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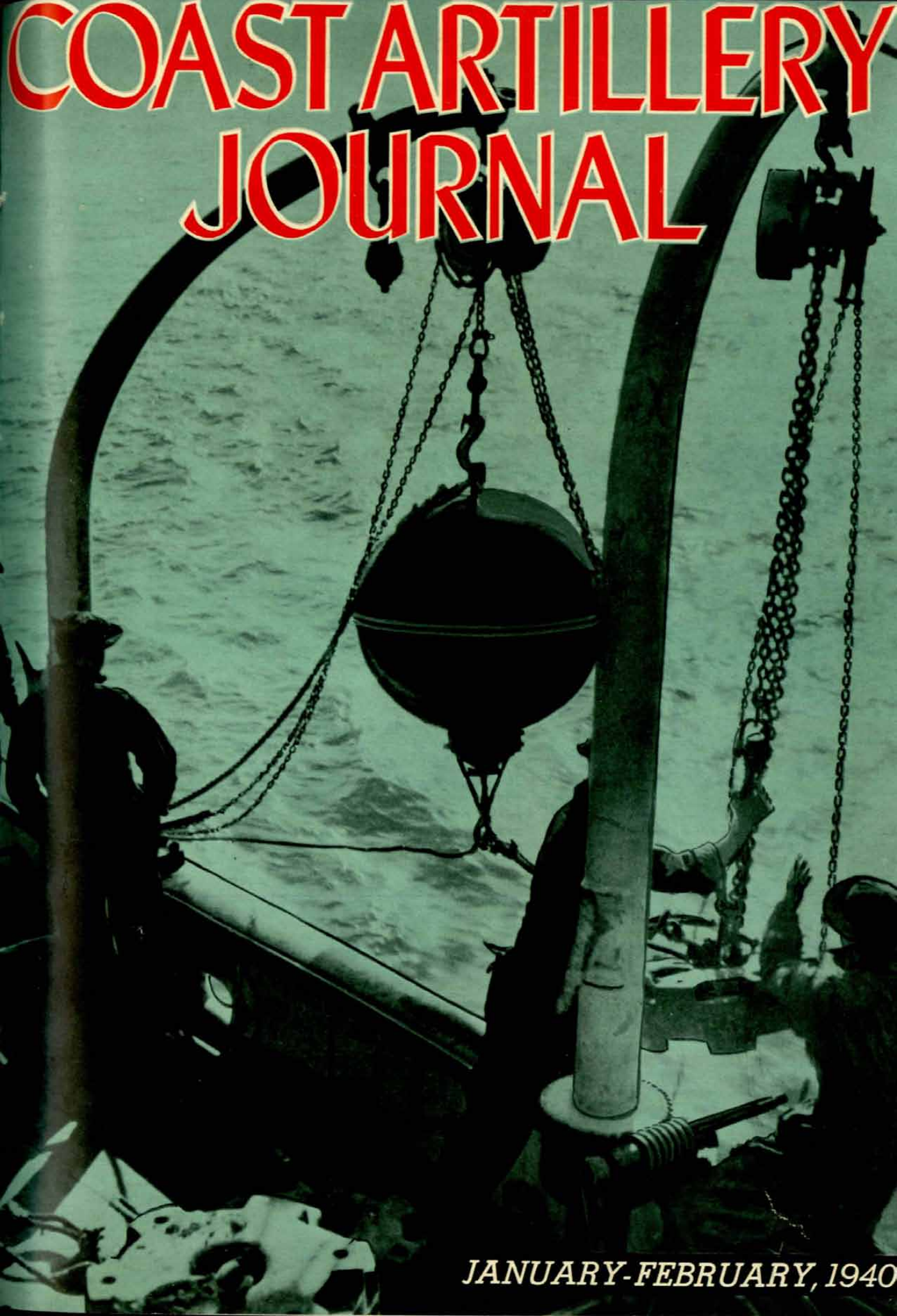

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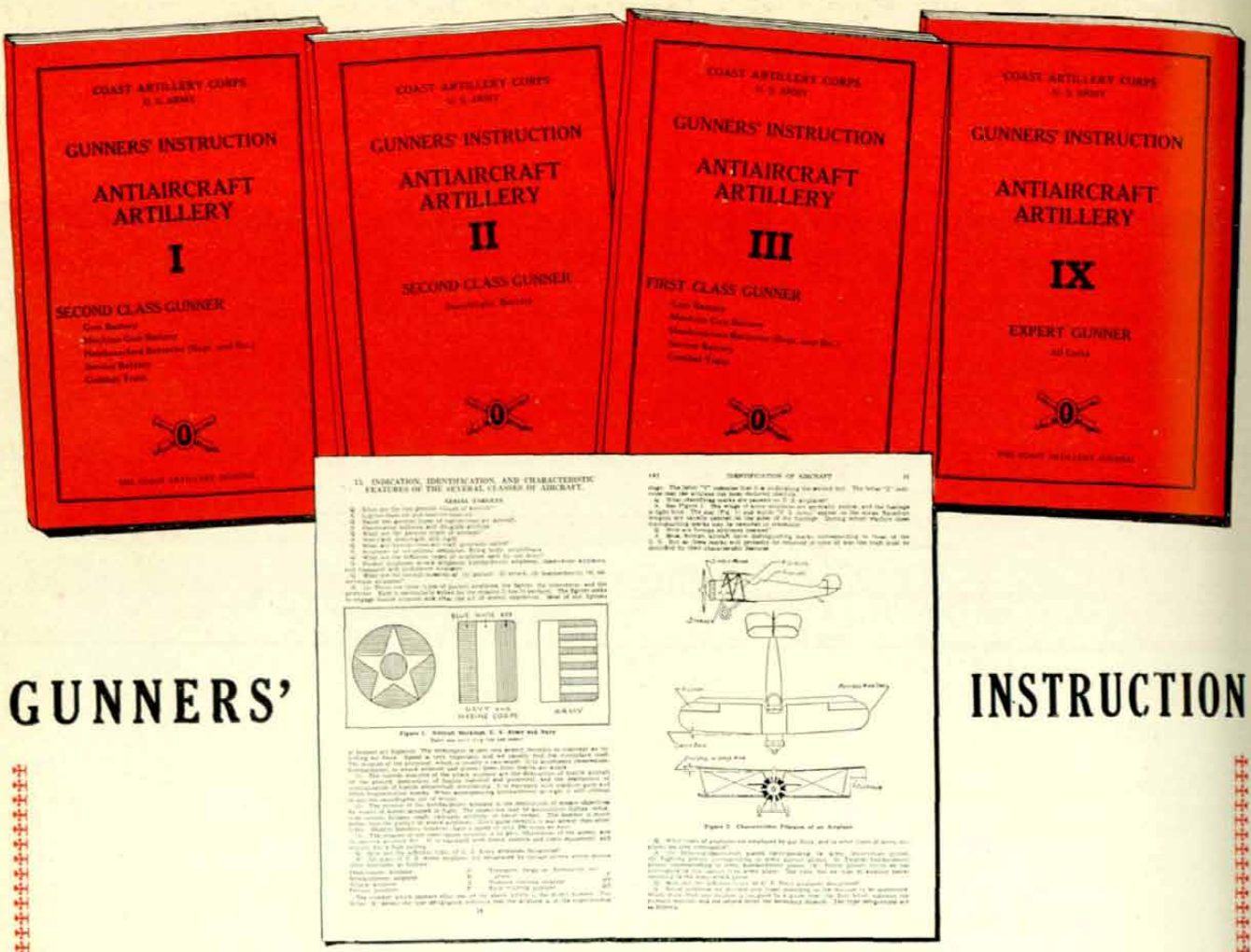

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NATIONAL DEFENSE AND ANTIAIRCRAFT DEFENSE

The 1939 Prize Essay

By
Major Thomas R. Phillips
COAST ARTILLERY CORPS

The great unknown of war today is the effectiveness of antiaircraft defense by ground fire. Its effectiveness will influence enormously the most important strategical problems. If the antiaircraft fire of the British fleet is effective it will permit a close in blockade of German North Sea ports and the entrance to the Baltic, effectively shutting off German commerce raiders from the Atlantic. If it is not effective, the British fleet will be forced to maintain its blockade far at sea and beyond the range of German bombers. If Italy were to enter the war, the ability of antiaircraft guns to defend Malta and Cyprus, as well as the fleet, would be the determining factor whether Britain gives up operations in the Mediterranean or remains in control of that vital sea.

The same considerations will influence the location and defense of industrial areas in Europe. If these can be defended, then they should be concentrated and the strongest possible defense provided. If the antiaircraft artillery defense is not effective, then they must be dispersed widely, and moved as far as possible from vulnerable borders.

It is the opinion of General Armengaud, formerly In-

spector General of the French Air Army, that antiaircraft artillery can furnish the necessary defense for bases and ships. He considers the abandonment of Malta by the British fleet during the Ethiopian crisis to have been unnecessary. In support of this thesis he cites the antiaircraft defense of Cartagena during the Spanish Civil War.

Cartagena was the naval base of the Loyalist fleet. During the entire course of the war the fleet was based in this harbor and suffered no damage from bombing operations, although it was vulnerable to attacks, both from Majorca and western Spain. Cartagena, General Armengaud states, was defended by eight modern antiaircraft batteries, fifteen searchlight sections, and the necessary range finding and subsidiary equipment.

The successful defense of Cartagena can be offset by figures which show that antiaircraft defenses of Barcelona and Valencia failed to protect these cities. Datum is not available to draw any conclusions from this. It is not known whether the best batteries and crews in Loyalist Spain were concentrated at Cartagena, what types and kind of equipment were available at Barcelona and Valen-

cia. A much greater quantity of matériel would have been required to defend these sprawling cities than that required to defend the relatively limited area of a naval base. Likewise, the cities could be bombed from great altitudes, whereas the bombing of naval vessels requires precision bombing from lower altitudes.

In a recent article in *Popular Aviation*, entitled "Antiaircraft Failed in Spain," the author, a former antiaircraft gunner with the Loyalist forces, states that his group "consisting of three batteries shot down seventy-three bombers and two fighters in about twenty-six months of action." These were brought down in 400 airplane raids in which the antiaircraft group was involved. This may or may not have been a failure. Seventy-three bombers is a pretty good score for three antiaircraft batteries, but that does not supply the answer to the problem of success or failure. This should be judged by how effectively the guns kept hostile aviation away. The author does not explain whether hostile aviation avoided his battery when it was located, or whether its opponents continued to bomb in its vicinity regardless of losses and fire.

General Rudel, who commanded the German antiaircraft artillery in Spain, wrote in *Völkischer Beobachter*, Chancellor Hitler's newspaper, that the fire of his batteries was so effective that the Loyalist aviation avoided the localities where it was emplaced. He stated that the Condor Legion manned five heavy batteries and an unstated number of light batteries, using 128 officers and 4,717 men.

The widespread differences in effectiveness reported from Spain can be explained, both by the differences in excellence of matériel and by the expertness of the crews. The World War type of matériel first used by the Loyalists was practically useless. That used for the defense of Cartagena is believed to have been modern Skoda equipment. The German equipment was completely modern and was manned by well-trained German crews. Army witnesses before the military sub-committee of the House Appropriations Committee testified that half the airplane losses in Spain were due to antiaircraft fire and that at Canton one German antiaircraft battery accounted for sixty per cent of the Japanese losses.

An illustration of the effect of antiaircraft fire, in which there were no planes shot down, is supplied by the correspondent in China of the British aviation magazine, *Aeroplane*. This correspondent interviewed some Chinese flyers who had attempted to bomb a Japanese airplane carrier. They stated that as they approached the carrier the protecting ring of destroyers commenced traveling a sinuous course at high speed and at the same time fired all their antiaircraft guns as fast as they could. The Chinese airplanes were not hit, but the concussion from shell bursts tossed them around and turned them over so that they were forced to drop their bombs and run for safety without ever approaching a position from which to bomb the carrier. It was Japanese antiaircraft fire which forced Chinese flyers to drop their bombs on their own city, Shanghai—still the most disastrous bombing in the history of warfare.

Little data is available from the current European war. The Germans claim to have shot down five planes from a twelve-plane attacking squadron by ground fire. This raid was at low altitude, in cloudy weather, and a difficult test for antiaircraft fire. The raiders claim to have damaged two German ships seriously, but this is denied from Germany. The German statement claims that the only damage done was by an English plane which crashed into a German ship.

On another raid on the German fleet, the Germans claim that five of the six raiders were destroyed by interceptor pursuit after the bombing. The British statement indicates that the bombing again was at low altitude and was opposed by strong antiaircraft fire; they admit an unstated number of losses.

Coöperative Defense of Aviation and AA Artillery

The best of all antiaircraft defenses is the destruction of the hostile aviation by offensive operations by our own air force. This was accomplished by the Japanese against the Chinese and by Germany against the Poles. But the conditions that made this possible were a ten-to-one air superiority. Without overwhelming superiority such operations cannot anticipate complete success. In war between the great powers it is out of the question. Every possible element of defense must be resorted to, in the air and on the ground.

Berlin is defended by an enormous concentration of antiaircraft artillery and pursuit. The Ruhr industrial area, however, is too close to the German border to be protected by aviation. Field Marshal Goering, speaking to the workers there early in August, stated that the defenses of the Ruhr were impregnable against air attack. The German band of antiaircraft defense, he said, was thirty-seven miles deep and unpassable by any hostile airplane.

The British plan to use both interceptor pursuit and antiaircraft artillery for the defense of southern England. In air defense exercises held in August, 1939, the press stated that hundreds of antiaircraft batteries were manned for the defense of southeast England.

The entire problem of the usefulness of interceptor pursuit for antiaircraft defense is a matter of time and distance factors, and of visibility. Pursuit defense at night during the World War was practically hopeless and this was admitted after extensive attempts in France in 1918. Captain Weiss, a specialist in night pursuit, wrote in *Revue Militaire Generale* (November, 1920) that: "Night pursuit has never given results comparable to its expenditures. . . . There are also some examples of night combat between our bombers and the enemy pursuit and reciprocally, but all these combats are exceptions. . . . The aviation of Paris obtained no success with night pursuit. The aviation forces of Le Bourget, charged during the war with the security of the capital, did not prevent, or even trouble, any raid of the Gothas or dirigibles. Several of our comrades were injured or killed on returning from these excursions, which ended at times with disastrous crashes. I have never heard of authentic aerial combats at

The 3-inch antiaircraft gun is standard equipment in the United States Army

night above Paris. The Antiaircraft Defense Corps can thus inscribe in its book of honor all the victories reported by the boasters."

British experience was similar, although the British claim to have had some slight success. However more British and French planes were lost by accident in attempted defense than they claim to have brought down of enemy aircraft.

More serious than the lack of success of pursuit, was their interference with antiaircraft fire. The gunners, unable to distinguish friend from enemy, withheld their fire until too late. This finally resulted in an order, issued May 20, 1918, sending all airplanes previously held for the defense of Paris to the front with instructions to attack German bombers on their return, after they had bombed Paris. From then on, according to General Mordacq, Clemenceau's Chef de Cabinet, the defense of Paris was assured. The antiaircraft defenses were constantly strengthened and on September 20, 1918, General Mordacq reported that they were complete. September 20 was the date of the last German raid on Paris. According to General Mordacq, sixty to eighty planes participated in this raid. Only three got through the outer rings of defenses and flew over Paris and two of these three were shot down.

"It had taken time," remarks General Mordacq, "to fight the stupid ideas of certain influential personages, who had no competence in these matters, and arrive at last at a logical and practical result."

The lack of reliability of night pursuit was shown in the Spanish Civil War. There were a few instances of night combat, but these appear to have been accidental and exceptional.

The only rational and effective defense of an objective against night attack is provided by antiaircraft artillery.

Daylight presents a more favorable problem for interceptor pursuit. Time and distance enter this problem. Aviation was ineffective for the defense of Paris because there was insufficient time to give warning, gain altitude and attack the bombers. In the case of Berlin today, French bombers must fly more than three hundred miles over Germany to reach their objective. With an effective warn-

ing net, this gives ample time for interceptor pursuit to gain altitude and meet the attackers in front of Berlin. The defense of Paris, with approximately half the warning distance available, again may have to be left exclusively to antiaircraft artillery, just as Germany depends upon antiaircraft artillery for the defense of its western industrial areas.

The distance from which warning must be given to interceptor pursuit, if they are to be able to meet an attacker, depends upon the degree of readiness of the defenders, the rapidity with which they can gain altitude, and the difference in speed between the pursuit and the bomber. With pursuit speeds of 300 miles an hour and bomber speeds of 250 miles an hour, and an alert factor of fifteen minutes, a 200-mile warning is required to offer a fair chance of meeting the attacker in front of the objective. With a fifty-mile increase in pursuit speed and a shorter alert factor, the warning distance may be reduced to 100 miles. Under exceptional conditions it might even be slightly lessened, but this cannot be depended on.

From these considerations one conclusion can be drawn definitely: our antiaircraft coast defense cannot be supplied by interceptor aviation.

Warning from sea may be given occasionally, but cannot be depended on. Our own interceptor pursuit will find its usefulness in chasing the attackers *after* they have dropped their bombs. For the defense of inland objectives interceptor pursuit is effective.

Our antiaircraft coast defense is supplied by the Navy which tries to compel an enemy to base so far away as to be harmless, by long-range bombers which attack hostile bases either on carriers or land, by antiaircraft artillery which provides protection at the objective, and by interceptor pursuit which attacks bombers *after* bombing of coastal objectives and *before* bombing of inland objectives. All of these elements of antiaircraft defense are essential and all are coördinate and coöperative elements of national defense.

Can We Be Bombed?

When at war we always have been subject to naval raids and bombardment. Fifteen years ago we had no fear of aerial bombardment. Today we can be bombed. Airplanes now are in being that can make the round trip from Europe to the United States with a small load of bombs. Such bombing would not be effective and it would be costly. It would be in the nature of the Paris gun of the World War, of military value only for its moral effect, and unproductive in any other sense in relation to its cost. But it is possible today.

Airplane carriers that managed to avoid our fleet, could come within a few hundred miles of the coast, drop bombs at dusk and return to the carrier in darkness. Such bombing also would be small-scale, but the results against our great ports are almost incalculable. The demands for defense would be immediate and enormous. And most important of all—this could happen immediately upon the outbreak of war.

Antiaircraft Readiness

Our traditional defense has been based on a great navy and substantial coast defense able to buy us time to raise an army if needed. The navy is always ready for war, the army never. Coast defenses were in substantial readiness prior to the World War, but have been neglected since. With the advent of air power, our national instinct has demanded aerial readiness. Antiaircraft artillery has been neglected as one of the arms of instant readiness.

The logic of a navy in readiness is apparent—it might have to meet another great navy immediately upon the outset of war. The same reasoning applies to the coast defenses, essentially a naval adjunct. The identical logic has been applied to the Air Force as an M-day defensive force. Does not antiaircraft readiness bear the same relation to aviation readiness as coast defense preparedness does to naval preparedness? All of these elements of national defense may have to meet an enemy almost immediately after war starts. The navy cannot guarantee complete protection against naval raids nor can the air force guarantee complete protection against aerial raids. Both can guarantee protection against invasion by a great land army; consequently, we do not need a great competitive army in the European sense. We shall have time to build it if we have a suitable nucleus. But we have no assurance of time to build our antiaircraft coast defense after the start of war. It, too, is an M-day force just as is the navy, the coast defenses and the air force.

In August, 1939, the German antiaircraft artillery and warning service was only slightly smaller than the United States Army. The British antiaircraft Territorials were 140,000 strong. The German antiaircraft detachment in Spain was greater than the entire American antiaircraft service. A belated recognition, primarily in Congress, within the past two years has resulted in earnest efforts to build up our antiaircraft defenses. The long neglect and sudden spurt almost found us without a rational program either for personnel or matériel. What type of guns do we need? Do those being manufactured meet today's requirements? Where is personnel to come from? Will it be National Guard or Regular Army? Is the Army ready with long-range recommendations? Should we make periodic studies of antiaircraft defense requirements?

Matériel Requirements

Ten years ago the American antiaircraft artilleryman could report, with justice, that his gun had the bomber stopped. The electrical data computation and transmission system had solved the worst of fire control problems. The 3-inch gun was effective at altitudes well above the capacity of loaded bombers at that time. Since then, the speed and ceiling of bombers has doubled. Loaded bombers can fly at 28,000 feet. Our own Air Corps is bombing at 22,000 feet more accurately than they were bombing at one-third that altitude ten years ago. Speed has increased from 100 miles per hour to 300 miles per hour. Antiaircraft artillery now being manufactured should be able to cope

The German forces take AA guns to sea. (Photo passed by German censor)

with a 300-mile per hour plane flying between 25,000 and 30,000 feet.

While aviation has progressed by yearly bounds, American antiaircraft has devoted itself to refinement of the matériel of ten years ago. It no longer can fulfill its mission. Area targets can be bombed from altitudes five to eight thousand feet in excess of the effective range of the 3-inch gun. Above 18,000 feet the effective radius of fire decreases so rapidly, that it can be said that the 3-inch gun is practically useless above 20,000 feet. Because of the small radius of effective fire at and above this altitude, the number of batteries required to protect an area becomes almost astronomical and certainly impracticable.

The theoretical effectiveness of antiaircraft matériel can be varied by the standard of airplane performance adopted. In the *Coast Artillery Field Manual*, Volume II, Part one, "Antiaircraft Artillery," 1933, the computations of the bomb release line and the size of the critical zone were based on an 120-mile an hour bomber and an altitude of 15,000 feet. In the same *Manual*, page 14, it is stated that light bombardment airplanes have an operating speed of 180 miles per hour and heavy bombardment a speed of 150 miles per hour. By adopting performance figures for this manual that already had been exceeded, unjustified conclusions of antiaircraft performance and effectiveness were deduced. If a speed of 200 miles per hour, which was then in sight, had been adopted, it would have been found that four batteries, instead of three were required to defend a point target according to the standard set forth. If a 5,000-foot increase in airplane altitude had been anticipated, and this also was in sight, it would have been found that the 3-inch gun was incapable of furnishing effective defense against extremely high bombardment, such as may be employed against large area targets.

This should have been a sufficient demonstration of the need of anticipating airplane performance. But in the 1938 edition of the same *Manual*, the speed of bombers, for purposes of calculating the bomb release line, is taken as 200 miles per hour, about what should have been assumed five years ago. It also is assumed that "atmospheric

The Swedish Army uses the Bofors antiaircraft gun

This is a Danish AA gun and crew

conditions of visibility and density and decrease in accuracy of bombing at increased altitudes will probably confine bombardment attacks to much lower altitudes and, since an average bombing altitude may reasonably be taken as 17,100 feet, this figure is used."

Seventeen thousand one hundred feet happens to be the approximate altitude above which the effective radius of fire of the 3-inch gun begins to decrease so rapidly that defense at higher altitudes will require quantities of matériel that never will exist. At an altitude of 22,000 feet, the effective area of fire of the 3-inch gun is less than one-third as great as at 17,100 feet. By using figures of airplane performance that again have been surpassed at the time of publication of the *Manual*, the 3-inch gun is made to appear still to be effective against all bombardment. Even using such data, six batteries are indicated in the *Manual* as necessary to defend an area target 4,000 yards in diameter.

Were a larger gun with a radius of fire of 6,000 or 7,000 yards at 22,000 feet available, five batteries could provide effective defense for the critical zone of a point target. For protection of the area target shown in the *Coast Artillery Field Manual*, four of the larger batteries would supply a more effective defense than six 3-inch batteries. Even if higher effective altitudes are not yet essential, one-third less matériel is needed of the larger type than the present type.

This is an important economy when the enormous requirements for antiaircraft defense are added up. The larger gun can reach into any immediately possible altitude of bombardment, while the 3-inch gun permits bombing with impunity at altitudes that today are practicable to the bombers of every nation in the world.

In England, early in 1938, when the press discovered that the War Ministry was remodeling a large number of 3-inch antiaircraft guns, popular protest rose to the volume of a public scandal. The Government was questioned in the House of Commons. It was explained that this was only a stop gap; that the 3.7 inch antiaircraft gun was the weapon on which the War Ministry was concentrating its production. In England, not only the War Ministry but also the public—educated during the past three years to antiaircraft defense—is aware of the lack of effectiveness of the smaller gun against modern aircraft.

It is a serious error to assume that bombers will not use their higher altitudes. Altitude requirements are placed

in design specifications for the very purpose of protecting bombers against antiaircraft artillery and pursuit aviation. If the pilot is faced with the possibility of being hit at 17,000 feet and escaping at 25,000 feet, there can be no question about the altitude he will choose. At higher altitudes he has the additional advantage of relative invisibility and noiselessness. Any assumption based on the theory that bombardment will not use its maximum altitude is false, any reasoning to support it is specious. Haze or scattered clouds are an asset to the bomber. The pilot needs only to look directly beneath himself for orientation, while the ground observer must search along the slant range. The earth the pilots see occasionally is everywhere below; but to the ground observer the airplane is a speck in the hemisphere of the sky.

Regardless of altitude requirements, the 3-inch gun has never been the most efficient size for an antiaircraft gun. Perhaps exaggerated ideas of the need for light weight and high tactical mobility had something to do with the adoption of this size. The most effective antiaircraft gun is a compromise between conflicting requirements. One wants a gun with high muzzle velocity, high rate of fire, high ballistic coefficient of projectile, and a large bursting area of the shell. The larger gun has a lower rate of fire. Great muzzle velocities require a thick walled shell which limits the burst effectiveness, etc. One limiting requirement is a reasonable mobility, which limits weight; another is a requirement of high altitude effectiveness, which eliminates small guns.

The German compromise representing the most effective size is the 88-mm. gun (about 3½ inches). This gun was developed as the most effective size before the high altitude fire of which it is capable was necessary. It will fire at a rate of twenty rounds per minute and has ample tactical mobility. Its effective altitude is said to be in excess of 25,000 feet. The British have adopted the 3.7 inch gun as standard. Its performance exceeds that of the German gun. The French use a 90-mm. (about 3.6 inches) in the defense of Paris. This was originally a naval design, the army having been laggard in providing the larger guns. A unique feature of the French 90 is an automatic loader that gives it a rate of fire of thirty rounds per minute.

A size somewhere between three-and-one-half and four inches probably represents the most effective antiaircraft gun with tactical mobility today. But this, when developed, should not be considered the ultimate in guns, or we shall repeat the mistake already made in delaying too long to replace the 3-inch gun. It is quite possible that new detection and tracking devices will permit fire on airplanes at ranges far beyond those now considered practicable and that the increased time that a plane could be held under fire would warrant the building of a gun with still greater range. It might have to be built in two loads for mobility and would require an automatic loader, but it may become necessary to have such a gun. In spite of greater cost, its superior range would make fewer guns necessary for the defense of an area and thus the larger gun is cheaper than the smaller one.

The 3-inch gun now in production is not a waste. It will always be valuable to use in the field and for defense of targets which require precision bombing. But a larger gun is essential, and more economical, for antiaircraft defense of cities, industries, harbors and bases.

Slight excuse can be given for a fixed antiaircraft gun in the continental United States. In Panama, yes. But in the United States all antiaircraft guns should have strategical mobility so that all can be concentrated on either coast in case of need. Our 105-mm. fixed gun does not meet this requirement. It is planted in concrete and it would take months to replant it on the opposite coast if needed. It is probable that a mobile gun of between three-and-one-half and four inches will meet all the requirements of antiaircraft coast defense for some time to come and that there is no need for the installation of any more fixed antiaircraft guns in continental United States.

Machine guns are not now and never have been effective weapons against low flying planes. The antiaircraft artillery has been trying to make itself a machine-gun outfit for twenty years and has failed. Colonel J. P. Hopkins, Chief, Antiaircraft Service, AEF, in his report December 31, 1918, stated: "On our Army front there were probably 1,500 antiaircraft machine guns which were identical with the total of ninety-six that were used by our two antiaircraft machine-gun battalions. Probably there were planes brought down by these 1,500 guns, of which we have not had a report; but the total of which we have specific information is two. The number of planes brought down on the entire British front is about two per month."

Today, we count holes in a sleeve and think the practice is pretty good. In Ethiopia, 259 planes were hit by small arms fire, most of them many times, and only eight were shot down. An American pilot flying in Loyalist Spain had an air duel with Bruno Mussolini. When he landed he counted 326 entering bullet holes in his airplane, his instrument board was shot away, but still he was able to return to his field. Effective fire against low-flying planes demands an explosive shell and a gun light enough to keep ahead of the tremendous angular travel of a plane close to the ground.

The 37-mm. gun is not a substitute for the machine gun. According to Dr. Helmut Klotz, a former German officer who observed the Spanish War closely, the 20-mm. automatic cannon is superior to the 37-mm. Its rate of fire is 300 rounds a minute against 150 rounds a minute for the 37-mm. Although its shell is much smaller, the explosive it contains still is sufficient to wreck an airplane wing. It can follow a low-flying plane while the 37-mm. cannot at equally low altitudes. The fire control cannot take advantage of the increased range of the 37-mm. cannon. Both the 37-mm. and the 20-mm. are limited to about the same altitude by fire control—that is to about 4,000 or 5,000 feet. In addition the 20-mm. cannon weighs about 800 pounds and can be manhandled anywhere. Its small size and low silhouette make it a poor target for aerial attack or ground fire.

If and when the 37-mm. fire control system is perfected

to make it a useful gun at altitudes of from 4,000 to 10,000 feet, it will be an enormously valuable weapon and will replace the heavier guns in forward areas. Until the fire control problem is solved the 20-mm. cannon is superior to the 37-mm. and should be adopted as a substitute for the machine gun. Even when the 37-mm. fire control is perfected, the 20-mm. cannon will remain essential for all the missions now assigned to the antiaircraft machine guns. The German 88-mm. batteries are supplied with two 20-mm. cannon for protection of the batteries against low-flying attack.

This British 3.7-inch AA gun is shown in the outskirts of London before the outbreak of the war

Blackout

The aircraft warning service is nobody's baby and no one wants to adopt it. Who will organize and man it in the field? Will the technical equipment be supplied by the Signal Corps or the Coast Artillery Corps? How much warning is required for marching troops? Truck columns? Railway trains? How wide must the interceptor pursuit net be to enable them to meet an attacker? No answers are available. But a warning service is just as important to antiaircraft defense as are the antiaircraft guns. A year and a half ago Germany had 15,000 men in their peacetime warning service. This was to have been doubled by the present time, along with the more than doubling of the air force and antiaircraft artillery. Like antiaircraft defense, of which it is a part, the aircraft warning service has a double function. It must be supplied for the field forces as well as for antiaircraft coast defense.

The problem of a warning service for the field forces is relatively simple. The approximate extent of division, corps and army areas in battle is known. It is easily practicable to devise a type organization suited to these units and to provide the staff and personnel to operate and coordinate the system. There will be few commercial installations in the field for conversion; the entire net will have to be a military installation. These needs cannot be met by superimposing a warning system upon the existing means of military communication, nor by attempted coordination of existing agencies.

The antiaircraft artillery cannot stand to their guns twenty-four hours a day; they must have warning. Troop columns must be warned to give them time to disperse and deliver effective fire. How much warning do they need? Two minutes will require warning from a distance of eight or ten miles. They cannot supply it themselves. Truck columns should have warning in time to halt, disperse when practicable, and get ready to fire. A small bomb on a moving convoy might pile up a dozen trucks. Halted, the damage would be limited.

Railway trains must be warned, when threatened with air attack, and stopped. In 1917, a low-flying German plane dropped a small bomb just in front of a moving train near Abbeville, on a long, low brick arch bridge. The bridge was undamaged, and the crater in the track was very small, but sufficient to derail and pile up the train. This double line took nearly twenty-four hours to clear. On the other hand, three heavy shell craters and one large bomb crater in a main double line near Poperinghe took only just over four hours to repair in darkness one night in 1917. All four craters were large ones, eighteen to twenty-two feet in diameter.

Quite obviously the warning service must dispose of radio communication as well as wire. Personnel of the warning service will have to be attached to all movements of all sorts just as antiaircraft artillery may be attached. All major movements in the field will have to be plotted so that warning will be given only to those endangered.

Broadcast warnings would hold up all movements so frequently and uselessly that they soon would be disregarded.

No organization of field forces can be complete without warning batteries. They are as essential as any other part of antiaircraft defense. They should be a part of existing organization. Until they have been formed and used extensively in maneuvers no one can know what they can do nor what their requirements in personnel and equipment will be. A minimum peace organization might be one warning battery in each corps area. Today there are none.

More difficult is the problem of providing warning service for antiaircraft coast defense. This will require use of existing commercial facilities under military supervision and in coöperation with civil agencies. It will be too late, after a war starts, to commence the organization of the antiaircraft coast defense warning service. An organization consonant with our military establishment would be based upon a special branch of the National Guard. The necessary specialists could be enlisted with the understanding that they would perform their duties in their home area and, in many cases, they could continue normal work. A very considerable group of permanent personnel would be required to insure the organization and training of the service.

The Requirements of Antiaircraft Defense

There are two reasons for the general delay, both in the army and by the public, in recognizing the requirements of antiaircraft defense. One of these, effective for many years, was a defeatist attitude about the effectiveness of ground defense. Many soldiers had witnessed the futile firings of the Archie guns during the World War and counted their effectiveness by the number of misses. They failed to realize that it was not the number of planes brought down that was the measure, but rather the number of raids disrupted and broken up. It was easy for the civilian to see a Sunday supplement picture of a great bomb being loaded into a great bomber and then later see an airplane above him and imagine that bomb being dropped at his feet. Conversely, it was difficult to imagine hitting that barely visible speck high in the sky.

Our great cities have to be defended and can be. The moral effect of unresisted attacks in incalculable. If the army fails to realize and demand the means to fulfil its obligation of defense, it can have no alibis when war comes. Of course expenditures will be large; but so are naval expenditures; so are air force expenditures. But antiaircraft costs will be trifling compared to passive submission to partial destruction. No excuse avails the army unless it has thought large and has presented its needs to Congress.

The second reason for our laggard antiaircraft preparations is directly attributable to the army itself. Antiaircraft artillery is a new arm. It is added to the military team, but the older members of the team tend to see only that their proportion of the forces is reduced and resist it. For the same reason, air increases have been resisted. Soldiers have known that the air force must be added to the defense forces, but resisted a reapportionment of available funds that appeared to be to their own detriment. The air force that all admit we need was forced on the army by popular demand and congressional action, however little we may like to admit it. The antiaircraft artillery is in the same category. It is incredible to the older arms that this upstart should need more men and money than they are allowed. But this is just as certain to happen as the air corps expansion which already has taken place. With the development of the airplane must come protection against it. Every increase in our own air force is a signal that an increase is needed for antiaircraft defense.

How much antiaircraft defense do we need? Unquestionably as much as Great Britain in peacetime with her 140,000 Territorials in addition to her Regular forces. Our two constant allies, the Atlantic and Pacific oceans, are still effective to give us a small delay in assuming defensive readiness. For this reason, we like the British, can depend upon the National Guard for the major increments of necessary antiaircraft defense.

Nevertheless, the irreducible minimum of permanent personnel is many times as great as that now in existence. Congress recognized the need in Panama and added 8,000 men to the Army for increasing antiaircraft defense there. The Hawaiian Islands require more, so do the Philippines, and the antiaircraft defense of Puerto Rico is just being started. For protection of vital coast cities, industries, harbor defenses and naval bases on both coasts, a largely increased nucleus of permanent antiaircraft personnel is indispensable. In terms of permanent personnel, these requirements, very roughly estimated, might amount to: 100 batteries for foreign possessions, thirty-six batteries in the nine corps areas, sixteen batteries for the Pacific Coast, and twenty-eight batteries for the Atlantic Coast.

This totals 180 batteries, not including headquarters, searchlight and warning units. The personnel requirement exceeds 25,000 officers and men. The existing army cannot provided these men by taking them away from other arms. They must be furnished from army increases. Absurd? Not in the least. This is the requirement to meet the threat of a new arm which we recognize, but fail to realize that a new arm is required to counter the new enemy.

But this is only the beginning. An additional force of 800 or 1,000 batteries of antiaircraft artillery, with the necessary warning elements, must be supplied by the National Guard. At least 100,000 men will be needed. The major portion of the National Guard force could be a strictly home defense element, men physically unfit for other military service, men with dependents serving in defense of their own cities or own factories. In the protection of industries removed from the coast, if an efficient warning service were provided, these units could continue their normal work, manning their guns on receipt of warning.

The antiaircraft coast defense warning service could be organized similarly. It should extend several hundred miles inland. Certain port cities of great importance will require warning from ships stationed at sea for that pur-

pose and cannot be defended adequately unless antiaircraft ships are provided to complete the defensive ring. A sea going antiaircraft service will have its charms for our yachting enthusiasts.

It is also inevitable that commerce destruction by airplane bombing will require that our merchant ships be armed with antiaircraft guns, both large and small. The army should be prepared to supply the matériel and personnel to meet this need when it comes. In the Spanish war more merchant ships, by ten to one, were sunk by airplanes than by submarines. Such a method of blockade is inevitable again when the going gets hard.

Conclusion

Thinking small in terms of antiaircraft defense for many years has resulted in almost no defense. It is not too late to think big and repair the delays of the past. Any further delay may be too late. Money and personnel will be supplied generously when true need is demonstrated. And it is up to the army to demonstrate that need to our people.

* * *

Editor's Note: It should be borne in mind that this article was completed during the early days of the current war in Europe. This accounts for the lack of comment on more recent events in air warfare. But our readers will also note that no event to date of going to press has invalidated any of the author's major premises.

This is a German 88-mm. AA gun mounted along the West Wall

HOFFMANN

In the shadow, he worked to make fame for other men

By H. A. DeWeerd

It has become increasingly fashionable to interpret leaders of the First World War in terms of their closest advisers. Thus Foch tends to appear as the "action mechanism" of Weygand. Old Paul von Hindenburg becomes the rubber stamp for his all-absorbing Quartermaster-General, and Max Hoffmann is described as the *alter ego* and lucky star of Erich Ludendorff. This last assumption has been made because, with the exception of the Rumanian campaign, Ludendorff's luck deserted him when he left Hoffmann. Like most catch phrases, no one of these evaluations is strictly accurate. Although most of the important leaders of 1914-1918 have been subjected to intense and in some cases painful scrutiny, Hoffmann has received less attention outside Germany than his importance seems to warrant. His portrait is conspicuously absent from the various volumes of military reputations. This may be due to the fact that, to use the title of one of his own volumes, Hoffmann's career was in a sense one of "lost opportunities." The vicissitudes of war raised him from the rank of colonel to that of Chief of the Staff of the Eastern Armies. In the latter rôle he performed miracles of military economy and achievement—but always in a minor theatre. He missed the procession of destiny that led to the fateful and decisive theatre in the West. He always worked under the shadow of a greater or at least a royal name. And just when, at the summit of his career, he might normally have been the next chief of the great German general staff, the Versailles restrictions cut away the old army and left no place for his restless spirit.

Carl Adolf Maxmilian Hoffmann was born in Hamburg on January 25, 1869. His father was a substantial member of the legal profession, his mother a descendant of the famous du Buisson family. After a period of elementary education, Hoffmann passed the *Kriegsschule* and entered the *Kriegsakademie* at Torgau. Here the young Hessian cadet officer demonstrated a lightness of touch and quickness of mind at once a source of wonder and exasperation to his teachers. He was a tall, slight youth, of tenaciously indolent habits, but unfailingly lucky. His unsoldierly qualities were marked; he hated all forms of military drill and athletics. He disgraced the corps by sloppy performances at swordplay and horsemanship. On the other hand his capacity for downing Moselle and wolfing sausages was unrivaled at Torgau. While other student officers were plugging away at their books, Hoffmann spent his nights at the officers' club leaving his study lamp burning in the window. Favored with a photographic type of memory which rarely failed him and a remarkable facility for learning by listening, Hoffmann swept by his heavier-footed colleagues in examinations, passed with distinction, and was chosen for a tour of special duty in Russia.

During a six-month stay in Russia Hoffmann perfected his knowledge of Russian and became acquainted with the people against whom he was to distinguish himself in the fighting of 1914-1918. Often in the war years he used to clinch his arguments for a certain course of action by insisting: "I know the Russian people." On his return to Germany in 1899 he was attached to the Russian section of the general staff and came under the eye of Wartenburg and Schlieffen. Despite a surviving tendency toward youthful irresponsibility, he seems to have won the favor of Schlieffen. For that hard taskmaster once approved a bill for a special train to Warsaw made necessary by an act of carelessness on the part of Hoffmann. Doubtless the old man gave him a withering reprimand but when the Russo-Japanese War broke out selected him for the post of observer at the Japanese headquarters. This may have been a decisive stage in the career of Hoffmann.

