. Bright, sunny weather, which had been believed to be the exception rather than the rule, has predominated during the past few months. Vacationists—in happier days—travel hundreds of miles to enjoy such a pleasant climate.

As a result, Coast Artillery units on duty here have been able to enjoy outdoor sports in their spare time. These have included not only traditional American games, but considerable fishing, a sport dear to the hearts of many people.

Newfoundland's waters—both salt and fresh—abound in game fish. A short distance from any of the American stations it is possible to take out the old rod and reel and throw the fly where one can be certain of a strike.

Mr. Lee Wulff, explorer, sportsman, outdoor enthusiast, is one of Newfoundland's staunchest advocates. He spends part of every year in the island and much of his stay in the field or stream. Most of the garrison has been privileged to see his 16mm films—done in Technicolor—of caribou and moose hunting, and salmon and tuna fishing. Some have had the opportunity of accompanying him to streams on fishing trips.

These few hours of recreation only point out what lies in store for a possible peacetime garrison which will have more time to devote to sports and recreation than do the present units. Permanent construction on the American posts is far enough along to indicate what the stations will look like when they are completed. Newfoundland will be a choice detail, believe me.

Just now, of course, this World unpleasantness occu-

pies the minds of all military personnel here as well as elsewhere. Coast Artillery armament is constantly manned and gunners itch to shoot at something other than targets.

Target practices, incidentally, will be completed by the time this appears in print. All batteries have done well, and some have done particularly well.

Distinguished guests have not been uncommon in Newfoundland. Through the airports have come General G. C. Marshall, Lieutenant General H. H. Arnold, Admirals King and Towers, the Russian Commissar, V. Molotov, Mr. Harry Hopkins and Mr. Steve Early, to mention a few.

Lieutenant General Hugh A. Drum, Commanding General, Eastern Defense Command, accompanied by several of his staff, made a recent inspection trip and expressed himself as satisfied with the Coast Artillery installations and personnel.

As this is being written, Newfoundland is honored by the visit of The Earl of Athlone, Governor-General of Canada and the Princess Alice. American troops participated in a review for him, along with representatives of all allied forces stationed in this island. Afterwards, he made an inspection of Fort Pepperrell, including Coast Artillery positions.

U.S.O. Camp Shows continue to visit the garrison at regular intervals, bringing a bit of America and Broadway to troops which are so near and yet so far. The St. John's U.S.O. Club, under its Director, Mr. Clifford Cunningham, carries on its work which is one of the greatest morale factors on the island. Dances, picnics, swimming parties (the water's cold but, yes, it is possible to swim!) bingo nights, and above all, the

Club's excellent cuisine, have been featured this summer.

One of the Coast Artillery Units here held its first Organization Day celebration recently. As its commanding officer commented: It was not unusual for most of the officers present at the dinner to go to such affairs. It was unusual, however, to be present at a *first* Organization Day. The unit was organized in Newfoundland and has seen all of its service here. Its approved coat of arms contains a likeness of famed Cabot Tower, named after the discoverer of the island and noted as the location of one end of Marconi's first trans-Atlantic wireless transmission.

A local celebration at St. John's in which Coast Artillerymen participated was "Regatta Day." This is a time-honored holiday in a country which goes in for its holidays in a big way. No trains ran, no newspaper was printed, no stores opened. The entire population turned out en masse to the shores of Quidi Vidi Lake, adjoining Fort Pepperrell, to witness boat races, engage in games of chance and in general, enjoy an outing. The shore was lined with hastily erected bazaar stands. In fact, the affair reminded one of Epsom Downs, Kentucky Derby, Poughkeepsie Regatta, Barnum and Bailey and Ringling Brothers Circus, a County Fair and a Block Carnival rolled into one. To the Newfoundlanders, it represented just about all of those things too.

The races—in four and six oared shells—included one for American troops and one for the combined allied forces. A crew from one Coast Artillery battery (including a former Harvard oarsman) ran off with the American Championship and was a close second to the Newfoundland Militia veterans in the finale. Navy crews failed to uphold their traditions.

After a year and a half in Newfoundland, the American forces which were sent here are playing an increasingly large rôle in the social and recreational life of the nearby communities during their off hours.

This close relationship between American soldiers and a foreign population is probably more in evidence at the bases in Newfoundland than at any others which the United States Army has established, for a variety of reasons.

In the first place, the Newfoundland base was the first overseas post to be occupied by an American Expeditionary Force in World War II. U. S. troops came here in January, 1941, when their country was still technically at peace, and have had plenty of time since to get acquainted with the island and its people.

Another reason why the American boys are fitting so well into life here is because the people of Newfoundland are closer to the United States in spirit than the people at almost any other Army Overseas post. The

Newfoundlanders have always had a high regard for Americans and, generally speaking, this regard has improved, rather than diminished since the arrival of the troops.

Still another reason—and a very important one—is the natural friendliness of the Newfoundlanders, or the "Newfies," as our boys now call them. The natural curiosity of the Newfies regarding our troops is exceeded only by the latter's interest in them and their customs.

Another factor entering into this "acclimatization" of the American boys is the way in which the troops are constantly exposed to local influences—on their frequent visits to St. John's, through their acquaintances there, and through the Newfoundland press and radio stations. Both local newspapers and radio stations have a large audience among the troops and they have come to look upon the city's dailies almost as their home town papers.

All these factors have made for a relationship between soldiers and the resident population, which, although it has been ruffled at times by scattered and unavoidable incidents, is highly praiseworthy. It is the "good neighbor policy" at its best.

Hardly a public social affair in town is seen these days without men of the United States Army in attendance. Both enlisted men and officers have been taken up by local society en masse.

Fifty years ago band concerts were quite the thing in the United States on a Sunday summer afternoon. Most of the present generation of Americans know this only through hearsay, but in Newfoundland today some of them at least are discovering what a pleasant way to spend an afternoon this can be. Newfoundlanders love band music, and soldiers are partial to it also. On Sunday afternoons, and on the summer evenings, when it remains light until 10:00 or 10:30 o'clock, the park is dotted with soldiers and their dates listening to the music or strolling around greeting friends. This is something they wouldn't think of doing in the 'States, because few others do it. Here, it is the natural thing to do.

The soldiers are acquiring some of the habits of the Newfies also. Since drivers in Newfoundland keep to the left of the road, as in England, the American bases have adopted that custom. It is believed this is the only North American locality in which this rule exists.

Walking is a Newfoundland specialty, and this has found favor with the United States troops. A sergeant told me that back in New York with a date he would often take a cab to go a few blocks. Here the boys walk miles through the city and its environs, as the Newfoundlanders do, and think little of it.





## Fort Sheridan

BRIGADIER GENERAL LARHETT L. STUART, *Commanding AATC*

*By Captain Frank M. Dailey*

This is the first news letter in the COAST ARTILLERY JOURNAL from the Antiaircraft Artillery Training Center at Fort Sheridan. However, the fact that this is a comparatively new organization does not mean that it was not swift in getting off to a good start. The training center was activated on March 26th at which time there were but a few troops coming under the jurisdiction of this headquarters. Since that day in March when the organization was born much has happened. Shortly after activation Brigadier General LaRhett L. Stuart took command and officers to compose his staff began to arrive ready for the task of training new regiments and separate battalions for field service. Now only a few short months later this post is busy with the ever-growing task of training antiaircraft troops. Almost since the day of activation the post seemed to take on a new appearance, an appearance caused by all of the officers and men knowing that they were preparing for the deadly game of war, and the realization that the training that they were getting here would in a few short months be put to an advantageous use on the far-flung battlefields of this world conflict.

Realizing that training time is all too short, every effort is being made at the Training Center to impart a maximum of training in the minimum of time. So far all enlisted men have been received from replacement training centers which has relieved the burden considerably. However, it is expected that in the future all trainees except cadremen will be received direct from reception centers and the problem of giving basic training must also be borne. Emphasis has been placed on firing with all the weapons available and on hardening the men to prepare them for the rigors of modern warfare. The post of Fort Sheridan, while relatively small in acreage, is ideally equipped for this latter purpose. A

three mile stretch of sandy beach, many steep ravines, and an exceedingly difficult obstacle course provide many of the training aids which are required for physical training. Great stress is also placed on teaching the men to live comfortably in the field. To this end all troops are required to spend at least one night each week in bivouac with at least two meals served in the field. Towards the end of the training period all units can sling their packs and spend a night in their pup tents on a moment's notice and with as much ease and comfort as they find in barracks.

A great deal of assistance has been obtained from the Civil Air Patrol. As yet the Air Corps has not assigned a tow target squadron to the training center, but the civilians have most ably filled the gap. Due to the relatively low horsepower of civilian planes as compared to Army planes many problems had to be met and overcome before towing was successful. A scheme has now been worked out by which the difficulty of getting off the ground with the target has been overcome. An ingenious release device has been developed since it is necessary to drop the tow line at the completion of the mission. The Civil Air Patrol pilots fly like veterans. Contact with the firing battery is maintained by radio and the normal use of panels. In addition to towing and tracking missions the Civil Air Patrol has cooperated in practicing air-ground liaison, dropping and picking up messages, performing aerial photographic missions, and making simulated attacks on the troops while on the road and in position.

The presence of Major General Joseph A. Green at Fort Sheridan July 11, 1942, was the highlight of our short career. General Green, accompanied by Lieutenant Colonel Courtland Schuyler, stopped over for a brief one day visit on his way to the west coast.

Although General Green's visit was short it was crowded with events. He was able to inspect the post, to observe the conduct of fire by one of the training units, and to watch a battalion struggle through the intricacies of the newly constructed obstacle course. Later in the afternoon he witnessed a regimental review given in his honor on the beautiful and spacious parade ground which falls within the shadows of the famous old Fort Sheridan tower.

A soldier's life here is not all work, but it is work interspersed with enjoyable entertainments. Coöperative and patriotic citizens from the neighboring towns have generously equipped the battery day rooms to provide real havens of relaxation during off-duty hours. Also the neighboring towns, with their numerous and well equipped U.S.O. clubs, offer a pleasant change from life on the Post. For an occasional extended trip, the city of Chicago offers limitless diversion.



BRIGADIER GENERAL JAMES R. TOWNSEND, *Commanding AATC*

*By Lieutenant Harry B. Berman*

Expansion at the training center proceeds in Hydra-like manner—when one unit departs, two others spring up to take its place. Coincident with new activations has been the rapid extension of the camp's physical facilities, and the surge of construction has pushed the fringe of buildings in some areas to the camp limits. Construction innovations here include the converted "winterized" tents, the fifteen-man prefabricated hutments, black-top tennis courts, and the installation of oil-burning tent heaters in place of the gas heaters, since the constituents of gas fuel are to be used in the production of synthetic rubber.

The progress of the training mission has found impetus in the rounding out of the school program which now consists of a full schedule of centralized and unit schools for both officers and enlisted men. The arrival of newly-commissioned officers and enlisted men from reception centers has necessitated concentrated development of an adequate school schedule. The current mathematics classes preparing enlisted men for officer candidate schools have induced a larger attendance than any previously offered course indicating the acute enthusiasm and initiative prevalent.

Because of the opportune geographical location of Camp Haan, troop training has been enriched and diversified by the proximity of varying climatic and natural surface conditions. Within easy reach is the desert with its problems of barrenness and temperature; even closer are the mountains and attendant lakes presenting their peculiarities to the antiaircraft battery. Both

mountain and desert training are included in the training curriculum for antiaircraft units here.

Newest of the training aids has been the formation of two AATC bands, consisting of some sixty men, who also, but not incidentally, are concerned with the business of morale. These "morale-men" were recruited into the bands, and represent one of the finest accumulations of individual musical talent in the country. Collectively, the sum of the abilities has produced two bands which in the short time of three months have reached and surpassed all ultimate hopes of their performance. Their precision and skill was the subject of a commendation by a visiting inspector, and for good reason, for within a month after their activation, both bands were playing for parades and ceremonies and for recruit infantry drill training.

Their expanding list of activities includes concerts for hospital patients, troops in the desert, and orchestras for post and regimental dances for both officers and enlisted men. On July 23, a formal introduction of the band members was made to the training center troops in the form of a giant musical presentation at the War Department theatre, when each bandsman voiced a greeting in music. A two-hour program of modern music convinced a capacity audience of the distinguished constituency of the bands.

Coincident with the expansion of the bands was the formation of a chorus of thirty voices, many of whom are bandsmen. On August 16, a twenty-five-piece band and the chorus were featured on Mutual Network's I

Hear *America Singing* radio program, with Robert Armbruster as guest conductor. A similar program is planned from the stage of the camp theatre.

Completed last week in August was the intricate and novel obstacle course. Built by a former constructing engineer, the course consists of seventeen obstacles, calculated to test the dexterity and nimbleness of the most accomplished athletes. Ladders, cat-walks, ropes, jumps, fences, hurdles, entanglements, and barricades will segregate the strong and the swift, and provide the incentive and the means for the development of capable agile bodies. The course awaits its baptism by troops.

Troops stationed at the Mojave Antiaircraft Artillery Range in the Mojave Desert about 100 miles from Camp Haan are telling a strange story—that the desert heat exists more in fable than in fact. Instead of scorching heat, they have found surprising comfort and pleasantness, and the myth of desert horrors has been dissipated by soldier health and soldier eagerness. The reason lies with the humidity which varies between the astonishing low levels of 12° to 16°. Wily desert men say that if you know desert ways, water can be found plentifully, evidence of which can be placed in the fact that there is a well or spring about every ten miles. The average daily maximum temperature approximates 100° F., but in December of 1940 the temperature sank to 16° F. Proof of the fickleness of weather was a three-inch snowfall in 1941, and the sporadic and localized nature of the desert rain which averages six inches a year. Fog has been recorded in the Mojave Desert only twice, once in 1914 and again in 1938. The entire water supply for Camp M.A.A.R. (Mojave Antiaircraft Artillery Range) comes from an underground lake some 500 feet below the earth's surface.

Recently completed at Camp M.A.A.R. was the installation of a cooling system in the administration building, mess halls, and the post exchange. The conversion into winterized tents is in progress, and a probable expansion of the camp facilities is planned for the near future.

To assist the training of machine gunners a dummy paper tank has been constructed which is towed back and forth in a "W" pattern by a system of pulleys connected to a motor. The not-so-long-ago novice gunners thoroughly riddled the target.

Recently among visitors to Camp Haan was a four-man inspecting team headed by Brigadier General G. de L. Carrington from the Antiaircraft Command at Richmond who conducted a two-day inspection of the progress and completeness of the training program here and at Camp M.A.A.R.

Among the highlights of interest at Camp Haan comes word that the camp fire department was awarded first in fire prevention in all the military installations of the Ninth Service Command for the first six months of 1942. Nor has fire fighting been the range of the department's activities for under the direction of the fire chief, classes in the control of incendiary bombs have been conducted, with demonstrations in technique given by the firemen, all of whom are skilled in incendiary bomb control.

Civilian entertainers visiting Camp Haan included Harpo Marx, Lucille Ball, George Burns and Gracie Allen, Bert Wheeler, Herbert Marshall, Eddie Cantor, Veronica Lake, Hattie McDaniels, and Dr. Josef Hoffmann. Boxing celebrities giving exhibitions were Henry Armstrong and Jimmy McLarnin, former champions.

Newest of the recreational features is the initiation of a weekly officers' buffet supper and dinner dance at the Officers' Club which provides a pleasant means for social meetings between officers in different units.

As an aid to the orientation of new soldiers, an illustrated booklet has been prepared by the S-2 office, pointing out the recreational opportunities, basic military laws and customs, and the facilities of the camp and nearby towns and communities. Maps, diagrams, and caricatures lend interest, clarity, and humor to the booklet which is hoped will ease the adaptive process of incoming soldiers.



This war probably will be long. It will be the toughest, hardest, most merciless war we ever have fought. It calls for the united power of every American, in uniform and out of uniform, on the fighting line and on the factory line.—ADMIRAL WILLIAM D. LEAHY.



## Fort Eustis

BRIGADIER GENERAL FORREST E. WILLIFORD, *Commanding*

*By Lieutenant John O. Looney*



Perhaps the brightest highlight in the news emanating from this Antiaircraft Replacement Training Center was the presentation of an all-post show, *Fort Eustis Cavalcade of Stars*, which was produced entirely for and by the men at this station. The show was given on the evening of August 25 on the large new outdoor stage and entertained nearly 10,000 enlisted men, officers, their wives and guests. A sparkling array of talent was revealed by a thorough auditioning search through the personnel of the post, and the acts presented in the cavalcade required more than two hours to display. The scene was made all the more colorful with the natural effects of a full moon brilliantly lighting the stage and audience. Beginning at 8 o'clock, a continuous performance of comedians, tap dancers, magicians, vocalists, instrumentalists, "girl" choruses and many other phases of entertainment kept the large audience under its spell until the broad beam of an antiaircraft searchlight was focused on the American flag to the accompanying strains of the National Anthem, ringing down the curtain on a show which was entertaining from beginning to end.

This station has started a post paper which will be distributed free to personnel. A contest was held to determine the soldiers' choice of a name to be given the publication, titled *The Sky Watch*. The paper, to consist of eight pages, will be distributed weekly to each battery, battalion, and detachment on the post. With the aid of the classification section of the station, men who have had complete experience in the newspaper and publishing business have been chosen to comprise the staff. These men have already begun their work and the first edition of the paper was distributed September 4. Each battery in Fort Eustis is assigned a reporter, one taken directly from that organization, and it is his job to be in charge of news from his unit. Deadlines for news from the different battalions have been staggered to make possible a well-balanced paper. This newest addition to the public relations office of Fort Eustis now divides it into three component parts: the post newspaper, press relations section, and the radio section.

Fort Eustis is doing more than its share when it comes to the contribution of talent for the Eastern Army grid team which will meet the New York Giants, professionals, September 12 on the Polo Grounds. Proceeds

of the game will go to the Army Emergency Relief. Corporals George Cafego and Kenneth Fryer have been selected as candidates and have left the post to report for their new duties at Yale. They will be coached by Colonel Robert Neyland, who is mentor at the University of Tennessee, where Cafego was an All-American quarterback.

EDITOR'S NOTE: Score: Eastern Army 16—Giants 0.

Before coming into the service Corporal Fryer starred at the fullback position for the University of West Virginia. Orders were rescinded on Private George Zorich, Northwestern University star, who originally was directed to play on the Western All-Army team. He was prepared to leave this post for the west coast when the new orders came through.

Special swimming convoys were conducted through-



Private Eugene Zion draws posters for visual training in Chemical Warfare.

*Photo by Sergeant Charles W. Hunt*

out the summer months by the recreation office of Fort Eustis so that enlisted men would have transportation to and from Yorktown Beach, where they could enjoy a cool swim on Sundays. The men were allowed an hour and a half in the water and as soon as they had their time limit, the convoy would return to the post and take another group of men to the beach. This continued throughout the day, beginning at 8 o'clock in the morning, the last convoy returning at 6:15 P.M.

With the discontinuance of the Civilian Conservation Corps, the buildings and equipment of Camp Spruce Glen, which formerly was situated near the western boundary of the post, have been turned over to the army, and the barracks will be used as temporary quarters for troops which are about to be transferred from the post for further technical schooling, officer candidate school and other movements.

A new long-distance attended pay station, complete with eight booths and a three-position switchboard has been installed on this post. The new station presents a vast improvement over the older facilities which

were available to the men of the post who wished to make long-distance calls. The new equipment has been installed in the post signal office so that the men would not have to wait outside, exposing themselves to the rain, cold, or hot sun. The new installation is open from 4:30 P.M. until 10 P.M. during the week and from 2 P.M. until 7:30 P.M. on Sundays.

A series of fourteen articles, each dealing with a deadly gas, has been publicized by the public relations office of Fort Eustis, after a survey in cooperation with the chemical warfare service of the post. Component parts of each gas, its physiological reactions, most effective remedy and instructions on how to best avoid becoming a gas casualty of the different types are given in each story and these are published in newspapers in the area. The series is being conducted in an effort to acquaint the civilian populus with warfare of this type and to enable the individual to know immediately what to do should such an emergency arise. Tentative plans have been made for use of the series by one of the large newspaper wire syndicates for general publication.



## Camp McQuaide

BRIGADIER GENERAL FRANK S. CLARK, *Commanding*

*By Lieutenant Franklin L. Deibert*

Once a National Guard tent camp, Camp McQuaide, California, is now buzzing with the activity of a new construction program. The station hospital is being enlarged; tent houses have been torn down and sixteen-man hutments built in their places; new officers' hutments have been erected; new hutment areas are under construction; and a new Camp Exchange and Service Club will be built. All of this construction is required to make Camp McQuaide the Seacoast Artillery Replacement Training Center of the country.