AT OBER-OST — HEADQUARTERS, EASTERN FRONT

Ludendorff (left) the man of energy; Hindenburg (center) the social front; Hoffmann (right) the man of fertility of ideas

Many of the military observers in the Russian-Japanese campaign afterwards became important leaders. The list is impressive: Generals March, Pershing, and Crowder of the United States Army; Sir Ian Hamilton of Gallipoli fame; and General Caviglia who later became Italian War Minister.

No doubt this period of travel and observation had a broadening and sobering effect on the somewhat arrogant Hoffmann. His proud Junker naïveté was punctured in conversation by sly Chinese mandarins, and his air of superiority was shattered on the tough imperturbability of Japanese staff officers. Though disarmingly amiable when he wanted to be, Hoffmann could be and sometimes was a thoroughly irritating person. In the tiresome periods of inactivity between battles he was often a great trial to his German colleague, Major von Etzel. Frederick Palmer, the famous American war correspondent, saw him as "a domineering Junker of the Bismarckian type." Often he tried to get his own way by sheer force, a procedure which seldom worked with the Japanese. Like other observers he resented the intense secrecy and excessive caution of the Japanese staff. He wanted to see military actions from close up. On one occasion he asked permission to watch an operation from a nearby hill. When General Fujii refused, Hoffmann lost his temper and shouted before the group of foreign attachés that the Germans had taught the Japs everything they knew about war, and now they in turn would show them nothing. "You are *yellow* —you are not *civilized* if you will not let me go to that hill!" The diminutive Japanese officer flushed but did not pay Hoffmann the compliment of raising his voice when saying: "You may not go." Later General Fujii observed to the tactful Palmer: "We Japanese are paying for this military information with our blood: we don't propose to share it with others."

Hoffmann returned from the East with first-hand knowledge of how the Russians fought, with a newly developed cynicism regarding the follies of his profession, and a philosophical attitude toward some of the vagaries of officialdom. "The most important matter in the world," he used to say, "is *not* how to mount a perfect infantry attack." He tried to describe the warfare of trenches as he saw it in Manchuria, but expressed doubts as to whether its lessons would be grasped in Berlin. As might be anticipated, trench warfare annoyed the higher officers of the general staff. The younger Moltke wrote: "There never was such a crazy way of making war." Sir Ian Hamilton got the same treatment when he reported that the Japanese had decided that the only thing cavalry could do in the face of entrenched machine guns was to cook rice for the infantry. "He must have a tile loose somewhere" was the War Office comment. Hoffmann also brought back with him a clear picture of the possible military consequences of previous mistakes in diplomacy. His contacts with Japanese officers convinced him that Germany would some day pay dearly for the folly of forcing the Japanese to revise the Treaty of Shimonoseki in 1895.

After his return from Manchuria Hoffmann was promoted to the rank of major in 1907, filled staff appointments in Posen and Berlin, and did not—as in the case of Ludendorff, with whom he was closely associated—make himself unpopular by championing lost causes. He lived in the same house with Ludendorff from 1909 to 1913 in Berlin, and saw him struggle so vigorously for an increase in the size of the army that in 1913 he was transferred to an infantry command by way of punishment. Hoffmann's rank was that of lieutenant colonel in 1914, and his war assignment was G.S.O.1 (first general staff officer in charge of operations) attached to the Eighth Army.

Advancing years had by this time filled out Hoffmann's huge frame; his ruddy face was round; the light hair on his "Bismarckian skull" was cropped almost to baldness. He was extremely vain about his appearance, trained his bushy eyebrows to slant upward, paid great attention to his delicate hands and the crease in his trousers. Pince-nez glasses added an effect of supercilious detachment to his appearance. He might have served as a model for the war-time caricature of a typical Prussian officer. He had already begun to demonstrate an irrepressible impatience and growing irritability with slower minds, and an unshakable sense of self-confidence. Surviving traces of his youthful recklessness and buoyant spirit were not to be extinguished by the day-and-night trials of four years of staff responsibility.

His colleagues on the staff of the Eighth Army were well known to him. They included Colonel-General von Prittwitz, *der dicke soldat* (the fat soldier), commander-in-chief, "a clever but harsh superior"; Major-General von Waldersee, chief of staff, former Quartermaster-General, but recently recovered from a serious illness and operation; and General Grünert, Quartermaster-General. Though Hoffmann observed as early as August 13: "Waldersee is rather weak—I hope he will not let us down at the last minute," the divisional and corps commanders and staff officers were of much sterner fighting stuff: Mackensen, François, von der Goltz, Kundt, Litzmann, Morgen, von Below, Hell—names that afterwards became well-known.

The rôle of the Eighth Army in the revised Schlieffen plan was to hold off a Russian invasion of East Prussia until after a decisive success in the West. Though it was assumed that the Russian system of reserve units had been revamped after 1905, there was little definite knowledge of their numbers, organization, or fighting value. From information obtained in 1910 by Colonel Nicolai of the German intelligence service, it was assumed that a Russian attack on East Prussia would take the form of a double advance from the north and south with a juncture behind the Masurian Lakes. From the date of the Russian advance, it could be deduced, however, whether or not the force would include units from the eastern military districts (Moscow, Kazan, Caucasus, Siberia). If it came soon after the estimated completion of mobilization for the western military districts (Warsaw, Vilna, St. Petersburg) on August 15, it was obvious that the troops from distant areas would not be available. What surprised the

officers of the Eighth Army was that the armies of Rennenkampf and particularly Samsonoff were prepared to advance before their transport equipment was complete.

II

Like that of Hindenburg and Ludendorff, the star of Hoffmann rose at Tannenberg. Because of the change of command which followed the momentary panic of Prittwitz, he was one of the few senior staff officers who guided the destinies of the Eighth Army from the false start at Stallupönen to the crowning triumph of Tannenberg. No other campaign during the First World War produced more fantastic legends or more unsoldierly scrambling for honors among the participants. Since the main features of the operation are well known no attempt will be made to repeat them here except in so far as they relate to Hoffmann's activity.

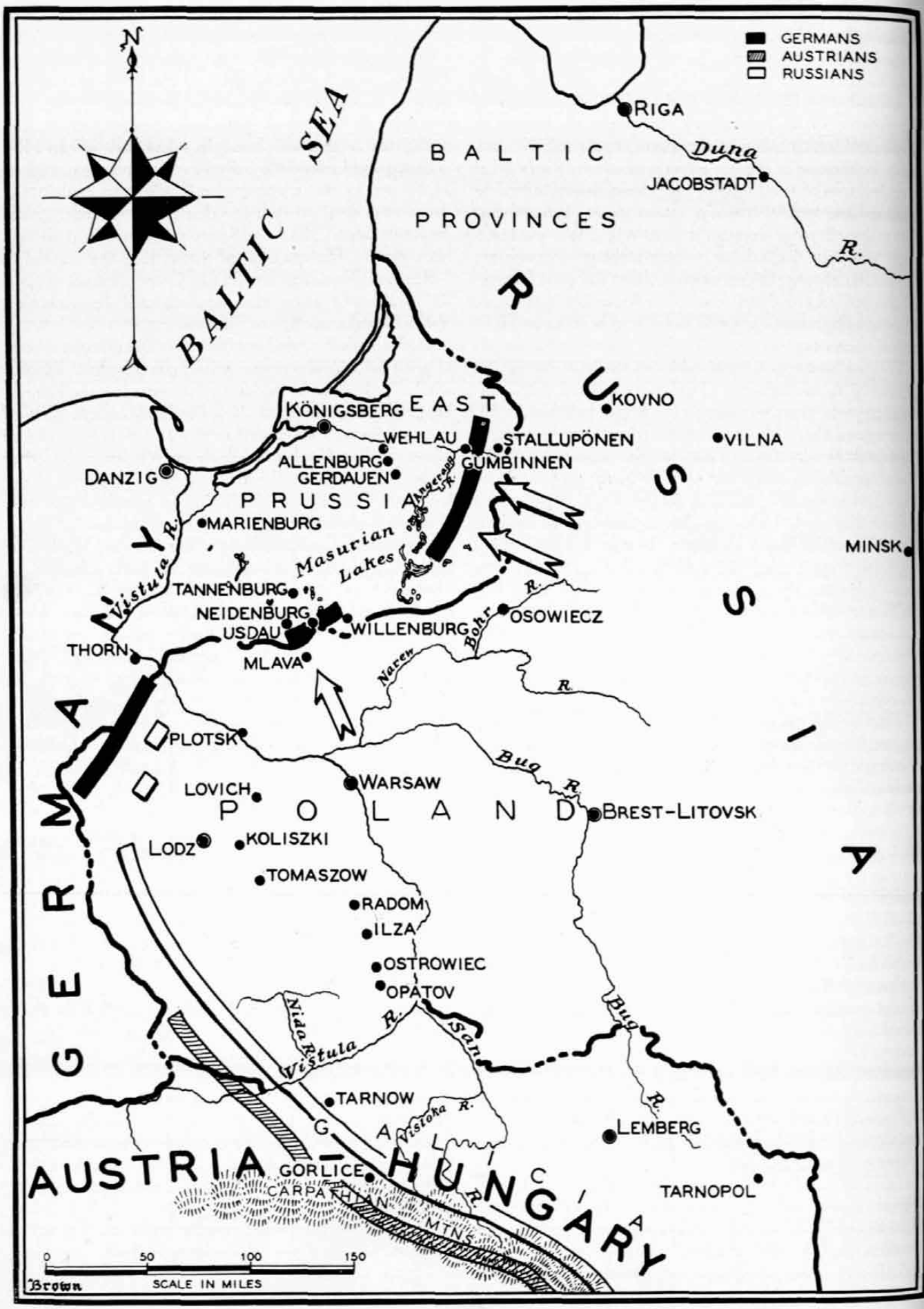
Despite attempts of some critics to attribute the success primarily to his influence, Hoffmann insisted that Tannenberg was not the victory of a single individual. He maintained that as an example of effective staff work, it could not be compared to certain other operations in the East, notably the campaign of Lodz in 1914. A study of the operation confirms this opinion. It was the spectacular culmination of the battle, coming on the heels of Gumbinnen and offsetting the disaster at the Marne, which appealed to the imagination of the German public. But those who eagerly accepted the legends of Tannenberg did not know of the hasty improvisations, the false moves, the confusion, and the decisive acts of insubordination and initiative by corps and divisional commanders, and the heart-breaking marches of the infantry which combined to hide these weaknesses.

To any staff officer who had sat at Schlieffen's feet, the correct line of action for the Eighth Army in event of a converging attack by two Russian armies was pike-staff plain. The whole German force should be directed first against one, then against the other Russian force. Destruction of potentially superior forces in detail was the ancient and appropriate solution. It was, in fact, the course decided upon by Prittwitz, Waldersee, Grünert, and Hoffmann after Gumbinnen had shaken the nerve of Prittwitz and he had secretly telephoned his jittery resolution to retire behind the Vistula to the false serenity of Moltke's headquarters in the West.

From Hoffmann's diaries it becomes clear that the date of the much disputed *General Order No. 8,* which prepared the way for Samsonoff's disaster, was August 20 at 9:30 P.M. and not as stated in the official account of the *Reichsarchiv,* August 21. The matter of the changed date on this all-important order withdrawing forces from in front of Rennenkampf and concentrating them against Samsonoff is closely bound up with the question of supreme honors for Hindenburg and Ludendorff. The popular version of Ludendorff sending battle orders to the Eighth Army while en route to the east will not bear examination. Indeed, the only orders received by the headless Eighth Army had evil results. Not only was the whole command upset by the brusk replacement of Prittwitz and confused by letting the command temporarily fall to each corps, but a day's rest was ordered for all corps, which had to be made up later by forced marches, and the headquarters of the army was moved back to Marienburg—a most illogical choice. All these unhappy decisions could have been avoided had Moltke or the new commanders used the telephone. When Hindenburg and Ludendorff arrived in Marienburg and asked Hoffmann as the remaining staff officer to explain the situation in detail, they found that all the necessary orders preparing for an attack on Samsonoff's army had already been given. The question of transferring the remaining I Reserve Corps and the XVII Corps depended upon Rennenkampf's action when he discovered the evacuation of the German position at the Angerapp.

Hoffmann's knowledge of Russian mentality was soon of great value to the newly arrived commanders. Russian wireless orders *en clair* had been intercepted by the Königsberg radio station and forwarded to headquarters. One of these messages set Rennenkampf's objectives for August 26 as the line Gerdauen-Allenburg-Wehlau. The other showed that Samsonoff had interpreted the retreat of the German XX Corps as indicating a general retirement. If genuine, these messages showed that the Russian movements would play directly into the German hand. But could they be regarded as genuine and not a subtle trick? Hoffmann assured Grünert this "naïveté was typically Russian" and insisted they were bona fide. When subsequent Russian action confirmed this opinion, other wireless messages were correctly regarded as genuine. These interceptions proved of immense value to the Eighth Army, and when the Russians finally adopted a cipher, the code was easily discovered by the German experts. Throughout all the stages of Tannenberg Hoffmann urged that the Germans could afford to take great risks in dealing with their enemy commanders. He told Ludendorff how Samsonoff's heroic Siberian troops had been let down by Rennenkampf while defending the Yentai coal mines in 1905. He also told of the blistering interview between these two commanders after the battle on the Mukden railway station where these unlucky commanders nearly came to blows before a group of embarrassed foreign attachés. To the anxiously repeated question: "Will Rennenkampf march?" Hoffmann replied, "I'm damned if he will!"

The written accounts and diaries of Hoffmann show that the popular misconception of the battle as having been planned and executed on the *Cannae* principle cannot be maintained. The whole movement of the German east wing to envelop Samsonoff developed out of the heaven-sent inactivity of Rennenkampf. He thus refutes the eloquent special-pleading of certain German historians such as Dr. Hans Delbrück. Nor does he share Mr. Churchill's enthusiasm for General François as the principal hero of Tannenberg. He praises François' judicious insubordination in slowing up the attack on Usdau and in advancing along the Neidenburg-Willenburg railway.



Map 1: The situation before Tannenberg

As the German infantry marched into Lodz

These acts of initiative, like those of Morgen and Mackensen, added greatly to the success of the Eighth Army, but he also remembered François' rash action at Stallupönen. He protested when François wrote against Ludendorff in the *Reichsflagge* for September 17, 1925, claiming that Ludendorff's memoirs concerning Tannenberg were of "no historical value." He apparently felt that Hindenburg made his weight felt only on one occasion during the encounter, when the situation of the XVII and the I Reserve Corps seemed critical on August 27. Here the ponderous Hindenburg bolstered the shaking nerve of Ludendorff and insisted that previous decisions be adhered to. Officially Hoffmann observed in summary: "The decision to fight the battle was taken under the command and on the responsibility of Colonel-General von Prittwitz; and the logical and inevitable fulfillment of that decision, which led to the great victory, took place under the command and on the responsibility of Colonel-General von Hindenburg." Privately he used to show visitors Hindenburg's old bed at *Ober-Ost* and remark: "There is where the Field Marshal slept *before* the battle, that is where he slept *after* the battle, and that, my friends, is where he slept *during* the battle."

In addition to giving the name Tannenberg to the victory, Hoffmann had to intervene personally on two occasions to stem the tide of panic in certain units of the Eighth Army. The last of these wild unpredictable outbreaks came after the German victory was absolutely assured and it was only a matter of collecting Russian prisoners. Tannenberg had all the earmarks of a first campaign. Even those who were supposed to know most about the affair were frankly astonished at the bag of prisoners. Hoffmann and Count Dohna were talking on September 1st about the probable number of prisoners. Dohna set the number at 20,000 and Hoffmann at 30-40,000. The total captures ran to 92,000 men and 350 guns. When the defeat of Rennenkampf September 9-14, cleared East Prussia of the Russian invader, the theatre of activity of the Eighth Army widened. The armies of Austria needed quick relief.

III

Tannenberg and the Masurian Lakes brought Hoffmann the Iron Cross First Class—won, as he observed, by sitting at the telephone. Although he gradually assumed a dominating rôle in all operations matters in the East, he did not receive the coveted order *Pour le Mérite* nor an increase in rank until he was in the curious position of being the Chief of Staff to the Commander-in-Chief in the East with the rank of lieutenant-colonel. The combination Hindenburg-Ludendorff-Hoffmann proved to be an unusually effective one. Hindenburg provided the social front and balance, Ludendorff the driving energy and rare organizing ability, Hoffmann the fertility of ideas and caustic sense of reality. He knew the Russians so well that they only surprised him once during the war

and—to his sorrow—he soon came to know the Austrians equally well.

While Falkenhayn was attempting to retrieve the loss suffered by Moltke in the west, the German armies in the east undertook a series of brilliant movements to offset the Austrian defeat at Lemberg. Conrad von Hötzendorff's audacious plans had collapsed and nearly seventy Austrian divisions had been crowded into a pocket on the west bank of the Visloka between the Vistula and the Carpathians. To relieve them a bold advance by the newly formed German Ninth Army was made on September 27 on the line Opatov-Ostrowiec-Ilza-Radom-Tomaszow-Koliszki. The rapidity of this change of front by the German command surprised the Russians, and caused them to withdraw 14 army corps from the Austrian front. By October 12 the German Ninth Army was within twelve miles of Warsaw, but was forced to retreat by heavy Russian pressure.

As soon as the Russian advance weakened, the Ninth Army was quickly withdrawn from the southern Polish front and transported northward. On November 3 it was in place prepared to advance against the Russian Fifth, Second, and First Armies. These operations resulted in the famous battle of Lodz. They represented the war of movement at its highest point of development in the East. As the German XX and XXV Reserve Corps turned the flank and virtually surrounded parts of the Russian Second Army, they in turn were attacked and virtually surrounded by the Russian Lovitch force. Days and nights of ceaseless anxiety followed for Hoffmann. "One has need of nerves like ropes," he complained. In the end the German forces broke through the Russian lines carrying their prisoners with them. When the battle died down on the northern Polish front at the close of the year, a temporary line of positions ran from East Prussia southward through Plotsk, along the Vistula and Nida to Tarnow and the Carpathians.

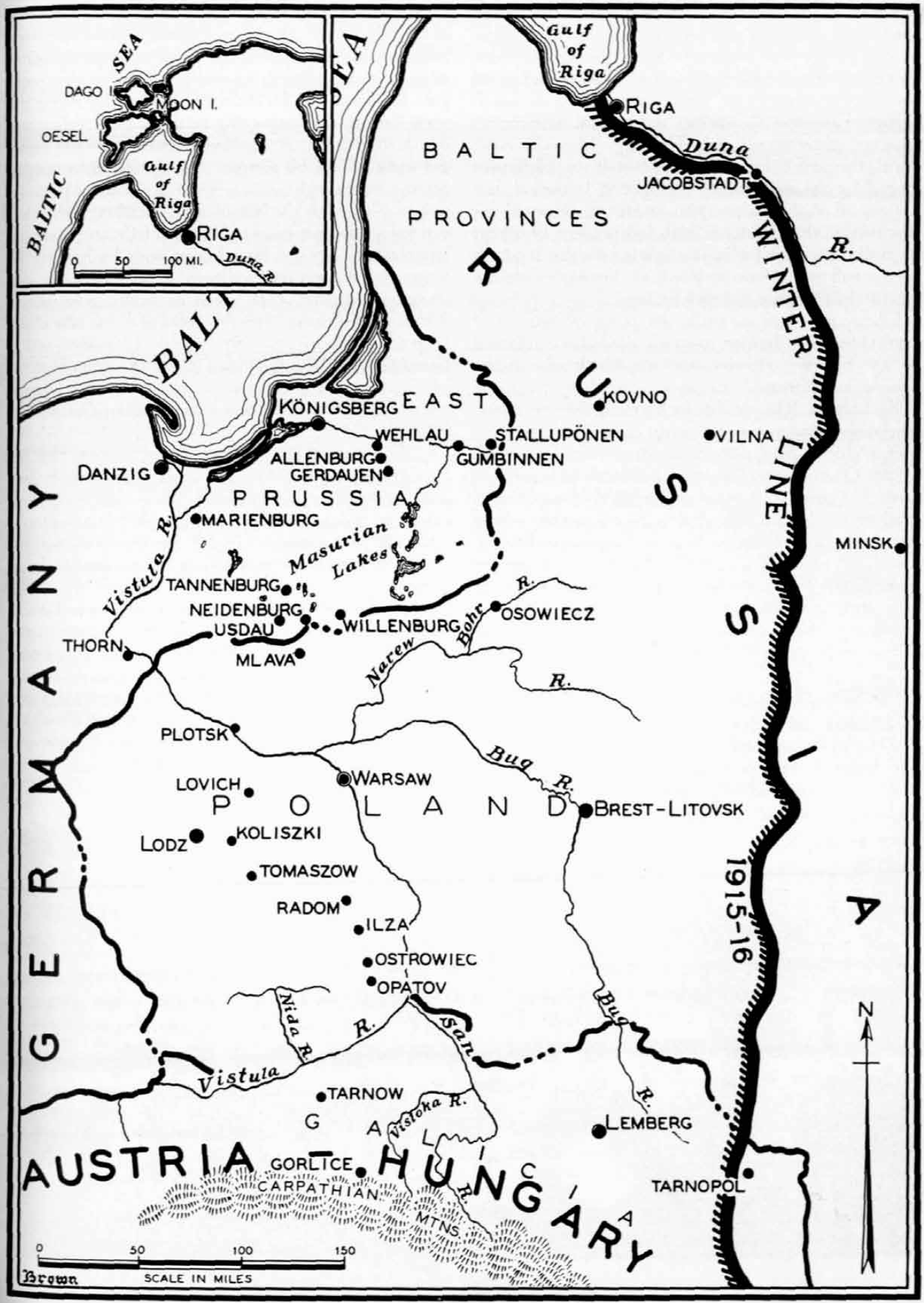
These striking operations not only brought Hoffmann into contact with the exasperating inefficiency of the Austrian war machine, but the succeeding operations brought his superiors into direct conflict with Falkenhayn. The Eastern Command had been disappointed in October and November, 1914, when the four newly raised army corps had been sent to the west and wasted in the attacks on Ypres. In the opinion of Ludendorff and Hoffmann these corps might have produced decisive results in the East. With Conrad they urged that, once the modified Schlieffen plan had failed, the major effort of the Central Powers should be directed against Russia. Since Falkenhayn's battles in Flanders had merely produced heavy casualty lists the Eastern Command made a determined bid to wrest four new army corps which were available in January, 1915, from the control of Falkenhayn. In a showdown meeting at the Imperial War Ministry on New Year's Day, 1915, the Kaiser finally decided in favor of the Eastern Command. The four new corps were transferred to the East, and Conrad and Ludendorff undertook a gigantic double-envelopment attack from East Prussia in the north to Galicia in the south.

The quarrel with Falkenhayn was based on an essential difference of views. As Chief of Staff of the Field Armies, Falkenhayn did not believe in the attainment of decisive results from an experiment on a 600-kilometer front with the small German forces available. He was essentially a limited-objective man, who regarded the activities of the Eastern armies as merely "collecting Russian prisoners." As if to vindicate his rather discouraging forecast, the armies of Conrad bogged down in their attack, and the advance of the reinforced German armies in the north imposed bitter sufferings on the troops in the winter battle in Masuria (February 7-21, 1915) and only resulted in the destruction of the Russian Tenth Army.

When operations were resumed in the spring of 1915, Falkenhayn invaded the preserves of Hindenburg and Ludendorff by sending Mackensen on an independent break-through mission at Gorlice in May. Wide strategic results followed. The whole Russian front recoiled. Falkenhayn's star continued in the ascent with the repulse of French and British attacks on the Western Front in 1915, and in the conquest of Serbia. The great heroes of 1914—Hindenburg-Ludendorff-Hoffmann—were now playing minor rôles. When they resisted Falkenhayn's efforts to reduce their forces for the Serbian venture, he wired bluntly: "Whether your Excellency [Hindenburg] agrees with the views of OHL does not matter. Every portion of our forces must adapt itself unconditionally to OHL." Hoffmann openly groused at the distribution of decorations saying ironically: "Mackensen is to have command. Now that all available honors, titles, and orders have been showered in so short a time on this one devoted head, after the capture of Belgrade there is nothing left but to rechristen him 'Prinz Eugen.'" As the year 1915 drew to its close, and as Hoffmann watched his restless chiefs at Kovno intrigue against Falkenhayn, he came to see for the first time "history as it really occurs." Though his own hatred for Falkenhayn was intense and unremitting, he saw that this continual struggle for power at the top of the army "destroyed all men's character." He saw that the much-vaunted loyalty of the German officer corps was just so much idle talk. "If anyone comes near me with a Nibelung's oath of fidelity and offers to die in battle at my side—I shall knock his head off."

He regarded Falkenhayn as "the evil genius of the Fatherland" and saw little hope for Germany as long as "that criminal—had the Kaiser in his pocket." To Hoffmann's repeated appeals for troops to carry out hoped for decisive strokes against Russia, Falkenhayn turned a deaf ear or with lofty irony remarked: "Again and again there were local commanders who maintained that they had discovered a sure way of striking a more or less serious, indeed, a decisive blow—if only the necessary means was placed at their disposal. Now it was four, now twenty or more divisions, of course, with the corresponding heavy artillery and ammunition. . . ."

Hoffmann's irritation at Falkenhayn extended to the government which supported him. Sometimes, when



Map 2: The winter of 1915-'16

vexed beyond endurance by the "slimy treatment" his chiefs were receiving, Hoffmann would break out before the visiting politicians at *Ober-Ost* saying: "We can't go on much longer with a damned slack government like ours —it is beginning to smell to heaven." He took an active part in the intrigues of Hindenburg and Ludendorff against Falkenhayn, writing the critical statements, speeches, and telegrams of Hindenburg. More than once during the period of Falkenhayn's ascendency, Hoffmann longed for the assignment to a fighting command, but Ludendorff would not spare him, and his relations with his two famous chiefs were on such independent lines that he would have been lost in any fighting position to which his low rank would have entitled him. He stayed, and the men in the East soon had their innings.

Falkenhayn's luck ran out in the spring and summer of 1916. His tragic decision to attack Verdun was followed by the Brusilov offensive, the English attack on the Somme, and Rumania's entrance into the war on the side of the Entente. The pressure for his removal became overwhelming. On August 31, 1916, Hindenburg replaced him as Chief of Staff of the Field Armies with Ludendorff as his Quartermaster-General. Falkenhayn's face was saved by giving him command against Rumania, and Hoffmann inherited the whole military burden of the Eastern front as Chief of Staff to Leopold of Bavaria. Hoffmann apparently never overcame his distaste for Falkenhayn. When the latter came to the Eastern front as an army commander after the Rumanian and Turkish campaigns, Hoffmann dealt with him only through his chief of staff.

IV

Even before Hindenburg and Ludendorff departed for their historic and fateful mission in the West, it was clear that Hoffmann was the intellectual mainspring of the Eastern command. His special province was operations questions, and in this field he early reached an effective working arrangement with Ludendorff. His diaries reveal that in most cases he had his way. Where he did not, he always put forth his views with vigor, and made the best of the other plans. He was a glutton for work, took very little exercise, and found it impossible to get his quota of sleep. When perplexed subordinates brought their problems, he would call for the maps and end by doing the work himself. To keep going he drank black coffee and cognac incessantly. As his blood pressure increased under the strain, so did his temper. His already bitter tongue became increasingly acid. When well-meaning diplomatists asked what the best means of breaking the power of the sluggard aristocracy of Vienna, Hoffmann answered "strychnine!" As for his relations with Ludendorff he observed: "We get on excellently in spite of a few differences of opinion, over which he finally gives way." Although Hoffmann charitably referred to his new chief, Leopold of Bavaria, as "an impassioned soldier and a *Grand Seigneur,*" he also makes it clear that from September, 1916, on "the entire responsibility for the Eastern front" was his own. The routine at *Ober-Ost* was as follows:

> "Every morning at about eleven o'clock H.R.H. (Leopold) came to my office to hear the report; he had his mid-day meal at home (Szkoki), and in the evening at half-past seven he came to the mess dinner at the officers' quarters. . . . He was always at my disposal at any time if he were required (except in shooting season)."

While Falkenhayn overwhelmed Rumania and Ludendorff repaired the mistakes of the previous regime in the West, Hoffmann's main task was to support the Eastern front with the limited resources at his disposal. In this task the undependable character of his Austrian allies was his main headache. It was necessary to bolster their sagging morale and fighting capacity by inserting more and

Russian troops evacuating Warsaw shortly before the fall of the city

more German "corset-stave divisions" into the line. His irony was boundless:

> "The Austrians have grown more and more *dear* to me in the last fortnight. They are really impossible. . . . Not content with running away, they lie and send in false reports, and with it all are quite unashamed. . . I should like to go to war with *them!*"

To this sort of criticism, the Austrians replied with subtlety, conferring upon Hoffmann the Austrian Iron Cross, Second Class! Effective coöperation became even more difficult after the Archduke Karl replaced the talented Conrad with a mere military errand boy, General Arz. The German General von Seeckt who was sent as a military adviser to Karl helped somewhat, but he seemed to become "Austrianized" in the process. Hoffmann did not share the post-war German enthusiasm for von Seeckt's military talents.

Throughout 1916 and 1917 Hoffmann coöperated very closely with Ludendorff in the advancement of the Rumanian campaign and in the defensive battles in the West. He described the Eastern front as a "widow's cruse of oil" from which he always managed to scrape up a few reinforcements when they were badly needed. In a moment of self-confidence he once declared he would hold the Eastern front single-handed if necessary! This close coöperation with the Quartermaster-General continued until larger questions of policy: Poland, the U-boat war, and peace terms, gradually separated them.

Hoffmann seems to have been one of the few soldiers who throughout the war kept the fact in mind that the purpose of war is to make peace. From the first he advocated strictly limited territorial claims. The arrogant and absurd claims of the Pan-German Party he opposed with all his might. They were acting as if the war was already won—Hoffmann knew better. He saw that Germany could not hope to win a military victory over her enemies *before* the Russian revolution changed the whole picture. He wanted no part of Belgium except Liége, and no more of Poland than would give Germany a strong defensive line in the East. For a time Ludendorff seemed to share these views. He promised Hoffmann in September, 1916, that if the slightest possibility of a reasonable peace presented itself, he would grab it with both hands. The U-boat war he opposed, not on moral grounds, but on the strong suspicion that Germany did not possess the necessary number of U-boats to carry it off successfully. To the end of the war he remained ignorant and frankly contemptuous of American military strength. These erratic views reflected his absorption in the affairs of his own front. He naturally appeared at his worst when offering an opinion on something he knew nothing about.

In March, 1917, the Russian revolution took place and the regime of Kerensky replaced that of the Romanovs. Since the aim of the provisional government was to continue the war for the previous imperialistic objectives, no immediate change occurred in the affairs of the Eastern command. Until the November Revolution Russian troops still fought with dogged resolution on the defense and with an occasional display of dash in the attack. Hoffmann did not have enough troops for big-scale movements of the 1915 type, but he was able to carry out a number of tidy limited attacks. He combined a remarkable eye for points of strategic advantage with a very realistic appreciation of the troop and transport requirements. He worked out a theory on the extent of Russian advances against the Austrians by calculating the distance from where railway destruction began. He discovered in Lieutenant-Colonel Bruckmüller an artillery expert whose skill in reconnaissance enabled him to estimate to a hundred shells the artillery preparation required for a given attack. In April, 1917, he supervised a neat and economical operation involving the capture of the Toboly bridgehead. In July, 1917, he countered the final Russian offensive against the Austrians by a swift attack against Tarnopol which caused the whole Russian front in Galicia to recoil. The troops which Hoffmann borrowed from the west for the Tarnopol operation were retained until September to enable him to carry out a long-desired attack on Riga.

The Riga operation by the German Eighth Army under General von Hutier began on September 1 and was instantly successful. This far-reaching victory not only vindicated the new infiltration method of attack but it revealed a startling decline in Russian morale. The enemy infantry no longer held its ground long enough to be scooped up by the German dragnet. Hoffmann decided to take advantage of this condition in order to take the Jacobstadt bridgehead on the Duna. He also arranged for a joint naval and military operation against the Dagö, Moon, and Osel Islands. With these successful movements active military operations against the Russians ceased, pending the assumption of peace negotiations.

In the autumn of 1917 Hoffmann asserts that he would have been able to add considerable German units from the east to the Caporetto attack on Italy—had he been asked to do so. Whether or not the Austrian railway system could have handled them in time for the attack is doubtful. None the less, this curious observation of his indicates a growing lack of coördination between Ludendorff and his erstwhile colleague. The real break between the two, however, came over political rather than military questions. Hoffmann opposed the formation of a separate Polish state on the grounds that its creation would bring no military advantage to Germany and would dim the prospects of a separate peace with Russia. Ludendorff wanted to add a considerable strip of Polish territory to the Empire. The German Emperor shared Hoffmann's views. To the latter's embarrassment the Emperor ordered him to attend a painful meeting with OHL on January 2, 1918, in order to present his views. Before doing so Hoffmann tried repeatedly to see Ludendorff to explain that the Emperor had *ordered* him to take this step. He found Ludendorff "too busy" to see him before or after the meeting.

So Hoffmann appeared at the fateful meeting and advocated adding only the districts of Bendzin and Thorn, the heights of Mlava, and the crossing of the Bohr at

Osowiec to Germany. Ludendorff's plans called for adding about 2,000,000 Poles to the German population, and the Emperor firmly decided in favor of Hoffmann's program. This led Ludendorff to ask for Hoffmann's dismissal and made plans to transfer him to the command of *a division* by way of punishment. But by this time the Emperor was getting tired of Ludendorff's prima donna temper and strongly supported Hoffmann. At the end of this painful episode Hoffmann went back to his headquarters at Brest-Litovsk, but Ludendorff never forgave him.

V

Hoffmann's rôle at the treaty of Brest-Litovsk has often been wildly distorted. He was OHL representative at the meetings. Under the constitution of the Empire, Secretary of State Kuhlmann had sole responsibility for the negotiation of the treaty, but actually Ludendorff was running the German Empire at this stage. Hoffmann merely carried out the wishes of OHL. When the Bolsheviki delegates sought to make Brest-Litovsk the sounding board for their propaganda efforts, talked blandly of peace without annexations, and delayed procedure on silly pretexts, Hoffmann put them in their place. Taking a lesson from the experience with General Fujii in 1905, Hoffmann did so without rising from his place at the table, without pounding the table or raising his voice. In plain soldier language he told them that the Russian delegates were there to receive terms not to dictate them. This put an end to Trotzky's oratory. When the latter left the conference with the dizzy announcement that the Russians *would not* sign the treaty—but that *the war was at an end*, Hoffmann brought them back to realities by setting the German armies in motion all along the front. This advance presented interesting military problems, chiefly those of transport. Russian resistance except for local units disappeared and infantry pushed forward in trucks and railway cars. The Bolsheviki government soon saw the wisdom of signing the treaty.

These experiences gave Hoffmann a profound contempt for the Communist mind and a conviction that their crazy and murderous conduct and philosophy held great potential menace to all of Europe. His relations at Brest-Litovsk with the Austrians were along the usual unpleasant lines. Count Czernin, the Austrian delegate, was so eager to have a treaty concluded for fear of an Austrian collapse, that when things dragged on he threatened to sign a separate peace with Russia. If he intended this as a weapon over the Germans' heads, Hoffmann neatly brought it down on his own by observing that he favored this *splendid* plan since it would free twenty-five German divisions which were necessary to hold the Austrian front. That was the end of separate peace talk.

With the conclusion of the peace treaty German efforts to secure stocks of grain from the Baltic provinces and the Ukraine began. On paper the German program looked good, but it filled few food bins. The peasants hid their stocks, transport facilities were limited or crippled through want of lubricants, and the Ukrainian delegates enormously over-estimated their capacity to sell foodstuffs. Constant friction between Germans and Ukrainians finally led to the murder of General Eichhorn, the German Governor, on August 1. And to add to Hoffmann's problems, the German troops in the occupied areas were willy-nilly thrown in contact with Bolsheviki ideas and doctrines. Hoffmann laughed early in 1918 when the Russian Admiral Altvater told him how his sailors in the Baltic stations had simply melted away after being exposed to Bolsheviki propaganda and warned that the same thing would happen to the German naval and military leaders. Later, as the fortunes of war turned against Germany in the West, Hoffmann recalled Altvater's warning and admitted that the Russian was right. Students of the present conflict may find in existing conditions a number of interesting parallels to the situation in the East in 1918.

VI

To Hoffmann's way of thinking the collapse of Russia offered the Germans a rare bit of soldier's luck. If only the assumption of unrestricted U-boat warfare had been delayed a few months, the advantages of its occurrence might not have been offset by the entrance of the United States into the war. He still hoped in the spring of 1918 that a peace acceptable to Germany might be attained. Ludendorff, however, had by this time nerved himself to take the greatest military gamble in history. He decided on a peace offensive in the west aimed to win the war before American manpower could turn the balance. A steady stream of German divisions moved from the Eastern front to the west. When the dependable divisions had been sent, Hoffmann gradually sent smaller artillery and engineer units, leaving formations of older men to hold the occupied areas.

Unfortunately for Germany the old liaison between Hoffmann and Ludendorff no longer existed. The Quartermaster-General evidently did not feel the need of using Hoffmann's brain on the Western front. True the latter knew the situation in the east better than anyone in Germany, but the fighting was over on that front, and Hoffmann was enough of a soldier to crave active service whenever possible. Perhaps Hoffmann's utter frankness had ended all hopes of renewed coöperation. When Ludendorff at their last meeting in 1918 spoke of his coming offensive in the west, saying he "did not know whether it would be better to *probe* the front by individual attacks or make a gigantic drive at a given point with concentrated forces," Hoffmann is said to have replied: "Excellenz, any second lieutenant who answered the question in that way on his examination would be hopelessly ploughed!" Thus, while Germany approached her great crisis, the two best military brains in the Empire continued to work in separate air-tight compartments.

The moment it appeared that the March offensive toward Amiens had failed, Hoffmann held that Ludendorff should have advised the Chancellor that all hope of a military victory in the west had passed away. OHL, however, continued its program of piecemeal offensives, each formidable yet failing to produce a decision. One can

search military literature in vain for an example of more torturous language or more muddled thinking than was used by Hindenburg to explain this policy. The Field Marshal wrote: "We *also* wanted so to shatter the enemy's structure by closely connected *partial* blows that it must *after all* sometime break down." Words such as "also," "partial," and "after all" had no place in the German crisis of 1918. Meantime Hoffmann was holding his post in the east with a total of twelve German divisions. These were strung along the new frontier from the Baltic to the Ukraine. With these forces he could protect Germany from the invasion of a Red army, but he could not seal the frontier against the penetration of Communist propaganda.

Twice during the impending collapse in the west he was sent to Berlin to appear before meetings of OHL representatives and the Privy Council. Here he obtained first-hand evidence of dire straits of the Fatherland. He was appalled at the confusion of its military and political leaders. Ludendorff played to the gallery of politicians with sugared words about "my loyal comrade Hoffmann" but found means to sidetrack most of his testimony. For the rest he fretted away the tragic hours at Kovno piecing together from rumor and second-hand accounts the agonizing story of the collapse of the Central Powers. What made it hard was that he could see much of it coming: the Bulgarian surrender, the Austrian capitulation, and the slowly mounting disaster in the west, but had no power to alter the situation. His elastic mind could still find a little cold comfort in the Austrian débâcle: "We shall curl up like a hedgehog . . . and take the German part of Austria as compensation for what we shall lose." When things became hopeless in the west and Ludendorff resigned on October 27, Hoffmann was glad to be passed over for Gröner who replaced him. Under less desperate conditions Hoffmann would have been Ludendorff's logical successor, but he wanted no part of the "undertaker's rôle."