Some contingents of men have already arrived, having received some of their basic training at other training centers. Upon completion of their training cycle, many of these trainees will be retained as cadre to form new training battalions. New battalions will be activated as the housing facilities become available under the construction program in progress. Firing points for smaller seacoast weapons and for AA weapons have already been established and have been put to use. The AA firing point is used by tactical units and task forces from nearby areas. The close proximity of the two points aids in giving men training with the confusion of actual fire nearby.

Rifle and pistol ranges are being constructed and in a very short time, all facilities necessary for a full training program will be available at the Camp. While the nearest town at present lacks the facilities of a USO

clubhouse, entertainment for the men is not lacking. Many of the local clubs and organizations have opened their doors to the men in uniform and several entertaining features have taken place at the Camp in the outdoor bowl. Among these have been USO outdoor shows, Camel Caravan Shows and boxing bouts and entertainments put on by the trainees themselves.

*Overs and Shorts*, a weekly newspaper published as a civilian enterprise with all news and features written by the personnel of the camp made its first appearance September 25. A Bugle and Drum Corps is now in the process of formation and will shortly make its appearance at drills and ceremonies.

The Officers' Club has recently been redecorated and is the scene of semi-monthly dances which are quite popular with the commissioned personnel of the Camp. On September 4th, a reception was tendered Brigadier General and Mrs. Frank S. Clark, by the officers. Brigadier General Clark recently returned from the Australian Theatre to assume command of the Training Center.

Specialist's Schools are being set up to include Radio, Communications, Cooks and Bakers, Clerks, Tractor Drivers and Chauffeurs, Officer Candidate Preparatory, and Refresher Courses for Officers. Other Specialist Schools will be set up in the future as the need arises.



# Chesapeake Bay Sector



BRIGADIER GENERAL ROLLIN L. TILTON, *Commanding*

*By Lieutenant Colonel James B. Anderson, Jr.*

Although much of the news flowing into the Public Relations Office of the Chesapeake Bay Sector cannot be released for publication, reports to Sector Headquarters during recent months from all units in this intensely vital area reflect a new alertness of officers and men in response to enemy submarine action off the Atlantic Coast, which has made this area virtually a front-line of defense.

Exacting and frequent combat drills, accompanied by technical training in field work, are fitting these men for the toughest type of warfare.

Although the deafening rumble of bombs exploding and the raucous ack ack of antiaircraft fire were missing, Fort Monroe was subjected to its first "enemy" bombing shortly before this article went to press. Assisted by the Chemical Warfare section of the Chesapeake Bay Sector in simulating a realistic attack, "enemy" planes dropped their make-believe bombs with deadly accuracy, providing valuable experience for the damage control facilities of the post.

After the attack a critique was held for the benefit of the officer and enlisted personnel concerned to discuss the multiple phases of defense, damage control, and associated subjects, in an effort to uncover defects and iron them out for future training exercises.

From one of the Coast Artillery units at Fort Story comes the news that a rapid-fire gun battery held sub-calibre practice in July with very satisfactory results. This was followed by record target practice. This was a new battery, which had never fired anything except calibration fire. The men responded with zeal, and an analysis of the practice proved extremely favorable.

Regimental activities at Fort Story, are extensive in scope and cover a broad terrain. In view of the importance of its tactical mission on the first line of land defense, it must be ever on the alert against surprise attacks. A percentage of its original officer personnel has been promoted and transferred to newly activated units, taking with them a wealth of experience acquired during their tour of duty with the regiment, which has unquestionably and wholeheartedly subscribed in fact to its motto, *Prepared to Defend*.

Battle practice programs for the Coast Artillery and Antiaircraft units now stationed at Camp Pendleton have been prosecuted vigorously.

As a result of this patient and meticulous training, the efficiency of the units has been raised to a high point, officers claiming that if they could reveal their training records, examination would show their troops

to be the equals, if not the superiors of, the very best in this particular branch of the service.

An illustration of the physical fitness and quality of leadership of the troops in this camp was given recently when an officer braved a rough sea, swam out a quarter of a mile and recovered a large, black sleeve target shot down by the antiaircraft gunners during practice. The target was riddled completely, testifying to the excellent marksmanship of the gunners.

Although training is rigorous and the men are in the field constantly, commanders are not neglecting opportunities to increase the technical knowledge of both officers and men, so vital in modern warfare. A camouflage school has been set up for the officers, while courses are being given to enlisted men in master gunnery and radio.

Refresher courses for Service Unit Officers are also being held, the topics covering general military subjects with the objective to prepare these officers for possible future troop duty.

Colonel Paul H. Herman, CAC, recently arrived at Fort Story, assuming command of the Harbor Defenses of Chesapeake Bay. The officers of the Post tendered a reception at the Officers' Club in honor of Colonel and Mrs. Herman, and they were heartily welcomed to their new post.

In the sports field, Corporal Eddy Brickner, Virginia



"Enemy" planes roar over Fort Monroe, Virginia, during a simulated air attack, dropping 500-pound demolition "bombs," represented by paper bags filled with flour. Coastal defense batteries are camouflaged with smoke-pots, in an effort to impair the accuracy of the bombardier.

State welter-weight champion, easily romped off with the Third Service Command boxing tournament in the 135 lb. class. Corporal Brickner is conducting boxing instruction classes at Fort Story.

In an effort to promote closer cooperation between the civilians living near Fort Monroe and the armed forces stationed there, Major Alvin Caldwell, Chemical Warfare Officer of the Post, has given frequent lectures on the control of incendiaries and the other phases of civilian defense, in order that a considerable cross section of the local residents may be fully prepared to cope with any eventuality of enemy action in this area, when and if the occasion ever arises.

During the month of July, intensive training in guerrilla warfare and preparation for service target practice was the order of the day for the troops stationed at Fort Custis. Brigadier General Rollin L. Tilton, Commanding General, Chesapeake Bay Sector, visited the post

during the early part of August and witnessed the firing of one of the batteries.

Activities of the Ordnance Company at Fort Monroe during recent months have, in addition to maintenance of railway artillery, been directed towards the servicing of the numerous instruments used by the Coast Artillery School, in an effort to keep the much-fired 75mm's operating smoothly for the use of the OCS staff.

In their never-ceasing effort to better their previous firing scores, the batteries of the Coast Artillery regiment at Fort Monroe are now preparing for record target practice. The highlight of the regiment's training thus far has been the excellent showing made by the single battery which has completed its record fire.

During a recent four-day inspection of the defenses of the Tidewater Virginia area, Representative Thomas of New Jersey stated that "This sector is on the alert" and "There should be no Pearl Harbor here."



BRIGADIER GENERAL EARL H. METZGER, *Commanding AATC*

*By Lieutenant Walter H. Dustmann, Jr.*

While the boom of anti-aircraft guns continuously rolls out over the vast area of this south Georgia anti-aircraft training center as AA regiments and battalions go through their firing paces, numerous other events have taken place at Camp Stewart in the past two months.

One of the most important of recent days was the streamlining of Camp Stewart's administrative setup so that the Commanding General might devote more time to actual anti-aircraft training and firing activity.

Colonel William V. Ochs, former Provost Marshal and Commandant, Station Complement, was named Post Commander, with responsibility for administrative management of the post under the Fourth Service Command, Atlanta, Ga.

Brigadier General Earl H. Metzger continues as Commanding General of the Antiaircraft Training Center, relinquishing to Colonel Ochs responsibility for all administrative details, which have been re-

grouped under eight separate divisions to facilitate Post management.

Another recent highlight was the two-day inspection of Stewart's colored troops now undergoing anti-aircraft training by Brigadier General B. O. Davis of the Inspector General's Office, Washington, D. C. General Davis saw the troops in action on the anti-aircraft range and also at their housekeeping duties in the hutment areas. He said he was "very favorably impressed" by what he saw.

After a review of the colored troops, General Davis addressed them briefly, expressing his pleasure at what he had seen and telling them that "whatever I have become I owe to my officers and non-commissioned officers I served under as an enlisted man." He added that "I have great faith in my country and in that it will repay my descendants for any sacrifice I may make."

General Davis also saw the new guest house and

service club for the training center's colored troops and inspected the colored service detachments of the post. The new colored service club, which has cafeteria and library facilities, was recently dedicated with a dance attended by representatives of all colored units of the post.

Camp Stewart now has a "G. I." model of the ol' swimmin' hole. Under direction of the Special Services Officer, the "hole" was opened to all troops at a sandy bend of the Canoochee river. It has a large barbecue pit, tables to seat 150 and bathing facilities for 300, including twenty-five showers and bath house facilities.

Another development of direct value to the anti-aircraft troops here is the successful and continuing use of two post bands to "beat out" morale-building rhythm for the men. A daily chore now, the bands parade from firing point to firing point on the anti-aircraft range, pausing at each point to play several stirring marches or perhaps a bit of sentimental music or a jive number or two. One band usually plays from 8 AM to 1 PM and the other takes over and plays to 5 PM.

*Tiger Rag* is the favorite tune of the colored troops; and the most played. *La Cucaracha* and the *Peanut Vendor* are the favored numbers of the white troops.

"But whatever the bands play, the soldiers like it, and it is proving a great asset to the training program," one range officer said.

The anti-aircraft range was pepped up recently, too, by the weekend inspection and study visit of 135 advanced Coast Artillery ROTC students from the Georgia Institute of Technology. The ebullient potential officers arrived on the post by special convoy from Atlanta on a Friday night in time to view a colorful night-firing anti-aircraft practice.

All day Saturday they were kept on the go, watching firing activity after marching four miles out to the AA range, participating in a tear gas drill with beeps strew-



Georgia Tech ROTC students quickly got into their gas masks when a smoke and tear gas attack was staged for them at Camp Stewart.



A lifelike model of U. S. Heavy Tank T1 was judged best in Camp Stewart's tank demonstration contest. Soldiers who constructed the winning model (above) were given noteworthy training performance citations and three-day passes by the Commanding General.

ing smoke and tear gas all over the range, and getting lectures from Camp Stewart's experts on the art of anti-aircraft in modern warfare.

The "ROTC'ers" will be ready for commissions in the Army this winter or next spring and the "lab" work they did at Camp Stewart will help qualify them for their future Army careers. Among them was Donald Metzger, son of the training center's Commanding General.

One of the highlights of Camp Stewart's training program last month was a dummy tank construction contest, the purpose of which was to teach the anti-aircraftmen, who must also double as anti-mechanized troops on occasions, how to recognize both United States and enemy tanks.

Thirteen units constructed realistic, life-size tanks from nonessential materials, mounted them on jeeps and trucks, and paraded them before practically every soldier on the post. Officer-sponsors preceded each model in the parade and megaphoned details of the tank's structure and performance.

A committee of officers rated the models on life-like appearance and ingenuity of construction and use of materials, and awarded prizes to two participating units.

The winner was a true-to-life U. S. Heavy Tank T1. An engraved plaque went to the winning outfit and letters of noteworthy training performance and three-day passes went to the following, builders of the model: Sergeant Harley B. Leach, Corporal Booker T. Saunders, Private First Class Mose Nixon, and Privates James Anderson, Ulysses Moore, and Frank Tremble. Lieutenant Walter D. Swift was in charge.

Second prize winners, who built a medium Fiat-Ansaldo (Italian) tank, received the passes and letters. They were: First Sergeant Robert Black, Sergeants H. E. Bishoff, D. J. Sweeney, Frank de Martino, and Joe C. Peterman, Staff Sergeant Joseph H. Hammett, and Corporals David J. Tournay and Floyd E. Portell.



## The Coast Artillery School

BRIGADIER GENERAL L. B. WEEKS, *Commandant*

In step with the rapid expansion of the Army of the United States, the Coast Artillery School is continually revising its plans and schedules to maintain its ever increasing quota of graduates of the various departments. The Staff and Faculty recently has been augmented therefore by many new instructors.

September brought another graduation of a large group from the Battery Officers' Course in Seacoast Artillery. They received their certificates of proficiency from Brigadier General Lawrence B. Weeks after a short congratulatory talk in Murray Hall, and then left for their newly-assigned posts. Among the graduates were four Brazilian Army officers, who are now on duty as observers with the field troops in the United States. They are First Lieutenants Joaquin V. Alves, Oly Lopes Dornelles, Jose A. Martins, and Carlos Alvares Noll. When they first arrived at the School, they amazed many of the Post personnel with their green uniforms and the two silver stars they wear on their shoulder straps, the Brazilian way of denoting the rank of first lieutenant.

Upon reaching the States, the Brazilian officers ran into a more mature officer of the United States Army wearing one silver star, a brigadier general; the rank of one silver star in the Brazilian Army is a second lieutenant. So it turned out that the brigadier general couldn't figure out how four young officers could be major generals, and the Brazilians couldn't imagine what such an elderly gentleman would be doing with the rank of second lieutenant. However, after finding an interpreter, everything was straightened out!

With many officers and warrant officers passing through the control of the Coast Artillery School every week in the courses offered, there has arisen a problem. This problem is the proper classification and assignment of these officers, so that each officer will end up in the proper type of outfit and position.

Since July 1, this classification system has been taken care of by Major Dean W. Fenton of the Adjutant General's Department, who is here with the School and assigned to the staff of Brigadier General L. B. Weeks.

Major Fenton interviews the incoming officers and records their past military history, civilian occupations and hobbies, as to their main and secondary occupations.

This information obtained is gone over very thoroughly and the officers qualification card is marked accordingly. For example, if an officer with experience in railway engineering or maintenance is interviewed, he would be recommended for assignment to some railway artillery outfit.

When transfer orders from the Headquarters, Replacement and School Command, Army Ground Forces at Birmingham are issued for officers of certain grades, and troop or over-troop age, the proper officers are selected and transferred to fill the position specified.

The Department of Artillery has received an M1 8-inch railway gun as additional equipment for the armament inspection part of the course. It will be used during the field trips of both the Battery Officers' Courses and the Officer Candidate School.

A new course of instruction was installed lately in the Coast Artillery School curriculum—it is Theory and Practice, for both enlisted men and officers, on the Gun Data Computer. All of the staff named for the new course except one are at the Sperry Gyroscope Company in New York taking a short review course and will return to Fort Monroe in the near future.

The Department of Training Publications has also expanded in order to prepare more training films, film strips and manuals for dissemination to the Coast Artillerymen all over the world. The scripts for all these publications are prepared with but one thought

in mind, and that is that the proper instruction should reach the man in the field.

Captain John T. Kelton has returned to the Department from Hollywood where he was the technical adviser on the training film, *Fire Control and Position Finding for Seacoast Artillery*, produced in the RKO Studios, in conjunction with the Research Council of the Academy of Motion Picture Arts and Sciences.

Captain Charles L. Combes has returned from Fort Hancock where he finished a manual on the railway artillery, entitled *Service of the Piece, 8-inch Gun, Mk VI, Modification 3A2, on Railway Mount M1A1*, numbered FM 4-49, which will be released shortly. He is now working on FM 4-51 entitled *Seacoast Artillery, Operation and Care of Railway Equipment*.

The cameras have started to grind on location in the production of Major Harold Greene's scenario, *Care and Maintenance of the 155mm Gun*. The majority of the scenes are being shot at Fort Story.

The training film of the 12-inch gun on barbette carriage is progressing rapidly at Fort Saulsbury, with Captains A. W. Adams and Albert Ray in charge. They have already forwarded to the Coast Artillery School Part 2 for review by the School Staff. It is an excellent film and is entitled *Breech Mechanisms*. Part of it has been filmed in slow motion to bring out the more important movements.

The recently completed training film *Fire Control and Position Finding for Seacoast Artillery* will be ready for distribution shortly and is to be issued in the following ten parts:

	Running Time (Minutes)
Part I—Position Finding Systems . . . . .	38
II—Non-Standard Ballistic Conditions . . .	24
III—Computing and Setting Firing Data . .	31
IV—Pointing Methods and Reference Numbers . . . . .	21
V—The M1 Plotting Board and M1 Range Correction Device . . . . .	39
VI—The M1 Deflection Board . . . . .	26
VII—Dispersion, Errors, and Spotting Systems	13
VIII—The M3 Spotting Board . . . . .	18
IX—Fire Adjustment—The Magnitude Correction Method and Lateral Adjustment . . . . .	26
X—Fire Adjustment—The Bracketing Method . . . . .	15

An example of the excellent retouching abilities of one of the Visual Aid Staff artists, Sergeant Robert Held, is portrayed in the frontispiece of this JOURNAL, a picture of the Fort Monroe Post Chapel, The Church of the Centurion, which is well known to all personnel who have ever been stationed at Fort Monroe. When

pictures are taken and printed, for later transition to film strips, there is always a need for some art work to highlight certain features in the picture.

The Submarine Mine Department held graduation exercises for the Warrant Officers completing the Army Mine Planters Course on August 22. Enlisted men graduated from the Submarine Mine Maintenance Course on September 19.

There has recently appeared a new type of mine planter. One is here for trial runs and testing.

In the Officer Candidate School division of the School, three classes have graduated recently and received their commissions from Brigadier General L. B. Weeks.

Upon their graduation, General Weeks told the classes:

"At no time in the history of the United States Army has there been a more pressing need for dependable and capable Coast Artillery officers. During your course at the Coast Artillery Officer Candidate School, you have proved that you can stand hard work and you have received the rudiments of professional knowledge needed by young Coast Artillery Officers. Your future usefulness as officers will depend upon your square dealing with the soldiers entrusted to you for training for war, and square dealing with your fellow officers; upon your constant attention to duty, constant study, constant hard work, and above all, upon your ability to keep going, when the going is tough.

"The Coast Artillery School hopes and expects that you will become capable and useful officers and that each of you, individually, will always be eager to carry on more than your share of heavy responsibility and hard work."

The Officer Candidate School is now turning out more second lieutenants than ever before. Graduations are now held once every two weeks.

The Department of Enlisted Specialists under the direction of Colonel Clem. O. Gunn, continues to turn out in large numbers graduates of the various courses offered to the enlisted men of the Army.

The Master Gunners Course held graduation exercises on July 7 and had another one scheduled for October 5. The Submarine Mine Maintenance Course finished on September 19, while the Electrical Course students received their certificates in two sections, one on August 4, and the other on September 1. The Automotive Course men were due to graduate on October 5.

All the graduates received their certificates of proficiency from Brigadier General L. B. Weeks, in appropriate ceremonies.

The Coast Artillery School and Staff Officers who received promotions lately were hosts at a party on the Hotel Chamberlain Roof.





## Camp Callan

BRIGADIER GENERAL FRANCIS P. HARDAWAY, *Commanding AATC*

*By Captain W. J. Hauser*

Conditioning troops for ultimate field service has been a major consideration in troop training programs since last December. In line with this program Camp Callan has added several progressively more strenuous items to the heavily concentrated training schedules.

In addition to infantry drill during the first few weeks, new troops are marched to their various training areas and ranges. Soon they are making road marches, and as the few short weeks pass, these trainees go on more strenuous hikes, up and down hills and cliffs until they are fully conditioned for long over-night marches

and their pup-tent bivouacs. In the meantime, other items on their training schedules provide for progressive attacks on the obstacle course, and extended order maneuvers. The unscheduled alerts frequently called by individual units likewise aid in troop conditioning. Later in the training cycle, organizations engage in extensive tactical exercises including the selection and occupation of positions in varied terrain and in actual darkness. These items of training are all accomplished in addition to the primary mission of training the new recruits for their duties as replacements in their future



A Camp Callan Training Battalion takes a hike.



# PUERTO RICO



# C. A. COMMAND

COLONEL C. THOMAS-STAHLE, *Commanding*

*By Captain W. C. Devereaux*

The island of Puerto Rico, located on the northwest rim of the Caribbean Sea, is in an area that can claim a romantic background that is unsurpassed in most parts of the world. In the early days of conquest and discovery, the treasure laden ships plying the sea lanes from the new world to the old either stopped in Puerto Rico or at one of the nearby islands before embarking on the long and perilous trip across the Atlantic Ocean. These ships offered extremely valuable loot to pirates. The islands of the Caribbean were therefore profitable hunting grounds for these swashbuckling, swaggering men who would rather kill a man than argue with him, and their many coves and ports offered wonderful havens for pirate ships. Here they could lie in wait until an unsuspecting merchantman appeared, and here they could find suitable places to store their treasures and build castles for themselves from which they could rule their followers.

Jamaica, Puerto Rico and the Virgin Islands were islands that harbored many pirates since they had the larger ports at which most of the merchant ships stopped. Jamaica's most famous pirate was Henry Morgan, who was more of a privateer for England than a pirate, but he was notorious for his merciless treatment of captives. Puerto Rico had the doubtful honor of being the haven for Kofresi, whose name is now better known as a kind of rum, than as a pirate. The Virgin Islands could boast of two well known pirates. St. Thomas of the Virgin Islands was the port where both Bluebeard and Blackbeard harbored their ships, although not at the same time.