When the armistice and abdication of the Emperor came in November, it was of some satisfaction to Hoffmann that he could still walk around *Ober-Ost* without a guard. He never found it necessary to disguise himself with blue spectacles from the attention of his own troops as was the case with Ludendorff. He stayed on the job with the Eastern army, and although it involved the distasteful task of dickering with soldiers' councils, he brought the army home. To the end he tried to set an example of order which he felt was necessary for the survival of the German nation in its great trial. But before the vast affairs of the Eastern command could be wound up, the men could no longer be depended upon. The final entry in his war diary was for December 31, 1918. It represented a far cry from the glorious days of Tannenberg saying simply: "The troops will fight no more."

After the war Hoffmann retained his intense hatred of Bolshevism and saw in it the principal danger to European stability. He tried hard to ingratiate postwar Germany in the eyes of the Allies by proposing a joint Allied-German "sanitary campaign" against Russia. His Berlin home became the mecca of all types of anti-Communist sympathizers from crackpots to oil magnates. But his anti-Moscow drive never materialized. Though he still appeared hale and vigorous, the unremitting nervous tension of the war years had undermined his physical health. An illness in the year 1927 proved fatal. He died in Berchtesgaden on July 8. In his final moments of delirium he seemed to be living over the decisive attack on Usdau. He died shouting: "Fire! Fire! Artillery forward!"

Perhaps the best estimation of Hoffmann as a soldier was that of his adversaries, the Russians. They, at least, had no reason to withhold their admiration for his military resourcefulness and intrepidity. They regarded "Goffmann," as they called him, with a kind of awed affection. Wherever they flung their masses of infantry, sooner or later (depending on the railways) they met with the unyielding barriers of his German infantry and artillery or suffered the swift piercing stroke of his counter thrust. He was too intellectually arrogant to be popular with many people. His very presence always made the less intelligent half of his associates uncomfortable. His war memoirs were far too acid to be published in full. And since his criticism of the German high command in the crisis of 1918 was so destructive to the famous *Dolchstoss* legend (the homeland stabbed the army in the back), he has not been immortalized by the Nazis who have tried to build their new army on the psychological foundations of this myth. He will not need any artificial honors, however, since history will doubtless vindicate the observation of Conrad von Hötzendorff: "Hoffmann was the only man of ideas on the Eastern front."

FINNS

A Finnish infantryman

A Finnish father and two sons en route to answer the mobilization call

These Finnish soldiers were photographed during maneuvers prior to the outbreak of hostilities

The spearhead of one of the Finnish flying columns that have been harassing the Red invaders

A twin-mount antiaircraft machine gun stands on the alert against the hedgehopper

These are ski-mounted infantrymen awaiting action. Notice how even at close range white uniforms blend into the snow

NORWEGIANS

One of Norway's infantrymen. Note the short bayonet

A light machine-gun outpost near the Norwegian-Finnish frontier

Top: The frontier troops are equipped with light mortars
Bottom: The border is buttressed by machine gunners

SWEDES

Left: Skis help this Swedish infantryman to negotiate snow-laden country

Center: This is an automatic rifle nest in Lapland

In winter, Swedish soldiers travel by straw-lined truck

Even antitank guns move on runners in the frozen country. Note white tarpaulin to furnish camouflage in the snow

An antiaircraft machine

The Knox Trophy
How It Was Won

By Captain J. F. Gamber, Coast Artillery Corps

The Knox Trophy—presented annually by the Society of the Sons of the American Revolution in the Commonwealth of Massachusetts for excellence in target practice—this year goes to an antiaircraft organization: Battery B, 63d Coast Artillery of Fort MacArthur, California. As commander of the battery at the time it fired its practice I should like briefly to summarize the excellent work and wholehearted coöperation of the battery personnel which brought success to the organization.

In 1939 Battery B, 63d Coast Artillery (AA), held its target practice on the Upper Reservation of Fort MacArthur, California. In previous years, the battery had moved to a tent camp at Carlsbad, California, about sixty miles south of Fort MacArthur, in the belief that better weather prevailed there. However, the new regimental commander, Colonel E. A. Stockton, Jr., held to the opinion that firing should be conducted at home where the men had more comforts and consequently higher morale and spirit. It was therefore decided to fire from Fort MacArthur.

During the latter part of February the battery received the latest type matériel, consisting of the M-4 director, M-1 height finder, M-4 data transmission system, M-5 fuze setters, and the M-3 guns on the M2A1 mounts. During most of March, the training consisted principally of individual and group instruction on the care and operation of the new equipment. The latter part of March and most of April was devoted to the corps area ordnance inspection, and the tactical and garrison inspections by district and corps area commanders.

The battery went into its target practice position during the last week of April. Air missions began early in May, and were to be completed by the first of June. The weather during May was not at all ideal for antiaircraft gun training. Only about twenty per cent of the available flying hours could be utilized. A great deal of training therefore, had to be accomplished by the use of "canned courses." This medium does not give much training to the lateral and tracking observers on the director, and none at all to the height finder section, but it does give very valuable training to the clock-men at the guns.

The spotting section was trained by the use of a training film of actual practices held at Fort Monroe. At night the film was projected against the side of a white building and the spotters would spot the bursts as they appeared. This is ideal training for spotters.

The height finder section including the stereoscopic observer received very little training, except theoretical, prior to May. Their practical training was conducted almost entirely at an actual aerial target. The results obtained by the stereoscopic observer during the practice were excellent.

The regimental commander saw to it that all battery personnel was present with the organization during the month of May. He also made it plain that the success or failure of the practice was the responsibility of the organization.

Major H. P. Detwiler, regimental executive was plane director and safety officer. During the period of training

he rendered capable assistance and made suggestions which were always timely and appreciated.

During the practice capable assistance was received from Lieutenant Norman Hemphill, battery executive and Lieutenant Ray Hales, range officer, both Thomason Act officers. Lieutenant Dabney R. Corum, a former member of the battery, acted as range officer for the last practice.

The men of the battery, under the capable handling of First Sergeant Thomas J. Coyne, worked together splendidly, and always evidenced keen interest in all phases of the work. To name any one without naming all, would be an injustice to all. It can be stated, however, that on August 26, 1939, fifty members of B Battery, 63d Coast Artillery (mostly key men), were ordered to Panama and are now scattered throughout the 73d Coast Artillery (AA). Every man is a credit to his new organization.

The record section under the efficient direction of Lieutenant Roy K. Kauffman, obtained camera records of every course of the practice; only part of one course was lost when the target was towed across the sun.

The first practice was carried off with great rapidity. On the night of May 24th the target appeared on the course at scheduled time and was perfectly illuminated. The first course towed was fired upon as was each succeeding course. The first round was fired at 8:41 P.M. and the last round at 9:09 P.M. giving an elapsed time of twenty-eight minutes. A great deal of the success of this practice was due to the splendid illumination of the target by Battery A, 63d Coast Artillery, commanded by Lieutenant William Massello, Jr. The second practice was held on May 26th and the last practice on May 30th.

The new scoring system was received prior to May. After careful study it was decided to fire at extreme slant ranges when obtainable. This was carried out in so far as possible in all towing missions. In one practice the average slant range was over 7,000 yards.

We encountered no particular difficulties with the M-4 director. After the first practice, it was found that on a right-to-left course a correction of right twelve mils was called for and on a left-to-right course a left four mils. By using these corrections on succeeding practices the initial bursts were much closer laterally.

It was also discovered during the preliminary practice, that if a range correction is applied while firing, as an altitude correction, dispersion in all directions was quite noticeable for several bursts. When an altitude spot is applied the range rate operator must cease following the rate with the range rate knob, push in the prediction arresting button and match pointers with the range setting hand wheel. After the pointers are matched, it is necessary to hold the prediction arresting button in for at least three seconds to avoid excessive upsetting of rates. During this elapsed time in all probability the range rate has changed and when the button is released it is necessary to re-establish the rate. This operation of changing altitude plus change of rate causes all data to fluctuate for several seconds. The receivers on the guns oscillate clockwise and counter clockwise past the true data several times before they settle. All rounds fired during this operation give erratic deviations.

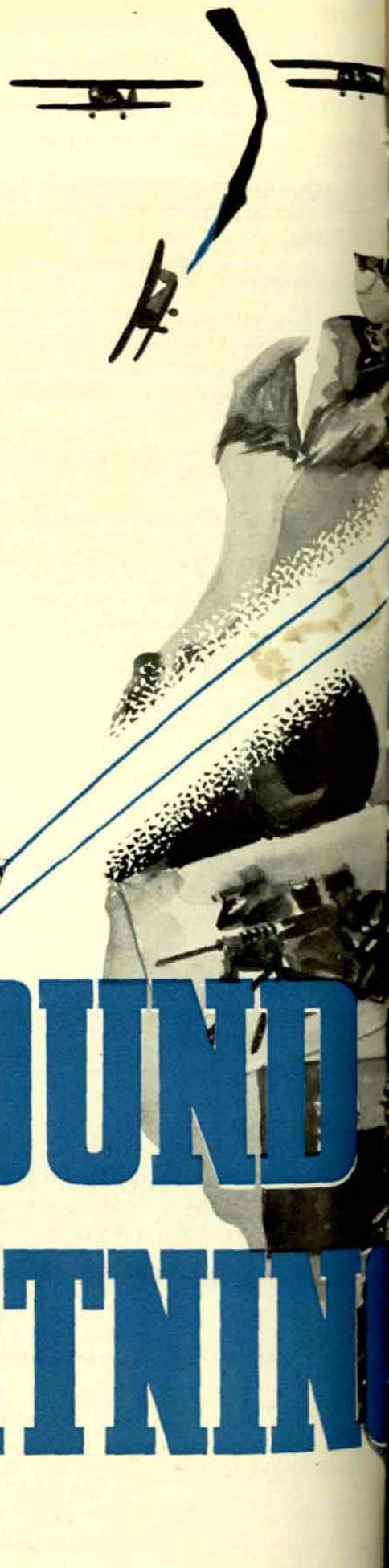
It was decided to apply all range corrections as fuze spots and not altitude spots. The fuze spot merely feeds into the outgoing data through a differential and causes no change in any receiver except that of the fuze and this change is positive and not accompanied by oscillations. During the entire practice when range corrections were called for they were applied as fuze spots.

REGULAR CLASS, COAST ARTILLERY SCHOOL, 1939-1940

Rear row, left to right: Lieutenants Greenlee, Root, Hale, Foote, Baynes, Walter, Miner, Howell, Alfrey, Morris, Morgan, Murrin, Frith, Kramer, Spann.

Middle row, left to right: Lieutenants Hampton, Steele, Farnsworth, Longanecker, Somerville, Massello, Schenck, Lawlor, Shepardson, Porter, Hill, Waugh, Waterman, Weld, van Ormer, Hildebrand, Moore.

Front row, left to right: Captain Brownlee, Lieutenants Bosworth, Wood, Haggerty, Boyd, Carter, de Goma (PA), Godbold (USMC), Bascunan (CN), Lieutenant Commander Aguayo (CN), Lieutenants Hemphill (USMC), Stonecliffe (USMC), Ellis, Stiness, Mansfield, Duff, Diestel, Spangler.



BACKGROUND FOR LIGHTNI

By Brigadier General Henry J. Reilly
Officers' Reserve Corps

We have decided to rearm. How are we going to rearm? Are we simply going to make better models of types of weapons we already have, or have we available an example of a new type of war—making use of all the latest technical advances—which we can safely take as a model?

We have even a better opportunity than had Germany, disarmed by the Treaty of Versailles, because she rearmed before the Spanish Civil War was over. We, disarmed by our own faith in pacifism, can take advantage of the lessons of that war, the seizure of Albania by Italy, and Germany's lightning campaign in Poland. Oddly enough, while discussing rearmament we have not yet begun seriously to rearm.

These three campaigns furnish examples which it will pay us to study in our rearmament.

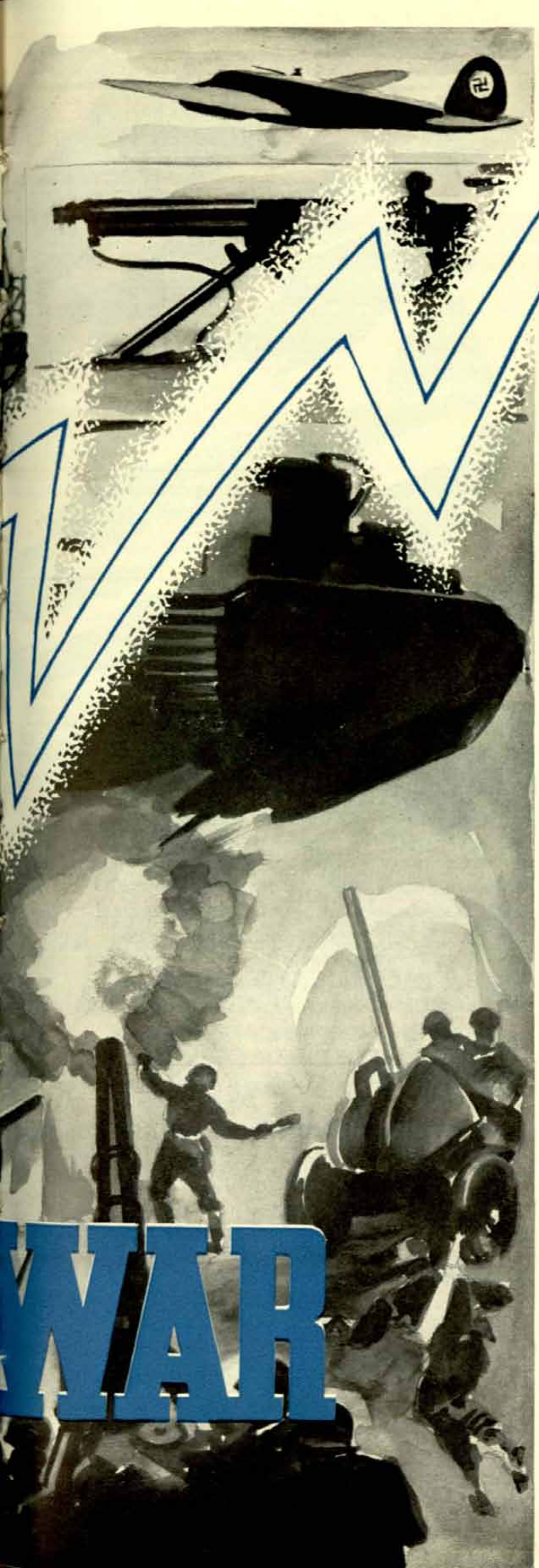
The author in the last two and one-half years has traveled throughout Europe and around the Mediterranean Sea.[1] He studied the European military and political situation, the relationship of nations to each other and the lessons to be ascertained regarding the most modern type of war and the armament necessary to wage it.

His conclusions are: (1) Spain was the proving ground for German and Italian arms; (2) Albania was the dress rehearsal; and (3) Poland the proof. From it all this evolves: *Blitzkrieg is the latest type of war.* It can be used everywhere, except against heavily fortified frontiers whose flanks rest on natural obstacles, such as the Franco-German frontier and the Alpine frontier of Italy and France.

As the United States possesses no such frontiers, blitzkrieg—the lightning war—is therefore the best example for us to choose as a model for our rearmament and reorganization. For defense or defensive attack that is what we need.

At present we are not prepared to wage such a type of warfare or even

[1]With previous trips, the first in 1904, this makes a total of approximately eleven years spent in Europe.



to resist it should we have to face it.[2] Remember that. More dangerous is the fact that our excellent and tremendous American industry is not prepared to furnish the necessary armament in less than a period of years.

After a period of peace during which many technical improvements in armament and transport have developed, we find it most difficult to decide what types of armament and organization will best fit the battle of the future. If the proper types are not selected the considerable sum of money spent upon rearmament is wasted and defeat at the hands of a better-armed enemy is inevitable.

It is now something over twenty-one years since the Armistice closed the last combat chapter of the Fourth World War of modern times, that of 1914-18.[3] During this period many new battle theories have been evolved. These have run in two general channels. The first consists of the vivid imaginings of those with little or no military education but perhaps some battle experience. They have maintained that aviation and mechanization have made the infantrymen, field artillerymen and cavalrymen as obsolete as the pike carriers, the horse, armored men-at-arms and knights, the culverins, and bombards of the olden days when our ancestors in Europe were first groping to bring some organization and discipline to the armed mobs which settled the so-called battles of those days.

The second current of thought has been held by the professional soldiers who, in most cases, not only had experience in the Fourth World War but also in other wars. These soldiers, while greatly interested in the development of aviation and mechanization, have not been satisfied as to the precise rôles of these new developments. What part their powers and limitations enable them to play has not been decided. There is a fluidity about it all.

Peacetime experimentation showed the powers of aviation and mechanization to be limited, and this limitation was frequently great. In consequence, the second group of studious soldiers could never subscribe to the imaginings of the first group, whose ignoring of limitations or exaggeration of powers led to the fear of destruction of great metropolises or the poisoning of millions—or other fanciful disasters. Of course, among the second school there are conservatives who entirely underestimate the powers and overestimate the limitations of aviation and mechanization. Yet this fine balance must be maintained.

Aside from the dozen or so minor conflicts incident to settling down after the Fourth World War and the Russian Revolution, there has been in recent years the Abyssinian-Italian War, the Second Sino-Japanese War, the Spanish Civil War, the Albanian Occupation, and the Polish-German War.

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[2] "Had our mechanized units met the German *panzers* we would have been outnumbered in combat cars, in light tanks and in medium tanks. Against them we could raise but a few antitank guns. We have not even one full-strength mechanized brigade. In Poland alone Germany used ten panzer divisions."—Speech of Hon. Louis Johnson, Assistant Secretary of War, October 10, 1939.

[3] I use the term "Fourth World War" because the average person believes that the war of 1914-18 was the first world war. Discarding the world wars of ancient times, the first world war was that of the Spanish Succession, the second the Seven Years' War, and the third the French Revolution and Napoleonic wars.

The Italians themselves discounted the lessons learned in Abyssinia because the enemy was semi-savage and did not possess modern armament. The Second Sino-Japanese War is a special case, because it is an example of a well-armed modern army of a comparatively small nation using all types of troops against a badly organized, badly armed and badly equipped army of a much larger nation.

The Spanish Civil War in its last year was a modern war. However, except in Germany and Italy the tendency has been to pay but little attention to it, because in general the belief has obtained, even in France, that few lessons of importance could be gained from its study.

In general, the military world was convinced that Poland had the armed force sufficient to hold out at least three months against the German invaders. Few, if any, saw any way in which France and Great Britain could send military aid to Poland. However, they were convinced that if Poland held out three months, France and Britain would be able to bring enough pressure along the Westwall to force Germany to fight on two fronts. Yet fighting on two fronts was the nightmare of the German High Command during the Fourth World War. From then on, Germany's one desire has been to avoid facing this situation again. Yet had Poland held out, Germany would have been confronted with it. The German plan, therefore, was to quickly dispose of Poland.

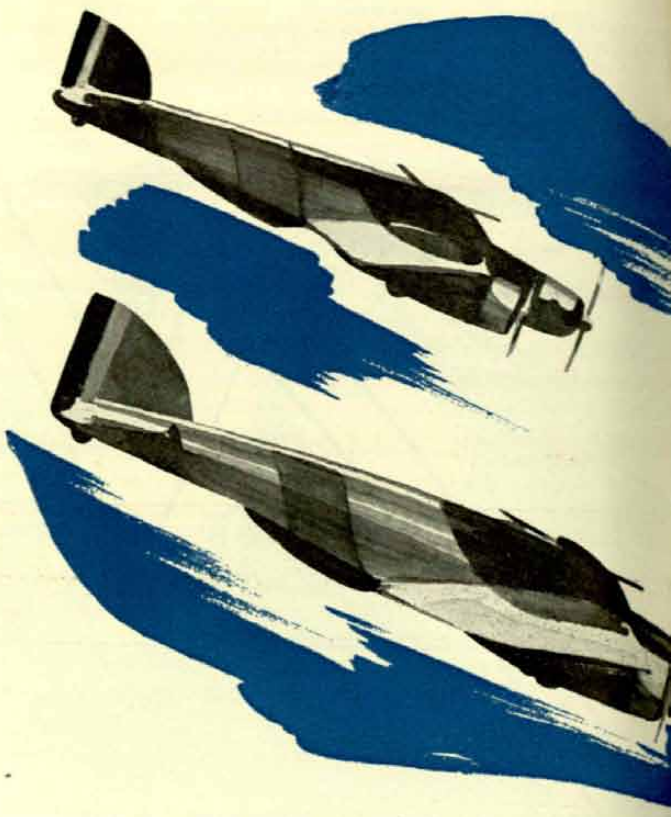
As a consequence of all this, Germany's armament, organization, tactics and strategy were based on the blitzkrieg that Spain and Albania proved feasible. As a result Poland collapsed in three weeks.

Germany's rearmament was based initially on conclusions arrived at from study of the Fourth World War and the technical improvements made in the period of peace which followed. She had largely completed her rearmament before she had the opportunity to test in battle whether or not these theories were sound. Not until the Spanish Civil War did she have the opportunity to test her new matériel.

Italy, emerging from the Fourth World War of modern times as a victor, was in the same position as France and Japan. She had on her hands a tremendous amount of matériel accumulated during the Fourth World War. Due to the cost of its replacement she had to move slowly in the adoption of any new armament.

Italy worked steadily on the production of new types to fit the theory of what war would be. Like Germany, she evolved this theory from her experiences in the Fourth World War and peacetime technical developments. And also feeling doubtful as to whether or not this theoretic development would prove correct when tested, the Italians welcomed the opportunity afforded by the Spanish Civil War.

Germany sent aviators, airplanes, antiaircraft artillery, some tanks and signal corps personnel to Spain. Probably at no time did her personnel there exceed 10,000. Italy sent aviation and an army corps. It consisted of corps troops and three divisions of infantry including tanks and also a cadre of officers and twenty per cent of enlisted men for two infantry brigades. Probably the maximum of Italians present in Spain at any one time was 60,000. Both the German and Italian forces were visited frequently by officers studying questions of organization and armament. Since the majority of the former Spanish regular army officers were on the side of Franco, his forces, both land and air, were organized and trained from the beginning by professionals.



Two things helped to bring the insurgents to a relatively high state of efficiency. The first was that Franco and his young generals made up the group of Spanish regular officers who prior to the downfall of the king struggled to correct the inefficiency of the Spanish Army and Air Force and tried to make Spain a modern military power. They welcomed the republic because they thought the opportunity would be afforded them. Probably the fact that this did not happen was the primary reason for their subsequent revolt. In any case, no officer in Franco's army could hold command and no officer could be promoted who did not prove his efficiency and leadership in combat.

The second factor was that the Germans and Italians helped train the new Spanish Army and Air Force. Above all, this training in new technical methods was invaluable.

As a result of this Spanish combat the Germans and Italians had the opportunity of finding out whether their organization, equipment and armament were suited to modern war. Also, they both had an excellent opportunity of watching the experiences of the Spanish Army and Air Force.

As Franco's army reached a strength of more than 800,000—that is, exclusive of Moors—and his air force a probable strength of 600 aviators, the forces engaged were large enough to make it safe to base broad conclusions on the conduct of the march and battle.

The author spent four and one-half months in Spain. This period began with the termination of a successful pursuit to the Mediterranean after a large-scale battle—that of the Alfambra. It finished just as the Battle of the Ebro was coming to a close, and the assault across the Segri River which opened the way to the conquest of Catalonia was about to begin.

Franco's answer to the governmental offensive which brought on the Battle of Teruel[4] was a general offensive from Teruel north, practically to the French frontier. This offensive began with the Battle of the Alfambra which was

the first of a series of blows which drove the governmental troops eastward to the Ebro River and the Mediterranean. This cut the governmental army in two. From then on Catalonia was cut off from the rest of governmental Spain.

The Battle of the Ebro began when the Catalonian troops crossed the river in a surprise attack against General Yague, in hopes of stopping Franco's successful offensive from Teruel south towards Valencia. Franco immediately ordered divisions in reserve of Arande's Army Corps, then facing south astride the highway running from the mouth of the Ebro to Valencia, sent north by truck to strike the left flank of the Catalonians. These divisions drove this flank back and inflicted considerable losses. Other reserve divisions, sent by motor trucks, coupled with General Yague's reserves, stopped the center and right of the Catalonian offensive. By noon of the second day it was evident that the Catalonian surprise assault had failed.

Franco then made the decision to destroy the Army of Catalonia and thus conquer that province. His plan was simple. A reasonable estimate showed that Catalonia had eighteen fairly good infantry divisions. Nine had crossed the Ebro, two were in close reserve on the other side. This left but seven good divisions available to meet any assault Franco might make elsewhere than on the Ebro. His plan was to avoid any general assault on the nine Catalonian divisions across the Ebro which would cost him heavy losses and might cause a withdrawal of the Catalonian divisions before they were used up. He decided to wear them down on the ground on which they stood by heavy artillery fire and aviation bombardment and by periodic infantry assaults supported by tanks to seize the more important parts of their defensive system.

This wearing-down process was to continue until the nine divisions were no longer fit for combat. It was hoped that the two in reserve could be drawn across the Ebro to suffer the same fate. Then, when at least nine and possibly eleven of Catalonia's eighteen divisions were worn down, a general assault was to be made along the line of the Segri River from near where it runs into the Ebro, north almost to the French frontier. With at least fifty per cent of Catalonia's best divisions used up there was little doubt that this assault would succeed and open the way for a rapid advance through Catalonia in the same fashion that the Alfambra series of assaults had opened the way for the rapid pursuit which brought Franco's troops to the Mediterranean the previous spring.[5]

Events worked out as Franco had planned. Instead of retreating the Catalonian troops tried to hold their position

[4]The Battle of Teruel was not confined to the fighting around the town of that name. The battlefield stretched for many miles along the highway running north to Zaragoza.

This operation, highly successful in its first phase, had already come to the pause which exhaustion of troops and ammunition brings in any offensive. I heard from reasonably reliable military sources that a discussion began at Franco's headquarters as to whether, in view of the reorganization and rearmament of the governmental army in Catalonia and the general political situation in Europe, it would not be better to wipe out Catalonia before continuing the advance on Valencia. The surprise attack across the Ebro indicated clearly the decision had been reached to wipe out Catalonia first.

[5]The author was told twice of the order with regard to the wearing down of the Catalonian troops across the Ebro. Once was when the chief of staff of General Yague explained the matter while the author visited the Ebro front during the course of the battle. The other instance was when the commanding officer of the Italian heavy bombers which were bombarding the Ebro position day and night explained in exactly the same way what Franco's plan was and said that those were the orders they had received and were obeying.

west of the Ebro. Consequently they were steadily worn down while Franco's infantry suffered much smaller losses. When the time was ripe, Franco ordered the general assault across the Segri River. Once the position on the other side was pierced, the Catalonian Army was through. From that time on no actions took place other than the small ones incidental to the retreat to and across the French frontier.

These two major operations, one which began with the Alfambra battle and the other with the Battle of the Ebro, are worth close study. They illustrate the problems which must be met in modern warfare other than in a stalemate of two opposing fortified lines with flanks resting on natural obstacles.

Too much military thought has been influenced by the tendency to take as standard modern warfare the operations which resulted from the continuous lines of trenches from the Swiss border to the North Sea. As a matter of fact, it was the exception, as there is no other place on the earth's surface except the Alps frontier between France and Italy, where a comparatively short line with natural geographical features protecting its flanks could be the battleground for two peoples, each with a dense population.

These two Spanish campaigns probably typify the conditions which would be met by armies fighting in other parts of the world. Above all, this is true of the conditions American armies would meet.

The main lesson to be drawn from these two campaigns is that there are two general classes of combat. The first is heavy combat, the hard fighting necessary to win a knock-down, drag-out battle in which each side exerts its maximum power. The second is light combat against a weak foe, or in advance- and rear-guard work and in a pursuit. For the first of these the ability to give and take hard blows is essential, speed is of insufficient importance to warrant any subtraction from combat power in order to increase mobility.

In the second of these, speed is of great importance, but at the same time if the resistance is to be overcome there must be sufficient power available or the movement will be brought to a halt and another knock-down drag-out combat is inevitable.

In other words, if the fruits of victory are to be gathered, a force must have not only the means to fight hard but also to move quickly.

This is the prescription for blitzkrieg.

This division into two types of warfare is important because on it is based the armament and organization of different types of troops. Also, the use made of aviation and mechanized forces is based upon it. In fact, the different types of mechanization depend entirely upon it.

The author had the good fortune to spend four and one-half months at the town of Zaragoza which was the headquarters of Franco's Army of the North. This army carried out the principal campaigns from the beginning of the Battle of Teruel to the end of the war. It was the one in which the Italian expeditionary forces served and most of the Germans in Spain. The town of Zaragoza was also the headquarters of the Spanish, Italian and German aviation. At or nearby were the fields from which the Italians and many of the Spanish air squadrons operated.

During twenty visits to the front, some of which lasted several days, the author saw all types of Spanish, German and Italian troops, equipment and armament in action. He saw nine assaults, the smallest being that of a division and the largest that of two army corps, each of four divisions.[6] During this period he had the opportunity to talk to Spanish officers and flyers of all grades, Italian officers of all grades, occasionally to German flyers and quite frequently to the Germans at the German headquarters.

The older Italians and Germans who had fought in the Fourth World War were always pleased to discuss it and to comment on the changes the Spanish war showed to be essential in armament, organization, tactics and strategy. The Spanish were very proud of their new army and air force. They were eager to see Spain restored to a position as a first-class power in Europe and the Mediterranean. They were anxious to prove that Spanish military ability which had made Spain a great nation in the past had been reborn and was safe in their hands. As a consequence they were eager to discuss technical questions with anyone who had a military background, education and experience in battle.

From all this the following can be stated. For heavy combat the Spaniards, Italians and Germans were in agreement on the following:

Infantry

The infantry is still the "Queen of Battles." However, the Queen must have the most modern armament and must keep up to date with all new technical methods of industry.

The infantry must control the forward zone of the battlefield. That area is the zone which delivers fire from infantry weapons and in which the enemy's fire is great and accurate enough to put out of action anything which makes a target more noticeable than the infantry.

As a consequence, each section of the Spanish infantry had at least one small trench mortar and several automatics. Every Italian infantry regiment had a battery of nine 65-mm. mountain guns. There were numerous mountain batteries among the Spanish troops which, like the Italian ones, were practically under infantry control. In addition to the smaller trench mortars of from 25- to 50-mm. caliber there were trench mortars of larger caliber. These also were in the hands of the infantry, but not in the companies as were the light trench mortars. For close defense the infantry had antiaircraft and antitank guns of various calibers up to include the 37-mm.

The question as to the best caliber for AT and AA infantry defense had not been decided when the war ended. Opinion wavered between two qualifications. The first was that no weapon in the infantry zone which makes too big

[6]The Spanish division consists of twelve battalions of infantry with artillery and services.

a target will survive the preliminary artillery and aviation bombardments. On the other hand, the enemy tanks[7] with a 45-mm. cannon in the last year of the war did not come within range of the 37-mm. or smaller antitank guns. The tanks were put out of action.

Both the Spaniards and the Italians maintained that their best defense against tanks was the 65-mm. mountain gun, because it outranged the tank cannon. Also, one of its shells, even if not a direct hit, could damage a tank if it burst close by. The Italians considered that a 75-mm. mountain gun would be even better.

Artillery

The artillery has been promoted from assistant to the infantry to its Prince Consort. Not only does the infantry depend upon it both in attack and defense, but also tanks and aviation need its support.

There is an increasing tendency to follow the German Army in substituting the 105-mm. howitzer for the 77-mm. and guns of similar caliber.

Similarly, the 77-mm. AA guns used at first by the Germans were found inadequate. As a consequence a new antiaircraft gun of 88-mm. caliber was tested in Spain. Both the artillerymen and aviators believed these pieces solved the problem of reaching any bomber carrying a war load.

The bombardments of the enemy positions by heavy bombers, the invariable practice of Franco, could not have been carried on without undue loss had not a thorough and adequate artillery bombardment preceded it. The same is true of the dive attacks with light bombs and

[7]Either Russian or made from Russian models.

machine guns made by light bombers from flank to flank of the enemy's position during the advance of the infantry and the tanks.

Similarly, tanks during the assault suffered undue loss in matériel and personnel unless the artillery and bombers had prepared the way.

Franco and his generals understood the importance of having enough guns to prevent the infantry from suffering as they frequently did in the Fourth World War by making improperly prepared assaults which failed. From time to time the charge was made that he was too slow. He was slow because with limited means he frequently had to wait some time after one battle before he could accumulate the ammunition necessary for the next if heavy infantry loss was to be avoided.

As a result his infantry always attacked confident that even though losses might be severe, they would seldom fail to drive the enemy from his position.

In other words, the Queen knew that the Prince Consort was always there to give her the greatest possible help in her most difficult moments.

Tanks

The light tank soon showed that it was not fitted for heavy combat. First, because it was armed with machine guns alone instead of at least one cannon. Second, because insufficient armor led to rapid disablement or destruction.

The longer the war went on, the more evident it became that the only tank fit for heavy combat is a reasonably armored vehicle carrying a cannon.

The idea that speed furnishes protection against fire was proved to be a fallacy.

Franco's infantry frequently burnt[8] tanks which had gotten among them with little or no support from their own infantry and artillery. The consequence was the day arrived when tanks were only used as part of an infantry assault, with their own infantry in close support.

Aviation

Aviation played a considerable part in all combats. Besides its use for reconnaissance and observation it had a definite battle mission. In all assaults as the artillery preparation closed, heavy bombers flew several times from one flank to another over the enemy's position, bombing it. As the heavy bombers left, light bombers made diving attacks. The first few times around they would use light bombs, the next few times alternate planes would use bombs and machine-gun fire. On a division front such diving bomb attacks were made as often as twelve or thirteen times by the same planes in the course of a half hour. As these left, other light bombers appeared to aid the tanks to subdue such points as held up the infantry.

During all this, pursuit planes high above watched for enemy aviation. In some of the larger combats it was evident that complete control of the air was not essential, because on several occasions enemy aviation flew over Franco's troops and bombed their rears while the assault was going on.

In other words, heavy combat in Spain proved that neither aviation nor mechanization can replace the infantry and artillery. On the other hand, it showed that both are essential components along with the artillery and infantry of any battle team.

So much for the general lessons of heavy combat in Spain.

The picture of what is necessary in light combat differs in a number of ways. Here speed, which in heavy combat is subordinated to fire-power and the ability to survive fire either through making a small target or through armor, is important.

Until the Spanish Civil War, the machine gun enabled small groups to hold up advance guards or pursuing groups, because the necessary artillery, tanks and infantry to dislodge machine guns were with the main body, in the rear.

The time it took for these forces to arrive gave the enemy machine guns the chance to get away or to become the basis of a determined defense.

To prevent the enemy from occupying a strong defensive position is the objective of a speedy advance of the troops preceding the main body.

The high speed essential to such an advance has forced horsed cavalry, armored cars and light tanks to relinquish the fire-power and armor necessary to cope with the resistance of small groups armed with machine guns and light artillery. In Spain the use of armored tanks with cannon as mobile field guns has increased the defensive powers of such groups.

To increase the fire-power of the advance groups, motorcycle infantry and machine guns have been added. Also, motorized infantry and artillery have followed in the rear.

However, the motorcycle infantry and machine guns did not add enough fire-power, while the time necessary to bring up the motorized infantry and artillery over poor roads and particularly when bridges had been blown out, was too long.

Aviation furnished the solution. In addition to reconnaissance far to the rear it did three[9] things.

(1) Through bombing it furnished a substitute for artillery concentrations.

(2) Through light bombs and machine-gun fire delivered in diving attacks it furnished a substitute for artillery accompanying fire during the assault.

(3) It bombed and machine-gunned the main forces of the retreating enemy, thus encouraging him to continue his retreat, instead of settling down in a new defensive position.

As the war in Spain progressed there was an increasing demand for horsed cavalry, because of its ability to move

[8]The method consisted of throwing wine bottles full of gasoline and sulphur to which several "potato-masher" hand grenades had been wired, into the greasy tractors of the tanks. This was frequently followed by a hand grenade through the rear ventilator and also setting fire to the gasoline tank if its plug could be pried open. The operation required great courage.

and fight in country in which mechanized forces could not operate.

Thus Spain proved to the Germans, Italians, and Spaniards that forces for light combat should consist of motorcycle infantry and machine guns, armored cars, light tanks (carried in trucks), horsed cavalry and aviation.[10]

It proved to these three countries that light forces, backed up by motorized infantry and artillery, used against an unprepared enemy means certain victory.

Therefore Spain showed blitzkrieg to be certain of success under the conditions met with in the last year of the Spanish war.

The quick seizure of Albania by Italy has been ignored on the grounds that the Albanians were not prepared to resist. As a matter of fact, due to Italian military tutelage over a period of years, Albania was quite well prepared to mobilize a reasonably well-equipped army which, had it been given time to mobilize, could have offered considerable resistance. This would have been all the more true in mountainous Albania, particularly as most of the mountaineers were armed.

Even those who at the time the invasion started were loudest in predicting that it would take Italy months—

[9] While Franco used airplanes to transport troops from Morocco to Spain, the author knows of no incident in the Spanish war in which infantry and machine guns were transported by airplanes, to support light troops as was done by the Italians in Albania and as the Germans are prepared to do.

[10] Sometimes artillery carried in trucks and horsed artillery were added.

perhaps years—to subdue the country, seem uninterested as to why it was all over in a few days. Many of these are the same military critics who maintained that the conquest of Abyssinia would take years.

The author in Rome talked with General Pariani, then Assistant Secretary of War and Chief of Staff. Pariani showed the order for the invasion and explained his plans for a "surprise in time." He insisted 23,000 troops of the types needed for light combat were enough. His generals opposed him because they wanted to send 80,000 —planning to crush the Albanians *after* they were mobilized instead of catching them *before* they could mobilize. General Pariani explained the reorganization of the Italian Army and how this was based on the experience in Spain, with minor modifications.

The reason that there was no fighting to speak of and that the invasion was completed within a few days was that the Italians profited by the lessons of Spain. They used light troops and aviation backed up by hard-hitting forces and effected a "surprise in time." In other words, they occupied all important points before the Albanians had the time to mobilize.

This surprise in time was carried out by ground troops and aviation which had to make a sea crossing to reach the scene of operations. Some of the infantry was transported by air from Italy. The Italian plan succeeded admirably.

At the same time the information available with regard to the German campaign in Poland proves that it too was

a successful application of the idea of a surprise in time. The way for the heavy troops was opened by the light-combat troops, supported by aviation. The Germans did not have to use the total of the forces originally set aside to suppress Poland.[11] The initial faulty concentration of the Polish Army and the entry of the USSR do not change this fundamental fact.

Without doubt, modern war calls for both light-combat and heavy-combat troops designed to effect initially a "surprise in time" and then to crush the forces of the enemy. The blitzkrieg type of war, while making use of aviation and mechanization, restores to the older arms—the infantry, artillery, and horsed cavalry—their powers for march and battle. It nullifies the idea that the world war of 1914-18 had taken these powers from them forever.

But lightning war can only be waged—and successfully countered—by forces fully provided with the latest types of armament and mechanization on land and in the air. Moreover, these forces must be backed by a first-class infantry, artillery, and cavalry.

[11]Seventy to seventy-five divisions, including six panzer (armored mechanized) and four motorized, were earmarked for the Polish campaign. Of the infantry divisions not more than forty were used and possibly as low as thirty.

The Industrial Revolution has given the industrial nations the first-class navies necessary to dominate the seven seas. Similarly, it has put into their hands the power to dominate the land surfaces of the globe.

The United States of America is one of the leading—if not the greatest—industrial nations in the world. Yet its army lacks the armament not only to wage swift war, but what is more dangerous, to resist the lightning onslaught.

Moreover, our industry has scanty armament orders. At the same time, it hesitates to call attention to the danger of the situation for fear of drawing the charge of being "merchants of death." Yet it takes at least a year or more before industry can produce the wartime armament needed for the small Regular Army and its not much larger brother, the National Guard. What can be said of a war army of huge size?

Marshal Pétain once remarked to the author that industrial preparation for wartime production is of prime importance today. Moreover, he believed that a nation with lesser industrial power but which was prepared could defeat an unprepared nation of a much greater industrial power—because by the time the second nation was ready, it would be too late.

We might think that over.

a Military VACUUM

Unquestionably the Army displays an abysmal ignorance of the intangibles that actually make a military organization. Such words as discipline, morale, and leadership are used continuously, for they are the core of war-making. Yet no general understanding of them prevails. No precise and accepted definition of them exists; no knowledge of their derivation and growth is extant. Yet the learned, pedantic military writer patters in an abstruse way about such things. Perhaps he may have his own

You can't requisition discipline or morale

definite idea of the qualities and how they emerge and grow. But perhaps his readers have other ideas, vague, nebulous ones, or perhaps none at all. And furthermore, the writer may be wrong. Therefore we are not dealing with factual matter but airy ideas, and to top it we allow our regulations to ignore or befuddle such basic military factors. All this despite the fact that science can give light on these matters.

Yet how these intangible qualities are derived, from what they spring, what actually is this very substratum of an army from the squad up, has been blandly passed by. What is military discipline? one may ask, and undergo a deluge of definitions. How can one go about instilling it? And then in all likelihood one will get the old worn yet calmly accepted explanation that it is "based on hope of reward and fear of punishment." What a futility! What error! Frankly, such a method does not produce military discipline or anything worthwhile. It is but the basis of prison discipline.

It is such an iron rule that governs Alcatraz or Atlanta penitentiaries. But the people incarcerated never become soldiers. A little lack of vigilance and a prison may become a howling inferno where death stalks and the directors fall. It has happened often. These men are not soldier material, some may say. But be cautious here, for the cases are many where such people in a wartime military organization have gone out to battle. They followed their leader to the very point of death and did not shoot him down as in prison because the meals were poor or freedom was denied. Yet there is no freedom when moving into

By
Major J. Halpin Connolly

battle, meals are sparse and sketchy, and death is ever-present.

What reward or punishment governed Napoleon's Old Guard at Waterloo? There, with the French force in a rout, the Guard stood staunchly and refused to lay down their arms. Their case was hopeless, but to the English demand their reply was, "The Old Guard never surrenders." There they stood rocklike until volleys of musketry fire laid them all low and something of great worth—a rare, exquisite, human feeling—passed away in the smoke of the muskets. The origin and growth of this feeling, its development within the breast of man, the method of inculcating it and using it, is of far more importance to the soldier than all study of the Napoleonic era. For warfare today is vastly changed and it will keep changing. Man alone in the kaleidoscopic whirligig of modern times is static. But at least all should know this: Soldiers are not the product of prison methods of discipline. Strange, we do not preach or even admit that.

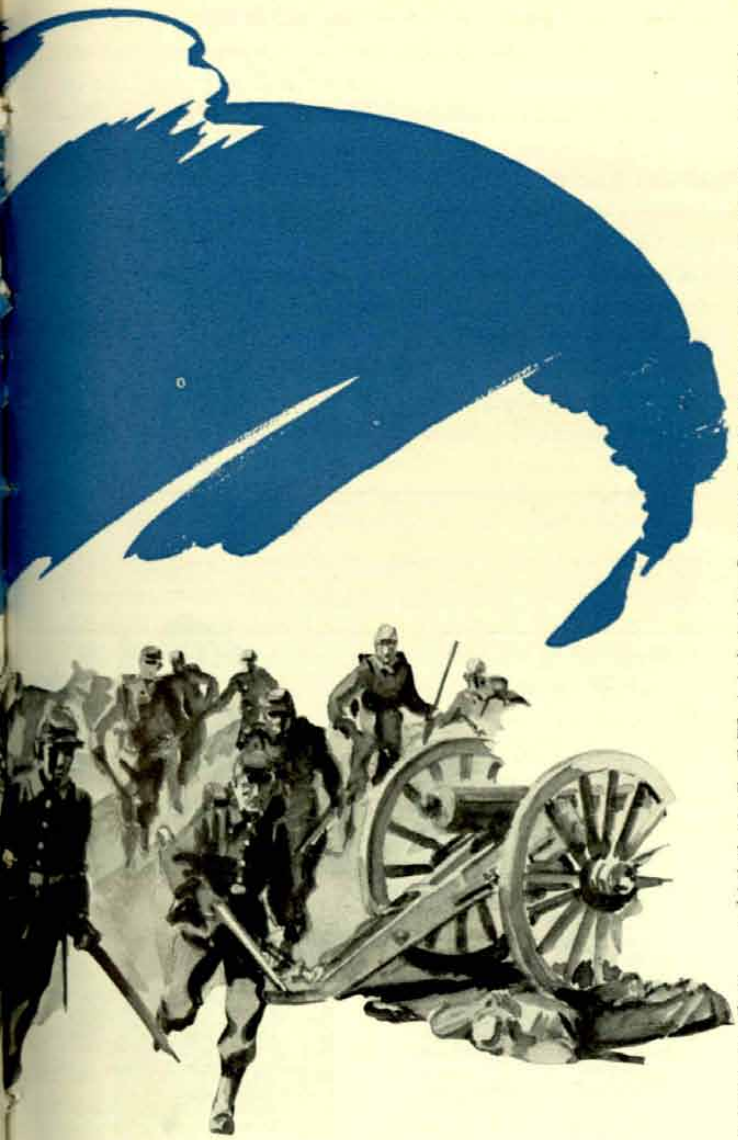
What punishment could the military give that was greater than the death that faced the Guard? What reward could be conferred on these individuals in the hereafter? Since when did the military parade ghosts and give them the reward of medals and honorable places in Valhalla, Elysium, Nirvana, Paradise, Heaven—call it what you will? Again, what about the Spartans at Thermopylæ, the men of the Alamo, and countless other groups who have brightened the drab history of war, gave it a coruscating light and left a precious memory in the world? They showed us the greatness that lies in man; they should make us humble, for very likely we lack this greatness of spirit—and so does the unit under us. But at least we can and should study such matters and discern how they develop. Yet we do not. The worst blunder of all is that we soldiers have little sound material concerning this aspect of war-making. Where is our literature about it? It is slender—and who knows if any of it is true? We will spend pages discussing river crossings and blandly wave aside in a few words one of the very fundamentals of war—discipline.

True, there is no question that in peacetime one can run a unit on a reward-and-punishment basis and one may obtain a snappy outfit that appears admirable. But this surface glitter will always lead one astray, for such units will not be fit for combat. Despite smartness they will lack the deeper spirit, the inner grimness, something, that enables a unit to fight its desperate way through battle which is harsh, slimy and revolting—nothing very glorious about it. For instance, the smartest and best-rated corps in the Army of the Potomac—judged so after a whole winter of observation—failed miserably at Chancellorsville. It broke wide open and fled. Were these surface results so noticeable in the corps produced by the application of reward-and-punishment? Who knows? But in any event the high command was sadly deceived about this corps. It could not judge the moral and disciplinary qualities of troops. And who can lay down the specifications today that will help in judging any war-making

body? Check all the books and see how little we have. Check the regulations that are skimpy and filled with old saws, aphorisms, and unctuous, erroneous thoughts.

In fact, the military neglect almost completely a study of this phase of war while it muses on the intriguing geometry of battle which changes as new weapons come in. From all this the scholastics try to produce an esoteric literature of physical war to the neglect of the human and unchanging element of war. Knowledge of discipline is an intangible something desperately needed, to be sure, but so far as our military culture is concerned it is not studied nor written about extensively so all might benefit. Frankly, there is a basis of science for these intangibles of war; the rest of warfare is an art. To be brutally frank, we airily ignore what science can give us and like dilettantes play with an art—and an archaic art.

We have become so awry in our thinking of discipline that if a higher commander directs that "disciplinary action be taken," the subordinate commanders hastily ladle



out punishment. Actually, the lower commander could in response and in all justice pass out a commendation. But memory fails to recall one that did, because we have actually tied up discipline with punishment. Yet, the two do not belong together—except in prison.

Morale—another word denoting an intangible human quality—is just as little understood. How is good morale produced? What must commanders do to obtain it? How can we judge it? Frankly, we know little of it except that it often exists and is militarily indispensable. Good leadership produces it, it is often said. Quite true. But what is good leadership, how is *it* developed and applied? Here is another intangible that can be recognized, but how it acts is so difficult to analyze that little valuable has been written about it. Morale and discipline both depend on this leadership, it is said. So what have we got? Nothing but a piece of circular argument. We are still among intangibles. We explain one by quoting another. The military are scholastic thinkers, not scientific ones.

At the same time our schools insidiously and unconsciously indoctrinate the students with error about the intangibles. For instance, in a problem they state a certain unit has lost a meal, therefore their morale is low. This is wrong. How did Lee's army fight its terrific battles of the latter Civil War with little to eat? Study the Wilderness battle—Spotsylvania. If Lee's men had poor morale let's hope our army always has it. Another example is to quote that an outfit has marched a great distance and therefore their morale is low, or is not excellent. Wrong again! A corps commander once marched his corps seventy-seven miles in forty-four hours. With five hours' rest he was placed in the battle line by the commander in chief exactly in front of the enemy's main blow. His corps fought like tigers despite their march. Their morale was so high that notwithstanding the fact that they were forced back by sheer weight of numbers, they clung tenaciously to positions. This morale was almost exalted. But it should be noted that this was a battle, not a map problem. If one thinks that this is sheer lunacy in war, it would be well to mention that the corps commander was Marshal Davout, and the battle was Austerlitz. Certainly Napoleon knew what morale was. It was not vitally necessary to place Davout on the line. He had other and fresher troops to go there and reserves aplenty. But Davout went in to meet the main blow—Davout, the backstairs, untried, waltzing marshal. The scholastic soldier would hand out a U for that. Napoleon won a battle with it. Take your choice.

Frankly, we think that any discomfort always lowers morale. This is not so. It is almost as great an error as the wartime custom of appointing a morale officer to pump morale into the troops—with mass singing, motion pictures, and dancing girls. If there is anything more ridiculous than this, it is hard to say what it is. Morale comes from the leadership of the commander and no one else. For the high command to believe that the morale procurement could be passed on to a staff officer and for local commanders to placidly accept this condition without a howl of rage, indicates clearly that all know little of morale. One cannot requisition it.

Frankly, all these events disclose one thing; and that is, we know nothing of morale. Yet it is a word that is often used. We can tell after a battle when one side has shown good morale, but how to judge it beforehand and how to produce it, both are beyond the ken of all except the good leaders. To try to judge such a subject is futile, for our standards mean little. All this because too little study has been given to the subject, and less is written. The core of a military organization is morale, leadership, and discipline. These things need far more study than river crossings, wide envelopments, or the like; for the whole game of war rests on these intangibles. Strange, we do not go into them more. Certainly it is true that "the moral is to the physical as three is to one." But knowing that means little; knowing what this morale is and how to arouse it and develop it, means everything to a soldier. The same goes for the other intangibles called discipline

and leadership. It is time we ceased memorizing and muttering old saws and maxims and start the study of the foundation of an army.

To indicate how much we skip in the study of war, it may be well to mention a certain general. He never flogged his troops for infractions of discipline, yet all other armies did—even our own. Often at night he used to wander between the campfires after he had finished his work. With the soldiers seated about the fire he exchanged stories—salty ones no doubt—and roared with laughter. But the strangest of all things was that he granted corporals and sergeants permission to try any of their number who was deemed guilty of a dereliction of duty. The officers did not have to worry about that. At inspection any soldier might have a written complaint or request stuffed into his musket barrel. It was extracted, read by the general, and action taken immediately. Money might be given, or a sword awarded or a promotion made on the spot. The soldiers had no hesitancy in writing direct letters to him, and often received a complimentary reply in the general's own handwriting. Once when going into action with a large army he himself actually helped his artillery by doing a private's job.

Certainly some or all this is queer to us today. But if this man was good and had a good army, then some of our feeling of queerness is born of a defective military idea of armies of war. Flatly, it can be stated that this soldier built and led a superb army. His victories were stupendous and his military stature has never been exceeded. His name was Napoleon.

The queer thing is not what he did, but our lack of study and understanding of this aspect of his work. We ignore that completely. Hence we cannot say what things he did that were wrong and what were right. Let us be honest—we don't know. Those who think they do are doctrinaires, not thinkers. Oddly, it is useless to follow in his tactical steps, for war has changed immensely; but to follow in his steps in the handling of men—there is something to think about. Napoleon had something of superlative merit in this field. What was it? We do not know. We do not study it.

One can get a precise and exact story of how he fought the battle of Jena, and adjacent Auerstädt, and then rolled over all Prussia in less than a month. But—Napoleon was mistaken about the Prussians; he did not fight their main body as he thought; his scheme was entirely awry and Bernadotte's corps, though on the line, never got into action. His plan of battle was a masterpiece but it did not work. Something else won. It was Davout's corps fighting like demons against a huge main force that won Auerstädt, connected it with Jena, and brought on the Prussian debacle. What we should strive to know is not the geometry of the battle—it was all awry anyway—so much as why the soldiers of Davout smashed up a much larger force in a straight slugging battle. They had morale, battle discipline, and Davout was a great leader. Granted. But what made this morale, battle discipline, and leadership? And why was it the Prussians did not have it then? They did later. This is the subject that should be getting laborious study but instead we hear only prattle of Napoleon's genius and Davout's leadership—both are regarded as unexplainable. The military are worshipers at a veiled shrine of mysteries instead of students of human action. Yet there is no mystery here; hard study of years will give us the answers. But we would rather play with battle geometry. It gives such lovely pictures.

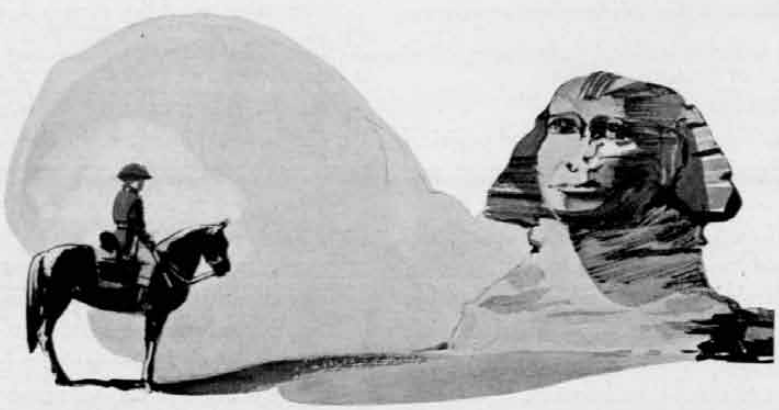
Times change, people change. Thus the culture that produces soldiers needs study. True, all men are essentially alike, but each generation, each nation, shows a change in soldiers as the people's society changes. It is not a change of the primitive man but the culture which calls for a different approach to the man. Today in the mechanized age the rapidity of change is breath-taking; stupendous is the speed of change. There has been nothing like it in all the world's history. And we do nothing about it. We make no study, we do little thinking. We accept the past and if anything is likely to be wrong that is it. For the past is good only in telling about the *primeval nature* of man, not his complex civilized nature, which is the product of society—and society always changes. Who can tell us the difference between the Civil War and World War soldier? There was a difference but just what was it?

We should be studying, delving into the world about us and the soldier material civil life is turning out. The man that walks the street is the one who will make our war army. Never forget that. It is he that should be studied. How can he be led, how disciplined, what produces morale? Do not try what has happened in the past or very likely we will be wrong. Study the subject scientifically. There is material turned out on it.

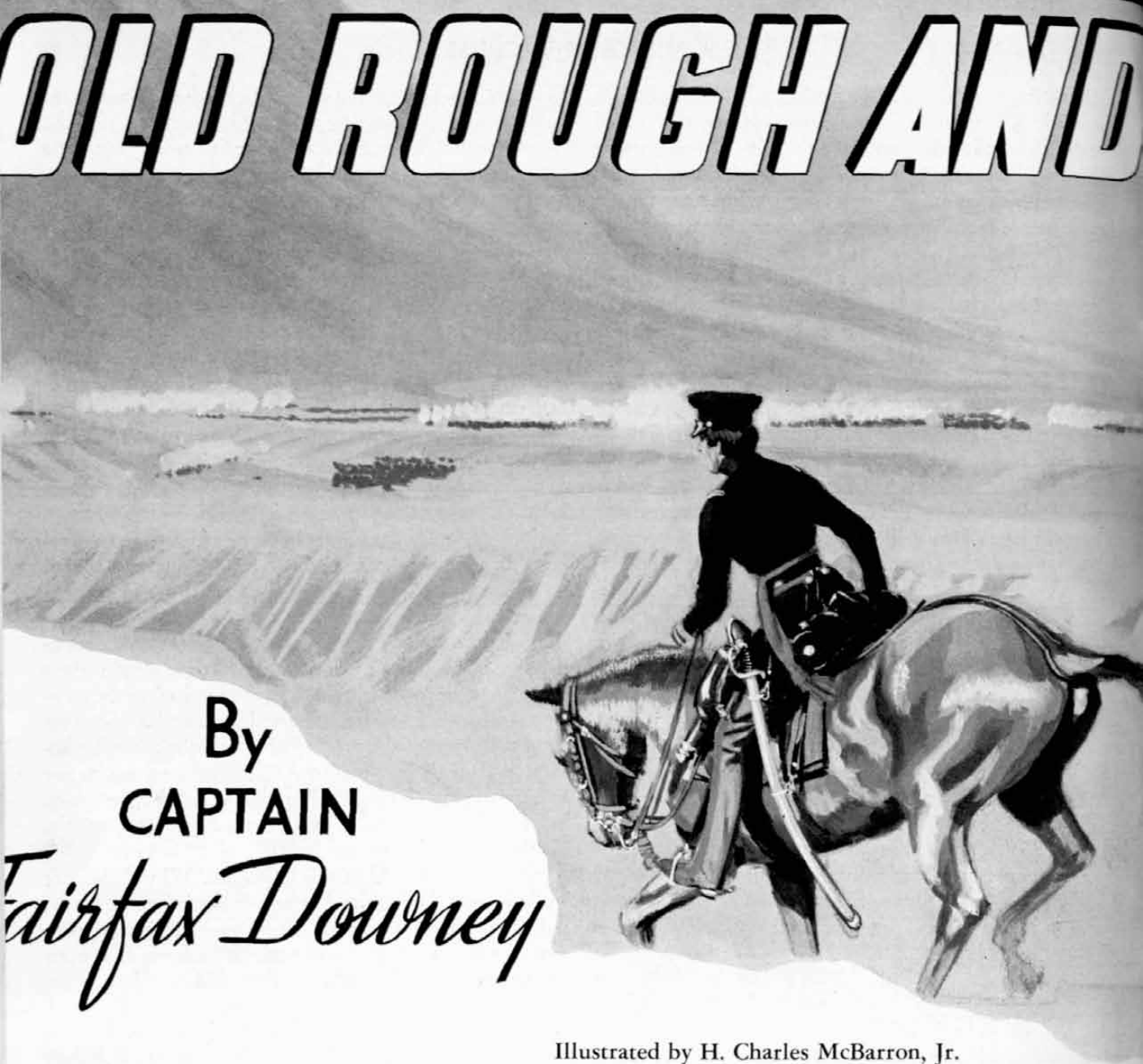
One great project entirely controlled by the military should be extensively and scientifically studied. That is the Civilian Conservation Corps. It had no *standard* military discipline but it ran like a piece of great machinery. Things went smoothly despite the fact that nothing in the army's past was utilized to inculcate standard army discipline. What kind of discipline controlled 300,000 men? How was leadership promoted? What made a leader? The very least we can say is that all was quite high. But how was morale produced and kept on a high level? Finally, could military instruction be introduced and succeed, using the same type of discipline and leadership? If this could be done, then we have struck something of tremendous military value. Even if certain slight changes are necessary, still we have found what the common American desires, what he will work under with great good will, what is the method of group discipline, leadership and morale common to Americans. That we do not know today. We let it pass. In military life we have copied too much from abroad. Yet we are a different people. Foreign material does not fit us.

There may be gold in this CCC hill. Why do we not study it to find out? Good or bad, it needs intense studying, as do other mores of American life. But no such studying is given in any of our military schools. It appears we are but a bookish soldiery that studies old and outmoded things.

Some may scoff at such study of modern trends because soldiery has always been the same. They may enjoy their chuckles now, but as commanders in the next war they will be old, querulous, and valueless. Chalk that up.



OLD ROUGH AND



By CAPTAIN
Fairfax Downey

Illustrated by H. Charles McBarron, Jr.

"Double-shot your guns and give 'em hell!"

That was General Zachary Taylor's command to Bragg and his battery standing between a crumpling American wing and the oncoming charge of the Mexican infantry about to win the day at Buena Vista. So testified an authoritative witness. Yet the textbooks have it that the General shouted above the din of battle:

"Give them a little more grape, Mr. Bragg."

So are heroic phrases tidied up for historical and political purposes. Thus did the Forties smooth out the rough and ready utterance of Old Rough and Ready so that it might ring more politely down our annals. In any event, Mr. Bragg and others obliged with grape-shot, double-shot and what-not. The Mexican charge reeled back, the tide of victory turned, and the battle of Buena Vista, which he fought against orders and risked dangerously, made Zachary Taylor President of the United States.

The political ball rolled back and forth merrily in those days from Washington to the Rio Grande, and the best ball-player was the man to whom the usually astute Daniel Webster referred as "an ignorant old frontier colonel." Taylor outplayed the regular politicians, for politics was the Old Army Game and the Old Navy Game, too, then as now. Passing the buck, that adroit military exercise, is only one of the methods of warming up on the sidelines. Non-voting officers, limited though they are, infrequently resist the aid of family political connections to speed the long, dreary wait for promotion. War gives the successful soldier a chance to knock the ball over the fence. Small blame to that indubitably strong and honest character, Old Zach, that like Jackson, Harrison, Grant and Roosevelt, he took that chance.

Buried beneath the obscurity of campaign pamphlets and old-fashioned biographies is the story of a unique career in a critical period of our history. Cross currents clash to produce unexpected results. Aaron Burr's schemes launch a future champion of the Union. The Mexican War trains more good generals for the South but makes President a man who does much to delay Secession for

Buena Vista: Through it all, Old Rough and Ready sat calmly on his warhorse, Old Whitey

ten precious years which strengthen the all-important industrial sinews of the North. Such is the story of Zachary Taylor who bent victory to his purpose as shrewdly as ever did Caesar or Napoleon.

It is not of record that Colonel Richard Taylor, a veteran of the Revolution, told his third child, Zachary, that he might be President some day if he were good, but he gave the lad a splendid start by begetting him in Virginia. Born in 1784, Zachary was less than a year old when his father emigrated to Kentucky. He could clothe himself in the purple of the Old Dominion dynasty and add the frontier tradition for good measure. When later he was stationed and made his home in Louisiana, it was evident that a fairy god-mother had been hovering around in 1784 and had graciously remarked: "And when the time comes, I'll deliver the Southern vote."

As if this three-starred nativity were not sufficiently potent, the pamphleteers in Taylor's Presidential race were subsequently to indulge in some naive pre-natal diagnostics. The spirit of prowess, they said, had been generated in the candidate by his father's encounters with the savages. While this was a trifle *ex post facto,* it was true enough that the elder Taylor had been encountering the British and that would account for the prowess. The

mind of the candidate's mother, they wrote, had been more than ordinarily wrought on and this excited in her brain those qualities which phrenologists infer are requisite for the formation of a hero. Nobody can infer more handsomely than phrenologists, save perhaps pamphleteers. Yet none could deny that at the time of writing Zachary Taylor had fully demonstrated both his power and his heroism, and the only argument could be *when* he developed those qualities, which seemed and was a minor matter.

A birthright of prime political geography, solid personal worth and then the lucky break of four wars—two Indian and two foreign. It was the making of a passport to the Presidency. But other soldiers have had the equivalent and when the inaugural parade marched down Pennsylvania Avenue they were on a horse behind the civilian gentleman in the open-faced carriage up front. Taylor took full advantage of the circumstances with which fortune favored him, but he was rather more the sage than the schemer, more the plain, practical man than the precipitous opportunist. For that was the way to get ahead in the army—and in politics.

II

It is no mean hitch along the road, if a man looks the part he intends to play. Zachary Taylor did not. His direct, gray eyes and firm mouth were well enough for a soldier, but he sadly lacked the military stature. He was always the short, thickset backwoodsman. "From the equestrian exercises the nature of his life has led him necessarily to undergo," wrote an apologist, "his extremities are somewhat bowed." Even Grant was to be a far more snappily uniformed general than the hero of the Mexican War. In spite of all this—and even because of it—Taylor managed to achieve his ambition.

Frontier life pointed him toward the career of a soldier, but an elder brother won out on seniority. Young Zach had to content himself with such adventures as swimming the Ohio, which the pamphleteers later compared to the Hellespont, adding that Taylor didn't have a boat along, like that fellow Byron. Then burst forth Aaron Burr with his idea on expansion without benefit of the United States. The ensuing excitement accomplished the result of putting young Taylor in the militia, thoroughly inoculating him with the army virus and starting a chain of events which was to curb later separatist ideas.

The elder brother died and President Jefferson gave Zachary the coveted commission in 1808 making him a first lieutenant. Here was luck, as anyone who has been a second lieutenant will tell you. And on top of that, Mr. Madison became the next President, and Mr. Madison was a relative of the Taylor family. The advantage to an officer of a highly-placed kinsman is perennial in armies and governments.

The new officer's regiment was the 7th Infantry which seemed to have few prospects of permanency. Older officers eschewed it carefully, since promotion was regimental in those days and they had no desire to be left flat in a disbandment. Not so Taylor. He stood pat, though he might have wangled a transfer. The 7th was retained and Taylor moved up rapidly. In two years he was a captain. It was as good as a war.

Fate put him out in Fort Harrison, Indiana, for the War of 1812. While other parts of the army were letting the British burn Washington and were otherwise inglorious, Taylor was defending his little frontier fort against Tecumseh's braves and doing it nobly. With only fifteen men fit for duty he beat off the Indians attacking one of his blockhouses, in flames fed by a supply of nefarious, pre-Prohibition whisky. In his report to his superior officer, he gave a delightfully unsophisticated picture of the action, writing:

"And sir, what from the raging fire, the yelling and howling of several hundred Indians, the cries of nine women and children . . . and the despondency of so many men, which was worse than all, I can assure you that my feelings were very unpleasant. . . . But my presence of mind did not for a moment desert me."

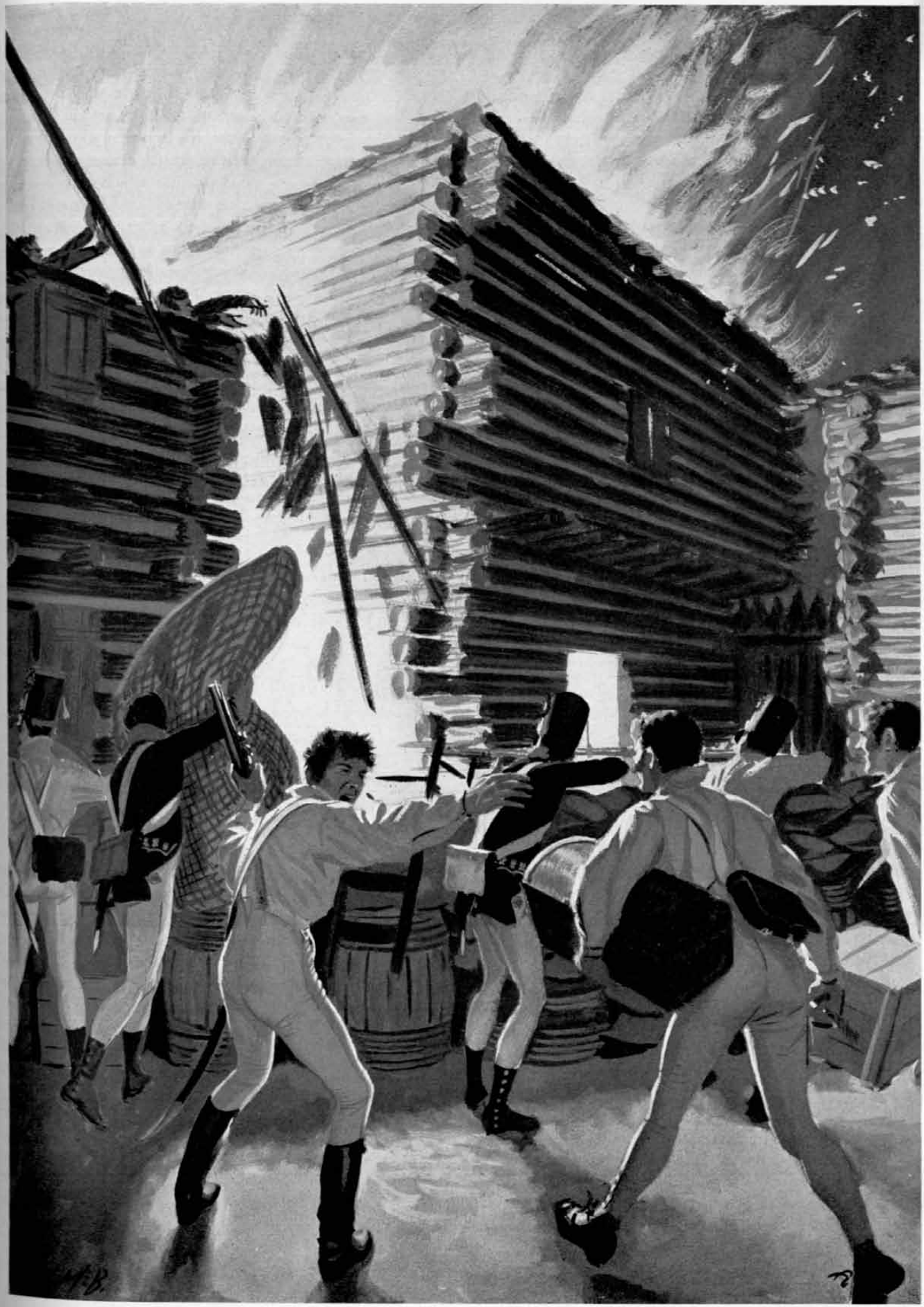
It made him a brevet major. He was full major when Congress resorted to its customary sport of reducing after a war an army that had been woefully inadequate during the conflict. This stepped Taylor back to a captaincy. He promptly resigned and went home to raise a crop of corn, farm relief being entirely uncongressional in those days. It was a wrench for a man who had the army in his blood, but Mr. Madison, like Taylor's presence of mind, did not desert him. The corn could scarcely have been in ear before Taylor was back in the army as a major again by order of the President.

Then came years of army routine, varied by Colonel Taylor's receiving the surrender of the Indian chieftain, Black Hawk. To the colonel in 1838 fell the important assignment of putting down the revolt of those tough customers, Osceola and his Seminoles.

It was a hard task, that campaign which was to open up Florida eventually to real estate booms and Palm Beach costume balls. Taylor and his troops waded through the swamps and snakes and cornered Chief Alligator and his band. In a severe action which cost him twenty-six killed and 112 wounded before he routed the Indians, he won the grade of brevet brigadier-general and something worth more, the sobriquet Old Rough and Ready—both well-deserved tributes. That excellent vote-catching nickname was later to be noted in numerous campaign songs, of which the following is a pattern:

I knew him first, the soldier said,
Among the Everglades,
When we gave the savage redskins
Our bayonets and our blades
I think I hear his cheerful voice,
"On column! Steady! Steady!"
So hardy and so prompt was he,
We called him Rough and Ready.

There remained troublesome guerilla fighting. Taylor went at it earnestly. Hampered by interference and the



"And sir, what from the raging fire, the yelling of several hundred Indians. . . . I can assure you that my feelings were very unpleasant"

intrigues of army contractors who were unwilling to have good business concluded by peace, he made little progress. It was time for a farseeing officer to get from under. Old Rough and Ready obtained his transfer to the command of the department of the South. Now he could settle down at leisure at Baton Rouge, acquire slaves, work a plantation and make Southern friends. As if his fairy godmother felt she had not done enough for him, it fell out that one of his daughters married Jefferson Davis.

And down on the Border, turbulent Texans and irritable Mexicans were busy guaranteeing all the martial prospects a soldier's heart could desire. Nobody was handier to the scene than General Taylor.

III

The causes of the Mexican War: advisability of annexing Texas rather than allow Sam Houston to hook up with California and Oregon in a new American republic—the not-to-be-conciliated, chip-on-the-shoulder attitude of revolution-ridden Mexico—the growing menace of European interference—these and the rest were not the concern of General Zachary Taylor. He was a soldier. His not to reason why.

"This child of destiny" concentrated his troops on the frontier. He advanced as ordered and the war was on.

American contempt for Mexico was strong. Jokes about the Mexican army and its superfluity of generals had some basis. At one time it consisted of 20,000 soldiers and 24,000 officers. Six successful revolts it was said, would promote a second lieutenant to a general. The army like the government was rotten with graft. Yet what we had to fight with was a regular army of only eight regiments of infantry, four of artillery and two of dragoons, with a militia called to arms that illustrated all the evils of unpreparedness. Mexico behind the barriers of her deserts was to be guided by the unscrupulous but strong hand of her dictator, Santa Anna, while the military fortunes of the United States were on a political poker table with President Polk, Secretary of War Marcy, Generals Scott and Taylor and any quantity of Congressmen sitting in the game.

"His extremities are somewhat bowed"

From the first the cards were stacked against General Winfield Scott, the experienced commander of the army. Beneath his pompous manner which won him the nickname of "Old Fuss and Feathers," he was an able and intrepid soldier, but he was also a known Whig candidate for the Presidency. At the time no such dire disqualification existed in the case of Old Rough and Ready. To the Democratic Administration the choice appeared simple. Scott to the pigeonhole, the less accomplished Taylor to Mexico.

Taylor, in the estimate of Justin H. Smith, in his *The War with Mexico* was a strong character, every inch a man, with a great heart, a mighty will, a profound belief in himself, and a profound belief in human nature. Yet he was often obstinate and ponderous. In his lifetime in the service, he never had fought a big battle nor led a real army. Still Old Rough and Ready did his best. With the assistance of fate, that served.

Taylor's command reached the Rio Grande in March, 1846, after breaking an encampment in which sickness, quarrels and indiscipline had been rife. His volunteers were sadly untrained. One inevitable bout in the Old Army Game was already well under way—the contest between West Pointers and officers who had entered the service from civil life. No West Pointer himself, Taylor was the object of considerable distrust by his subordinates from the Military Academy and not all of it was groundless. There he had an antidote in the adjutant General Scott had purposely sent him, the West Point graduate, Captain W. W. S. Bliss. Called without any sarcasm, "Perfect" Bliss because of his high capacities, the captain was Taylor's right-hand man throughout the war, winning for his reward his chief's daughter, the charming Betty Taylor.

Of the actions of the Mexican War, no more need here be given than such brief account as will indicate the political undercurrent which swept Taylor into the presi-

dency. Building Fort Brown across the River, General Taylor left a small garrison and made a belated march to Point Isabel for needed supplies. The fort still held out when the Mexicans under Arista were forced to leave the siege to meet the returning Taylor who routed them at the battle of Palo Alto. Again he was successful at Resaca de la Palma, the dashing American batteries of light artillery doing excellent service on both occasions. The bright halo of the first victories of the war settled over the head of Old Rough and Ready. Amid the cheers of the nation, he was made a brevet major-general. "The General" wrote Professor Smith, "had shown himself slow, unskillful, wanting in penetration and foresight, and poorly grounded professionally" in these battles. What was that to the people? He had won, hadn't he? His name rode on the crest of the tide of popularity to mention as a candidate for the presidency.

Hope of being President probably was not and certainly could not have been entertained with any logic by Taylor before these events. Now it could well be. The President of the United States is Commander-in-Chief of the Army. Few soldiers can resist the lure of promotion, and here was promotion to the very top beckoning.

What a pretty pickle it put the Administration in! Scott had been shelved, but here was another general gaining glory and possible votes. Polk and Marcy took Scott down off the shelf, dusted him off and routed him for Mexico. Competition might whack up the glory sufficiently so that it would not carry the next election.

Forthwith Taylor proceeded to storm and take Monterey. It was costly but "it was a famous victory." Old Rough and Ready's own high valor in the leadership of the assault lifted gallant men to heights of heroism. Criticism of his generalship there might be, but the country saw the red badge of courage upon his breast and his troops'. Little could be done in Washington against Taylor. Scott supported him nobly. The best strategy seemed to be to hasten Scott and an army to Vera Cruz for a vital thrust at the City of Mexico.

The expedition was sound both in a military sense and politically. The bulk of the regulars under Taylor were ordered, as was necessary, to join Scott, with Taylor to remain strictly on the defensive at Monterey.

To these definite orders, the ears of Old Rough and Ready, filled with the buzzing of the Presidential bee, were deaf. To the suggestion that he offer himself as a candidate he had written: "I could not, while the country is involved in war, and while my duty calls me to take part in the operations against the enemy, acknowledge any ambition beyond that of bestowing all my best exertions toward obtaining an adjustment of our difficulties with Mexico." But the ambition could exist unacknowledged and its owner was furious at what he saw as a plot of Polk's and Scott's.

Whereupon he plainly announced his candidacy. Casting orders and prudence to the winds, he advanced deeper into Mexico.

But now the talented Santa Anna, returned from exile in Cuba, was back in Mexico and in supreme power. This far from incompetent leader sized up the situation, saw Scott's strong force approaching and the rash advance of the weakened army of Taylor. There was time to crush Taylor before Scott could strike. Santa Anna pushed rapidly north with his army.

IV

"Old Zach" led into an adventure which might easily prove catastrophic to an army which felt for him a devotion comparable almost to that which Napoleon inspired in his troops. The talisman of his success and his personal courage had been impressed anew on his soldiers hallowed in the glowing paragraphs of newspapers from home. Their general in his broad-brimmed hat, old brown roundabout coat and linen pantaloons endeared himself to them by the very fact of his unkempt and unmilitary appearance and his genial and approachable manner. Other generals in their army blue and plumed hats and their air of discipline seemed to the volunteers lordly, distant and unlovable—almost un-American. Old Rough and Ready was a man to die for, thought the volunteers as they swung after him. And volunteers are the lads who cast the votes after the war is over.

So Taylor and Santa Anna met at Buena Vista, the Americans outnumbered four to one. It is a gorgeous canvas in our history, that two-day battle. The Mexican army, brilliant in its panoply, hearing mass before the combat. The American infantry flaming with volleys of musketry, as the lancers of Mexico charged. The light batteries at a headlong gallop across the field from one sorely threatened point to another, unlimbering and deluging the foe with grape and canister. The collapse of one American wing and the brave rally that turned defeat into victory. Through it all, old Rough and Ready sitting calmly on his war horse, Old Whitey, while fragments from bursting Mexican shells whistled through his clothes.

Among the paeans which arose, it may seem suitable to select a stanza of a rousing song which was later to do yeoman service in the political campaign.

Zachary Taylor was a brave old feller,
A Brigadier-General, A No. 1.
He fought twenty thousand Mexicanos.
Four thousand he killed; the rest they "cut and run."
In the thickest of the fight, Old Zachary appear-ed
The shot flew about him thick as any hail,
And the only injury he there received
Was a compound fracture of his brown coat tail.

So much for the only injury. And the benefits? Frantically enthusiastic celebrations all over the country. Wild ovations to which the brilliant victories of Scott at Cerro Gordo, Chapultepec and the City of Mexico were only so many more fireworks to add to the glory of the main piece, the laurel-wreathed image of Old Rough and Ready.

No chance for Candidate Scott. In vain the oratorical thunders of perennial Candidates Clay and Webster. Confusion to the Democrats and Candidate Cass. Popular and electoral, the votes piles up for that "moderate Clay Whig," Candidate Taylor.

The General's Clay Whiggery seemed to matter as little to the South as his ownership of three hundred slaves did to the North. Those items were lost under a post-war avalanche of Old Rough and Ready songs, Old Rough and Ready dramas, Old Rough and Ready almanacs and anecdotes.

It was Taylor and Fillmore in '49. "Old Zach" had his promotion, or rather his inauguration. Following that ceremony, a contemporary writer jovially draws this picture:

"When last heard from, General Taylor had drawn back inch by inch to the last rampart of the White House and was defending himself with his old Mexican sword against a cloud of office-seekers who were charging him in a solid column twenty-five deep."

Taylor's administration lay in the great Era of Compromise. Yet the old soldier of whom Abraham Lincoln wrote in a recently discovered eulogy, "No man was so little disposed to have trouble with his friends," still could be staunch. When Southern representatives came to him with plans for secession, he declared that he would crush such a movement unhesitatingly, if necessary with volunteers from the South.

That deadly combination, the cares of office and the Washington heat, ended his life after eighteen months in office. He was not destined to hear the bugle calls of the Civil War. That was for the next generation of soldiers.