There is no doubt that there were two pirates, Bluebeard and Blackbeard, whose castles are still standing in St. Thomas, but pirate history records little of Bluebeard's actions. Undoubtedly he has been confused with the famous character in fiction who had seven wives and murdered each of them as he tired of her. Since records indicate that this tale was translated from the French in 1440 it is clear that either our Bluebeard was a different one or that someone discovered the New World before 1492. Though Bluebeard's pirate history is not well known, the pirate Bluebeard was feared for his murderous deeds.

Blackbeard, it is said, was the meanest of all pirates and compared to him, the famous Captain Kidd was a law abiding citizen. Blackbeard's name was derived

from his flowing beard which was jet black and covered his face and chest. He was always extremely proud of his beard and it is recorded that he spent hours curling and combing it, although the rest of his body was always unkempt. Before an attack he took special pains with his beard and around the outer edge he placed about seven "slow matches" which he would light just as he was ready to go into hand to hand combat. During the battle, his foes were not only faced by his deadly cutlass, but by his bristling beard encircled by the burning "slow matches," that gave him an appearance which struck terror into his adversaries. Blackbeard roamed the Caribbean during the early days of the 18th century and made his headquarters in the Virgin Islands. It seems that he had considerable success and his downfall only came when he felt he was greater than the English Navy and challenged its power off the southern coast of the United States. Did you know that the Virgin Islands are a part of the Puerto Rican Department?

The year that Columbus discovered and named these islands was 1493 and ever since that date the islands have had their ups and downs. From the time of discovery until the year 1671, when the islands came under the rule of Denmark, their great harbors were used for rendezvous of the ships of warring nations and buccaneers who were harassing the sea lanes from the New World. For two centuries the ports of the Virgin Islands prospered under Danish control and after the wars of the New World became less frequent and the pirates were driven from the sea lanes, two economic factors contributed to their prosperity. The harbor of Charlotte Amalie, St. Thomas, one of the best of the three main ports in the islands, became a port of great importance due to the fact that it was a point of transshipment for merchandise brought there for redistribution. There can still be seen the large warehouses extending 300 to 400 feet back from the water front, where goods unloaded from one ship were sorted and reloaded into other vessels. Modern invention played havoc with this source of income and with the advent of steam, larger ships and oil burners, the cargo vessel found that it was not profitable to make this extra stop on its ocean crossings and the port suffered from the loss of this revenue.

The other factor that helped develop these ports was the American slave trade. The islands became the



Bluebeard's Castle. U. S. Navy Photograph

wholesale distribution point for new slaves being brought from Africa and up until the time of the Civil War, many valuable cargoes of slaves had passed through the islands. Today in St. Thomas and St. Croix, the old slave markets and warehouses can still be seen and in some cases the hand irons and shackles are still hanging on the walls.

Although many other things have affected the prosperity of the islands, the two mentioned previously seem to have been the major causes of the economic rise and the eventual decline of their value. One has only to look at the population figures and the rise and fall of the economic value of the islands can be traced. The population shows a steady increase from the time of discovery until 1835, when 43,000 people populated this region, and then a steady decline occurs, until today the population has dropped almost 50% and is now around 22,000 inhabitants. By the turn of the last century Denmark realized that these far off islands had turned into a liability and she began looking for a buyer. The United States had made an endeavor to purchase the islands before the end of the century, but due to a disagreement in Congress the purchase was not carried

out. In 1917 it was rumored that Germany was dicker-ing for the islands so that she could have a submarine base in the New World. This threat stirred the United States into action and the deal was carried out, but at a much higher figure than previously set. Although the price paid for these islands seemed exorbitant, it is far less than the price we would have to pay if Germany had been able to carry through her intention.

St. Thomas, St. Croix and St. John are the three largest of a group of approximately fifty islands that make up the Virgin Islands Group of which only eight are populated. The climatic conditions come closer to being "ideal" than any other location in the world. The temperature ranges from 69° to 91° with a difference of about 6° between the winter and summer averages. While mid-day is usually very warm and business is largely suspended from 12 to 2, there is generally a fine sea breeze blowing from the Atlantic, which tempers the tropical sun and keeps down the humidity. The rainfall varies from month to month, but there are no dry seasons or wet seasons such as are experienced in most semi-tropical countries. If this were not true, it would be impossible to live on these islands because the only source of water is rainfall and it is necessary to gather the water in large catchment basins that cover the hills. Tropical bugs are, of course present, but tropical diseases are practically unknown and flies and mosquitoes are about the same in quantity as in any of the mid-western states. Hurricanes pass over this region occasionally, but most of the buildings are able to withstand the high winds, and the people have been educated in how to cope with these storms; therefore damage is usually slight.

The population of the islands is made up mainly of descendants of slaves who were brought there during the time of the wholesale slave trading. This group makes up 96% of the inhabitants and the remaining 4% is mostly of Danish descent, with a small group of Puerto Ricans who have recently migrated to the islands. At the present time, the chief source of employment is in the native craft industries which have prospered through the sale of these products to tourists at co-operative stores set up in Charlotte Amalie and in Christiansted and Frederiksted on St. Croix. Some sugar cane is still grown and there is a little farming, but the soil is not suitable to good farm products, and the sugar cane market has practically disappeared.

The war of course stopped all of the tourist trade, but the Virgin Islands are doing their part in defense of the shipping of the Caribbean. The defenders of the Virgin Islands along with the defenders of the other islands of the Caribbean are exerting every effort to stamp out the submarine menace. The present day submarine pirates will find a warm welcome anywhere within gun range from the shore.



# Camp Davis



MAJOR GENERAL FREDERIC H. SMITH, *Commanding*

*By Captain L. B. Wantuck*

Judging from the number and importance of visitors at Camp Davis in recent weeks, Camp Headquarters would be almost justified in posting a welcoming committee permanently at the main entrance to the reservation. Enlisted men are arriving weekly from domestic and foreign stations to enroll in the Antiaircraft Artillery School, ranking representatives of the War Department and Antiaircraft Command are here rather frequently on inspection tours, and prominent civilians are occasional guests of the Camp.

In mid-August Secretary of War Henry L. Stimson, accompanied by Major General A. D. Surlles, paid his first visit to Davis. At the Camp he was met by Major General Joseph A. Green, Commanding General of the

AA Command, and Major General Smith, commanding Camp Davis. Secretary Stimson was interested primarily in the Officer Candidate School training program. The official party journeyed to the Sears Landing firing point and observed school crews fire 90mm's, 40mm's and machine guns at a plane-towed target. The Secretary of War spent the better part of a day at Davis.

The 160 upper-classmen of the U. S. Military Academy who attended classes in the AA School for several days might be classed as visitors. Accompanied by Lieutenant Colonel James L. Hayden, CA instructor at the Academy, the Cadets studied gunnery, fire control, operation of 90mm's and automatic weapons and anti-aircraft instruments such as height finders and search-



First aid station in the field at Camp Davis.



40mm practice is stressed.

lights. A short time after the Cadets returned to the Academy, Camp Davis was pleasantly surprised to receive a communication from Major General F. H. Wilby, superintendent at West Point, commending officers and enlisted men for the manner in which the visiting students had been treated and instructed.

In a classification similar to the Cadets from West Point are the officers from Brazil, Argentina, Colombia, Chile, Cuba and Venezuela who, as this is written, are nearing the end of a special course of instruction at the AA School. The Latin-Americans are brushing up on the latest antiaircraft weapons and tactics. None of the officers is above the grade of captain and all were members of the Field Artillery in their home countries except the Venezuelans, who are Infantry officers. The course they are taking lasts twelve weeks and a relatively large part of the time is spent at the firing points, actually firing all calibers of AA weapons. After school hours the visiting officers are getting a taste of North American hospitality. The South Americans have made many friends among the civilian population of Wilmington, N. C., and other nearby communities. Several Peruvian and Canadian officers have visited Camp Davis recently, but only for brief inspection tours and not for extended study.

Civilians visiting the Camp since our last news letter included Hon. D. W. Harter, chairman of the Subcommittee on Aviation, House Military Affairs committee, and Miss Betty Grable. The latter's visit was a big event for the enlisted men of the command, who jammed Theater No. 2 for two successive nights to watch Betty's performance in the USO-Camp Show Hollywood Follies. The actress also presented a special song and dance routine at the Station Hospital for the benefit of patients unable to attend the theater performance.

The Officer Candidate Division of the AA School is now hitting on all four, with an enrollment double that seven or eight months ago. Large numbers of candidates are coming to the school from such foreign outposts as Alaska, Hawaii, Trinidad, Panama and Bermuda. There is quite a number of men who were in on Japan's attacks on Hawaii and Dutch Harbor. Although the quota of the Officer Candidate School has been increased, there is no visible sign that the OCS course of instruction is any easier.

The Camp's tactical units are conducting more anti-aircraft firing sessions than ever before, using the facilities of Sears Landing and Fort Fisher to excellent advantage. Marksmanship on the 90's and 40's is showing a corresponding improvement.

The Camp authorities have adopted an ingenious method of relieving the transportation problem between Davis and Wilmington. To supplement the existing bus facilities, eight huge stock trucks, each with a capacity of sixty enlisted men, are being sent to Wilmington every Saturday, leaving the reservation right after noon and returning about midnight. The "cattle train," as it is known by the soldiers, has cut a swath in the stag line that used to wait for hours at the Holly Ridge bus terminal, across the highway from Camp Davis.

As a welcoming gesture, Camp Headquarters has prepared booklets for distribution to new arrivals, whether they be officers or enlisted men, describing the Camp in detail and listing recreational facilities to be found in the vicinity. The guide-books contain maps of Camp Davis and the surrounding area.



A wise man professes to be wisdom's amateur—never its professional.



What a whale of a difference two years made at Camp Hulen.

Camp



Hulen

BRIGADIER GENERAL HARVEY C. ALLEN, *Commanding*

*By Lieutenant Samuel H. Tumlinson*

Officers reporting at Camp Hulen and officers who are visiting the Camp for the first time have often commented on the attractiveness of the grounds and the pleasant appearance of the Camp in general. Such comments indicate that the energy which has been expended to convert a section of wet swampy Texas Gulf Coast pasture land into a suitable living and training area for soldiers has been somewhat successful. A true appreciation of these improvements may be gained by comparing the accompanying pictures of Camp Hulen two years ago and Camp Hulen today.