Dutch antiaircraft machine gunners use a motorcycle sidecar mount in order to gain mobility

What Makes the Wheels Go 'Round

By Warrant Officer B. C. Elders, Army Mine Planter Service

The recent commissioning of the mine planter *Niles* and the prospect of future replacement of others now growing obsolete has given rise to considerable discussion as to design and power. On these subjects there seem to be as many different ideas as there are individuals taking part in the discussion. But we of the operating craft, into whose care the planters are eventually consigned, are rather far down the line of command and in the natural course of events are little consulted during the period that ideas are aborning. A sincere desire to view the subject in the cold light of reason and without bias prompts the writer to present a short résumé touching upon the subject of powering a mine planter. I realize that any engineer whose time has been served in steam is immediately suspected of antagonism toward Diesel engines. Be that as it may, this argument hopes to maintain a fair and impartial attitude.

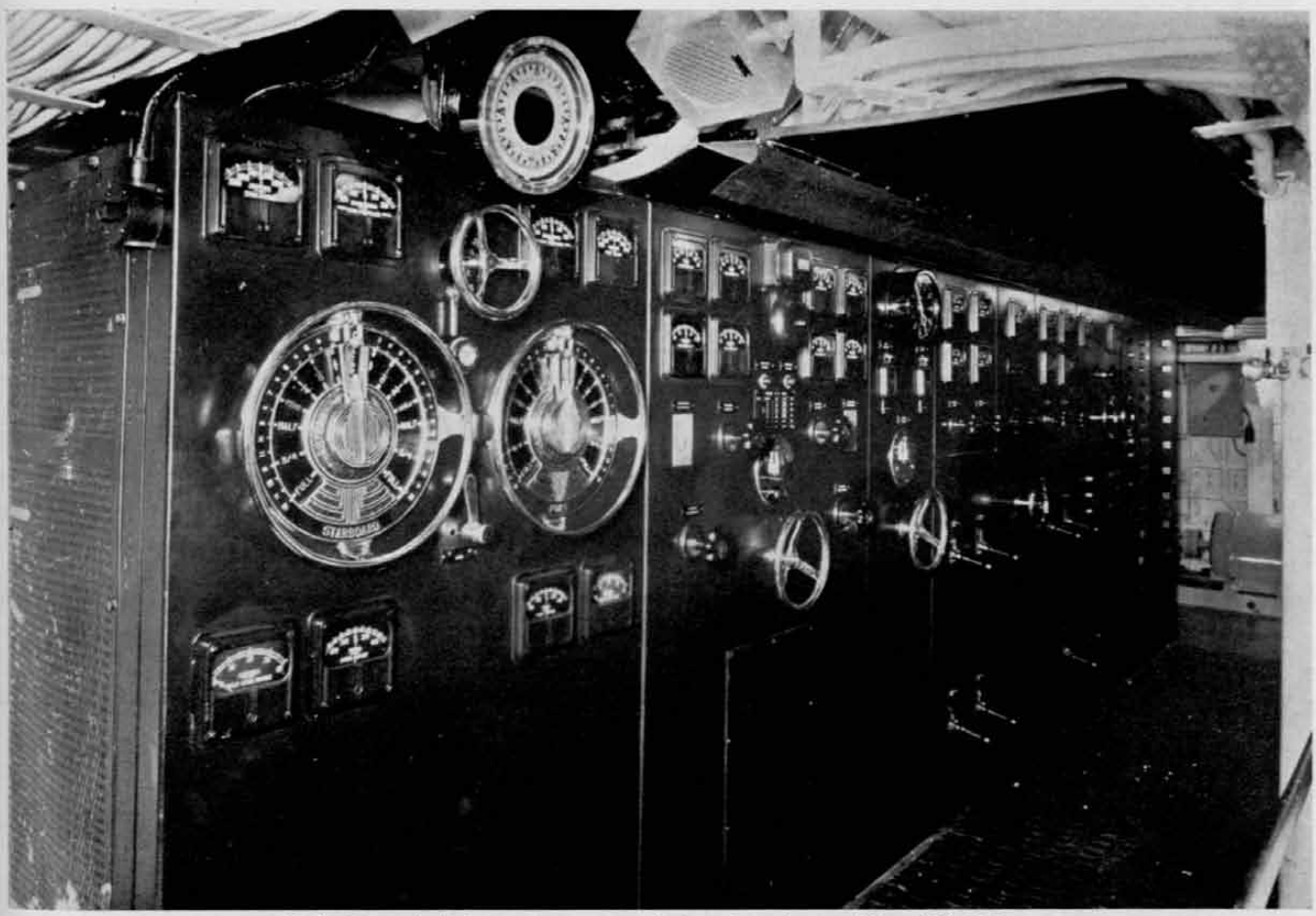
It is generally conceded that a mine planter should have ample power in her main engines, not so much for speed while cruising but for maneuvering. Since she has no contact with anything more substantial than water her "wheels" must act as brakes as well as to propel the vessel and must also augment the steering gear on quick turns during which one engine goes full ahead and the other full astern.

Cost, while an important factor is not the deciding influence as these vessels are closely comparable to a naval vessel, and must above all accomplish their mission.

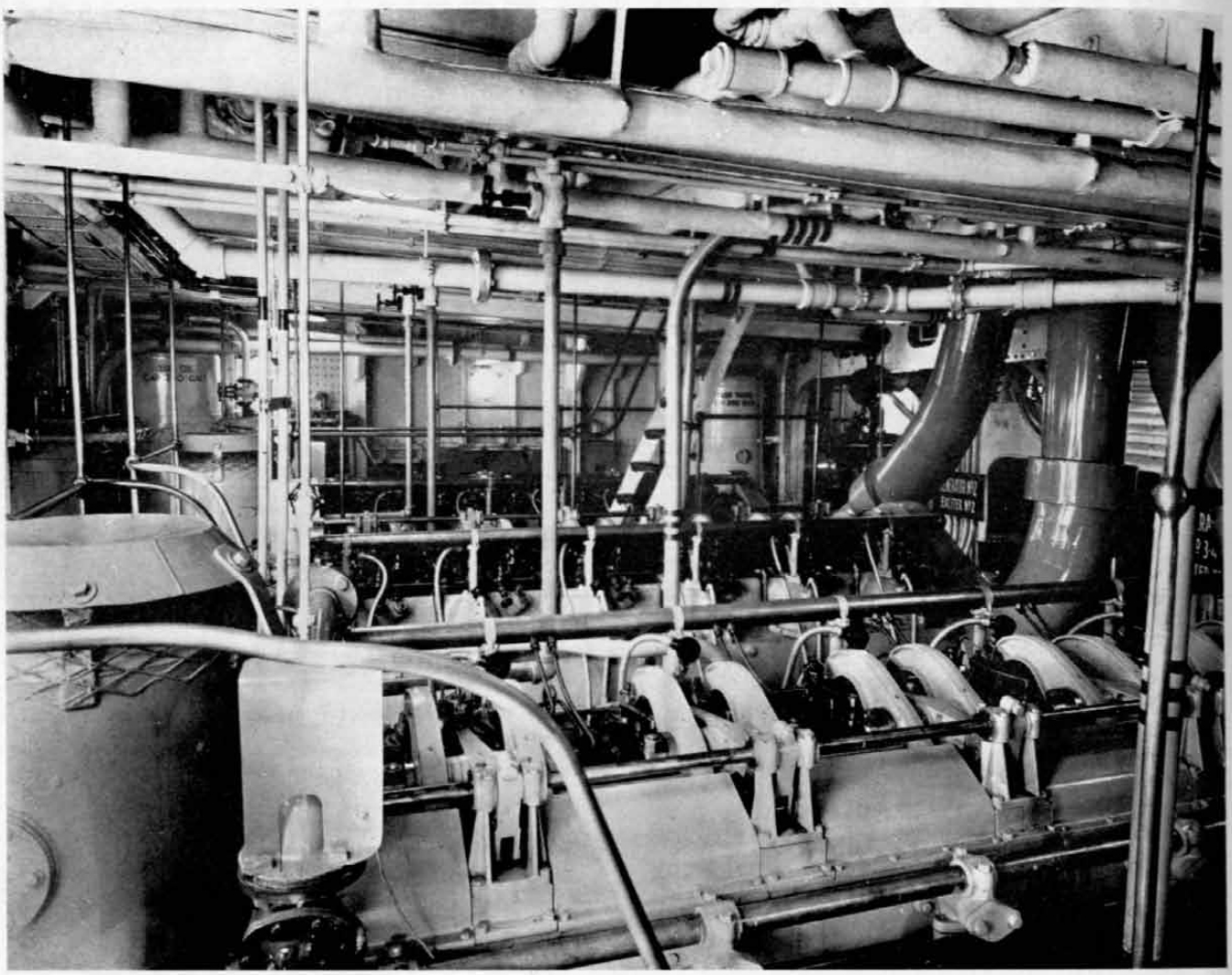
There are two (or perhaps more strictly speaking, three) general methods which may be used to power vessels of the mine planter type. These are steam, using reciprocating or "up and down" engines; steam, using turbines; and Diesel engines.

The reciprocating steam engine is without doubt the simplest and most reliable of the three methods. More than thirty years of service rendered by several of those now in operation attest to these facts. The original drawback of coal-burning Scotch boilers has been successfully overcome by conversion to oil-burning express-type water tube boilers. Boilers themselves may be considered an objection to the use of steam engines but with later types very little trouble is experienced; the chief problem is to keep down scale on the water side. Scale has been largely overcome in the later commercial installations by pretreatment or distillation of boiler feed water before it is used. There is a certain amount of unavoidable upkeep on boilers but the outlay is quite modest.

Reciprocating engines are coupled directly to the propeller shaft and thus eliminate any problems on this score.



Switchboard of the engine room of the mine planter Ellery W. Niles.



The engine room of the mine planter Ellery W. Niles. *This vessel is powered by Diesel engines.*

They are easily reversible and extremely flexible, both desirable features. They may safely be thrown from full ahead to full astern merely by use of the valve link motion without touching the throttle and the steam acts as a soft brake on the propeller shaft and cushions the entire assembly (from engine to propeller) from shock or vibration. It may be possible that the time required to attain maximum torque from full ahead to full astern is less when using electric drive; but the difference, if any, is so small as to be negligible. The more sudden torque applied to the shaft by the electric drive is almost certain to set up crystallization from shock and whipping which will result in a high percentage of propeller shaft breakage. It is believed that no recorded instance of this mishap in the planters now in service is known.

In the matter of thermal efficiency the reciprocating engine is definitely below the Diesel, but it compares favorably with the turbine. In point of fact, one American manufacturer claims that his engine will equal or excel any turbine. The improvements in this field probably have equalled if not exceeded those made in the Diesel engine during recent years. An example of the use of these modern engines is shown by their installation in the Pennsylvania Railroad steamer *Princess Anne,* one of the few streamlined ferries now in service, as well as in other ships of this line, where it is understood they have met with marked success. The steam plant can utilize a much cheaper grade of fuel, and owing to this fact will probably excel the Diesel engine on a cost-per-mile comparison.

Maintenance and repair of the reciprocating engine requires only a minimum of effort and cost. The engines are of comparatively simple design and the parts have an extremely long life because they are not subjected to any sudden shock or strain and operate at a very low rotative speed.

Operation of the reciprocating engine presents no great difficulties, and this feature means a lot to the engineer on the job. Crews are picked at random from men of the harbor defense organizations and must be trained from the ground up. The turnover is large, and good oilers and firemen are hard to get and easy to lose, because the training they receive aboard mine planters enables them to fit in very nicely and at a higher salary on commercial ships. It is the policy to hold the enlisted crew to a minimum with the result that the loss of two or more trained person-

nel disrupts the routine of the remainder until new men can be broken in. This condition would probably become acute in wartime. It is therefore desirable that the personnel training period be short as possible.

The steam turbine has many features which make its use as a prime mover desirable but it also has many serious drawbacks from a marine standpoint. Its thermal efficiency is excellent; it has fewer parts than the reciprocating engine; and requires even less maintenance and upkeep. Its inherent characteristics of high rotative speed and use of extremely high steam pressure are serious deterrents to its use in mine planters. Speed at the propeller shaft must be reduced either by gearing, which is out of the question due to lack of flexibility, or by employment of electric drive, which requires installation of generator and motors. This adds greatly to initial cost and introduces the difficult problem of upkeep on motors, generators, switchboards, and control devices. Direct current commutators have a tendency to fly apart when turned at a high rotative speed, but it is possible that the entire problem of electric drive could be solved by use of alternating current machines. Turbines require speed governors, high pressure superheated steam, and high vacuum equipment, none of which are necessary in a reciprocating job. It is believed that turbine limitations outweigh the advantages. In addition these installations require more space than either of the other two types.

Diesel engines are undisputed champions from a thermal standpoint and their use eliminates the necessity for boilers, an advantage which is not to be lightly dismissed. But that lack of flexibility, which has prevented Diesel use in automobiles, is also the greatest deterrent to their use in mine planters. In order to employ them efficiently it has been deemed necessary to use electric drive with the undesirable features of high initial cost, high upkeep, difficult maintenance and operation. The Diesel engine does not function well on light loads because it is better adapted for steady running on full load. This is an undesirable feature which even electric drive has not entirely eliminated. While a more or less minor point, the Diesel engine is noisy in operation and sets up considerable vibration which makes it an unpleasant machine for close daily association. This feature is probably responsible for the ten per cent additional pay which west coast unions require for engineers serving on Diesel powered vessels.

The use of Diesel electric drive makes electrically driven auxiliary machinery imperative, whereas in reciprocating or turbine methods a choice is available between steam or electrically operated small machinery. The Diesel is entitled to some additional weight as a space saver, but this advantage diminishes with the increased space necessary for motors, generators, and switchboard. With the improvement in starting methods found in modern Diesel practice, it would probably be better to connect Diesel engines directly to the shaft, which would eliminate much of the initial cost and operating expense as well as greatly reduce the maintenance problem. The engines would operate just as successfully at variable speeds as on a variable load, since their chief characteristic is a tendency to run well only when both conditions of full load and constant speed are satisfied.

The electric drive job is the better method for pilot house control, but this feature may be had with either reciprocating or turbine engines without too much trouble. The advantage of pilot house control consists chiefly in a few seconds time-saving over the engine room telegraph method and the value of this is debatable. The master who can gauge his momentum to the fine point necessary to make this advantage of any material value must needs have keen perception indeed. Pilot house control was tried out by the San Francisco ferry boats and abandoned at the insistence of the Inspectors of the Bureau of Navigation and Steamboat Inspection after hearings on a few cases dealing with some matters of carrying away pilings, docks, and so on, during the course of making a landing.

A tabulation of the various good and bad points inherent in each of the foregoing powering methods, with more or less arbitrary ratings, may be of some assistance.

	Reciprocating	Turbine	Diesel
Ability to perform mission	Excellent	Excellent	Excellent
Initial cost	Low	High	High
Upkeep	Low	Moderate	High
Thermal efficiency	Very good	Very good	Excellent (offset by higher fuel cost)
Operation	Excellent (Due to simplicity)	Very good (Simplicity offset by use of electric drive)	Fair (Difficulty with fouling at idling speeds or on light load)
Flexibility	Excellent	Very good (Using electric drive)	Fair (Too much sacrifice of other principles)

	Reciprocating	Turbo-electric	Diesel Electric	Diesel. Direct connected 2 stroke cycle
Simplicity. Maintenance and Repair	Excellent	Very good	Fair. Many moving parts in addition to electrical equipment	Very good
Personnel Procurement	Excellent. Short training period. More men available, with previous experience.	Very good. Longer training period required due to electrical devices.	Fair. Longer training period. Principles of internal combustion coupled with electrical devices must be taught.	Very good. Slightly longer training period than with reciprocating due to more complicated design.

The foregoing is based in the main upon practice rather than theory, but the reader can draw his own conclusions For my part I'll take steam, and I mean reciprocating engines.

BEACH DEFENSE: A Solution to the Fire Control Problem

By Lieutenant J. H. Twyman, Jr., Coast Artillery Corps

A couple of years ago the 4th Coast Artillery started tests at Fort Amador, Canal Zone, to determine whether minor caliber armament could fire accurately using a locally constructed predictor system, without the use of plotting boards and time interval apparatus. During these tests, which began in December, 1937, all fire control equipment—except the range finder—was improvised. The armament used included 155-mm. guns and 6-inch guns.

Now that six practices have taken place during a period of two years with more than satisfactory results, it is believed that the system is sound and worthy of adoption.

Since all practices fired were based on the procedures and equipment used in the first practice, that one will be described in great detail. The subsequent practices will not be gone into so elaborately.

The Problem

(1) Case II to be used.
(2) No equipment to be furnished except a DPF or CRF.
(3) Fire to be opened at maximum range.
(4) Target to be incoming, at the minimum VTG angle permitted by safety.

The solution of the problem necessitated improvisation of some form of predictor, that would correct for height of site, displacement of the DPF from the directing point, and predict for the travel of the target in range during the time of flight and dead time. It was decided to set this predicted range on a range percentage corrector, which would permit ballistic and arbitrary corrections, and provide a range-elevation relation for the guns. It was further decided to eliminate a time interval system, and fire the guns whenever they were ready. This called for a continuous flow of data.

The Solution

The "predictor" developed consisted of a tape mounted on a pair of rollers in a small box. This tape was graduated in elements of predicted range, using as arguments the DPF (uncorrected) range and rate of range change in yards per second, for any DPF range and any speed of target. The height of site and displacement from the DPF of the directing point were algebraically added to this predicted range on the predictor. (Fig. 1.)

The following assumptions were made:

(1) Dead time ten seconds.
(2) Target incoming.
(3) Closest practical reading twenty yards.
(4) Normal charge.

To compute a typical prediction: (Fig. 2.)

Range 14,640 yards

Time of flight forty-seven seconds (Firing Tables 155-B-3)

Time of flight plus dead time fifty-seven seconds.

Rate of range change five yards per second

Travel equals 5 x 57 or 285 yards (minus, as target incoming)

Displacement correction minus 320 yards

Height of site 150 feet; correction equals forty-eight yards minus

Total correction equals 285 plus 320 plus forty-eight or 653; use 660 (minus)

Predicted range equals 14,640 minus 660 or 13,980 yards *ANSWER.*

For simplicity, the tape was graduated only for incoming targets, and the limit of rate of range change was established by the known maximum speed of the towing vessel. However, if an all-purpose tape had been desired, another set of figures could have been added for outgoing targets, and the rate of range change extended as far as necessary. For example, if the target in the preceding illustration were outgoing, all other conditions remaining the same, the predicted range would be 14,640 plus 285 minus 320 minus 48, equalling 14,557 or 14,560 yards. This figure could be entered in the same space with the 13,980 for an incoming target, in a different colored ink.

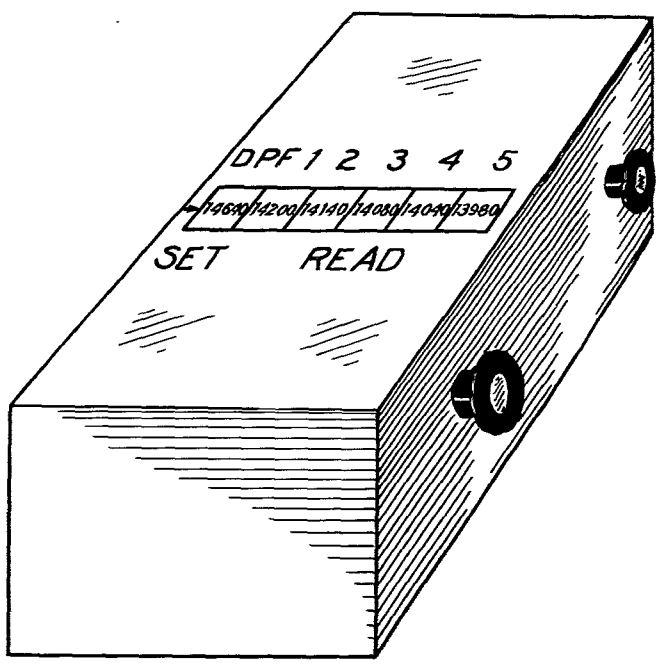


Figure 1: The "predictor"

DPF RANGES	RATE OF RANGE CHANGE, YDS. PER SEC. 1	2	3	4	5
14640	14200	14140	14080	14040	13980
14660	14220	14160	14100	14060	14000
14680	14240	14180	14120	14080	14020
14700	14260	14200	14140	14080	14020
14720	14280	14220	14160	14100	14040
SET	READ IN PROPER COLUMN				

Figure 2: A typical section of the tape

Displacement was assumed as the average for the field of fire. For batteries with a wide field, displacement could be eliminated from the predictor and, by use of an azimuth difference chart or similar device, applied from time to time on the ballistic scale of the range percentage corrector.

The errors introduced by not taking a second approximation from the firing tables for a more accurate solution of the predicted range were not considered serious enough to warrant the extra labor involved.

Operation

To operate the system: The observer kept the target waterlined constantly, halting every four or five seconds to allow the reader to phone the data to one predictor operator. This man set the DPF range in the left hand column against his index, and operated a stop watch in order to determine the rate of range change. He made this check every twenty to thirty seconds, and gave the rate to the second operator, who read the predicted range in the proper column to one of the range percentage corrector operators. The latter kept his tape set to the predicted range, and the second percentage corrector operator set ballistic and arbitrary corrections and read the elevation in degrees over the data line to the guns. The effect was to have a continuous flow of data, as each reading was about five seconds apart; no "repeat" was used, as a man waited for the next reading if he missed one. The estimated dead time for a DPF reading to be corrected and set on the guns was ten seconds. Guns fired on the next reading after "ready" and "set." The total range section, not including recorders, consisted of one officer and four enlisted men. (Fig. 3.)

The Results

Fire was opened at an actual range of 14,830 yards, against a maximum firing table range of 14,900 yards, normal charge. The average rate of range change was three yards per second, which gave a maximum prediction of 560 yards. Gun pointers were given an initial deflection, and thereafter "jumped" their splashes. Although no time interval system was used, the guns beat the K factor of fifteen seconds, firing staggered salvos. Adjustment was by the bracketing method. Out of twenty-four record shots, six broadside and sixteen bow-on hits were secured, for a score of 272.2 (believed to be a record for 155-mm. guns). No difficulties were experienced, but a few modifications were suggested, and tested in later practices.

Second Test

The next practice to be fired utilizing this system was the annual practice in May, 1938, of Battery D, 4th Coast Artillery, firing Battery Birney, 6-inch DC guns. This practice was unclassified, due to an unavoidable breakdown of the coincidence range finder assigned. It was an excellently conducted practice, and since the battery had previously fired a perfect mine practice, the results of the two gave Battery D the Knox Trophy for 1938.

The same setup was used as in the 155-mm. practice already described, with the following exceptions: Height of site was ignored, as this was incorporated on the range drums; and displacement was disregarded, since the range finder was near the directing point of the battery. Consequently, the predictor read only the range corrected for travel of the target in time of flight plus dead time. To quote from the battery commander's narrative report . . . "this system gave splendid results in subcaliber where the CRF was effective, and *matériel* hits on the small target were obtained in *every practice*."

Subsequent Tests

The next test worthy of note was another 155-mm. GPF practice fired by Battery I, in June, 1938. Supercharge was used instead of normal charge, and the first round was fired at an actual range of 17,820 yards. This excess over the firing table maximum of 17,400 was due

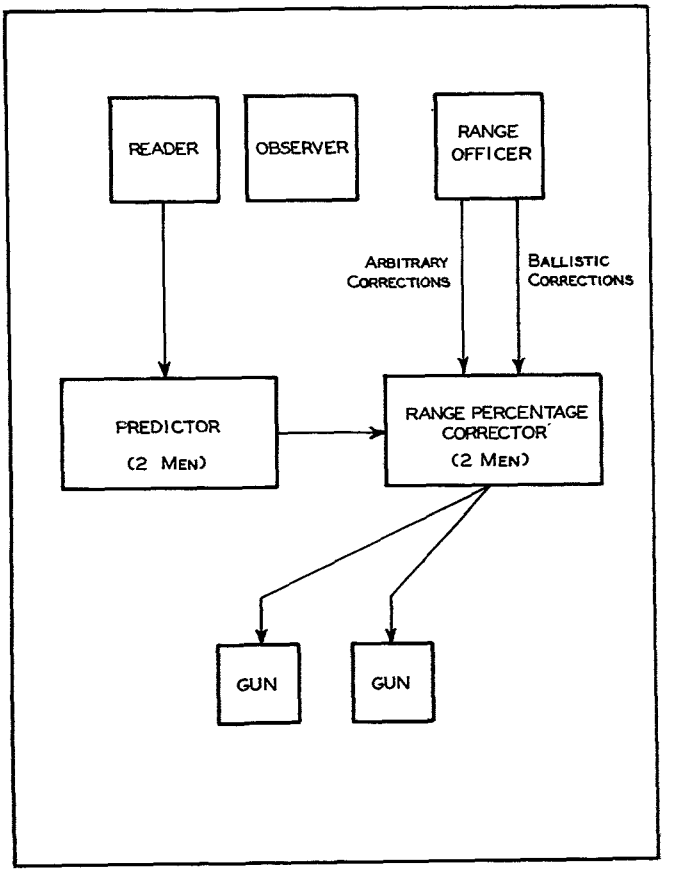


Figure 3: The range section

to a large ballistic correction. Conditions were the same as the first 155-mm. practice, except that the master gunner made height of site corrections on the range-elevation tape of the range percentage corrector, and as the DPF assigned was near the battery, displacement was disregarded. Therefore, as in the Battery Birney practice, the correction was only for travel of the target in time of flight plus dead time. Out of twenty-four record shots, seven broadside and twelve bow-on hits were secured, for a score of 170.1. It should be noted that this practice was scored under 1938 regulations, while the first 155-mm. practice used the 1937 score, which gave a higher result. Using the same formula for each, as a comparison, the practices were actually about the same in excellence.

Two other 155-mm. practices were fired during the next year, both by Battery G, using the same system. Inasmuch as nothing new was tried, it is not considered necessary to take the time and space to describe them. One fact only is worthy of note: in one of these practices the battery commander used a time interval apparatus, and fired on the bell. This definitely did not work so well for this system as the "continuous flow" idea, and was discarded in future practices of this type.

The last practice of all, Battery Smith, 6-inch DC, fired by Battery D, in June, 1939, was in many respects the most interesting of the tests.

The system used was basically the same as in the five preceding practices, except that the predictor itself was eliminated, being replaced by a rate of range change-percentage table. Time interval was discarded, and continuous data was provided. As in Battery Birney, height of site was included on the range drums, and displacement was negligible. Consequently, CRF range was set directly on the range percentage corrector, and the rate of range change, taken as usual by a man with a stop watch, was converted into a range percentage correction and added algebraically to the ballistic scale. It is interesting to note that the relation changed but slightly for an incoming target. Adjustment corrections were applied normally. The idea worked, and out of twenty record shots, four broadside and five bow-on hits were secured for a score of 168.5.

This modified system is sound, and should work very well for slow targets, at low ranges, in a limited field of fire. However, if the target were at maximum 155-mm. range, traveling at ten yards per second, the travel correction would be 3.68 per cent. This correction would fall off the ballistic scale of the standard range percentage corrector unless the scale were doubled, or a larger corrector constructed. These last two alternatives are impractical, as all tapes are printed in a standard scale, and a great deal of work would be required to construct a new scale of different size. Furthermore, for a battery requiring variable displacement corrections by means of an azimuth difference chart, these corrections would also have to be added to the ballistic correction, and such a system might break down as it is too susceptible of error. Therefore, it appears that a predictor is the only practical answer for batteries firing on long range high speed targets, especially if the range finder has to be relocated. For slow targets at low ranges, with a range finder near the battery directing point, the simplified system should prove satisfactory.

Conclusions

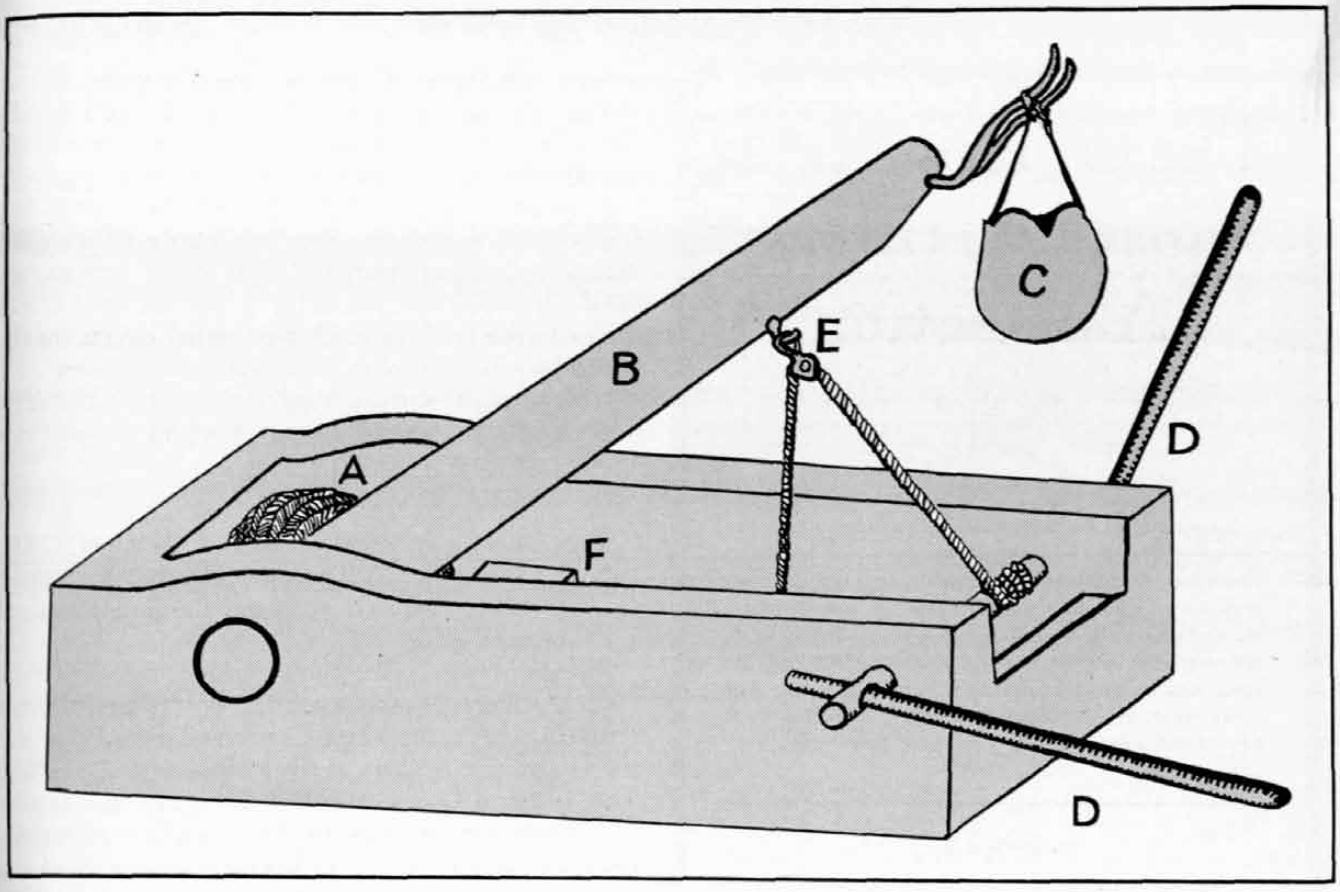
These six practices proved the merit of the locally constructed predictor system for rapid fire guns. All equipment needed is a range finder. Everything else, including the range percentage corrector, can be constructed by the battery personnel. This equipment is simple to understand, and easy to operate. A plotting board is too slow. A time interval system for rapid fire guns is believed impractical. The following suggestions are deemed sound and worthy of adoption by the service:

(1) All minor caliber fixed armament, and all minor caliber mobile armament on semi-permanent emplacements, should adopt a predictor system similar to that described in this article.

(2) Plotting boards and time interval apparatus should be discarded.

(3) Universal tapes should be issued, each type applicable to a particular class of armament. These tapes should be computed only for travel of the target during time of flight plus dead time, as height of site can be incorporated either on the range drums (for fixed guns) or on the range percentage corrector tape, and displacement, if necessary, can be corrected by the use of an azimuth difference chart. Furthermore, these tapes should carry two sets of figures, one for incoming and one for outgoing targets, in different colors, and the tapes should be extended to cover any expected speed of target. The tapes could be computed and constructed either locally or by the Coast Artillery Board, and then issued as required. Then all an organization would need to do would be to construct a box to house the tape, and provide a range percentage corrector with tape applicable to the particular battery.

(4) That short range armament should adopt a similar system to that used by Battery Smith, using a rate of range change-percentage chart in lieu of a predictor.



The Story of Artillery Through the Ages

By W. A. WINDAS

Chapter 6: THE SCORPIO

The Roman legion was well equipped with arrow-throwers and ballistae, one machine being designed for use against personnel, the other against structures.

But the ballista—even the 90-pounder—could not cope with a heavily-fortified city's main walls. Hence there was need for a more powerful engine, even at the sacrifice of mobility and the first answer to this requirement was the Scorpio. It received its name because, like a scorpion, it "carried its sting erect."

Like usual Roman engines, this was of the torsion type, the twisted skein of specially prepared rope or mule-gut being at A. The arm B was thrust through the skein which kept the arm pressed up and forward. At the top of this arm was a large hook (usually forked) from which hung a sling C. The winch at D pulled the arm back.

Cocking the machine put an additional fraction of a twist on the skein. The stone (or ball of lead) was placed in the sling, and the piece discharged by striking the pulley off the arm-hook at E. Note that one end of the cocking-rope is fastened to the frame, and passes over a pulley to the winch. This arrangement prevented undue "whipping" when the arm was released.

At discharge, the untwisting skein brought the arm smartly up and forward, until the latter's lower end struck the check-board at F. The sling, continuing forward, flipped over the end of the arm, throwing its projectile at high velocity.

The range and energy of this weapon considerably exceeded that of the ballista. It could hurl its 170-pound missile 600 yards.

The engine was quite heavy and once in position, it could not readily be shifted to bear on a new target. But this was comparatively unimportant in a weapon designed to break battlements.

Sometimes a wooden canopy-shield was erected to guard the "gunners" from enemy projectiles. This would seem to be the first recorded "gun shield."

After the time of Marius, the Romans altered the scorpio, replacing the sling with a ladle-like cup as an integral part of the arm. This and other modifications made the machine practically identical with the Greek ballista and the name in time was changed to Onager, or Wild Ass. This name was chosen because of a fallacious belief that the stones, kicked up by the heels of a fleeing donkey, were deliberately aimed at his pursuer.

Because of its greater range, the onager tended to replace the ballista for all stones of 50-pounds or larger, but the latter machine continued to be the favorite for smaller missiles, until the introduction of steel-tension engines, which revolutionized the whole Roman artillery system.

The United States Coast Artillery Association

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

The Coast Artillery Journal

MAJOR AARON BRADSHAW, JR., 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 the Chief of Coast Artillery or any other 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.

Election of Association Officers

The office of Vice-President and four places on the Executive Council have been filled by the election held recently.

Brigadier General William Ottmann, New York National Guard, was elected Vice-President to fill the office vacated by Colonel Avery J. Cooper whose term has expired.

The members of the Executive Council elected for the period January 1, 1940, to December 31, 1941, are:

Colonel F. S. Clark, CAC
Colonel C. S. Gleim, CAC, NYNG
Colonel E. A. Evans, CA-Res
Major A. V. Winton, CAC

The new officers replace Colonel E. C. Webster, CAC, RING; Colonel E. W. Thomson, CA-Res; Lieutenant Colonel R. M. Perkins, CAC; and Lieutenant Colonel J. P. Hogan, CAC.

Brigadier General Ottmann commands the New York Coast Artillery Brigade consisting of the 212th Coast Artillery (AA), the 244th Coast Artillery (TD), and the 245th Coast Artillery (HD). His service in the New York National Guard extends over the past two decades and he has long been an enthusiastic supporter of our Association. General Ottmann has been a member of the military staff of the Governor of New York since 1919. In civil life he is chairman of the board, the United States Printing and Lithograph Company, Brooklyn, New York.

Colonel Clark is on duty with the War Department General Staff. He is no stranger to the affairs of the Association for he served a four-year term as secretary-treasurer and editor during the difficult post-war years of 1919-1923 when the sledding was hard. His intimate knowledge of our affairs will prove a tower of strength.

Colonel Gleim commands the 245th Coast Artillery, New York National Guard. His thirty years of service began with the Infantry, but during the World War he found his proper niche in our Corps. Entering the Federal service as a first lieutenant he was soon promoted captain and commanded Battery E, 59th Artillery during the St. Mihiel and Meuse Argonne offensives. The end of the war found him in the grade of major. Affiliating with the National Guard shortly after his return from overseas he reached his present grade and command of the 245th two years ago. Colonel Gleim is a leading civil engineer, internationally known for his work in tunnel construction. He had a major rôle in the construction of the Hudson-Manhattan Tubes, the East River Tunnels and four water tunnels in Mexico. As engineer of construction on the Holland Tunnel he took a leading part in the completion of that famous artery of communication. He is now engineer of construction for the Port of New York Authority and has charge of all construction for that body including the new Lincoln Tunnel under the East River.

Colonel Evans of Los Angeles, California, commands the 203d Coast Artillery Brigade, Organized Reserves. Our readers will recall that Colonel Evans was regimental commander of the 977th Coast Artillery (AA) from

1929 to 1938 and that during his leadership the regiment won the Coast Artillery Association Trophy for excellence in Army Extension Course work. In civil life, Colonel Evans is a structural engineer, well to the forefront of his profession.

Major Winton recently came to Washington for duty in the National Guard Bureau as head of the organization section. He entered the Army in 1917 from the First Officers' Training Camp and since that time has seen variegated service at home and abroad. He is a graduate of the Battery Officers' Course and the Advanced Course of the Coast Artillery School, and the Command and General Staff School.

The number of ballots cast this year again exceeded those of previous years. This is truly indicative of the healthy growth of member interest in the affairs of our Association.

We congratulate the newly-elected officers and bespeak for them the same coöperation that has contributed so much to the work of the Association during 1939.

To the retiring officers, the Association extends its sincere thanks for their hearty coöperation and help. Their assistance has been a material factor to our success during their terms of office.

Essay Competition

The judges have completed their deliberations and have announced the results in the 1939 prize essay competition. In addition to selecting the winner the judges awarded honorable mention to one essay.

The winning essay is "National Defense and Antiaircraft Defense" by Major Thomas R. Phillips, Coast Artillery Corps. Major Phillips receives the Association's award of two-hundred dollars.

The honorable mention essay is "National Guarding the Harbor Defenses" by Major Bedford W. Boyes, 250th Coast Artillery (TD), California National Guard. Major Boyes received the Association's award of one-hundred dollars.

The judges for the contest were:

Colonel Frank S. Clark, GSC.
Colonel Godwin Ordway, USA, retired.
Colonel C. H. E. Scheer, CA-Res.

Major Phillips' essay appears in this issue. Major Boyes' article will appear in a later number.

Prize Essay Winner

By a unanimous vote the judges have declared the prize winner in the 1939 essay competition to be "National Defense and Antiaircraft Defense" by Major Thomas R. Phillips, Coast Artillery Corps. To him goes the Association's check for two-hundred dollars and to the JOURNAL'S pages an article that marks a milestone in military literature.

Major Phillips' essay therefore gets the lead position in this issue of your magazine. But we strongly suspect that his article would have occupied our opening pages had it reached us by the customary channels through which manuscripts flow to the editorial desk. For "National Defense and Antiaircraft Defense" is an able and penetrating study of the United States antiaircraft problem. Moreover, to judge by the comment that has already appeared in the press we are not venturing very far out on a limb when we predict that Major Phillips' essay will serve as benchmark on the air warfare map for years to come.

PORTRAIT OF AN AUTHOR
Major Thomas R. Phillips, winner of the 1939 prize essay competition.

Now, a word about the author; although this is hardly necessary for his name is known to all who only casually thumb military literature. He was born in Wisconsin on January 27, 1892, although he later transferred his home place to the state of Washington. He opened his military career by winning an appointment as second lieutenant, Coast Artillery Corps, Washington National Guard, on February 1, 1917. The date is important, for exactly three weeks later—on February 21, 1917—he was promoted to the grade of captain. In June of 1917 he accepted appointment as second lieutenant, Coast Artillery Corps, in the regular establishment and before the war was won had risen to the grade of major.

Among the military schools from which he has graduated are the Coast Artillery School Battery Officers' Course (1929), the Air Corps Tactical School (1928), and the Command and General Staff School (1936). Major Phillips is on duty as an instructor at the Command and General Staff School, Fort Leavenworth.

Major Phillips' reputation as an author has been earned by extensive writing not only for the JOURNAL of his arm but also for virtually all service publications of the United States Army. Several of his articles have been reprinted in full in the foreign military press and a considerable number have elicited editorial comment in French, British and German military publications. In addition to this,

he has found time to contribute to the *Saturday Evening Post* to give the layman a picture of modern war. Recently off the press is his book *The Roots of Strategy* and he is now hard at work on material that will shortly appear in print and which we hope to set before you.

Major Phillips has earned the congratulations of the Association and the thanks of our citizens for a material contribution to the literature of modern war.

Battery Fergusson—Battery Kessler

The JOURNAL is happy to announce that the War Department has honored the memory of two distinguished Coast Artillerymen by naming batteries at Fort Tilden, New York in honor of Brigadier General Frank K. Fergusson and Colonel Percy M. Kessler. General Fergusson died July 17, 1937. Colonel Kessler died September 15, 1935.

Both of these officers graduated from the U. S. Military Academy in the class of 1896 and were commissioned second lieutenants of Artillery. From that date until the date of their deaths they served with distinction at a large number of Coast Artillery stations in addition to occupying staff positions of great responsibility. Both were outstanding in the Coast Artillery Corps, and their names are associated with Coast Artillery activities in the New York area. General Fergusson died while in command of the Second Coast Artillery District, where the batteries were part of his command. Colonel Kessler died while in command of the Harbor Defenses of Sandy Hook in which these batteries are included.

It is particularly fitting to name these batteries, so closely related in the New York defense scheme, for two officers so closely associated with each other, the Coast Artillery Corps, and with these particular units of the defense.

Colonel Kessler was awarded the Silver Star and cited "For gallantry in action against insurgent forces in Manila, Philippine Islands, February 5, 1899."

Brigadier General Fergusson had been awarded the Distinguished Service Medal, "For specially meritorious and conspicuous service as Commandant of the Coast Artillery Training Center at Fort Monroe, Virginia. He rendered specially meritorious and conspicuous service in organizing and administering that center and in the preparation and execution of the plans for the organization, training, and equipment of the units of Coast Artillery for overseas service."

Germany's Aerial Westwall?

From *U. S. Naval Institute Proceedings*. Digest of an article in *Aviation*.—Keep your eye on the German attempt to prove (or is it for home consumption only) that an aerial Westwall can be set up that will be next to impassable for enemy ships. Instead of concentrating most of her air defense forces around probable targets, which is the system that has generally been followed, Germany is keeping hers up near the frontier in what she calls the West Air Defense Zone. If it works as well as the Germans think it will, the air strategy textbooks will have to be revised, as they all claim that defense of a frontier against air attack is so impossible that there's no use considering it seriously. The Germans have gone ahead on an elaborate permanent setup designed to prove the experts are wrong.

The backbone of the Air Defense Zone is a line of heavy antiaircraft guns (probably the 88-mm. that showed up so well in Spain) running from Switzerland to the North Sea. These are supposed to be thick enough to bring five or six guns to bear on any spot up to about 20,000 feet. Combined with them are lighter guns to take care of low attacks, and the usual array of searchlights and sound detectors. Light mobile antiaircraft units are also scattered around the fairly wide stretch between the Air Defense Zone and the front. Balloon barrages are also used—the Italians report that the Germans have been working on a variation of this idea by exploding the balloons from the ground like mines instead of depending on the attackers being brought down by running into the cables.

Just how effective the zone has been so far can't be said. British and French claims that it never touched them can be taken with a couple of grains of salt. Of more importance are the official German lists of enemy ships brought down, for these include a couple knocked off a long way behind the supposedly airtight zone. Just how it can hope to be effective in thick weather is one for the Germans to answer.

Behind the heavy antiaircraft guns come fields for fighters; in this part of the zone are a number of searchlight companies specially trained in cooperation with them. Apparently the Germans have not gone in heavily for the elaborate underground hangars that have been mentioned here and there. Instead they will depend on scattering their ships over a lot of small fields, which they figure will make destroying many of them on the ground a big job.

One possible by-product use of the Air Defense Zone that the Germans are counting on is employing the antiaircraft guns against a ground advance if one gets that far. They claim that at Balboa in the Spanish war the heavy antiaircraft units of the Condor Legion had to double as field artillery for Franco, and turned out to be very effective due to their high rate of fire. The guns in the Air Defense Zone have been mounted and protected with this use as a backstop in mind, and this may even have had something to do with the decision to concentrate so much antiaircraft up near the front.

Greetings from the Chief of Staff

The holiday greeting from General George C. Marshall, Chief of Staff, reproduced on the next page was received too late for inclusion in our November-December issue. Nevertheless, we voice a hearty—if belated—return greeting to the Chief of Staff on behalf of all members of the Coast Artillery Corps.

WAR DEPARTMENT
OFFICE OF THE CHIEF OF STAFF
WASHINGTON

December 18, 1939.

Major General Archibald H. Sunderland,
Chief of Coast Artillery,
Washington, D. C.

Dear General Sunderland:

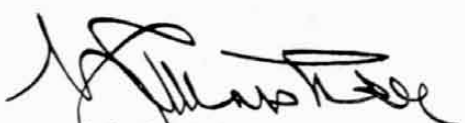
My Christmas greetings and good wishes for the New Year to you and the personnel of the Coast Artillery Corps, and my thanks and appreciation for the fine work and loyal support of your corps during these critical months.

The past year has been epochal in the peace-time history of the Army, first involving a major augmentation for the Air Corps and defenses of the Canal Zone, and recently the expansion, corps organization and concentration of ground forces and the reinforcement of both the commands in Panama and Puerto Rico. The furtherance of this program has made unusual demands upon the Army, and the whole-hearted response of all ranks to every demand has been an inspiration and profound gratification to the War Department.

We face the New Year with complete confidence in the ability of the Army to provide for the National Defense.

A Merry Christmas and a Happy New Year to each member of your corps.

Faithfully yours,



Chief of Staff.

New Field Manuals

A new series of Coast Artillery Field Manuals and one new Training Manual are to be published in the near future. These manuals are to replace the existing Coast Artillery Field Manual, Training Regulations, and most Special Texts. It is planned that they will be published under the following titles:

COAST ARTILLERY FIELD MANUALS

FM 4—5, CAFM Seacoast Artillery—Organization, Training and Tactics.

FM 4—10, CAFM Seacoast Artillery — Gunnery (present TM 2160-30-revised).

FM 4—15, CAFM Seacoast Artillery—Fire Control and Position Finding (present revised Special Text No. 32).

FM 4—20, CAFM Seacoast Artillery — Formations, Inspections, Service, and Care of Matériel.

FM 4—25, CAFM Seacoast Artillery—Service of the Piece, 155-mm. Gun (present TR 435-184).

FM 4—35, CAFM Seacoast Artillery—Service of the Piece, 14-inch gun, M 1920 MII on Railway Mount M-1920 (present TR 435-227).

FM 4—40, CAFM Seacoast Artillery—Service of the Piece, 12-inch Mortar, Railway Artillery (present TR 435-230).

FM 4—45, CAFM Seacoast Artillery—Service of the Piece, 12-inch Gun (Battignolles) Railway Artillery (present TR 435-234).

FM 4—50, CAFM Seacoast Artillery—Service of the Piece, 8-inch Gun, Railway Artillery (present TR 435-235).

FM 4—55, CAFM Seacoast Artillery—Service of the Piece, 12-inch Mortar (Fixed Armament) (present TR 435-255).

FM 4—60, CAFM Seacoast Artillery—Service of the Piece, 12-inch Gun (Barbette Carriage) (present TR 435-260).

FM 4—65, CAFM Seacoast Artillery—Service of the Piece, 10-inch Guns (Disappearing Carriage) (present TR 435-265).

FM 4—70, CAFM Seacoast Artillery—Service of the Piece, 6-inch Guns (Disappearing Carriage) (present TR 435-266).

FM 4—75, CAFM Seacoast Artillery—Service of the Piece, 6-inch Guns (pedestal mount) (present TR 435-267).

FM 4—80, CAFM Seacoast Artillery—Service of the Piece, 12- and 14-inch Guns (Disappearing Carriage) (present TR 435-270).

FM 4—85, CAFM Seacoast Artillery—Service of the Piece, 16-inch Guns and Howitzers (present TR 435-275).

FM 4—90, CAFM Seacoast Artillery—Service of the Piece, 3-inch Rapid Fire Guns (Pedestal Mount) (present TR 435-276).

FM 4—105, CAFM Antiaircraft Artillery—Organization, Training and Tactics.

FM 4—110, CAFM Antiaircraft Artillery—Gunnery, Fire Control and Position Finding (Special Text No. 26 as a basis).

FM 4—115, CAFM Antiaircraft Artillery — Searchlights, Sound Locators and Accessories.

FM 4—120, CAFM Antiaircraft Artillery — Formations, Inspections, Service and Care of Matériel.

FM 4—125, CAFM Antiaircraft Artillery—Service of the Piece, 3-inch Antiaircraft Guns (present TR 435-205).

FM 4—130, CAFM Antiaircraft Artillery—Service of the Piece, 105-mm. Antiaircraft Guns.

FM 4—135, CAFM Antiaircraft Artillery — Marksmanship and Service of the Piece, Antiaircraft Machine Guns.

FM 4—140, CAFM Antiaircraft Artillery—Service of the Piece, 37-mm. Antiaircraft Guns.

FM 4—150, CAFM Examination for Gunners (present TR 435-310).

FM 4—155, CAFM Reference Data (applicable to both Seacoast and Antiaircraft Artillery).

NEW TRAINING MANUAL

TM 2160-105, Coast Artillery Ammunition.

Adjustment by the Magnitude Method

By Captain Perry McC. Smith, C.A.C.

The following variation from the procedure outlined in paragraph 43, Coast Artillery *Field Manual,* Volume I, Part 2, has been found of great value in training inexperienced personnel in the magnitude method of fire adjustment and has saved considerable time in the application of corrections. By this method, the old bugbear of applying corrections in the wrong direction is apparently removed because the elimination of the "axis of correction" has done away with the source of this too-frequent error. The procedure has been approved as satisfactory and optional by the Chief of Coast Artillery.

The system might be termed the "corrections spotted" method, in contradistinction to the present "deviations spotted" method. The spotting board is modified by pasting scales over the graduations on the board so as to keep 300 as normal, but to make overs range from 300 to

o and shorts range from 300 to 600. Similar scales make rights show as less than 300 and lefts as over 300. Hence, each spot will appear on the spotting board as the correction which would have placed that shot on the target.

These spots are placed on the fire adjustment board as read from the spotting board. The operators of the adjustment boards then have a series of corrections, and by taking the center of impact of any desired number of shots or salvos, the reading of the fixed reference scale opposite that center of impact is the correction necessary to bring that center of impact on the target. To facilitate reading successive corrections, the reference graduations of the fixed scale should be repeated every inch or so vertically down the adjustment board. Thus the movable scale becomes merely a device for placing the corrections for the spotted deviations on the fire adjustment board, and its use for reading corrections is eliminated. So, too, the "axis of correction" may be omitted, as the original line of targets is along the 300 line, and each successive line of targets (positions of the normal-300-of the movable slide) is the vertical line drawn through the last center of impact used for making corrections.

In operation, therefore, the spotting board operators follow their usual routine. The readings sent to the fire adjustment boards, however, are opposite in sense to those used at present. The adjustment board operator (range or deflection), starting with 300 as the original line of targets, plots the spots (corrections) as received from the spotting board. When a correction is indicated, he computes the center of impact of the shots considered, as in the present method. He then reads the figure on the fixed reference scale at that center of impact to the range percentage corrector or the deflection board, draws a vertical line to indicate the new line of targets, and moves the zero of the movable scale to this new line of targets for subsequent shots or salvos. The time ordinarily consumed in moving the zero of the movable scale to the new line of targets and reading carefully the correction called for on the axis of correction is thus saved, frequently permitting corrections to be applied one salvo sooner than under the present method of adjustment.

World Navies

The following figures on the navies of the World Powers are taken from *U. S. Naval Institute Proceedings*, January, 1940:

UNITED STATES

Type	*Underage*	*Total*	*Building*
Capital ships	14	15	8
Aircraft carriers	5	5	2
Heavy cruisers	17	17	1
Light cruisers	17	17	8
Destroyers	54	221	43
Submarines	22	89	25

GREAT BRITAIN

Type	*Underage*	*Total*	*Building*
Capital ships	18	18	9
Aircraft carriers	7	9	7
Heavy cruisers	15	15	0
Light cruisers	24	47	25
Destroyers	107	178	37
Submarines	45	55	18

JAPAN

Capital ships	10	10	3
Aircraft carriers	11	11	2
Heavy cruisers	12	17	0
Light cruisers	15	22	5
Destroyers	75	111	9
Submarines	40	59	3

FRANCE

Capital ships	7	7	4
Aircraft carriers	2	2	2
Heavy cruisers	7	7	0
Light cruisers	11	11	3
Destroyers	70	71	30
Submarines	75	75	27

ITALY

Capital ships	4	4	4
Aircraft carriers	0	0	0
Heavy cruisers	7	7	0
Light cruisers	12	14	14
Destroyers	100	130	12
Submarines	98	105	28

GERMANY

Capital ships	5	7	4
Aircraft carriers	0	0	0
Heavy cruisers	2	2	3
Light cruisers	6	6	4
Destroyers	32	44	10
Submarines	50	50	21

Index

We have in process of preparation an index to the COAST ARTILLERY JOURNAL that will show by subject and author all articles printed since the JOURNAL was first published. The index will be exhaustively cross-referenced and when completed will be a complete guide to our pages for nearly half a century.

Old-timers will recall that to begin with our title was *Journal of the United States Artillery* and that our first number came off the press in January, 1892. In July, 1922, we adopted our present name of the COAST ARTILLERY JOURNAL. Our index begins with the January, 1892, number and will be worked up to the present.

We expect to complete the index within a month or two. Thereafter we will be prepared to furnish reference lists on subject matter contained in the JOURNAL to all who can make use of such material.

Coast Artillery Board Notes

Any individual, whether or not he is a member of the service, is invited to submit constructive suggestions relating to problems under study by the Coast Artillery Board, or to present any new problems that properly may be considered by the Board. Communications should be addressed to the President, Coast Artillery Board, Fort Monroe, Virginia.

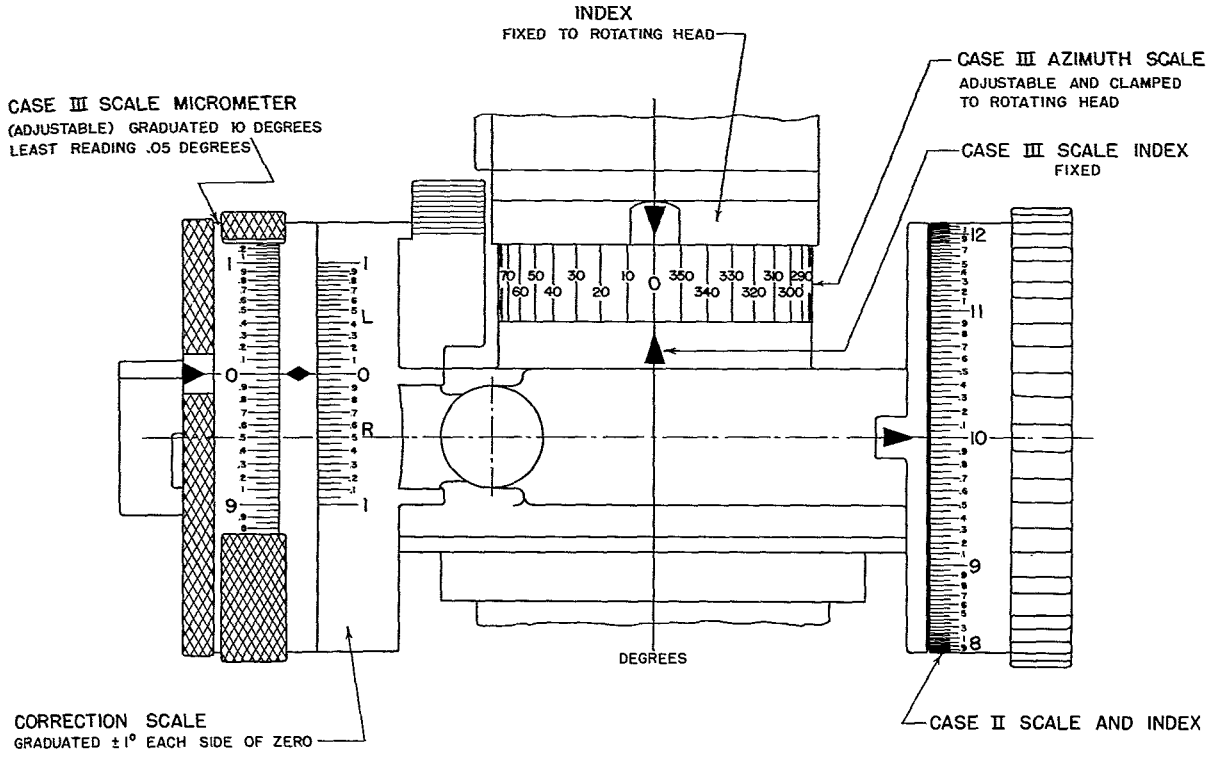
ANGULAR UNITS FOR 155-MM. GUNS. (COAST ARTILLERY BOARD STUDY.) Questions in regard to the angular units to be used with 155-mm. batteries have arisen at various times since the adoption of these guns as harbor defense weapons. Two types of sighting equipment have been developed. Sights and mounts employing degrees and hundredths for direction, and degrees and minutes for elevation have been adopted as standard for the 155-mm. guns in Panama. Another type standardized for use elsewhere, including the mobile 155 regiments, employ mils for both direction and elevation. Having differing sighting equipment for the same weapon has been disadvantageous from a procurement standpoint. Furthermore, except for those in Panama, the 155-mm. guns are now the only seacoast weapons utilized in harbor defenses which employ the mil as the azimuth unit. The use of other than a common azimuth unit for all seacoast artillery introduces difficulties in connection with intelligence and target assignment, as well as requiring the provision of fire control instruments to handle the extra unit. For example, two types of azimuth instruments have been supplied, one reading in mils and the other in degrees and hundredths. Azimuth data from a depression position finder cannot be utilized by 155-mm. guns unless a conversion is made from degrees and hundredths to mils.

For the reasons noted, unification of the angular unit for all 155-mm. batteries in the hands of the Coast Artillery Corps has been considered desirable, with the degree system preferred for azimuth measurement. The problem has been complicated by the availability of stocks of mil equipment, including M1918 azimuth instruments, and the fact that the degree graduated panoramic sights developed for 155-mm. guns in Panama have not proven entirely satisfactory. These sights have limb scales graduated to one degree, which results in a spacing of graduations hardly sufficient for facility and positiveness in setting. Proper spacing using this method of graduation would require an unduly large diameter limb.

The development of the Panoramic Telescope T2 for both Case II and Case III pointing of 155-mm. guns has afforded an opportunity for introducing a unified system of angular measure in azimuth. This instrument is described in the November-December, 1938, issue of the JOURNAL. The telescope, modified to employ degrees in place of mils as the angular unit, and with an additional subdial for Case II, has now been standardized as Panoramic Telescope M8. The arrangement of the scales of the telescope is shown in Figure 1. It will be noted that the limb is graduated to ten degrees while the micrometers carry ten degrees with a least graduation of .05 degree. With this arrangement, suitable worm gear ratios and spacing of graduations are obtained, without excessive diameters of either limb or micrometer scales. It is planned eventually to provide the Telescope M8 for all 155-mm. guns manned by the Coast Artillery Corps. The telescope can be installed on either the Telescope Mount M4 (degrees) or the Telescope Mount M6 (mils).

In its study, the Board considered the effect of adopting the degree unit for mobile 155-mm. regiments. These may be employed in land warfare, possibly with Field Artillery, which uses the mil unit. It was concluded that any difficulties due to the use of the degree unit would be minor because of the comparative simplicity of fire control against land targets, and the fact that fire control and intelligence data can be taken from grid maps in degrees and hundredths quite as readily as in mils.

The Board considered also the angular unit to be used for elevation. Unification in this feature is of minor importance with present fire control equipment. The relation between range and elevation is distinctive for each type of gun, or charge, and an individual device for setting up the relation, such as a percentage corrector tape, is required no matter what the elevation unit employed. However, the possible development of a mechanical computor for intermediate caliber guns points to the desirability of utilizing a common angular unit in elevation, as well as in azimuth, for these weapons. Otherwise a separate design



PANORAMIC TELESCOPE M8

ARRANGEMENT OF SCALES, INDICES AND MICROMETERS
FOR CASE II AND CASE III METHODS OF FIRING

FIGURE 1.

of computor may be required for 155-mm. guns, and for 6-inch or 8-inch guns. The standard seacoast data transmission system M5 employs the mil as the elevation unit. In view of this, and the fact that the mil has been found a convenient elevation unit generally, the Board recommended adoption of this unit of elevation for 155-mm. guns.

The policy in effecting the necessary changes in equipment, as approved by the Chief of Coast Artillery, is as follows:

(1) As rapidly as funds permit, all sighting and other equipment using the mil as the azimuth unit will be replaced with new or modified equipment employing degrees and hundredths as the azimuth unit.

(2) New elevation equipment will employ the mil unit, but existing elevation apparatus, such as the degree graduated sight mounts in Panama, will be retained in service.

IMPROVEMENT OF SPOTTING SET PH-32. In Coast Artillery Board Notes appearing in the May-June, 1939, issue of the JOURNAL, it was reported that the Chief of Coast Artillery had requested the Chief Signal Officer to undertake a redesign of antiaircraft spotting equipment with a view to eliminating certain troublesome features.

In accordance with this request, the Signal Corps submitted to the Board for test in December, 1939, two new photo-theodolites and an electric time interval device for synchronizing film records. Test of these instruments showed both to be very satisfactory. The camera movement in the new theodolites was considered to be greatly superior to that in the previous theodolite and it is believed that all defects noted in the latter have been eliminated successfully. The Signal Corps has awarded a contract for procurement of forty-two new theodolites and twenty-one electric time interval devices to the Mitchell Camera Corporation of West Hollywood, California.

The electric time interval device will be almost identical with the standard article listed in the Signal Corps *General Catalog* as Time Interval Device PH-73. The latter consists of two slow-acting relays, a rheostat, a milliammeter, a resistor and four switches assembled on a panel and mounted in a box 26½ inches long by 11½ inches wide by 5¾ inches deep. It is used for closing periodically an electric circuit to operate simultaneously time counters of two theodolites by means of which the photographic records of these theodolites are synchronized. While the impulse period in the electric device cannot be adjusted as accurately as in the metronome type time interval device, the former has the following advantages:

a. No mercury contact cups are needed as in the metro-

nome type, thus eliminating difficulties with mercury dip contacts and making supply of mercury unnecessary.

b. Electric device will operate in any position.

c. Electric device requires no winding.

d. Electric device requires maintenance of no mechanisms similar to the metronome clock.

A film viewer and editing machine called a Moviola will replace the projection equipment in the new spotting sets. Twenty-one of these devices, which are standard commercial products, have been purchased from the Moviola Company of Hollywood, California. A viewing microscope for use with the Moviola, instead of the viewing glass furnished as a standard part of the machine, is now being designed by the Signal Corps. This viewing microscope will include a reticle ruled with a grid of 10-mil squares similar to that on the metal projection screen now provided with projection equipment. The negative will be viewed directly through the microscope which will be designed so that the reticle grid may be rotated through the same angle as the camera prism. A mil scale inscribed on the circumference of the reticle grid will enable the operator to set the camera prism angle of elevation while looking through the viewing attachment. Movement of the microscope along the X and Y axes of the reticle grid will be provided for, to permit centering of the reticle on the target image. A magnification of about three-power is contemplated. The Moviola is operated either forward or backward by an electric motor with variable speed control. Although no shutter is used, the film is so controlled by a Geneva movement that the observer sees a conventional motion picture as the film runs through the Moviola. This feature has proved of value in detecting bursts whose images are indistinct on the negative.

Existing standard projectors do not produce a motion picture but permit only the laborious examination of single frames projected successively by hand operation. These projectors have been found to scratch the negative considerably as it passes through the machine while the Moviola can handle a negative repeatedly without scratching.

Standardization of the new type theodolite and time interval device and reclassification of the old type instruments as limited standard have been recommended by the Board. Replacement of existing equipment with new type instruments is not anticipated until the former has worn out.

EYEGLASSES WITH RED LENSES FOR ANTIAIRCRAFT AUTOMATIC WEAPONS BATTERIES. During recent tests by the Coast Artillery Board in connection with short range antiaircraft automatic weapons firings, the Board obtained locally several pairs of eyeglasses with red lenses. These glasses were used extensively by spotters, adjusters, and gunners (in individual tracer control) and were found to be much more satisfactory for observing the tracer stream than either glasses with lenses of other colors or binoculars with filters.

Under certain background conditions the tracers were visible through the red lenses when they could not be seen at all through amber glasses or with the naked eye. Under practically all conditions at least some improvement in tracer visibility was apparent with the red lenses.

As a result of its recent experience with eyeglasses with red lenses, the Board is of the opinion that such glasses are more satisfactory for spotters than Binoculars T-2 with filters, because the latter are heavy and awkward to hold and have an undesirably limited field of view which often makes it difficult to follow both target and tracer stream.

Tables of Basic Allowances for Coast Artillery Corps, January 1, 1939, provide for the issue of two pairs of eyeglasses, amber colored, per machine gun of antiaircraft, harbor defense, and tractor drawn units.

The Board recommended that:

a. No further steps be taken to provide Binoculars T-2 for spotters in antiaircraft automatic weapon fire units.

b. Tables of Basic Allowances for Coast Artillery Corps be amended to provide two pairs of eyeglasses with red lenses per machine gun in lieu of the amber-colored eyeglasses now authorized.

c. Four pairs of eyeglasses with red lenses be authorized per 37-mm. gun.

CALOBAR RAY FILTERS. The Coast Artillery Board recently tested a number of calobar ray filters, furnished by the Ordnance Department, with a view to determining whether they should replace existing standard filters used in telescopic lenses for Coast Artillery purposes.

Three calobar ray filters designed for the Elbow Telescope M2 were installed on the telescopes of a Tracker T1. Each calobar filter was of a different shade; light, medium and dark shades being provided. A second Tracker T1 was set up nearby and equipped with standard amber and blue filters in turn. Airplane targets were tracked simultaneously by observers at each telescope on both instruments. Tracking tests were conducted on different days and against differing sky backgrounds in order to obtain comparisons under various light conditions. Several sets of observers were used and each set was interchanged between instruments in order to obtain a record of individual opinions as to which type of filter was best. Extreme limits to which a target could be tracked were noted in an effort to learn whether individual observers were enabled to track at increased range through the use of a particular type of filter. Results of this test disclosed no advantages for calobar filters over the standard amber and blue filters.

The three calobar filters provided for the Azimuth Instrument M1910 were installed in three instruments which were mounted on tripods near a fourth azimuth instrument of the same type which was equipped with a standard amber filter. Various members of the Coast Artillery Board using each instrument in turn observed objects in water areas where bright sun glare was reflected from the surface. It was the consensus of opinion that the standard amber filter provided with the Azimuth Instrument M1910 appeared to be quite as satisfactory as any one of the calobar filters. Eye comfort, maximum range

of vision, clarity and definition of image, and reduction of glare seemed to be just as good for the amber filter as for the calobar.

An examination of light transmission curves for three shades of calobar glass and standard amber glass did not appear to indicate any important advantages for calobar glass as compared to amber glass. Because of the comparatively short periods during which observing instruments are used continuously by Coast Artillery troops, the difference between calobar and other types of glass is not considered sufficiently important to warrant a change from the standard filters with which such instruments are provided.

In reference to the manufacture of telescopic lenses from calobar glass it is considered desirable to use clear glass for this purpose to insure maximum light transmission under conditions of poor light. The use of removable filters which can be used at will to produce the desired effects in the optical system of the observing instrument is believed to afford the more satisfactory arrangement.

Based on the results of this test, the Board recommended that:

a. Existing standard filters for Coast Artillery fire control optical instruments not be replaced by calobar filters.

b. Calobar glass not be used in the manufacture of telescopic lenses for Coast Artillery purposes.

Advanced Technical Class, Coast Artillery School
1939-1940

Standing, left to right: Lieutenants Ogden, Chace, Cooper.
Seated, left to right: Captain Rutter, Lieutenants Fernstrom, Nelson

Coast Artillery Activities

OFFICE OF CHIEF OF COAST ARTILLERY

Chief of Coast Artillery
MAJOR GENERAL A. H. SUNDERLAND

Executive
COLONEL JOSEPH A. GREEN

Matériel and Finance Section
LIEUTENANT COLONEL H. B. HOLMES, JR.
MAJOR J. T. LEWIS
MAJOR S. L. MCCROSKEY
CAPTAIN C. V. SCHUYLER

Plans and Projects Section
LIEUTENANT COLONEL A. G. STRONG
MAJOR L. L. DAVIS

Organization and Training Section
LIEUTENANT COLONEL D. D. HINMAN
MAJOR AARON BRADSHAW, JR.
CAPTAIN J. E. HARRIMAN

Personnel
LIEUTENANT COLONEL K. T. BLOOD

☆ ☆

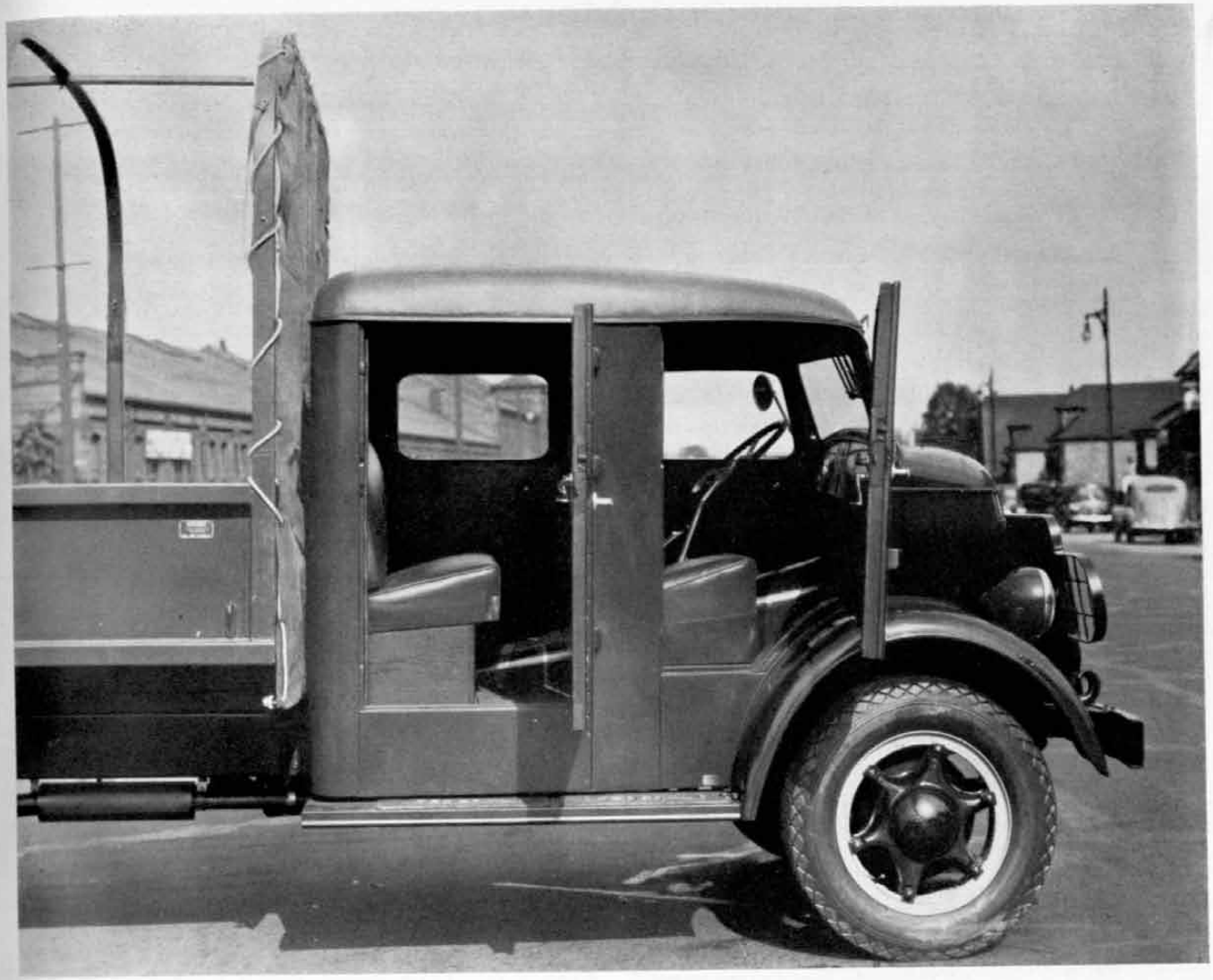
Notes from the Chief's Office

SEARCHLIGHTS AND SEARCHLIGHT EQUIPMENT

Transportation for 1939 antiaircraft searchlight equipment was discussed briefly under "Coast Artillery Board Notes" in the May-June issue of the JOURNAL.

As stated in the notes referred to, the 1939 equipment will be distributed in two trucks. Due to the reduction in weight and size of the new sound locator a trailed load for that article will no longer be necessary. The trucks supplied for this equipment are rated as medium 2½-ton vehicles, 6 x 4 (4 d.t.) with all steel body and a cab-over engine which provides space for four or five men in addition to the driver. Two views of the truck which was manufactured by the Federal Motor Truck Company, Detroit, Michigan, are shown in the illustrations. The flat floor of the body facilitates manufacture and the placing of equipment. Since there is room in the cabs of the two vehicles for an entire searchlight crew, no additional folding or detachable seats are required in the body.

The hold down devices will be bolted to the body and may be transferred to other trucks when required. These



fixtures provide definite and secure fastening for all essential articles of equipment including the sound locator, searchlight, power plant, controller and cable. The searchlight, power plant and cable reels will be held in place by turnbuckle fastenings. Ramps and block and tackle are provided for loading the searchlight and power plant. The ramps when in use will be fastened to the tail gate.

Due to manufacturing delay the hold down devices were not available when the trucks were delivered. It is understood, however, that deliveries will begin early in January. Instructions will be provided by the manufacturer to enable the organizations to complete this installation.

While the searchlight has been provided with pneumatic tires to provide against shock in transportation and to assist movement over rough ground, the searchlight should in no case be towed by a motor vehicle. The power plant is provided with an automobile type chassis and may be towed by a motor vehicle if reasonable care is used in turning corners and driving over rough ground.

Searchlights

The 1940 searchlights will be furnished in part by the Sperry Gyroscope Company and in part by the General Electric Company.

The Sperry equipment will be similar to 1939 and 1937 types except that the power plant is designed for single-speed operation for both listening and arc loads. This simplification has been made possible by improvement in sound proofing and quieting the power plant. The power and controller cable reels will be supported in an "A" frame type of rack instead of on warehouse reels as in recent models.

The 1940 General Electric searchlight and power plant will follow conventional lines but with certain differences in the lamp mechanism and distant control system.

Trucks for 1940 searchlight equipment will be similar to those described above. They are to be manufactured by General Motors.

Diesel Power Plant

The Chief of Engineers is purchasing for comparative test with gasoline powered equipment, a Diesel powered generating set. It is expected that the study and test of this set will permit further refinements of the characteristics of such plants in order that substitution of Diesel for gasoline motors may be made if the need for such substitution arises. It is also possible that certain locations may favor the use of a limited number of Diesel plants.

Fort Monroe

BRIGADIER GENERAL FREDERIC H. SMITH, *Commanding*

COLONEL WILLIAM S. BOWEN
President, Coast Artillery Board

COLONEL ELI E. BENNETT
Executive, Third Coast Artillery District

COLONEL FRANCIS P. HARDAWAY
Post Executive; Commanding Harbor Defenses of Chesapeake Bay and 2d Coast Artillery

COLONEL RICHARD F. COX
Commanding 70th Coast Artillery (AA)

LIEUTENANT COLONEL DELMAR S. LENZNER
Commanding Submarine Mine Depot

LIEUTENANT COLONEL HAROLD F. NICHOLS
Acting Assistant Commandant, Coast Artillery School

By Major L. W. Goeppert and Lieutenant J. DuV. Stevens

Recruit training is the order of the day for virtually all organizations. The 70th is being steadily built up and the initial cadres in both the 2d and the 70th are working hard to transform their organizations into homogeneous units. In addition to this daily recruit drill, routine, school and board firings, and submarine mine depot tests, make a full schedule for all hands in the harbor defenses.

The Coast Artillery School has finished the home stretch of its condensed course for the 1939-40 regular officers' class. Fifty members were graduated on February 1, 1940, with exercises at the school auditorium. Major General A. H. Sunderland, Chief of Coast Artillery, delivered an address and presented the diplomas. Brigadier General F. H. Smith, commandant of the school, also delivered a talk of timely and cogent appeal to the graduates. Officers just graduating will probably augment the foreign service detachments now training at various Coast Artillery posts, and some will doubtless participate in maneuvers announced by the War Department for this spring.

DRAMATICS

The Fort Monroe Dramatic Club has continued its good offices and contributed much cheer to the garrison by presenting a puppet show depicting the well known adventures of Ferdinand the Bull and a three act play, *Candlelight*. Mrs. Oscar D. McNeely prepared the entire cast and scenery for the puppet show and Lieutenant R. G. Finkenaur wrote the script. P. G. Wodehouse's adaptation of *Candlelight*, by Siegfried Geyer, presented at the new Fort Monroe Theatre on January 21st added a new wreath to the laurels of the club. An enthusiastic audience enjoyed this production which was directed by Lieutenant G. U. Porter.

FORT MONROE CLUB

Those who have served at Fort Monroe will be interested to know that a considerable addition to the Casemate Club has been made in the form of a cocktail lounge. The old open north porch has been enclosed in glass and is now a continuation of the already existing porch dance floor, practically doubling the enclosed porch space. This new porch area constitutes the lounge and has been furnished with chromium finished furniture. The whole interior of the porch has been painted a light color, whose cheerful note is enhanced by hanging baskets and wall brackets. Comfortable gliders afford a vantage point at the junction of lounge and dance floor, from which non-dancers may enjoy watching the dancers. An orchestra stand with curtain background adds a finishing touch to the very smart club atmosphere which has been attained. Needless to say, the New Year's Eve Party held at the club was a decided success.

PERSONNEL

Eleven new Thomason Act officers have joined the harbor defenses for duty. They are: Lieutenants S. W. Hickey, W. C. Mahoney, Jr., T. J. Bricker, H. P. Fasig, E. E. Bellonby, R. F. Hodge, J. C. Jeffries, Jr., W. J. Stricklin, Jr., T. H. Symmes, Jr., J. E. Arthur, Jr., and C. F. Coffey, Jr.

Two newly commissioned second lieutenants have also been welcomed to the harbor defenses: Lieutenants Allen Bennett of Fort Monroe and John E. Hart of Holly Hill, South Carolina. These two officers won their permanent commissions through competitive examination. Both are assigned to the 70th Coast Artillery (AA).

First Lieutenant F. W. Regnier, Medical Corps, has joined the station hospital as assistant to the chief of medical service. His previous station was Hot Springs, Arkansas. First Lieutenant J. Z. McFarland, Jr., Dent.-Res. has been ordered to active duty and is on duty in the dental surgeon's office. First Lieutenant W. B. Simms, Dental Corps, is on temporary duty at Carlisle Barracks, attending the Medical Field Service School. Second Lieutenant B. R. Painter, Ord-Res. has reported for active duty and is serving with the 6th Ordnance Company.