The program of construction and conversion has been so comprehensive that today it would be extremely difficult for a member of the old 36th Division of the Texas National Guard to recognize the Camp landmarks even though this was their home camp for many years. Even the pictorial records of the changes are hard to believe but there are several thousand men and officers who have a vivid memory of the months they spent here trying to carry out their normal duties and a training assignment while battling water and mud.

Hard-surfaced roads and walks have made the battle with mud largely a thing of the past and gradually as other projects for the improvement of the Camp have been completed the training program has become more efficient. We will probably never reach that static stage of completion where there are no new projects and the hammers and saws are all silent, but today there are a

reasonable number of facilities available to aid and comfort the hard-working soldier in training. The soldier's off hours will be made more comfortable when all the Camp's living quarters have been converted to huts.

The recently activated AATC Band has proved a very popular source of evening entertainment. Only two cadremen and two fillers have been furnished for this band but in spite of this lack of assistance from outside sources approximately twenty-two bandmen have been recruited from local talent, and this organization now offers a repertoire of some two hundred selections. In addition to three local concerts scheduled for each week, the AATC Band furnished the supporting cast for a musical titled *The Camp Hulen Review of 1942* which was enthusiastically received by the local soldiers and was presented before a capacity audience in Camp Wallace, Fort Crockett, and Ellington Field. Arrangements are now being completed to show *The Camp Hulen Review of 1942* for the men of Foster Field and the Naval Training Base.

Several of the Camps are cooperating on a plan to circulate shows. As each Camp develops a show it will be presented before the men of each of the other Camps. In this way each Camp will receive a series of shows and the maximum entertainment value will be derived from the effort and money expended on each program.



There are in the world two powers—the sword and the spirit. The spirit has always vanquished the sword.  
—NAPOLEON.



## Camp Wallace

BRIGADIER GENERAL E. A. STOCKTON, JR., *Commanding AARTC*

Camp Wallace observed Independence Day with an Open House program at the Camp. Rain caused the postponement of a parade in Houston of a Provisional Regiment comprising some 1,200 trainees from the camp. An indoor program was arranged for the numerous visitors to the camp during the day.

On July 16, Brigadier General Gordon de L. Carrington turned over command of the camp to Brigadier General E. A. Stockton, Jr., who arrived from the West

Coast to assume command. A reception at the Officer's Club was held to bid goodbye to General Carrington and to welcome General Stockton.

The camp was visited on August 9, 1942 by Major R. E. Steele, Major Gerald Emanuel, Major D. Logan, and Major W. D. Maddison of the British Army. The visiting officers toured the camp and observed all departments of the training.

Camp Wallace's weekly newspaper, *The Trainer*,



Officers Pool class on the range.



Nurses learn about Chemical Warfare.

celebrated its first anniversary on August 21. The first issue appeared on that date one year ago as a tabloid size paper. From that time the paper has grown in content and makeup, and at the present time provides a complete résumé of the weekly doings of the camp in sports and other happenings in a manner that rivals any city newspaper.

Recent additions of large sized ventilator fans to the Service Club and the Post Theater have added to the comfort of the patrons of the club and theater. The theater is also being decorated with murals, painted by

Corporal John A. Urbain, depicting various phases of the trainee's career at Camp Wallace. An "L" shaped porch is also under construction at the Service Club, which will approximately double the capacity of the lunch room.

A training battalion took over the rôle of an AA Gun firing unit in addition to its tasks of training communication specialists and officer candidates. Battery A of the battalion conducted a very creditable target practice with 90mm guns at Fort Crockett on August 18. The practice, a preliminary type, was conducted principally for the training experience of the cadre members of Battery A. The towing plane flew at an altitude of 9,000 feet and the target was well covered with high explosive bursts throughout each course.

The Camp Wallace Softball team defeated the Kelly Field ten by a score of 5 to 0 to win the Southwestern Servicemen's Championship in the Houston War Bond Tournament.

A three weeks' Battery Officers' course is being conducted for the Coast Artillery Officers' Replacement Pool comprising a group of officers returning to duty with the Coast Artillery after a tour with the Air Corps. The school begins with the various basic subjects and progresses through the firings of everything from a caliber .30 weapon up to and including a 90mm gun. In the Antiaircraft Gun and AW firing, the weapons are manned by the officer students.





# BOOK REVIEWS

The JOURNAL can supply any book in print at the usual Association discount.

## The Armed Forces

### Standard Military History

**HISTORY OF THE UNITED STATES ARMY.** By Colonel William A. Ganoe. New York: D. Appleton-Century Company, 1942. 556 Pages; Bibliography; Appendices; Index; Illustrated; \$5.00.

It would be hard to believe that any army officer who makes any pretense of keeping himself informed does not have a copy of the previous edition of this book. This new edition, which brings the history of the army right up to the fall of Bataan, is up-to-date, even to the inclusion of the new pay scale in one of the numerous appendices.

Colonel Ganoe's book, which since 1924 has been considered one of the standard military books, and probably the standard American Army history, does not need to be reviewed. A worthy review would take more space than these columns can afford. It is enough to say that this volume belongs with the dictionary, the *Army Register*, the *World Almanac*, and the *I.D.R.* on every officer's desk.

### Our Partner At Sea

**A LAYMAN'S GUIDE TO NAVAL STRATEGY.** By Bernard Brodie. Princeton: Princeton University Press, 1942. 276 Pages; Reading List; Index; \$2.50.

Bernard Brodie, whose *Sea Power in the Machine Age* has been received favorably by military readers, has written a book for laymen that army officers especially will find instructive. With only bare references to history, Brodie wades right into his subject.

Coast Artillerymen, especially, should know how fleets operate, what they can do, and why they do it. This book explains the varied factors that influence the creation of modern fleets and their employment, and does it in language that is doubly clear to the soldier, since the book was written for laymen.

The author has a sensible, almost conservative approach to the so-called questions which take up much space in the public prints. He finds that even an air-strong nation must still have a navy—that each arm has its uses and its limitations. He explains that long-range gunnery is more accurate than even low-level bombing.

A curious incident, unknown to the reviewer until he

read it in this book, occurred in the battle between the *Spee* and the three British cruisers off the Platte, when the British dropped depth charges just about the time the Germans' shots were due to fall. The resultant splashes confused the German gunners, who were not able to spot their shots.

### Civics Course

**SCHOOL OF THE CITIZEN SOLDIER.** Edited by Lieutenant Colonel Robert A. Griffin and Lieutenant Colonel Robert A. Shaw. New York: D. Appleton-Century Company, 1942. 532 Pages; Illustrated; General References; Index; \$3.00.

Adapted from the educational program of the Second Army, this book combines in one volume enough history, geography, and study of the organization of our own and other armies, to give the citizen, soldier or civilian, a fair idea of why we are fighting, how we are fighting, and what we expect to gain by our sacrifices. Propaganda, the Constitution, the Navy and the Marine Corps, and the Air Forces are treated.

If the book has any fault, it lies in presenting too much material. Without the incentive of an earnest desire to learn or the pressure of organized study, the average person might find the going overly long, and lose interest before the important lessons are learned. The discriminating reader, who knows where to skip and where to concentrate, will of course have no trouble here.

This is an excellent text for officers or other teachers who must prepare citizenship or like lectures.

### Number Three, Rear Rank

**SEE HERE, PRIVATE HARGROVE.** By Edward T. M. L. Hargrove. New York: Henry Holt and Company, 1942. 211 Pages; \$2.00.

Remember the little fellow in your battery who never did a mean thing and had lots of friends, but who managed to pull a punishment detail about three times as often as the average soldier? The things he did were never serious—his rifle was dirty, or his watch chain showed, or the inside of his locker was a mess. You hated to gig him because you couldn't help but like him, but gig him you must.

That was Private Hargrove, or at least it was the Hargrove Private Hargrove writes about.

This book is written in a light vein, but the subject is a serious matter—the American soldier. Every officer would gain a little better understanding of his men if he were to read this book. He would learn how they react to such intangibles as morale, patriotism, and the human desire for advancement, as well as the slightly more tangible items of training, discipline and punishment, and the discomforts of Army life.

Private Hargrove is a close observer, a humorous and interesting writer, and a fine example of the inept but intelligent soldier. His book reflects these things; it is good entertainment as well as a study in soldier psychology.

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### Moulded Men

WEST POINT: Moulder of Men. By Major William H. Baumer, Jr. New York: D. Appleton-Century Company, 1942. 252 Pages; Bibliography; Index; Illustrated; \$3.00.

Major Baumer, a West Point graduate, and later a member of the Public Relations department at the Academy, has written a thorough guide to his alma mater, including a bit of the past of the school and much about the present. West Pointers will appreciate this book; it contains a sympathetic estimate of the Academy's capabilities and its effect upon the army of today and the armies of the past. The author stresses the fact that West Point is not only interested in preparing its graduates technically, but that its primary purpose is to turn out army officers with the West Point conception of *Honor, Duty, Country*.

Major Baumer explains in detail how the West Point mould is impressed upon the cadets, and how this four-year course of rigid training is indelibly imprinted upon Academy graduates throughout their Army careers.

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### Soldiers Working

OUR NEW ARMY. By Marshall Andrews. Boston: Little, Brown & Company, 1942. 225 Pages; \$1.50.

Marshall Andrews, military writer for the *Washington Post*, has seen our new army in various stages of training, and finds it good. This book, written for civilians, is full of praise both for the men in training and the army which trains them. It is disappointing inasmuch as Mr. Andrews has ignored the Coast Artillery Corps in his mention of the different branches.

/ / /

### Fort Sill

CARBINE AND LANCE. By Lieutenant Colonel W. S. Nye. Norman: University of Oklahoma Press, 1942. 331 Pages; Illustrated; Appendices; Index; \$3.00.

*Carbine and Lance* is the history of Fort Sill, written by a former editor of the *Field Artillery Journal*. Colonel Nye spent years of research getting the material for this book, and the years were well-spent. There is a wealth of authenticated detail in this history which is in marked contrast to the usual embellished guesses in works of this type.

The history of Fort Sill is, of course, part of the history of the Indians and the Indian wars. Colonel Nye's Indian

stories are written for adults by an author who manages to tell the tales with humor, sympathy, understanding, and clarity, never forgetting that it is the story of Fort Sill, and not merely Indian anecdotes, that is his primary purpose.

The author starts with a general picture of the Indian troubles of 1833, and carries his story in logical train of events up to the World War I days. The colorful characters, both Indian and white, the breath-taking battles and other occurrences, and the continual impingement of the white man's ways on the Indians lose nothing in the telling.