Major Leroy H. Lohmann, has reported for duty and is assigned as executive, 2d Coast Artillery and mine group commander. Major Lohmann has recently returned from Philippine service.

Lieutenant Colonel D. B. Sanger, has recently joined the garrison for duty with the Coast Artillery Board. Colonel Sanger was previously on duty as Hawaiian Department signal officer.

The garrison has extended congratulations to Warrant Officer Ellis R. Lind, who was recently promoted to that grade from master sergeant. Mr. Lind has left for new duties at Fort Hayes, Ohio. Warrant Officer Edward Turner, U.S.A., has reported for duty with the post quartermaster. Warrant Officer J. R. Tudor, has recently left on retirement leave, for California.

Hawaiian Separate Coast Artillery Brigade

Brigadier General Fulton Q. C. Gardner, *Commanding*
Lieutenant Colonel C. M. S. Skene, *Chief of Staff*
Major L. V. Warner, *Adjutant General & S-1*

Captain G. Schmidt, *S-2 & Gunnery* — Lieutenant Colonel J. H. Lindt, *S-3*
Lieutenant Colonel R. M. Perkins, *S-4*

Captain I. H. Ritchie, *Com. and Engineer Officer* — Captain W. H. Kendall, *Sec. Ath. Officer*
Captain S. E. Whitesides, Jr., *Chemical Warfare Officer* — Lieutenant Colonel R. S. Barr, *Ordnance Officer*

Colonel E. B. Walker
Commanding Harbor Defenses of Pearl Harbor

Colonel Charles K. Wing
Commanding 64th Coast Artillery (AA)

Colonel W. D. Frazer
Commanding Harbor Defenses of Honolulu

By Lieutenant Milan G. Weber

Presentation of Soldier's Medal

Private William B. Evers, Battery B, 55th Coast Artillery, was awarded the Soldier's Medal for heroism displayed while rescuing another soldier from drowning in Pearl Harbor last summer. General Fulton Q. C. Gardner presented the medal to Private Evers at a review of the troops of the Harbor Defenses at Fort Kamehameha on December 15, 1939.

Special 8-inch Railway Practices

On December 5 and 6, 1939, two special 8-inch railway target practices were held at Brown's Camp. Under the direction of Major W. L. McMorris, Battery A and B, 41st Coast Artillery, commanded by Captains D. D. Martin and W. J. McCarthy, fired twenty rounds each at a target at a range of approximately 17,000 yards. Tentative scores appear to be:

Battery A	130.3
Battery B	225.6

The scores obtained in the 8-inch railway practices held in this brigade during the past year have been considerably higher than those obtained during preceding years with the same armament. For the four practices conducted this year, an average score of 181.7 was made.

Antiaircraft Practices

The 64th Coast Artillery, commanded by Colonel C. K. Wing, has returned to Fort Shafter after the completion of the third phase of annual target practices. For the 3-inch guns, this phase consisted of night firing using the angular unit of adjustment. Scores for these practices have not been computed, but hits were obtained in every practice. In these practices every effort was made to secure realism. In spite of the suddenly-appearing targets, hits were obtained in every practice conducted by the 64th Coast Artillery during the past year.

Battery A and E—the searchlight batteries of the 64th Coast Artillery—conducted their third advanced practice on December 12. These practices were conducted as a battalion problem, stressing control of searchlights in an area defense involving a considerable number of lights.

SOLDIER'S MEDAL

Private William B. Evers, Battery B, 55th Coast Artillery (right), with Brigadier General Fulton Q. C. Gardner, taking the review at which Private Evers received the Soldier's Medal

This control problem is one to which much thought and study is being directed because of the size and shape of the defended area and the great number of searchlights on the Island of Oahu.

Battery I, 64th Coast Artillery, fired its third series of target practices. Two of these practices were with .50-caliber and two with .30-caliber machine guns. No night practice was fired during this series. Machine-gun firing units of the seacoast batteries conducted training with the 64th Coast Artillery at this time.

Personnel Changes

Major C. R. Roberts left the Islands on December 16 for his new station with the Organized Reserves at Cincinnati. Major Roberts has been largely responsible for the success of the six advanced searchlight practices conducted during the past year. Other departures and new stations include Lieutenants Peter Schmick (Fort Worden), J. M. Donohue (Fort Barrancas), L. J. Ellert (Fort Totten), B. M. Warfield (Fort Crockett) and W. G. Easton (Fort Sheridan).

Lieutenant Colonel A. E. Potts arrived in the Islands on December 13, and has been assigned as executive of the Harbor Defenses of Honolulu. Major L. V. Warner is the new adjutant general of the Hawaiian Separate Coast Artillery Brigade. He relieved Major Francis A. Macon who had been on duty at this headquarters for two years and sailed for his new station on Governors Island on the December 16th transport. Major H. H. Slicer, who arrived on the same transport, has been assigned to command of the 1st Battalion, 55th Coast Artillery at Fort Kamehameha. Other new arrivals and assignments are Lieutenants B. S. Evans, Jr. (Fort Shafter), J. R. Gifford (Fort DeRussy), R. A. Janowski (Fort Kamehameha), R. E. Jordan (Fort Ruger), L. A. Simon (Fort Ruger), H. Weiseman (Fort Ruger), and K. L. Yarnall (Fort Ruger).

Major C. C. Morgan and Lieutenant K. E. Tiffany have been assigned to this brigade from Infantry units at Schofield and are stationed at Forts Ruger and Shafter, respectively.

Athletic Notes

The following summary shows the brigade leaders for the various sports, during the past year:

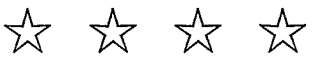
Basketball—Harbor Defenses of Pearl Harbor, coached by Lieutenant G. V. Underwood.

Boxing—Harbor Defenses of Honolulu, coached by Lieutenant W. S. Coit.

Track—Harbor Defenses of Pearl Harbor, coached by Lieutenant L. A. Hall.

Baseball—64th Coast Artillery, Ft. Shafter, coached by Lieutenant O. Swain.

Tennis—Harbor Defenses of Honolulu, coached by Lieutenant W. S. Coit.



Harbor Defenses of Cristobal

Colonel Rufus F. Maddux, *Commanding*

By Captain E. B. Thompson, C.A.C.

The intensive training program recently initiated in Panama has kept all organizations of the 1st Coast Artillery more than busy for some time. Gunners' instruction is being pushed, and preparations are being made for the functional firing of several seacoast batteries at Fort Sherman. Since these batteries have not been fired for several years, it is hoped that some valuable information as to their performance will be obtained.

In spite of being extremely busy with training, a few moments are found here and there to keep up our schedule of athletics. The interbattery baseball schedule has just been completed, and a post team is now being put in shape to enter the Atlantic Sector baseball league. Owing to the recent organization of one battalion of the 72d Coast Artillery (AA) on the post of Fort Sherman, the athletic year was divided into two periods, and Battery C, 1st Coast Artillery declared the winner of the post commander's trophy for the first period. Sports for the second period will include baseball, handball, softball, badminton, track and field, bowling, and tennis.

Corporal Joseph Chertick and Private First Class William L. Stringfield, Headquarters Battery 2d Battalion, 1st Coast Artillery, have each been awarded a personal letter of commendation by the department commander, Major General David L. Stone, for heroism displayed in an attempt to save government property. On the night of November 7, 1939, during an exceptionally heavy storm, the *J-47* broke her moorings at the Chagres River dock and washed up on the beach on the west side of the river. The next morning, while the storm was still raging, Corporal Chertick and Private Stringfield crossed the river in a native cayuca, succeeded in floating the *J-47*, and attempted to return it to the dock. However, they were unable to make any headway and were finally forced to jump overboard and swim ashore to save their own lives.

Fort Sheridan

LIEUTENANT COLONEL J. L. HOMER, *Commanding*

By Major C. S. Harris

During November, all inactive batteries of the regiment together with the Medical Detachment were activated, and by the end of the month, the regiment was at full enlisted strength.

The present assignment of officers is as follows:

HEADQUARTERS

Lieutenant Colonel John L. Homer, commanding
Major Charles C. Harris, executive
Captain William E. Griffin, S-3, S-4
Captain Robt. L. Anderson, adjutant
Lieutenant Dabney C. T. Davis, athletic officer

HEADQUARTERS BATTERY

Lieutenant Chas. C. Cloud, Jr., commanding
Lieutenant John M. Smythe, motor transport officer

1ST BATTALION

Captain Samuel H. Morrow, commanding
Lieutenant Frank E. Howard, adjutant

BATTERY A

Lieutenant Kenneth I. Curtis, commanding
Lieutenant Andrew M. Lundberg

BATTERY B

Lieutenant Wm. G. Easton, commanding
Lieutenant Melvin R. Swenson

BATTERY C

Lieutenant Robt. G. Platt, commanding

BATTERY D

Lieutenant Wm. L. Thorkelson, commanding

2D BATTALION

Captain Burgo D. Gill, commanding
Lieutenant Robt. W. Carlton, adjutant

BATTERY E

Lieutenant Thos. C. Griffin, commanding

BATTERY F

Captain Kenneth M. Briggs, commanding
Lieutenant Donald K. Nickerson
Lieutenant Darrell J. Inabnit

BATTERY G

Lieutenant Robt. B. Barry, commanding

BATTERY H

Lieutenant Goodman K. Larson, commanding

On December 2d, the following sergeants were appointed first sergeants:

Sergeant Carl B. Lorentz, Hq. & Hq. Btry.
Sergeant Arden W. Sistad, Hq. & Hq. Btry. Bn. (Gun)
Sergeant George W. Mooney, Btry. A.
Sergeant Clair M. Lamb, Btry. D.
Sergeant Scammon E. LaReau, Hq. & Hq. Btry. Bn. (AW)
Sergeant Emil F. Schlager, Btry. F.
Sergeant Fred N. Grossman, Btry. G.
Sergeant James G. O'Rourke, Btry. H.

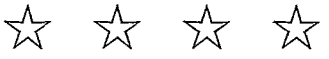
Sergeant John J. Dema, was appointed staff sergeant (color). Corporal Frederick V. McWold, was appointed staff sergeant (supply).

During December, all batteries participated in antiaircraft firings or searchlight exercises, utilizing ammunition available from the War Department allotment for winter training and air missions furnished by the 15th Observation Squadron. All batteries of the automatic weapons battalion conducted antiaircraft machine-gun firings with both caliber .30 and caliber .50 weapons and also antiaircraft rifle fire by sections with the service rifle. These firings were successfully completed on December 21st under a clear sky, but with the thermometer registering ten degrees below the freezing point.

Lieutenant Colonel and Mrs. Homer entertained the officers and ladies of the regiment at luncheon on December 23d, honoring Colonel and Mrs. Joseph A. Green, and were at home to the officers and ladies of the post and vicinity at noon on December 31st, to receive New Year's calls.

Lieutenant Charles L. P. Medinnis, now on temporary duty at Fort Hamilton, New York, visited the post with his mother, Mrs. Mary Medinnis, during the holidays.

Lieutenant William G. Easton reported for duty on January 3d and was assigned to command Battery B. Lieutenant Easton has just completed a tour of duty in the Hawaiian Department.



Panama Provisional Coast Artillery Brigade (AA)

BRIGADIER GENERAL SANDERFORD JARMAN, *Commanding*

CAPTAIN L. W. BARTLETT
Communications and Intelligence

CAPTAIN M. K. DEICHELMANN
Plans and Training

LIEUTENANT C. G. PATTERSON
Adjutant and Publicity

LIEUTENANT W. M. SKIDMORE
Aide-de-Camp

LIEUTENANT W. L. HEROLD
Aide-de-Camp

LIEUTENANT F. A. BOGART
Munitions, Supply and Assistant Plans and Training

72d Coast Artillery (AA)
LIEUTENANT COLONEL C. R. FINLEY, *Commanding*

73d Coast Artillery (AA)
LIEUTENANT COLONEL W. M. CHAPIN, *Commanding*

By Lieutenant C. G. Patterson

Although the dry season in Panama supposedly begins in January, it appears that there has been a slight mix-up in dates this year. On one day early in January there was more rainfall on the Pacific side than the normal average for the entire month during the preceding years! Afternoon downpours have been quite frequent, even during the reception hour on New Year's Day.

The biggest event of the pre-holiday period was the brigade conference early in December. The 72d Coast Artillery officers from Forts Randolph and Sherman came to the Pacific side on the morning train and attended an all-day session. Between maps, plans, and talks by General Jarman, members of his staff and Lieutenant Colonel F. M. Brady, executive officer of the 19th Wing, the present and future antiaircraft defense of the Canal was explained in detail. Battery T, 73d Coast Artillery (AA), at Fort Amador, was host to all the officers for dinner. Afterward members of the 72d Coast Artillery were taken around to visit installations on the Pacific side.

TRAINING

Despite the prolonged rainy season, the Antiaircraft Brigade-Air Corps exercises were conducted from January 4 to 10. All units occupied war positions throughout the entire period. The 400 recruits who arrived on the *Grant* on January 4 were assigned and sent to their batteries in the field. While the exercises were primarily in preparation for the department maneuvers in March, much valuable experience was gained, especially in the functioning of the antiaircraft artillery intelligence service. The plan for the exercises was based on the Fort Bragg Exercises of 1938. For the sixteen officers in the brigade who were at Fort Bragg, the exercises began where we left off when we departed from that station.

FIRING

Because of unforeseen difficulties in supply and transportation, the firing phase at Rio Hato has been postponed until after department maneuvers. However, the rainy season doesn't begin up there until July so no weather difficulties are expected. One admirable feature of Rio Hato is the complete absence of shipping lanes and fishing boats. At last the Coast Artillery has found a firing range with a perpetually safe field of fire.

Battery O, 73d Coast Artillery, left for Rio Hato on January 5 to construct the camp. Mess halls, latrines, and tent floors to accommodate one regiment at a time will be ready by March 1. La Venta Inn, close by, offers accommodations for families.

PERSONNEL

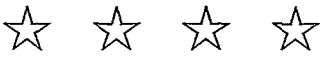
General Jarman has been relieved from his dual assignment of commanding Fort Clayton and the antiaircraft brigade and now devotes full time to commanding the brigade. Colonel Nichols left Quarry Heights on December 6 to assume command of the 4th Coast Artillery (HD) and the Harbor Defenses of Balboa. Several officers' families have arrived from the States and are living in Panama City and Colon until quarters are available.

72D COAST ARTILLERY (AA)

The 72d is making good its promise to create history. Rehabilitation of barracks and quarters, as well as new construction, is continuing with soldier labor at Fort Randolph. Battery I, commanded by Lieutenant F. B. Reybold, won the beer prize for the battery showing the greatest improvement since the organization of the regiment. Battery P, commanded by Captain D. J. Bailey, was a close second. Maneuvers over for a while, we hope to make the most of what dry season there is to finish construction.

73D COAST ARTILLERY (AA)

Drill, maneuvers, construction, recruits to train—the 73d never has a dull moment! The regiment is hitting its stride and getting big things done in an artilleryman's manner. Officers and men are experiencing field conditions, enjoying them, and boosting the morale. There hasn't been much time to think of athletics as yet. The Amador golf course looks most inviting—but, there's work to be done.



Fort Totten

Colonel Oliver L. Spiller, *Commanding*

By Major S. E. Willard

Training

The 1st Battalion is engaged in an intensive artillery training period. During December, Battery B (Captain Melton A. Hatch) and C (Lieutenant Leland R. Drake) fired 3-inch practices at Fort Tilden. Battery E (Lieutenant Alfred L. Brassel) conducted .50-caliber firing at balloons at Fort Tilden. In January, Battery A (Captain Peter W. Shunk) will conduct searchlight practice at Camp Upton, and the batteries of the 2d Battalion will conduct instructional firing with the 37-mm. gun at Fort Tilden. Moreover, both battalions will take part in a road march of three days during January. Gunners' instruction is well under way and it is expected to have the final examination conducted by the first of March. In spite of the cold and daily snow, infantry drills are held and the usual parades are "pulled" on schedule.

Recreation and Social

The Christmas season was a full and merry one at Fort Totten. Many post parties were held at the officers' club. Colonel and Mrs. Spiller entertained with a tea dance on the 27th. Captain and Mrs. Wald held a tea dance on the 26th. Lieutenant and Mrs. Skinrood and Lieutenant and Mrs. Ashman held a housewarming cocktail party on the 29th at Lieutenant Ashman's new quarters.

The club held a grand New Year's Party, including cocktails, dinner, a dance; and, for those still able to make the grade, breakfast.

The YMCA entertained with several parties, a dance, and the Christmas Tree and childrens' program with, of course, Santa and his bag of gifts.

Skating is in order just now, as the duck pond is frozen over and everyone is enjoying the ice.

Basketball is king indoors with boxing next in line.

Personnel

Recent arrivals include Lieutenant Colonel Small from Panama, Chaplain Storaasli from Fort George Wright, and Major O'Connell from Panama. The following named officers are on detached service from the post: Major LeRoy Lutes at Sixth Army Headquarters, Atlanta; Lieutenants Cory and Newcomber at Fort Hamilton; Lieutenants Routh, Wald, Schrader, Wood and Gilchrist at Fort Wadsworth; Lieutenant Jones at Fort Benning; Lieutenant Hullinghorst on the transport *St. Mihiel;* Lieutenant Cassevant at Fort Monmouth; Lieutenants Hinternhoff and Henry at Fort Adams; and Lieutenant Curtin at Fort Jay.

At a recent parade, Colonel Cooper, district commander, presented the Soldier's Medal to Private First Class George Foster for heroism in rescuing a man from drowning while on duty in Panama.

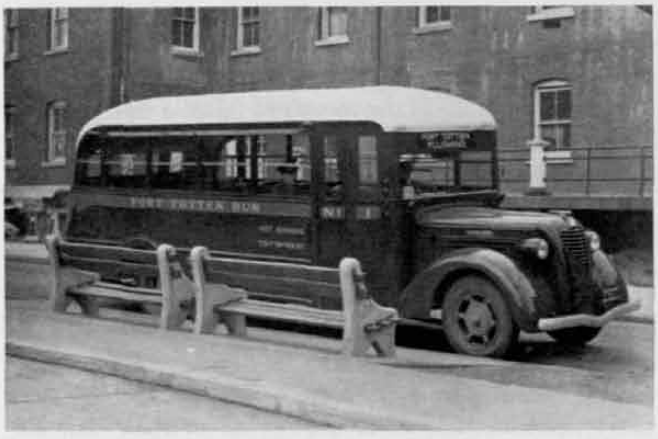
The entire garrison was shocked and saddened by the accidental death of Sergeant George Lucey of Battery A. Sergeant Lucey was returning to the post as a passenger in a friend's car, when owing to ice and snow the car skidded out of control and crashed into a large bus.

New Construction

The new temporary barracks are slowly nearing completion and Battery E expects to occupy one shortly. The motor park, garages and maintenance shops begin to take form and the sides and roof will be completed before January 15th.

The restaurant has been renovated and the tap room moved from the restaurant to a new location. In the new location the bar and tap room have been remodeled as an old English pub. Its beamed ceilings and panelled walls are very effective in dark oak.

The Fort Totten Bus Company has turned over its concession to the post exchange and the PX is now in the bus business. The new buses are gaily painted in the Coast Artillery colors. The bodies are OD and have silver roofs and a wide red stripe running completely around the bus. The lettering is in yellow on the red.



The new bus in use at Fort Totten

Corregidor

BRIGADIER GENERAL WALTER K. WILSON, *Commanding*
COLONEL FREDERIC A. PRICE, *Executive*
LIEUTENANT COLONEL R. B. PATTERSON, *Adjutant General & S-1*
MAJOR S. MCCULLOUGH, *S-2* — LIEUTENANT COLONEL C. E. COTTER, *S-3*
MAJOR L. R. CREWS, *S-4*
COLONEL R. P. GLASSBURN, *Commanding 59th Coast Artillery (HD)* — COLONEL WILLIAM C. KOENIG *Commanding 60th Coast Artillery (AA)*
COLONEL WILLIS SHIPPAM *Commanding 91st Coast Artillery (PS) (HD)* — LIEUTENANT COLONEL J. B. CRAWFORD *Commanding 92d Coast Artillery (PS) (TD)*

By Major S. McCullough

Outdoor training activities are in full swing. With the rainy season tapering off, matériel and personnel are coming out from under wraps and preparing for the target practice season and the West Sector maneuvers, which this year are to be on a larger scale than heretofore. Intensive training, to enable all organizations to perform their particular defense missions, is now going on. Beach defense exercises, mobilization tests, preparation for maneuvers, sub-caliber firing, artillery, communication, and searchlight drills, supplementary AA firings, with infantry close order drill and ceremonies, occupy every available hour in this intensive period.

Admiral T. C. Hart (new commander of the Asiatic Fleet) with Rear Admiral J. M. Smeallie and their staffs visited Corregidor recently and were conducted over the post by General W. K. Wilson and members of his staff.

Not only have the local climatic conditions of Corregidor received their just recognition lately by officers who have come here "to recuperate from the effects of the tropics," but the Navy has also been finding a welcome relief ashore on Corregidor from the confinement of destroyers and submarines operating in the uneasy China Sea.

The new U. S. High Commissioner, Francis B. Sayre, and his staff will shortly visit Corregidor to inspect the fortified islands across the mouth of Manila Bay.

Sports on the Rock have lately hit a new high, largely through the efforts of Major D. J. Rutherford (recreation officer) and his staff. Several excellent boxing cards have been put on, with both local and civilian talent, for the benefit of large and enthusiastic audiences. The 59th Coast Artillery won a closely contested match with the 60th Coast Artillery, 4-3, thereby winning the post championship in the American Division. The 91st Coast Artillery (PS) took a 3-2 decision from the 92d Coast Artillery (PS), to win the post championship in the Scout Division.

Large crowds have been turning out to witness the department basketball games that have been played on Corregidor. The 59th finally won the department championship for 1939, with the 60th tied with Post of Manila for second place. In the Scout Division, the department championship in basketball was won by the 24th Field Artillery, who nosed out the 91st Coast Artillery by one game.

Fort Mills teams fared well in the department bowling tournament. In the Officers' Division, the Fort Mills team won the ten-pin event, and the Fort Mills Team A won the duckpin event. The 91st won the enlisted men's ten-pin tournament and the five-man duckpin congress, and the 60th won the ten-pin five-man and two-man congress and also high singles.

The track season started November 1st and will extend through December. Each of the four regiments will conduct a regimental meet followed by inter-regimental meets between the 59th and 60th, and between the 91st and 92d, for the post championship in the American and Scout Divisions.

Baseball comes out officially on December 1st and does not withdraw from the athletic scene until June 1st. Separate inter-battery post, and department leagues will be run off in that order.

For the benefit of our many ex-golfing addicts, we report that the golfing season is in full swing. An energetic golf committee, good weather, the golf course in excellent condition, have all combined to make this the main form of recreation among the officer personnel at this time of year.

Many replacements arrived on the transport *Grant* after an uneventful crossing of the Pacific. Among them are Chaplain Philip F. Coholan; Major John D. Cook, the new quartermaster; Major Edmund H. Stillman, the new post exchange officer; Major Leonard R. Crews, the new S-4; Major Samuel McCullough, the new S-2; Lieutenant Harold L. Gard, MAC; Lieutenant Dwight D. Edison, the new assistant provost marshal; Lieutenants Helen Adams and K. L. Dollason, Army Nurse Corps.

Sailing on the *Grant* for the Golden Gate were Major James J. Firestone, QMC, to Fort Hayes; Major "Dad" Lohmann, CAC, to Fort Monroe; Captain John Harry, CAC, to Fort Rosecrans; Lieutenant A. M. Lazar, CAC, to Fort Monroe; Lieutenant F. LeR. Furphy, CAC, to Aberdeen Proving Ground; Lieutenant P. A. Roy, to Fort MacArthur; and Lieutenant Thomas R. Jones, MAC, to Brooklyn Army Base. Good luck and best wishes from us all on your new assignments.

59TH COAST ARTILLERY

By Major Louis H. Thompson

During the first part of October beach defense firing of machine guns, 37-mm. and 75-mm. guns was completed with excellent results. All gun batteries are now engaged

in sub-caliber practice in preparation for the service practice to be held in January and February.

The October transport brought two new battery commanders to the 59th, both of whom drew outpost details. Captain Albert D. Miller was assigned to command Battery G and Fort Hughes, and Captain Guy H. Stubbs to command Battery E and Fort Drum. Captain H. E. Breitung was transferred from the 60th and from duty at Fort Wint to command Battery C, relieving Captain R. R. Hendrix, who has been temporarily assigned to regimental headquarters pending return to the U. S. on February transport. Lieutenant Lawrence C. Baldwin was transferred from the 60th and was assigned to Battery G at Fort Hughes.

Included among the noncommissioned staff arriving on the October transport, and assigned to the 59th were the following: Staff Sergeant Stephen J. Machuta (regimental sergeant major), Staff Sergeant Daniel O'Connor, Staff Sergeant Marion F. Greathouse, and 1st Sergeant H. D. Whitfield.

The *Grant* carried away from us and back to duty in the States the following: Lieutenant Aaron M. Lazar (popularly known as "Lazy," but whose characteristics are the antithesis of this nomenclature), assigned to Fort Monroe; Master Sergeant Richard Parry to Fort Winfield Scott; Staff Sergeant John F. Pray to Fort Totten; Staff Sergeant Laurie C. Martin to Fort Banks; Staff Sergeant Foy K. Heath to Fort Barrancas; and Staff Sergeant Henricus L. Ooms to Fort Rosecrans. Technical Sergeant Barney Machovic retired on October 31st and has established residence in Manila.

During October the 59th won the post boxing championship (American) by defeating the 60th in four out of seven bouts scheduled. The 59th basketball team, after losing the post championship (American) to the 60th, won first place in the Philippine Department league.

60TH COAST ARTILLERY

By Major Allison W. Jones

Following the completion of supplementary machine-gun firings by the other regiments for which the 60th furnished the records section and the directing personnel, Batteries E and F commenced their final drive for the heights of machine-gun excellence. Records are not as yet entirely ready for check and for the computation of scores, but indications are encouraging and a large number of gunners have received valuable training. One innovation tried this year worked out very successfully. In the past the smallness of the landing field and the velocity of the wind have made dropping targets difficult and more than one has been lost. During the latter part of this season targets were dropped near the safety boat, their kapok-filled seams keeping them afloat long enough for the crash boat to pick them up. Our lost target problem appears to be solved. The searchlight Battery (A), considering old equipment, has been making marked progress. In spite of the long hours put in on overhauling, and tuning up equipment and training personnel, it appeared that the usual bad weather breaks might beat the battery again. The "night owls" reported that excellent weather usually prevailed from 3:00 A.M. to dawn. As a result, the battery has been in position and ready to go at 3:00 A.M. daily for the past week and will continue this routine until service practice is held. It began to look as if their fighting spirit had broken the jinx at last and that Battery A will not only have a target practice but an excellent one. The gun batteries are using all available missions for their training with special emphasis on the stereoscopic height finders. While their intensive period will not begin for another month, their preparations are well under way and point to a successful season.

The big event of November was the celebration of organization day. The usual ceremonies were held in the morning, followed by a baseball game between Topside and Middleside organizations, which Middleside won, 2-1. Noon found all organizations sitting down to meals which make Thanksgiving and Christmas dinners look lean. Free movies followed for the members of the 60th. In the evening a dinner was held at the Corregidor Club for the officers of the regiment and their guests, after which they joined the 60th rooting section for their department basketball league game with Nichols Field.

The 60th was fortunate in gaining the following officers on the October transport: Major Alexander H. Campbell (regimental executive and CO, 1st Battalion); Lieutenant Arthur C. Peterson (Battery A); Lieutenant Robert D. Glassburn (Battery D); Lieutenant William H. Ball (DS Fort Wint). A further gain was Lieutenant James R. Holmes, transferred from the 59th. We had the misfortune of losing Captain E. W. Breitung and Lieutenant L. C. Baldwin, by transfer to the 59th, and Lieutenant Earle M. Shiley, by transfer to the staff, as assistant post exchange officer.

The 60th defeated the 59th for the post championship, American Division. In the department championship series, we are now in third place, with excellent prospects of moving to second; the 59th obtained revenge for their earlier loss by going into a tie for first place. In boxing we lost to the 59th by one point, the meet hanging on the decision of the heavyweight bout, which was fast and furious, with both fighters almost out at the last gong. In the recent department bowling congress the 60th won the ten-pin, five-man and two-man congress and also high singles. In the golfing world the 60th won the annual golf marathon and the inter-regimental Caldwell cup matches by a comfortable margin, after some tough competition. Regimental golfers have placed well in the numerous tournaments that started with the dry season. In the post championship tournaments the 60th has lost out in the top flight but is doing well in the others.

91ST COAST ARTILLERY (PS)

By Major V. P. Foster

Intensive training on primary armament assignments is now going on, in preparation for annual target practices, scheduled to begin shortly after the first of the year.

The regiment lost Major Leroy H. Lohmann when the *Grant* pulled out. The mine command gave him a lusty *Mabuhay* as he left the dock here, Manila bound.

Our new arrivals were: Major Joseph P. Kohn, who became regimental executive; Captain Will K. Stennis and Lieutenant John H. Davis, Jr., who went to outpost duty, while Lieutenant Stephen M. Mellnik was assigned to command Battery D.

The inter-battery basketball league concluded with Battery B — Captain Caluya, commanding — winning easily. The season's play produced several outstanding players and the regimental basketball coach, Lieutenant D'Arezzo, had little difficulty in organizing a highly promising regimental squad in preparation for play in the post championship against our arch-rivals, the 92d, and for play in the department basketball tournament (Scout Division). The 91st won the post championship again this year by defeating the 92d in the first two games, by scores of 38-25 and 31-25, respectively. Thus for another year we are post champions (Scout Division). The squad of fifteen players is divided into three teams, all about equal in ability. The veteran players—Imperial, Yambao, Alberto, Dela Cruz, Reyes, Benito—were augmented this year by several outstanding recruits, among whom are Denaga, L., and Cunanan. The entire regiment has been behind the team as is evident by the large crowds which witnessed every home game. In spite of the slow start in the department tournament, the team finished in second place.

On November 4th, the boxing team defeated the Far Eastern University, last year's inter-collegiate champions, by the count of 6 to 2. The addition of Rosalino Rojas, a featherweight, materially strengthened the 91st team. Rojas' unusually fast work and slyness is material for study. Armistice Day the 91st and the University of the Philippines fought it out, with the 91st winning by the score of 5 to 2. Another newcomer to the 91st, Felix Villamor, demonstrated his ability as a pug. Villamor's straight left jab is something worth watching. The annual "Army" boxing classic took place on November 22d, when the 91st defeated the 92d, 3 to 2. Sixto Fajardo, flyweight, Rosalino Rojas, bantamweight, and Felix Villamor, lightweight, were the stars for the 91st.

92D COAST ARTILLERY (PS)

By Major W. C. Braly

All batteries have completed their annual beach defense firings since our last report and are now engaged in subcaliber firing, preparation for the department maneuvers, and conditioning of matériel for the target practice season.

Small arms firing was completed in October, with much success, under the direction of Lieutenant Haynes, regimental range officer.

In a boxing match with National University of Manila at Fort Mills the 92d won, 6 to 2, before a large and enthusiastic audience. A joint smoker was staged with the 91st Coast Artillery (PS), also before a packed Arena. The 92d won three out of four preliminary bouts but dropped three out of five of the championship matches.

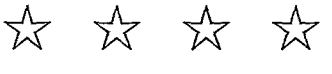
In the Caldwell Cup match for officers' golf teams, the 92d finished in second place, being nosed out by the 60th by a few points. The team consisted of Captain Kyster (team captain), Lieutenant Croker, Lieutenant Colonel Crawford, Lieutenant Kessler, Major Braly, and Lieutenant Harvey.

Organization day for the regiment was observed on November 15th. During the morning a short program was held in the Bottomside Cine, at which the commanding general made an inspiring address on teamwork. Trophies and medals were presented to winners in various department and harbor defense athletic events by the commanding general, after which the regimental commander presented cups to the following regimental champions for 1939:

Event	*Organization*
Soft ball	Battery C
Volley ball	Battery B
Duckpins	Battery D
Ten-pins	Guard Battalion
Basketball	Battery C

The regiment is pleased to welcome Lieutenant and Mrs. George H. Crawford, who arrived on the last transport. Lieutenant Crawford is now commanding Battery E of the Guard Battalion.

Colonel Crawford is recovering splendidly from an appendectomy and will, with Mrs. Crawford, spend the month of December at Baguio.



First Coast Artillery District

COLONEL RODNEY H. SMITH, *Commanding*

MAJOR ROBERT T. CHAPLIN, *Adjutant*

COLONEL ROBERT C. GARRETT
Commanding Harbor Defenses of Portland and Portsmouth

COLONEL MONTE J. HICKOK
Commanding Harbor Defenses of Boston

COLONEL T. H. JONES
Commanding Harbor Defenses of Long Island Sound

MAJOR E. P. JOLLS
Commanding Harbor Defenses of Narragansett Bay

CAPTAIN CHARLES N. BRANHAM
Commanding Harbor Defenses of New Bedford

The winter training and maintenance program for the First Coast Artillery District is progressing toward all objectives scheduled. This work is proceeding smoothly in conjunction with the many added duties of all personnel incident to the intensive recruiting program; the formation of new units; training of personnel for the Coast Artillery units in Panama; and, in some of our harbor defenses, the increased training activities of National Guard units.

The District Commander and Mrs. Smith entertained at a party at their home on the afternoon of November 24th. Over 150 guests, including many of the officers and ladies of the First Corps Area and the First Coast Artillery District and many prominent citizens, were invited to meet Miss Lucy E. Worthington, daughter of Mr. and Mrs. Robert Briggs Worthington. The engagement of Miss Worthington and Major Robert Chaplin, Coast Artillery Corps, has recently been announced.

HARBOR DEFENSES OF PORTLAND AND PORTSMOUTH

The 68th Coast Artillery (AA) is a new antiaircraft unit, although not a new Coast Artillery regiment, as the original 68th served overseas during the World War. The first week of November saw the activation of the regiment with station in the Harbor Defenses of Portland, Maine, evacuated recently by the 5th Infantry.

On November 15th a cadre of 184 enlisted men arrived from Fort H. G. Wright, to provide the nucleus for the regiment. In addition, several staff sergeants from the 69th Coast Artillery in Puerto Rico have augmented the original cadre. Recruits have been, for the most part, from the Fifth Corps Area, and are arriving in such numbers as to soon bring the regiment to full strength.

The new commanding officer of the Harbor Defenses of Portland and Portsmouth, and the 68th Coast Artillery, Colonel Robert C. Garrett, arrived and assumed command on December 5th.

In December the Portland Chapter of the National Sojourners welcomed the officers of the 68th with a reception and dinner at the Columbia Hotel. At this time the regiment had reached such strength that the 2d Battalion, less Battery E, was able to move to its new home at Fort McKinley. Later, Battery E moved to Fort Preble.

Training has necessarily been restricted to recruit instruction owing to the rapid expansion and high percentage of men with no previous service.

A basketball team has been organized and has played one game with a civilian team from Sanford. Although the regiment lost—83 to 36—a start in regimental athletics has been made.

The Panama Coast Artillery Detachment, 8th Coast Artillery, was organized at Fort McKinley with a nucleus of Lieutenants E. E. Hackman and W. M. Vann, both from Fort Monroe, and twenty-seven enlisted men from Fort H. G. Wright. This cadre was augmented by the transfer of twenty men from the 8th to the Panama Coast Artillery Detachment.

The 8th Coast Artillery proper continues its function of maintenance of harbor defense material with regard to the primary mission of the moment: recruiting for the Regular Army.

HARBOR DEFENSES OF BOSTON

During November and December many delightful parties were given both on and off the post. However, the event of the season was the annual Christmas party for the younger members of the garrison. There are many children on the post, most of whom attended this very popular party at Fort Banks. It was thoroughly enjoyed by eighty-one children as well as by the older members. The post gym with its colorful decorations, amply reflected the season's spirit. The post commander gave a brief address which was followed by spirited music by the orchestra. Santa Claus, played by Technical Sergeant Henry H. Launspach, then made his appearance and presented each child an appropriate gift. Refreshments completed the entertainment. In charge of decorating the gym was Technical Sergeant Joseph F. Hardiman, assisted by Corporal Frank G. Underwood.

Plans are under way for the construction of a skating rink in the vicinity of the barracks occupied by A Battery, 9th Coast Artillery. However, the opening of the rink must be postponed until the arrival of freezing weather. Winter sports are not unknown in Winthrop, but because of the usually very temperate climate in the vicinity of Boston Harbor it is not expected that the rink will be in operation before the first of January.

Bowling is now in full swing with nine teams completing the first half of the annual bowling tournament. Headquarters Battery and the Quartermaster Corps tied for first place. After January 1st the second half of the tournament starts and it is expected that a team from Headquarters First Corps Area will be entered.

Approximately eighteen per cent of the Coast Artillery troops of this command were transferred to the 10th

Coast Artillery, Fort Adams, to form the cadre for the training of 500 Coast Artillerymen in the Panama Recruit Detachment.

For the past month unit recruiting has been conducted with satisfactory results. Several recruits who have been enlisted at this post are making good progress in their elementary training.

Harbor Defenses of Long Island Sound

By Captain Frank T. Ostenberg

On November 1 orders were received directing all the Thomason Act officers at Fort H. G. Wright to report to new stations. Three went to Fort Adams and three to Fort Preble.

The 11th Coast Artillery transferred twenty-seven men to the 8th Coast Artillery, Fort Williams, and twenty men to the 5th Coast Artillery, Fort Hamilton.

The 11th Coast Artillery furnished a cadre of 184 men for the 68th Coast Artillery (AA) being organized at Fort Williams. The noncommissioned officers' club gave a farewell party for those departing from Fort H. G. Wright.

Master Sergeant Charles E. Zonnevylle retired at Fort H. G. Wright in October. Master Sergeant Emil Myers retired in November, at this station.

The following noncommissioned officers have recently arrived at Fort H. G. Wright: Staff Sergeants William H. Lebert, Norman R. Yeo, Alan D. Goucher and Horace B. Davis; and Sergeants Joseph Vinelli, Gustin J. Schwager, and Walter G. Streeter.

The following members of the 11th Coast Artillery were recently promoted to master sergeants: Technical Sergeants Edward L. Ledoux and Gordon L. Harrington. Sergeant William J. Beggs and Privates First Class Statson Floyd and Luther Pierce, were promoted to staff sergeants.

In December a detachment (Battery E) of the 242d Coast Artillery (HD) Connecticut National Guard, commanded by Major Raymond Watt, arrived at Fort H. G. Wright for one week of intensive training with antiaircraft guns.

Later Battery D, 242d Coast Artillery (HD) Connecticut National Guard, commanded by Captain Donald G. Kimball, replaced Battery E. Battery D fired a target practice with the 10-inch guns with excellent results.

Colonel Russell Y. Moore, commanding the 242d, was present for all firings.

Fort H. G. Wright was recently visited by the following officers from Corps Area Headquarters: Colonel Charles L. Scott, Colonel Frank K. Chapin, and Lieutenant Colonel John S. Rice, Major Marshall J. Noyes, and Captain Harry V. Ellis.

The mine planter *Baird,* commanded by Captain Nathan A. McLamb, returned from the shipyard during December.

The post football season ended with Battery D 11th Coast Artillery the winner. The final standings were:

Battery	*Won*	*Lost*	*Percentage*
D	3½	1½	.750
C	3	2	.600
B	2½	2½	.500
A	2	3	.400
E	2	3	.400
Hq.	2	3	.400

The duckpin bowling tournament is now in full swing with seven teams entered. At the half-way point no team is sure of its ultimate position in the final standings.

The post small-bore rifle team is doing well in the Mohegan Rifle League. A special boat transports the team to New London, twice a week for this competition.

The post basketball season will be at its best after the holidays.

Harbor Defenses of Narragansett Bay

By Captain Virgil M. Kimm

Recent departures from Fort Adams include the 2d Battalion, 13th Infantry, to Panama, Major Edward L. Supple, to Organized Reserve duty, Duluth, and Colonel Jere Baxter, to Salt Lake City.

Colonel and Mrs. Baxter were tendered an *aloha* party prior to departure. Just before dinner all officers and their families met at the new Officers' Club where an appropriate ceremony was held in connection with the installation of a bronze plaque over the fireplace with an inscription as follows: "Dedicated to Colonel and Mrs. Jere Baxter, whose creative efforts made possible this Fort Adams Officers' Club."