/ / /

### When Husbands Depart

THE ARMY WOMAN'S HANDBOOK. By Clella Reeves Collins. New York: Whittlesey House, 1942. 192 Pages; Appendix; \$1.25.

It is a safe bet that any officer or enlisted man who is separated from his family and facing action will feel easier in his mind knowing that his wife has a copy of this book. Without letting down the bars on superlatives, this is the most complete, most easily understood of the many books the reviewer has read on the subject of handling financial affairs during the absence or after the death of the soldier in the family.

Mrs. Collins doesn't merely mention death benefits and the handling of funds, she tells *how* to handle many of the details, and tells it in clear language.

The part of the book that deals with customs and courtesies is also well done, being clear and detailed.

/ / /

### The Long Voyage

THE RAFT. By Robert Trumbull. New York: Henry Holt and Company, 1942. 204 Pages; Illustrated; \$2.50.

The 1942 successor to *Mutiny on the Bounty* is the story of the three naval aviators who fought the sea for thirty-four days on a rubber raft, and who walked up the beach in a military manner when they found land, "in case the Japs were looking." Practically every literate American has read either the story in *Life* magazine, or one of the numerous newspaper stories, about the epic voyage of Dixon, Aldrich, and Pastula.

Robert Trumbull spent a week-end with Dixon, the leader of the trio, and this book is the result. It is the complete history of the voyage. For a real story of adventure with the authentic American flavor, and a story that at the same time is true, this is it. The Japs can't beat a nation of people like these three sailors.

/ / /

THEY WERE EXPENDABLE. By W. L. White. New York: Harcourt, Brace and Company, 1942. 205 Pages; Roster. \$2.00.

This is the story of Americans who were second to none as fighting men—the Motor Torpedo Boat squadron that did such fine work in the Philippines during the course of our resistance there. W. L. White, one of our top-notch war reporters, interviewed Lieutenants Kelly and Bulkeley, and Ensigns Akers and Cox, to put together the story of a gallant band of Americans.

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### The Coast Artillery Journal

1115 Seventeenth Street, N.W.

WASHINGTON, D. C.

Use the Handy Order Blank on Page 128

Improvising everything but courage, of which these PT Boat men had plenty, the squadron harassed the Japs and slowed their advance for precious days and weeks. Some of the starkest reading of the modern war is reproduced in Kelly's matter-of-fact statements of the death and destruction caused by these little stingers of the sea.

The retreat from Corregidor, in which the little boats took General MacArthur and selected personnel to the outlying islands, is told in detail. The squadron's later battles in the southern islands makes reading every bit as exciting as the incidents around Corregidor and Bataan.

When we put down this book, we can feel that men like these, and the men they describe in the fighting on land, can never lose if they are given the training and the tools of war. There is nothing wrong with the individual American.

✓ ✓ ✓

### Pig Boats

WHAT THE CITIZEN SHOULD KNOW ABOUT  
SUBMARINE WARFARE. By David O. Woodbury.  
New York: W. W. Norton and Company, Inc., 1942.  
225 Pages; Bibliography; Index; Illustrated; \$2.50.

In this, the latest of the lengthening list of "Citizen" books, there is a slight departure from the usual policy of the series. Mr. Woodbury permits himself more of the luxury of editorial comment and criticism than the other authors of the series.

This volume traces the development both of the submarine and antisubmarine measures, gives the reader a view of what goes on in a submarine during cruising and action takes in a section on the submarine school at New London, and carries his subject right up to the present critical situation of the Battle of America. He does not forget a chapter on the work of American submarines in the present war.

On the whole, this addition to the "Citizen" books is informative and interesting, and a worthy addition to an effective group of books.

✓ ✓ ✓

## The Broad Picture

### American Newsreel

AMERICAN REVEILLE. By Ward Morehouse. New York: G. P. Putnam's Sons, 1942. 248 Pages; Index; \$2.50.

Imagine watching a particularly fast, and a particularly good, newsreel for three solid hours. The camera takes you through seventeen thousand miles of auto, train and plane travel. There are quick, pithy interviews with important people and the little people, there are views of plane plants and sailors and soldiers. Every word and every picture is interesting, but when "The End" flashes across the screen, there is a feeling of welcome relief as well as of the termination of something very enjoyable.

Ward Morehouse has done a peculiar job of writing; the technique is different, if not new. He traveled across the land, and then crisscrossed back, interviewing everybody from the President to hitchhikers, and tells in short, meaty paragraphs what they said. All his questions and all his observations had to do with the war effort. The re-

viewer was struck with the fact that not one of the people with whom Mr. Morehouse spoke was still isolationist-minded.

Reference after reference is made to the troops of the Coast Artillery Corps; Mr. Morehouse says, in one place, "Monle? It's up, way up. Particularly with the boys of the coast artillery. If they're to be in the war they want a ringside seat and, being where they are, they certainly have it."

### The Studied Approach

**LIFELINES OF VICTORY.** By Squadron Leader Murray Harris. New York: G. P. Putman's Sons, 1942. 151 Pages; Index; \$2.00.

Squadron Leader Harris' primary purpose in writing this short book seems to be to answer those impetuous souls, unhindered by knowledge of warfare in general or the present facts in particular, who clamor for second fronts, attacks on Tokyo, or aggressive action from Dong Dang to Essen. As the author phrases it near the end of the book, "This is no highly colored canvas such as those which have been so ably drawn by others with a more reckless brush than I choose to wield. A picture of the storming of the enemy stronghold, of smiting him hip and thigh, of cleaving him from chin to brisket, in just retribution for the ruin he has wrought, would be much nearer to our heart's desire. This drab chiaroscuro of my painting only shows the tollsome road of attrition we have to tread."

The author explains, in lay language, the importance and difficulty of supply for any military operation, and he carries through with names, places, and figures for the operations of the present war. He points out repeatedly the dangers of committing troops to fighting when logistics cannot keep up the pace.

Every one who has read Colonel Kernan's *Defense Will Not Win the War* should read this book to help balance his viewpoints.

### Log of Events

**THE FACE OF THE WAR.** By Samuel H. Cuff. New York: Julian Messner, Inc., 1942. 277 Pages; Maps; Index; \$3.00.

Mr. Cuff, a television news commentator, has written and compiled what amounts to a well-designed and arranged log of the events of the present war. He has divided the log into time periods and geographical theaters in an orderly manner, and has enriched the orderly mass of facts with clear, understandable maps. The author gives facts, not interpretations.

The author himself was born in the Near East, and lived there from the building of the Suez Canal through the period of the first World War, part of which he spent as an unwilling Turkish soldier. He knows the territory of which he writes.

This will be a fine reference book for future historians, and should be valuable for today's writers.

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### Gas!

WAR GASES. By Morris B. Jacobs. New York: Interscience Publishers, Inc., 1942. 172 Pages; Index; Appendix; Illustrated; \$3.00.

Written primarily for the gas identification officer, the war gas chemist, the decontamination officer, and the health officer, this book is not of a type for beginners. Written entirely from a scientific viewpoint, and a defense viewpoint at that, there is nothing here of tactics—the author sticks to his knitting, writing of identification, testing, and decontamination.



### Maps Plus

GLOBAL WAR: An Atlas of World Strategy. By Edgar Ansel Mowrer and Marthe Rajchman. 125 Pages; Illustrated; Index; \$1.00.

Secretary of the Navy Knox, in his forward to this paperback volume which is dedicated to "the uncounted other amateur strategists of the United States" says "In such a changing world, an attempt like this is decidedly an experiment. Even if it turns out that this is less a definitive answer to the problem (of presenting in 120 pages the essentials for following the present conflict) than an invitation to others to undertake the same job, there remains the glory of exploration. And in the meantime, this atlas will have been of real help in visualizing the path of victory."

The Honorable Secretary has written the review. This atlas, with the well-written text that explains the lines on the maps, is a real help in visualizing what is happening in the world's theaters of war, and why it is happening.



### "Calling Satan the Devil"

THE GUILT OF THE GERMAN ARMY. By Hans Ernest Fried. New York: The MacMillan Company, 1942. 381 Pages; Notes; Index; \$3.50.

Dr. Fried sets out to prove not the guilt of the German army, but the guilt of the leadership of the German army—those officers (the majority of the officers of the Regular forces) who came from the nobility and the aristocratic landowners. Whether or not he makes his case, the author has succeeded in giving us a fine history of the German army and the uniformed brigands of the Nazi party in the period between the two World Wars.

According to the author, Hitler is a creature of the German officer class, who saw in him a means of keeping the German military spirit (and their own place in the scheme of things) alive after the post-war reaction. In fact, Hitler was a political instructor for the German army before he began his long rise to power.

Interesting facts crop up in the book: for instance, the nobility shunned the technical branches of the army. There were fewer noble officers in the artillery and engineers than in any other branch. The famous Kapp *putsch* failed because the army, after arranging the revolt successfully, had no program to offer after the *putsch* was a fact. The author traces the beginnings of National Socialism from that incident.

German military punctiliousness, including respect for

the rank of prisoners, is motivated, the author says, by the feeling that if Germany loses the war, the German officer class will be absolved from reprisal by the Allies because they are not Nazis, but soldiers—as witness their observance of military etiquette.

For peace in Germany after the war, the author proposes not a large Army of Occupation, but to arm the enemies of National Socialism within Germany and to take away the arms of the military.

✓ ✓ ✓

### Blitz

**ATTACK.** By F. O. Miksche. New York: Random House, 1942. 262 Pages; Index; Illustrated; \$2.50.

Major Miksche, a former Czechoslovakian officer, fought on the Republican side in the war in Spain, and is now with a Czech volunteer detachment with the British. This book, published in a British edition under the title *Blitzkrieg*, has already created much discussion in this country among the officers who were able to obtain copies of the work.

*Attack* is an analysis of the modern concept of offensive warfare. It is a deep, searching analysis, and as complete as is possible to put between the covers of one book to be sold at popular prices. Major Miksche covers units from the combat team to armies, and describes the tactics in a manner that a civilian can understand and a soldier can appreciate. The maps and diagrams are especially clear.

This book has been cited by other reviewers as one of the most important military books of the present war. This reviewer will not disagree.

✓ ✓ ✓

### Free American

**YANKEE FIGHTER.** By Lieutenant John F. Hasey. Boston: Little, Brown and Company, 1942. 293 Pages; Illustrated; \$2.50.