The recruit training center has given the post an entirely new complexion. Five batteries are being recruited and trained for service in Panama. Cadres were furnished by the 7th, 9th, 10th, and 52d Coast Artillery.

Appointments to staff NCO grade as a result of the new organization are: To be first sergeants: Staff Sergeant Eugene K. Marx, Sergeants William R. Belyea, Thomas P. Hogan, George F. McPhee, and Louis L. Rath. To be staff sergeants: Sergeants David L. Dockerty and Raymond C. McCormick.

Plans are under way to have the newly formed organizations fire service practices in the spring with Batteries Greene, Edgerton, Wheaton, Varnum, and Dickenson. Battery Edgerton has not fired a service practice since 1915, Battery Varnum since 1911 and the others since 1929.

Our oldest resident, Mr. Gilbert H. Burnham, the Ordnance machinist, relates that the last service practice of Battery Varnum was one of his earliest experiences here. The battery was fired by the old 117th Company. After waiting all day, Battery Walbach, of which only the carriages remain to remind one of its former glory, fired its practice. Then just before sundown, October 28, 1911. Battery Varnum opened up and scored a perfect practice which gave the coveted E to the 117th. Present for the firing was a Pathé News cameraman, and this was probably one of the earliest efforts at getting the Coast Artil-

lery into the movies. At the first round both camera and cameraman toppled over backwards. However, the cameraman recovered and secured a few shots which were later shown in Newport theaters.

Construction at Forts Adams and Wetherill continues. The new boathouse is nearly finished. The dock and new mine storehouse at Fort Wetherill are well under way. A WPA project to restore and repair the redoubt tower and galleries at Fort Adams has started. During the summer the old barracks at Fort Wetherill were repaired and made habitable.

A new unit to train at Fort Adams is the 243d Coast Artillery, Rhode Island National Guard, Colonel Earl C. Webster commanding. Batteries Greene and Edgerton and a 155 T.D. Battery have been made available to the 243d for week-end training throughout the fall and winter seasons.

Harbor Defenses of New Bedford

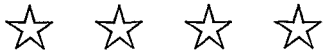
By Captain Charles N. Branham

All military, naval, and civil authorities in New Bedford coöperated in the parade and ceremonies here on Armistice Day. Congressman Charles L. Gifford was the principal speaker on the program which did honor to the fallen soldiers and sailors in our last war.

The majority of the buildings at Fort Rodman have now been completely renovated and the new paint has improved the appearance of the post. It is hoped that it may be possible to rehabilitate the remaining buildings, including the main barracks, the guard house, and the fire station, before the cessation of current WPA work here.

Officers of the 616th Coast Artillery (RAI), Lieutenant Colonel R. C. Allen commanding, hold monthly troop schools at Fort Rodman. Use of available fire control instruments is stressed at these meetings and the opportunity of these officers to couple theoretical with practical training is proving very satisfactory to all concerned. These schools will be continued at Fort Rodman each month until June, according to the present schedule.

Several members of this garrison had house guests during the Christmas holiday period. The children of the post attended the annual children's Christmas party at Fort Adams.



Puerto Rico

Brigadier General Edmund L. Daley, *Commanding*

By Lieutenant Peter S. Peca

The peace and quiet of Puerto Rico has been broken many times during the last two months. Numerous transports have arrived—loaded with men, guns ammunition and supplies. Trucks, tractors, guns, and men have traversed the entire island. Never before in the history of Puerto Rico has such activity been witnessed.

In the overseas movement to Puerto Rico, Coast Artillery troops played the important rôle. The 1st Battalion, 69th Coast Artillery, Lieutenant Colonel Otto G. Pitz, commanding, completed its concentration on October 7, when Battery A (less one platoon), B, and C arrived from Galveston. Battery D, with one platoon, Battery A, 69th Coast Artillery attached, was already here. First Battalion, 51st Coast Artillery, Lieutenant Colonel G. L. Flanigen commanding, arrived on October 20 from Fort Monroe.

The password in the Puerto Rican Department is intensive field service. Our definition of field service can be found by reading the accounts that follow.

1st Battalion, 69th Coast Artillery (AA)

By Captain J. E. Mortimer

On October 2d, the 1st Battalion, 69th Coast Artillery participated in a grim scene. As we stood in the interstices between trucks on the deck of the *St. Mihiel* in Galveston, we saw the rest of the regiment (four officers and 126 men including band), our families and sweethearts on the pier we had just left. At the pier on the other side of us, lay two British ships being painted dark gray as fast as the painters could work. But the American flags painted on the sides of the *St. Mihiel* looked like a million dollars to us right then. However, that scene was the only event worth mentioning until we were met at the dock in San Juan by Lieutenant Colonel C. W. Bundy, Lieutenant Peter S. Peca, and Captain W. F. McKee, and his cohorts from Battery D, who told us, "You can set your bags right there and start loading trucks." We gradually worked our way out to Camp Buchanan. After getting ourselves comfortably fixed, we then had the privilege of unloading another transport filled to the gunwales with the equipment of the 51st Coast Artillery and 2d Battalion, 7th Field Artillery.

With the arrival of the troops of the 51st and 7th, we put our shirts back on and retired from the stevedoring business. Since then, we have been engaged in practicing some of the things you read about in books, but seldom do, namely, reconnaissance, occupation and organization of positions in virgin territory. This island, old as it is, is so virgin that there is not even a contour line or datum point to get in your way.

Between road marches, we have been getting plenty of drill, Spanish lessons, basketball, volley ball, swimming,

excursions to historic points, many opportunities to see the beautiful scenery, and last but not least, free movies in our open air theater. At present the theater consists of the side of a hill, a screen on poles and a shanty housing the projector. Sometimes it rains, but so far, it has always stopped.

With three weeks of maneuvers next month and an augmented target practice season to give the finishing touch, this battalion will not dip its colors to any other. When our tour is over, will we snow them under back home with "How we fought the battle of Puerto Rico!"

1st Battalion, 51st Coast Artillery

By Captain George R. Burgess

Rounding El Morro early on the morning of October 20, the transport *St. Mihiel* brought the 51st Coast Artillery its first glimpse of its new station. The advance detachment of the battalion, commanded by Lieutenant W. G. Fritz, was on hand at the dock with transportation and the battalion proceeded immediately to Camp Buchanan where camping facilities had already been prepared. The arrival of this battalion, together with the 7th Field Artillery (now the 25th Field Artillery), completed the bulk of the troops stationed at Camp Buchanan, bringing the total complement of officers and men to almost 1,300. Lieutenant Colonel B. L. Flanigen established his separate headquarters and within a few days the troops had settled down to a routine which embraces the intensive field training schedule of this new department.

The problem confronting the battalion has been twofold: first, the training in the use of its many new pieces of equipment and matériel, and, second, the thorough reconnaissance of the Island of Puerto Rico. Both fields of activity have been carried out simultaneously and with a great deal of dispatch. The additional problem of acclimatizing the personnel to tropical service has required constant attention. While the two firing batteries, Battery B, commanded by Captain G. R. Burgess, and Battery A, commanded by Captain R. H. Grinder, proceeded with the training on their new guns and tractors, Headquarters Battery, commanded by Captain E. D. Peddicord, undertook the training of field radio operators and meteorological details, at the same time setting up the battalion motor pool and repair shop. The transition of the 51st from an integral unit of the Harbor Defenses of Chesapeake Bay to a self-sufficient, field-operating battalion has been a difficult, but highly interesting accomplishment.

Both firing batteries are equipped with new 155-mm. guns mounted on roller bearing wheels and equipped with electric brakes. In place of the traditional Holt tractor, so familiar to all tractor drawn units, the batteries are powered with new Caterpillar Diesel Tractors, Model D7. Tests of this new equipment were undertaken immediately around the vicinity of the camp and the operation of the new tractors proved to be far in excess of expectations.

Shortly after midnight, November 25, both batteries, accompanied by the CO, Colonel Flanigen, moved out of Camp Buchanan for a four-hour march to the town of Bayamon and return. At the time this is being written, Battery A is undertaking the longest march since our arrival. As a test of its mobility, it is moving at top speed along the north shore of the island in order to determine the minimum time in which it can move from San Juan to Punta Borinquen, the army air base some ninety-five miles away. Battery B is expected to march up into the mountains within a few days to further test the equipment, this time under more difficult road conditions.

While these tests were being initiated, small reconnaissance parties were sent out daily to various parts of the island. Detailed reports from each party have resulted in an unusually complete study of all roads and the coastline of the island.

Firing positions have been located in at least two places around the harbor of San Juan, and both batteries have fired sub-caliber at towed targets from the position at Escambron Beach. These firings were the first efforts by Coast Artillery troops to prepare for their primary mission. Curiously enough these were the first shots fired at water targets from the Island of Puerto Rico since the old Spanish regime. Both batteries have also camped for two-week periods at Punta Salinas where artillery drill has been carried on simultaneously with instruction in their new weapon—the caliber .50 machine gun. Headquarters Battery has maintained two-way radio communication with camp sites, towing vessel, and Camp Buchanan.

The organization assignments are as follows:

69th Coast Artillery—Commanding, Lieutenant Colonel Otto G. Pitz; Executive, Major Eugene T. Conway; Adjutant, Captain John E. Mortimer; Battery C, Captain Charles H. Crim; Battery B, Captain Ernest A. Merkle; Battery D, Captain William F. McKee; Hq. Btry. & Com. Trn., Lieutenant Preston Steele; Battery A, Lieutenant Ethan A. Chapman; Battery D, Lieutenant Robert Totten; Hq. Btry. & Com. Trn., Lieutenant Wilford E. H. Voehl; Battery A, Lieutenant Harrison F. Turner; Battery B, Lieutenant Kermit R. Schweidel; Hq. Btry. & Com. Trn., Lieutenant Josephus A. Bowman; Battery B, Lieutenant Lionel B. DeVille; Battery D, Lieutenant Lee M. Kirby; Battery C, Lieutenant John P. Mial; Battery C, Lieutenant Richard F. Ludeman; Battery A, Lieutenant Calvin O. Smith.

51st Coast Artillery—Commanding, Lieutenant Colonel Barrington L. Flanigen; Executive, Major Mario Cordero; Battery B, Captain George R. Burgess; Battery A, Captain Richard H. Grinder; Hq. Battery, Captain Everett D. Peddicord; Hq. Battery, Lieutenant Edgar O. Taylor; Hq. Battery, Lieutenant William G. Fritz; Battery A, Lieutenant Maurice M. Simons; Battery B, Lieutenant William J. A. Hussey; Battery B, Lieutenant Oliver K. Marshall, Jr.; Battery A, Lieutenant Charles W. Reeves; Hq. Battery, Lieutenant John R. Snow.

The Contributors

MASTER SERGEANT WILLIAM H. BROWN is the draftsman whose maps you have been admiring in the JOURNAL these past three years. A native of Petersburg, Virginia, he enlisted in 1925 at Fort Monroe as a private, Coast Artillery Corps. After graduation from the Coast Artillery School master gunners' course in 1927 he was appointed staff sergeant and reached his present grade in 1939. He has drawn the maps and diagrams for many military books and for various service magazines. Sergeant Brown is on duty in the office of the Chief of Coast Artillery.

MAJOR J. HALPIN CONNOLLY will be recalled as the author of "War in a Mechanistic Civilization" in the July-August, 1939, number of the JOURNAL.

DOCTOR H. A. DEWEERD, professor of history at Denison University, is also editor of our learned contemporary the *Journal* of the American Military Institute.

CAPTAIN FAIRFAX DOWNEY is a writer living in New York. Born in Utah, he was educated at Yale (A.B. 1916). After service as a sergeant with the Yale Batteries he was commissioned a second lieutenant of Field Artillery and served with the 12th Field Artillery (2d Division) during the World War. When he resigned he held the grade of captain, 31st Field Artillery. Captain Downey is the author of a number of books, and his work has also appeared in many magazines. At various times he was a member of the staff on the Kansas City *Star,* New York *Tribune* and *Herald Tribune* and the New York *Sun.*

WARRANT OFFICER B. C. ELDERS, Army Mine Planter Service, was born in Missouri. After wartime service in the SATC he enlisted in the Coast Artillery Corps in 1920. He is a graduate of the Electrical Course, the Coast Artillery Enlisted Specialists School. He won his appointment as warrant officer of the Army Mine Planter Service in 1933. Mr. Elders is licensed as chief engineer of steam vessels by the Bureau of Steamboat Inspection. He is stationed at Fort Monroe.

CAPTAIN J. F. GAMBER, Coast Artillery Corps, hails from Ohio. Enlisting in the Infantry, Regular Army in 1919, he won a cadetship at the U. S. Military Academy in 1921. Graduating with the Class of '25 he was appointed in the Coast Artillery Corps. Captain Gamber holds the degree of BS in ME from Massachusetts Institute of Technology (1931). He is a graduate of the Ordnance School (1931) and the Coast Artillery School Regular Course (1937). He is on duty with the 4th Coast Artillery in the Canal Zone.

H. CHARLES MCBARRON, JR., is the artist who illustrated "Old Rough and Ready." A native of Chicago, he attended the local schools and ROTC and later studied at the Chicago Art Institute. He has been chiefly engaged in commercial illustration and his work has appeared in magazines of national circulation. For hobby, he collects old American military uniforms and equipment. He painted a series of Revolutionary Marine Corps uniforms for Marine Corps Headquarters and designed the uniform now worn by the Chicago Black Horse Troop. Mr. McBarron makes his home in Chicago.

BRIGADIER GENERAL HENRY J. REILLY, ORC, was born at Fort Barrancas, Florida. He is the son of Captain H. J. Reilly who died in action in 1900 at the gates of Pekin while commanding the famous Reilly's Battery. General Reilly was graduated from the U. S. Military Academy as a second lieutenant of cavalry in 1904. He resigned in 1914 to devote his time to newspaper work, becoming the war correspondent for the Chicago *Tribune* in Mexico and in Europe. Upon our entry into the World War he rejoined the service as a captain, rising shortly to the grade of colonel, Field Artillery. He commanded the 149th Field Artillery and 83d Infantry Brigade of the 42d (Rainbow) Division. For his World War service he holds the Distinguished Service Medal, the French Croix de Guerre, and the Legion of Honor. Later, as war correspondent he covered the Polish-Soviet war of 1920-1921, the Manchurian campaign of 1925, and the recent Spanish Civil War. He has written for various magazines and newspapers and is the author of several books. General Reilly makes his home in New York City.

LIEUTENANT J. H. TWYMAN, JR., Coast Artillery Corps, is a native of Virginia. Graduating from the U. S. Military Academy with the Class of 1930, he was appointed a second lieutenant, Coast Artillery Corps. He is a graduate of the Coast Artillery School Regular Course (1937). Lieutenant Twyman is on duty with the 3d Coast Artillery, Fort MacArthur.

W. A. WINDAS is a writer-artist who makes his home in California.

Coast Artillery Orders

(Covering the Period November 1 to December 31, 1939)

Colonel W. K. Dunn, to General Staff Corps, Philippines Dept., revoked.

Colonel E. L. Kelly, retired, Jan. 31, upon his own application.

Colonel R. M. Mitchell, from U. S. Army transport *Republic* Brooklyn, to Athens High School, Athens, Georgia.

Colonel J. T. H. O'Rear, to the Philippines, sailing San Francisco, January 20.

Colonel J. P. Smith, detailed General Staff Corps, assigned Chief of Staff, 4th Corps Area, Atlanta.

Lieutenant Colonel H. C. Allen promoted Colonel, November 1.

Lieutenant Colonel Franklin Babcock promoted Colonel November 1.

Lieutenant Colonel C. A. W. Dawson to 13th, Ft. Crockett. Previous orders amended.

Lieutenant Colonel E. B. Dennis promoted Colonel November 1.

Lieutenant Colonel F. M. Green promoted Colonel October 1.

Lieutenant Colonel M. M. Kimmel, Jr., to Panama C.A. Detachment, Ft. Wadsworth.

Lieutenant Colonel D. S. Lenzner promoted Colonel October 1.

Lieutenant Colonel A. V. Rinearson, to 13th, Ft. Barrancas.

Lieutenant Colonel F. C. Scofield, to Panama, sailing New York, February 21.

Lieutenant Colonel E. C. Seaman, to Org. Res., Providence, R. I.

Lieutenant Colonel O. L. Spiller promoted Colonel November 1.

Lieutenant Colonel R. W. Wilson promoted Colonel October 1.

Major E. L. Barr, to the Philippines, sailing New York, December 18, revoked.

Major L. J. Bowler, to the Philippines, sailing San Francisco, January 20.

Major G. W. Brent, to Panama C.A. detachment, Ft. Adams.

Major H. D. Cassard, to 68th, Ft. Williams, revoked.

Major A. K. Chambers, to the Philippines, sailing San Francisco, January 20.

Major B. C. Dailey, to Org. Res. Fifth Corps Area.

Major F. G. Epling, to Third Corps Area, Baltimore, to General Staff with troops.

Major D. B. Greenwood, to 68th, Ft. Williams, Me.

Major A. L. Haggart, to 13th, Ft. Barrancas.

Major T. E. Jeffords, to 7th, Ft. Hancock.

Major E. C. Jones, to 65th, Ft. Winfield Scott.

Major E. W. King, to Panama C.A. detachment, Ft. Hamilton.

Major G. M. O'Connell, to 63d, Ft. MacArthur. Previous orders amended.

Major C. R. Roberts, to Org. Res. 5th Corps Area, Cincinnati. Previous orders revoked.

Major H. W. Ulmo, to 10th, Ft. Rodman.

Captain J. G. Bain, to 69th, Ft. Crockett, revoked.

Captain O. DeF. Bowman promoted Major, September 1.

Captain G. F. Heaney, Jr., to 63d, Ft. MacArthur.

Captain F. R. Keeler, to First Corps Area, Boston.

Captain J. R. Lovell, to assistant military attaché to Germany.

Captain H. H. Myrah, to 69th, Ft. Crockett.

Captain J. H. Pitzer, to 69th, Ft. Crockett.

Captain H. W. Smith promoted Major September 1.

Captain W. M. Vestal, to 7th, Ft. Hancock.

Captain S. E. Willard promoted Major November 5.

First Lieutenant W. S. Blair, to 52d, Ft. Hancock.

First Lieutenant A. S. Buynoski, to 62d, Ft. Totten.

First Lieutenant J. C. East, to Hawaii, sailing San Francisco, November 25. Previous orders amended.

First Lieutenant G. H. Holterman, to 61st, Ft. Sheridan.

First Lieutenant W. H. Kinard, Jr., to 65th, Ft. Winfield Scott.

First Lieutenant R. H. Mattern, to 2d, Ft. Monroe.

First Lieutenant H. P. Persons, Jr., to 2d, Ft. Monroe.

First Lieutenant G. R. Wilkins, to 65th, Ft. Winfield Scott.

First Lieutenant P. H. Wollaston, to 70th, Ft. Monroe.

Second Lieutenant Allen Bennett, CA-Res. appointed 2d Lt. CAC, to 70th, Ft. Monroe.

Second Lieutenant D. R. Boss, to Randolph Field.

Second Lieutenant F. X. Bradley, CA-Res. appointed 2d Lt. CAC to Panama C.A. Detachment, Ft. Hancock.

Second Lieutenant B. R. Brown, to the Philippines, sailing San Francisco, April 16. Previous orders amended.

Second Lieutenant W. D. Chadwick, Jr., to 69th, Ft. Crockett.

Second Lieutenant M. H. Clark, to 14th, Ft. Worden.

Second Lieutenant W. C. DeBill, to 6th, Ft. Winfield Scott.

Second Lieutenant T. W. Davis, 3d, to 62d, Ft. Totten.

Second Lieutenant A. L. Evans, Jr., to Randolph Field.

Second Lieutenant S. C. Farris, to the Philippines, sailing New York, April 2.

Second Lieutenant W. J. Fling, to Panama, C.A. detachment, Ft. DuPont.

Second Lieutenant F. H. Foerster, Jr., to Randolph Field.

Second Lieutenant J. D. Garcia, to Randolph Field.

Second Lieutenant R. E. Greer, to Randolph Field.

Second Lieutenant C. J. Hackett, to Panama C.A. detachment, Ft. Preble.

Second Lieutenant L. A. Hall, to 68th, Ft. Williams.

Second Lieutenant J. E. Hart, CA-Res. appointed 2d Lt. CAC to 70th, Ft. Monroe.

Second Lieutenant L. W. Hendricks, to Randolph Field.

Second Lieutenant S. F. Hudgins, to 11th, Ft. H. G. Wright.

Second Lieutenant J. T. Kingsley, Jr., to Randolph Field.

Second Lieutenant A. J. Kinney, to Randolph Field.

Second Lieutenant P. H. Lehr, to the Philippines, sailing New York, April 2.

Second Lieutenant Carl Lentz, II, to Hawaii, sailing New York, February 20.

Second Lieutenant C. J. Long, 3d, to Randolph Field.

Second Lieutenant J. L. McBride, to Randolph Field.

Second Lieutenant N. J. McGowan, to Randolph Field.

Second Lieutenant E. O. Meals, to Randolph Field.

Second Lieutenant R. B. Miller, to Randolph Field.

Second Lieutenant J. G. Nelson, to 7th Ft. DuPont.

Second Lieutenant D. K. Nickerson, to 61st, Ft. Sheridan.

Second Lieutenant J. G. Pickard, to Randolph Field.

Second Lieutenant W. T. Smith, to Randolph Field.

Second Lieutenant J. T. Walker, to 11th, Ft. H. G. Wright.

Second Lieutenant C. E. White, to the Philippines, sailing San Francisco, January 20.

Second Lieutenant D. K. White, to Randolph Field.

Second Lieutenant J. W. Williams, CA-Res. appointed 2d Lt. CAC to 13th, Ft. Barrancas.

Second Lieutenant T. P. Wright, to Randolph Field.

Second Lieutenant P. D. Wynne, Jr., to Randolph Field.

BOOK REVIEWS

Mr. Villard's Military Chaos

OUR MILITARY CHAOS: The Truth About Defense. By Oswald Garrison Villard. New York: Alfred A. Knopf, 1939. 202 pages; $1.75.

The title of this book, like most book titles, is of course an exaggeration. More to the point, so is the subtitle. The prominence of the author, and the near-reverence with which his pronouncements are regarded by not uninfluential parts of the community, suggest that it may be worthwhile to point out the obvious factual inaccuracies contained in the book, and to consider, if perhaps only briefly, the emotional animus which pervades the entire volume.

Mr. Villard's thesis, succinctly stated, is that the United States is impregnable, and that a warlike attack on us by a major power would be impossible. He insists that our military policy is planless and chaotic, primarily because our foreign policy has not determined whether we are to "defend" America or to wage an offensive war abroad. Our military organization is defective, our military expenditures wasteful. A Council of National Defense should be established to coördinate the fighting services. The war referendum measures should be passed. And a representative committee—not, however, to be appointed by the President, whose bias in favor of large armaments disqualifies him for the task of making the selection—should make a national inquiry into the wisdom of present-day military expenditures and into the unclarified aims which have brought them about.

The major premise in the above is that war is impossible, and that our foreign policy should be "clarified" so as to insure our always withdrawing in the face of aggression. It would be comforting could one believe in the impossibility of war, but the year just past has demonstrated very dramatically the need for circumspection in chalking up international Q. E. D.'s. The Hitler-Stalin pact was considered impossible by most of the informed statesmen of the world, and Russia's invasion of Finland was surely regarded as impossible by the many persons who, sympathetic to Mr. Villard's essential point of view, felt that the Soviet was the single disinterested force in European affairs.

"Our Planless Defense," Mr. Villard's first chapter, is essentially an attack on present-day foreign policy: the services cannot plan sensibly for war because they have not been told whom we are going to fight. Running a football team is so much simpler, of course, because a schedule of opponents has been carefully arranged, and the traditional rival for whom the team must point is known in advance. If foreign policy could likewise be formulated in a vacuum, without regard to what other nations will or might do, consistency of object and tactics would be much easier of attainment. But the hard actuality of events does not permit of absolutes, and policies abroad, just like policies at home, necessarily represent the adjustments of expediency. A foreign policy cannot be constructed along the lines of a rigidly logical system, least of all in the troublous times of today. Therefore the only possible military policy is one that will serve to meet all contingencies—and Mr. Villard has obvious distastes for the graver ones.

Apart from this, however, Mr. Villard is troubled by the notion that, even in a defensive war, offensive action may be necessary. (It is amazing how difficult it is to drive this idea home to many of the most intelligent citizens; the eager acceptance of the alleged distinction between "offensive" and "defensive" weapons is a symptom of the same difficulty.) This desire for offensive action Mr. Villard attributes to "the professional military officer" who "wants to extend the operations of a war to the enemy territory so that it may suffer and not the home country." One would have supposed that this particular desire was shared by the civilians of the home country, but then, as is pointed out later, they may have been influenced by militaristic propaganda and the Army-Navy "social lobby."

Much of the foregoing, of course, is not susceptible of mathematical proof. But the conclusions drawn by Mr. Villard rest in so many instances upon demonstrable inaccuracies that an unbiased reader would be justified, by that token alone, in first suspecting them, and then rejecting them altogether.

ESSAY COMPETITION 1940

a. PERMISSIBLE COMPETITORS:

Any member of the Coast Artillery Association at date of submission of essay.

b. SUBJECT:

To be selected by the author. Appropriateness of subject for Coast Artillery readers is a point to be considered in awarding prize.

c. PRIZES:

(1) *Number:*

(*a*) One First Prize—$200.00. Not to be awarded if no essay submitted is outstanding.

(*b*) Not to exceed two Honorable Mention Prizes—$100.00 each.

(2) Awarded by Chief of Coast Artillery upon recommendation of Board of Officers appointed by him. Membership of Committee to be published only after awards for the year have been made.

(3) *Time limit.*

No essay received after September 30th, 1940, will be awarded a prize.

(4) *Payments.*

Payments of prizes will be made immediately after awards are made. All essays submitted become the property of the COAST ARTILLERY JOURNAL. Any person receiving a prize for an essay will receive no other compensation. If any essay is published the author of which received no prize, such author will be paid at the usual rates.

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Essays will be submitted to the Editor of the COAST ARTILLERY JOURNAL in a sealed envelope bearing the notation "Prize Essay Contest." The copy submitted will contain nothing to indicate its authorship, will be signed by a "nom de plume," and will be accompanied by a separate sealed envelope containing the nom de plume and also the name of the writer. This latter envelope will be delivered to the Chief of Coast Artillery when received and will be opened in the presence of the Editor of the COAST ARTILLERY JOURNAL after the relative merits of the essays have been determined.

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(1) Essays should be limited to approximately 8,000 words, but shorter articles will receive consideration.

(2) Three typewritten copies of each essay will be submitted on letter size paper (one original, two carbons) with double-spaced lines. At least one of any illustration will be a drawing, tracing, or photograph, not a blue print or brown print.

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For instance, Mr. Villard bases his contention that the currently authorized American air forces are excessively large upon the reports of the Morrow Board, the Baker Board, and the Howell Commissions—dated, respectively, 1925, 1934, and January, 1935. To suggest, in view of what everyone knows of the development of aviation and of aggressor air forces since then, that these reports are valid arguments against the recent authorizations, is, it is submitted, either downright silly or else intellectually dishonest. And to state (pp. 71-72) that there has been no marked increase in the flying range of bombing planes since *1923* is to make an error so egregious that, at the most charitable, one dismisses it as an oversight in the course of hasty composition, on a par with the mention of 627 Congressmen and Senators (p. 182), which counts in the Senators twice.

But this is not all. Mr. Villard says (p. 115): "It is a startling fact, however, that only once in our entire national history have we decreased the defense forces in peace-time." Startling, indeed, if it were a fact; but even a dim recollection of history recalls Army reductions in 1821, in 1869, and in 1920-22. This is exclusive of what might be called post-war peace-time reductions, in 1784, 1802, 1815, 1842, 1866, and 1919-20, to say nothing of the 1922 scuttlings of our ships.

Mr. Villard states (pp. 98-99):

> "There are various reasons for this huge number [of Reserve officers], the need of officers for the Army of millions we are to raise being again the chief one; but it must be pointed out that a large majority of these officers have nothing to do with combat troops. They are part and parcel of the War Department's plans for taking over the industrial machinery of the United States so as to ensure the production of the 700,000 articles which the Army will need if war comes again. These particular Reserve officers are executives of large industrial plants; on the outbreak of war they will be called to active duty and assigned to take charge of the factories or mines or whatever enterprise it is in which they are now engaged."

If Mr. Villard had taken the precaution to look at the Secretary of War's Annual Report, he would have learned that, far from there being a large majority of reserve officers who "have nothing to do with combat troops," some two-thirds of all the active Reserve Officers belong to the combatant arms, and this does not include the many Medical, Quartermaster, and Chemical Warfare officers who are attached to or closely associated with combat units.

The rest of the statement is a canard, pure and simple. The Industrial Mobilization Plan does not contemplate militarizing industrial plants, nor is there any body of Reserve officers assigned to operate their own factories or mines in uniform on M-day. Mr. Villard owes it to his public, if not to himself, to avoid repeating a statement entirely devoid of factual basis.

Mr. Villard says (p. 130) that high-ranking Army of-

ficers "have a freedom of utterance not granted to similar officials in other countries except under governmental direction and with its approval." It is obvious that he is unacquainted with the contents of Army Regulations. Mr. Villard—but why go further? One does not have to eat the whole of an egg to know that it is bad.

Having demonstrated to his own complete satisfaction that our military expenditures are too large, and thoroughly unnecessary, Mr. Villard proposes a national inquiry into those expenditures. The risk of having a committee appointed by President Roosevelt is, he feels, a greater danger than to have a privately appointed committee without the power of subpoena witnesses. As a matter of fact, witnesses will not be necessary, for Mr. Villard has not only supplied his proposed committee with the question which he wishes them to answer, he has generously furnished them with the answer as well. Here is his neatly loaded query (p. 198):

> "What will it avail us to arm to the utmost limit, to subordinate our national and industrial life to preparations for war, if thereby we lose our democratic soul—that soul we are supposed to preserve by pouring out armament expenditures without end?"

Mr. Villard, of course, eagerly echoes the familiar refrain that war will mean the end of our democracy. That modern war will involve some pretty thoroughgoing controls is obvious, but that the peace will not see the abandonment of those controls is a statement which neither he nor any of his fellow-singers of the same song have ever proved or even undertaken to prove. Indeed, both the post-Civil War and post-World War experiences are proof that our democracy has survived and will again. But the contrary is, in their minds and in Mr. Villard's, unnecessary to prove; it has become an article of faith, to be accepted without questioning.

And that suggests that perhaps it has been unfair to treat this volume as though it were a scientific treatise. The fairer course would be to consider it as a tract in Mr. Villard's anti-military crusade, which he has been preaching, with fervor verging upon hysteria, for at least a quarter of a century. (See e.g., Proceedings, Academy of Political Science, July, 1916, p. 50.)

In the present work will be found all the manifestations of intense emotional bias—the tone of sustained indignation, the conjuring up of imaginary horribles, and the magnification of trifles. Thus, Mr. Villard figuratively splutters with passion at the 1916 federalization of the National Guard, "in violation of historic tradition and perhaps of states' rights" (p. 100); at the attention given by the press to the military services—"Even a small-boy cadet corps may come in for much publicity if the son of the owner is a member" (p. 151); at Admiral Leahy's alleged position as a *de facto* Secretary of the Navy, called "a curious and rather ominous development" (p. 163).

Nor is there any dearth of the *ad hominem* attack so characteristic of crusading editors. (Reflections on the President may perhaps be discounted; all Presidents have

been fair game for choleric critics of every persuasion.) General Arnold's veracity is questioned (pp. 65-66). The circumstance that no disciplinary proceedings were instituted against General Moseley is the subject of adverse comment (p. 137), though one may be permitted to speculate whether court-martial, dismissal, and martyrdom would as effectually have silenced that irate warrior. And a distinguished field officer on the active list, now the editor of a service journal, is accused of writing "poisonous Nazi stuff" (p. 136) because he had occasion to publish his findings on the psychology of military leadership.

If Mr. Villard were more interested in facts than in fascist footprints under the bed, he would not compare adversely the large number of our Reserve officers with the much smaller number of officers in the pre-war German army (p. 95). The fact is that the German officer corps opposed any increase in its numbers, when Germany's military program required such an increase, for fear that the purity of its Prussian Junkerdom might be diluted by the admixture of bourgeois strains. Unbiased observers might suggest that a large body of Reserve officers, drawn from all walks of life, and entering into the Regular Army through the Thomason Act and similar legislation, would militate against the ascendancy of a particular caste, and insure the essentially citizen character of the military forces. But Mr. Villard views the O. R. C. differently, and sees Reserve officers as potential spies, in industrial centers, upon the working class (p. 150).

As an objective text, Mr. Villard's book hardly merits extended consideration. As the product of a highly emotional state of mind, however, it deserves the closest kind of study. Indeed, there is need for psychological research into the complexes and neuroses of political life and public affairs. There have been papers galore on the inferiority complex, on the mother-fixation, on the many curious attitudes and points of view recorded and classified by Krafft-Ebing and Havelock Ellis. Is it not time to devote some attention to the various kinds of tariff enthusiasts, to the single-taxer, to the bureaucrat, or—save the mark—to the congenital pacifist?

For the work under review is the product of emotion, not of reason. Mr. Villard clings to his first love, pacifism, let the logic of events be what it may. Therefore he dedicates the volume "to the American business men"—we may disregard them; they are no friends of his—"and to the liberals who will not see." That is to say, to those liberals who, in a world where only the strong are respected, which has seen the submergence of Ethiopia, Austria, Czechoslovakia, Albania, and Poland—must we now add Finland, too?—have abandoned the easy shibboleth of non-resistance and the peace that is no peace.

If they will not see through Mr. Villard's eyes, it is because their instinct is sounder and their vision clearer.

FREDERICK BERNAYS WIENER,
Captain, JAG-Reserve.

ECONOMIC PROBLEMS OF THE NEXT WAR. By Paul Einzig. New York: The Macmillan Company, 1939. 146 Pages; $2.50.

ECONOMIC ASPECTS OF DEFENSE. By Harold Macmillan, M.P. New York: The Macmillan Company, 1939. 67 Pages; $.50.

These books were written by Englishmen to persuade their countrymen and their Government to prepare the Empire's economic resources for the war that has now arrived. Printed words thus run to obsolescence more rapidly than a publisher might desire.

However, there is a certain interest in arguments which turn out to be *post facto*. Dr. Einzig, in his conclusion, lists twenty-nine reasons for an English victory. They appear to be based on six general premises: (1) a long war; (2) British ability to isolate Germany economically; (3) German lack of gold reserves and foreign credits; (4) British superiority in all matters relating to cash and credits, and the ability to use them in the right places; (5) a greater potential productive capacity among Britain and her allies; and (6) economic aid, at least, from the United States.

Reason No. 19, which says that Britain will win "because among the potential allies of Great Britain, Soviet Russia possesses immense economic resources and is more than self-sufficient," now looks very sick and makes some of the other reasons look a little peaked too. Einzig could see the possibility of a Russo-German pact but he could not see British statesmenship so "utterly short-sighted" as to allow such a situation to develop. Just how much short-sightedness was involved—and when it came into play—now remains to be seen.

Einzig is a money economist, and though he surveys briefly the prospective internal control of war-time consumption and production, his best work is in the field of budgetary control, foreign trade and exchange, and monetary control. Mr. Macmillan, a member of Commons, is primarily concerned with the political aspects of economic defense and with war objectives. His brief tract discusses problems connected with the attempt to accommodate democratic means to the social end of war, an end which is collectivistic—if not totalitarian—in its economic characteristics. Both books are suggestive and persuasive, rather than detailed.

Einzig's discussions of the problem of inflation resulting from war financing are worth noting. The Nazi economic and financial system, he says, while it has worked "satisfactorily" in time of peace, is not likely to stand the shocks of a long war, especially in view of an inflation-minded public. Economists have been fond of predicting the downfall of Nazi financial schemes, perhaps without recognizing the revolutionary aspects of the regime. The question of foreign credits, particularly the length Germany will go to receive economic aid from Russia, seems to provide the more crucial problem for Germany to solve. Which revolution will swallow which? W. C. G.

THE WAR GASES. By Dr. Mario Sartori. Translated by L. W. Marrison. New York: D. Van Nostrand Company, 1939. 360 Pages; Index; $7.50.

The title of the original Italian edition is *Chimica delle Sostanze Aggressive*. This title should have been translated "The Chemistry of War Gases" since this is descriptive of the contents of this truly chemistry textbook. It is the first book to be written on chemical warfare from the purely chemical viewpoint and, as such, it should be in the library of every student of military chemistry.

Part I of the book, covering only thirty-two pages, deals with the physical chemical requirements of war gases in general, viz, the physiopathological properties—lower limit of irritation, the limit of unsupportability, the mortality product; the physical properties—vapor tension, volatility, boiling point, melting point; and the chemical properties—stability to atmospheric and chemical agencies, stability on storage, stability to explosion, and absence of attack on metals. It also contains an interesting chapter on the relation between chemical structure and aggressive action and a chapter on the several classifications of war gases.

The remainder of the book is devoted to a systematic description of the several war gases. This covers history, methods of preparation, physical and chemical properties, methods of detection and analysis. In keeping with the strictly chemical treatment of the subject this section contains no description of the physiological action of the several war gases and related toxic gases which are covered.

The book is notable for the thoroughness of the literature study which went into its preparation and for the scientific and technical ability of its author, who is the chemist of the Italian Chemical Warfare Service. The author index covers five pages.

The translation is well and accurately done. It is a welcome addition to the comparatively few books on chemical warfare published in the English language. Incidentally, so far as known by this reviewer, this is the only published translation into English of any book on chemical warfare published in a foreign language. A. L. K.

♦ ♦ ♦

HOW STRONG IS BRITAIN? By C. E. Count Pückler. New York: Veritas Press, 1939. 239 Pages; $2.50.

This is essentially an economic estimate of British strength by one of Germany's leading journalists who has long been recognized both at home and in England as an authority on just this subject. Its fairness is best attested by the glowing reviews it has received in the leading British papers and this in spite of the fact that it glosses none of the weaknesses of the British Empire. Personally we got a better and clearer picture of just what England is up against from Herr Pückler than from any other estimate that has come our way. Therefore this book naturally wins our hearty and unqualified endorsement.

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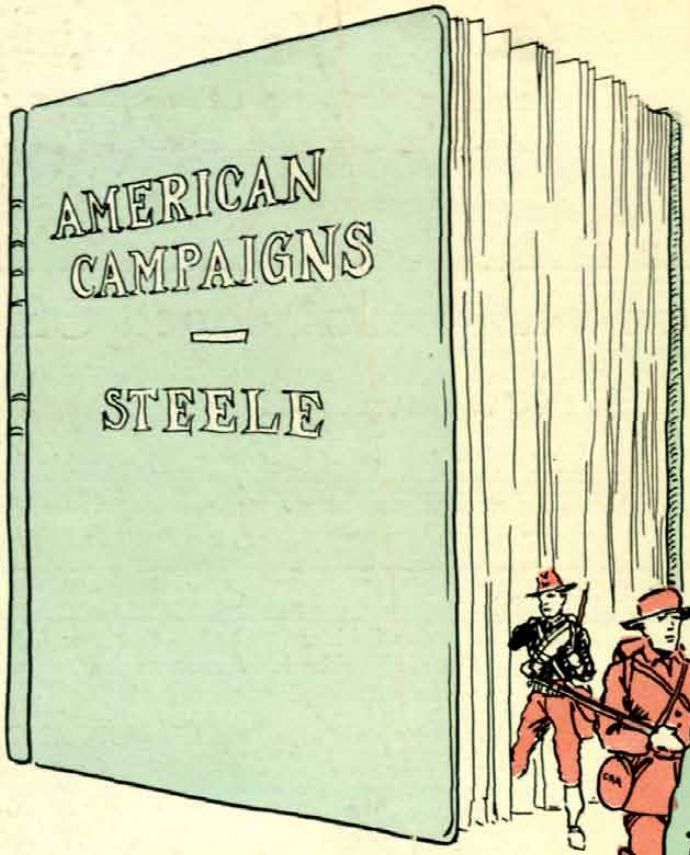

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