This is the story of a young American who lived in France for the few years before 1939, who began his military career as an ambulance driver in Finland, and by a logical train of events ended that military career by being wounded with the Free French Foreign Legion in Syria. From jewelry salesman at Cartier's, vending expensive baubles to movie stars and royalty, to hard-bitten officer of the Legion is quite a jump for a spoiled and wealthy American youth, but Hasey makes the process seem as reasonable as most things people do.

The value of this book is not in the story of a hitherto unknown American youth, but in his surprisingly keen observations of European politics, the decay of France, and the qualities that make a fighting man. The very lack of background that Hasey brought to his varied experiences brings out more clearly the things he tells—the lack of confidence of the French soldier in his officers, the high regard many Frenchmen feel for General De Gaulle, the exultation of a smoothly working tactical plan, and the let-down feeling after the stab at Dakar. Hasey feels things emotionally, and his collaborator, Joseph E. Dineen, is successful in transmitting the emotions to the written word.

This is a book for youth to read for profit, and maturity to read for satisfaction. It is the Haseys in this world who restore faith in the triumph of the things we stand for.

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### German Tactics

ENGINEERS IN BATTLE. By Lieutenant Colonel Paul W. Thompson. Harrisburg: The Military Service Publishing Company, 1942. 108 Pages; Illustrated; \$1.50.

Colonel Thompson, one of our clearest military writers, has chosen fifteen examples of engineer activity of the German army during the present war to describe and interpret. The incidents described give us an easily understood picture of German engineers, how they operate, how they win successes, and how they fail.

The chapter on "silent soldiers," or land mines, is of particular interest to soldiers of every branch. The Germans seem particularly efficient in the use of this weapon. The German methods of effecting river crossings are also "must" reading.

### The East

#### The Jap Character

JAPAN RIDES THE TIGER. By Willard Price. New York: The John Day Company, 1942. 210 Pages; Appendix; Illustrated; Index; \$2.50.

Willard Price has known the Japanese for a long time. He has lived in Japan and Japanese-dominated lands for many years. An observing and apparently skillful reporter, the author draws his pictures from the broad trends as well as the seemingly trivial incidents, and uses his words well to explain the Japanese nation and the Japanese character, such as it is.

Price depicts the Japanese as fanatics, although not in the sense emphasized in popular stories of Japanese fighters. He finds them fanatics on the subject of Japan's mission in the world, which strangely enough seems to be Nazi Germany's mission, although the author does not mention the parallel—the mission of course is to spread the advantages of their own peculiar brand of culture throughout the entire world.

The author makes much of the idea that Japan's modern trappings do not indicate that she has accepted 20th century ideas—on the contrary, all the science and all the rest of the modern knowledge she has acquired is being used, paradoxically enough, to strengthen the old feudalism and the rest of the doubtful glories of the past. In other words, the outside world has brought Japan techniques and material things, but not new ideas. Two centuries of feudalism is hard to eradicate.

#### More of the Same

YEAR OF THE WILD BOAR: An American Woman in Japan. By Helen Mears. Philadelphia: J. B. Lippincott Company, 1942. 346 Pages; \$2.75.

Stressing the "Never-never Land" quality of the Japanese people as well as of the country itself, Helen Mears gives us the fruits of her stay in Japan, where she tried to learn what she could of the nation and its people. The author did not do her research from the vantage point of a luxurious hotel room, but tried conscientiously to get as close to the people as possible.

The most important point made in this book is that it is a mistake to try to understand the Japanese people using the Western World as a yardstick. They are an entirely different breed of cats. They have the faculty of ignoring reality and emphasizing fantasy when it suits the purposes of their leaders, and none question the motives or actions of the leaders. Their entire life is bound up in the belief that their only purpose on earth is to respect and enhance the glory of their Emperor, and in the countless manifestations of *shukan*, or custom.

Added to these attitudes is one of distrust of the West at the same time they use those things of the West that help the leaders of Japan.

Miss Mears has done a fine job of reporting; it is the subject, not the reporter, that leaves the reader mystified as to what the result will be when we have set the Rising Sun.

\* \* \*

**Points West**

**THE AGELESS INDIES.** By Raymond Kennedy. New York: The John Day Company, Inc., 1942. 198 Pages; Map; Index; \$2.00.

With true professorial thoroughness, Mr. Kennedy has written a survey of the geography, history, social customs, and practically everything else of the Indies and the seventy million people who inhabit them. The contrast between the English and Dutch colonial systems is touched upon.

This is not the newspaper reporter style of survey, but the scientific type—yet written with a minimum of terms that are not familiar to the vast majority of adult readers. Mr. Kennedy has written what should be a valuable handbook for officers who expect duty in the territory between Australia and Japan.

As the author himself points out, much has been written about the strategic values of the Indies, both from the geographical and economic standpoints, but few authors and fewer statesmen seem to have given much consideration to the people of the Indies, their desires, and their effect upon lasting policy. Mr. Kennedy explains the problem without attempting to thrust a solution upon the reader.

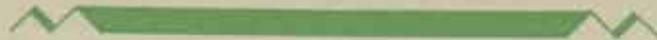
\* \* \*

**I ESCAPED FROM HONG KONG.** By Jan Henrik Marsman. New York: Reynal & Hitchcock, Inc., 1942. 249 Pages; \$2.50.

Jan Marsman, a citizen of the Philippines and a construction engineer well-known in the Orient, was in Hong Kong when the siege began. He became a leading member of the citizens' committee that aided in the defense of the city.

The author does not tell much of the military tactics used by the Japs in taking the city—his impression of the job seems to indicate that superior fire power, unrelenting pressure, and countless numbers of snipers infiltrating into and around the city did the job. He has no quarrel with the bravery of the British who defended the city, although he does question their judgment at times.

The greater part of the story deals with Marsman's period of captivity and with his escape from the Japs. His details of atrocities tie up with many of the newspaper stories we have read on the same subject.



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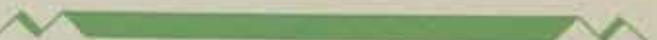
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German shepherd dogs, the author relates, are trained to work as a team with the Jap snipers. The dog locates Allied soldiers who are approaching the snipers, distracts the soldier at the critical moment, and makes the sniper's job much easier and much more effective.

### Stolen Base

**STRATEGY AT SINGAPORE.** By Eugene H. Miller. New York: The MacMillan Company, 1942. 138 Pages; Map; Index; \$2.50.

Professor Miller has done a particularly deep job of research on the subject of the Singapore base. His numerous quotations and references take in newspaper and publications from New Zealand to London, with all way points.

The book argues a surprising lack of continuity in Britain's naval policy in the years after World War I—result of the many changes in the British government during that period. This asserted aimlessness of purpose was reflected in the efficiency of the base; it is reasoned that nobody was quite sure whether it was wanted or not, and if it was wanted, whether it could be defended or not. The impact of the base on Japan as well as upon Australia, New Zealand, and India had to be considered. All in all, the entire history of the base demonstrates fully the difficulties of attaining a coherent policy when many conflicting interests cannot come to agreement.

### Ghandi, Et Al

**INDIA TODAY: The Background of Indian Nationalism.** By W. E. Duffett, A. R. Hicks, and G. R. Parkin. New York: The John Day Company, 1942. 173 Pages; \$1.75.

This book was first published in Canada as a pamphlet, and was well received because of its thorough, dispassionate, scientific approach to the facts behind the Indian political problem. It has been brought up to date and bound in cloth, at a time when India is not only a problem to herself and to Britain, but to every one of the United Nations. The authors, all Canadians, emphasize facts and do not permit themselves the luxury of thrusting their opinions upon the reader.

### Singapore to —

**ACTION IN THE EAST.** By O. D. Gallagher. New York: Doubleday, Doran & Company, 1942. 300 Pages; Illustrated; \$3.00.

The reviewer started to take notes as he read this book that starts with the siege of Singapore, with the intention of marking the important items to be mentioned in the review. If all the notes were used, the review would spread over several pages.

The tragedy of the British efforts in the East, as the keen reporter from South Africa sees it, was a compound of many things—selfishness, arrogance, and the love of luxury of the colonial leaders in business and government; unbelievably inefficient staff work; too few soldiers and those ill-equipped and worse trained to meet the seasoned and wily Jap; fifth-columnists who were unmolested to the very

and; underestimation of the capabilities of the enemy; and most outstanding, the refusal to put to use the lessons that were already learned the hard way.

Mr. Gallagher certifies to the bravery and the devotion of the British soldier, Colonial as well as those from the British Isles.

The A.V.G. pilots come in for a large share of Mr. Gallagher's praise—his stories of them carry much of the color that the daily papers missed. The author finds the new Chinese army a well-trained, effective, well-disciplined force that, given equipment commensurate with only a small part of its needs and deserts, would give an account of itself that would make its stand to now look like child's play.

As for the Jap, the reporter finds him an effective fighter, but the rest of his opinion is practically unprintable.

This is a fine book for any officer or intelligent soldier who must meet the Jap, or who must fight in the jungle. Mr. Gallagher is that happy combination, a reporter with the eye of a soldier, and he has seen war as the Jap fights it.

✓ ✓ ✓

### Diggers

MEET THE ANZACS. By W. L. Holland and Philip E. Lilienthal. New York: American Council, Institute of Pacific Relations, 1942. 48 Pages; Illustrated; Maps; 10c.

The authors have managed to cram many a fact and quite a few interpretations into this little paper-bound pamphlet. Since the people of Australia and New Zealand are our very active allies, it behooves us to know more about them and their countries than the very little most of us have managed to acquire. This pamphlet is a good start.

✓ ✓ ✓

### Miscellany

#### Math

MATHEMATICS FOR TECHNICAL TRAINING: Series of three books by Paul L. Evans of the Curtiss-Wright Technical Institute, California. New York: Ginn and Company, 1942. Single copies, \$1.25. Complete set, \$3.40.

*Algebra*: A compact volume of 126 pages giving in handy form an exposition of the practical parts of algebra which will be a necessary aid to the technical and practical student. \$1.25.

*Plane Trigonometry*: A practical treatise of eighty-four pages written in easily understandable language covering all the important elements of trigonometry used in engineering work to include seacoast artillery requirements. The volume includes five-place tables of common logarithms of numbers and of trigonometric functions, natural functions and other pertinent tables. \$1.25.

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AMERICAN UNITY AND ASIA. By Pearl S. Buck. New York: The John Day Company, Inc., 1942. 140 Pages; \$1.25.

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THE ARMY MEANS BUSINESS. By Herbert Corey. Indianapolis: The Bobbs-Merrill Company, 1942. 298 Pages; Illustrated. \$2.75.

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