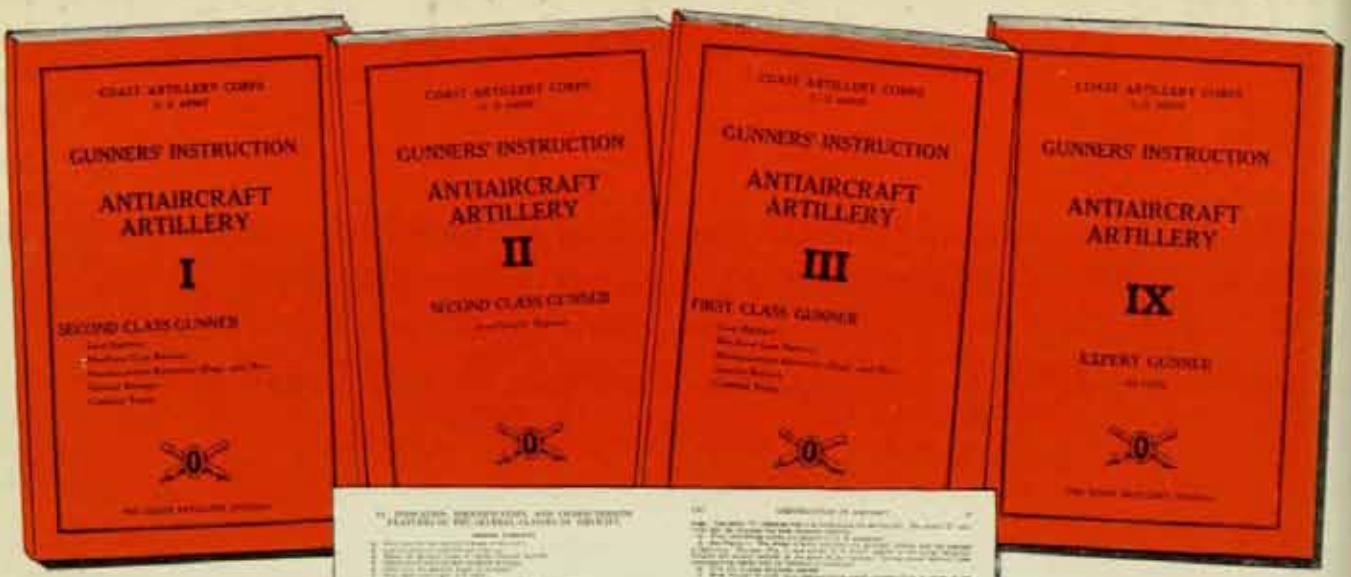
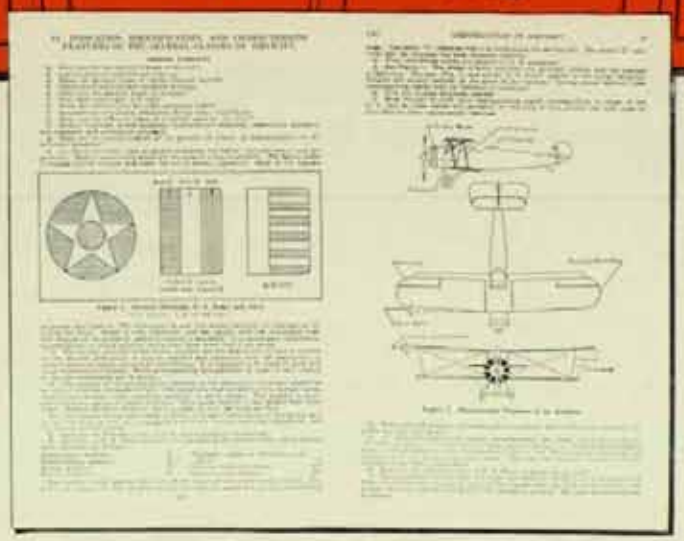
The Coast Artillery JOURNAL

JULY-AUGUST 1938



GUNNERS' INSTRUCTION



PAMPHLETS

New Subject Matter, New Illustrations, Complete—Official

For all Coast Artillery Organizations. Fully meets the requirements of Training Regulations 435-310 (Examination for Gunners). Used for instruction in a number of R.O.T.C. units.

NUMBER	GUNNERS' INSTRUCTION PAMPHLETS	PRICE
I.	2nd Class Gunner, Antiaircraft Artillery (Except Searchlight Battery)	$0.65
II.	2nd Class Gunner, Antiaircraft Artillery (Searchlight Battery)	0.50
III.	1st Class Gunner, Antiaircraft Artillery (Except Searchlight Battery)	0.65
IV.	1st Class Gunner, Antiaircraft Artillery (Searchlight Battery)	0.40
V.	2nd Class Gunner, Fixed Seacoast Artillery (All Units)	0.55
VI.	1st Class Gunner, Fixed Seacoast Artillery (All Units)	0.50
VII.	2nd Class Gunner, Mobile Seacoast Artillery (All Units)	.65
VIII.	1st Class Gunner, Mobile Seacoast Artillery (All Units)	.75
IX.	Expert Gunner, Antiaircraft Artillery	1.00
X.	Expert Gunner, Fixed Artillery	1.00
XI.	Expert Gunner, Mobile Seacoast Artillery	1.00
XII.	Submarine Mining	1.25

These pamphlets recently have been revised and brought up-to-date. They cover the instruction of all 2nd Class, 1st Class, and Expert Gunners of Antiaircraft, Fixed and Mobile Artillery.

Invaluable for the training and instruction of Coast Artillery personnel. Each enlisted man of a submarine mine detachment should have a copy of "Submarine Mining."

The above prices are retail (postpaid) for single copies. To ORGANIZATIONS of the military establishment a discount of 20% will be allowed on any order regardless of number. F.O.B. Washington, D. C.

THE COAST ARTILLERY JOURNAL

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

JULY-AUGUST, 1938 VOLUME LXXXI

MAJOR AARON BRADSHAW, JR., C.A.C., *Editor* NUMBER 4

CONTENTS

COVER DESIGN
By Lachlan Field

DEFENSE OF THE BELGIAN COAST: 1914-1918 243
By Lieutenant Colonel Rollin L. Tilton

THE NAVY (Pictures) 254

BOMBARDMENT TACTICS 260
By Brigadier General Henry C. Pratt

THERE WAS NO PLACE LIKE HOME 262
By Lieutenant Colonel A. C. M. Azoy

THUNDER IN THE EAST 270
By Lieutenant Jack W. Rudolph

MORGAN MACHINE-GUN SIGHT 283
By Major Maurice Morgan

DISCIPLINE IN THE NATIONAL GUARD 286
By Lieutenant Alfred D. Haigh

GREAT BRITAIN (Pictures) 288

WHAT ABOUT MILITARY HISTORY? 290
By Major John H. Burns

THE SPANISH WAR: A Review of the Best Foreign Opinion 297
By Captain Wendell G. Johnson

AN ANTIAIRCRAFT TRAINER 303
By Lieutenant Colonels Charles I. Clark and Hazen L. Hoyt

EDITORIAL 306

NEWS AND COMMENT 307

COAST ARTILLERY ACTIVITIES 311
Notes from the Chief's Office—Fort Monroe—Panama — Hawaii — Corregidor — New York National Guard—Fort Barrancas—Hartford—Maryland.

COAST ARTILLERY BOARD NOTES 321

COAST ARTILLERY ORDERS 325

AT THE SCHOOLS, 1938-1939 327

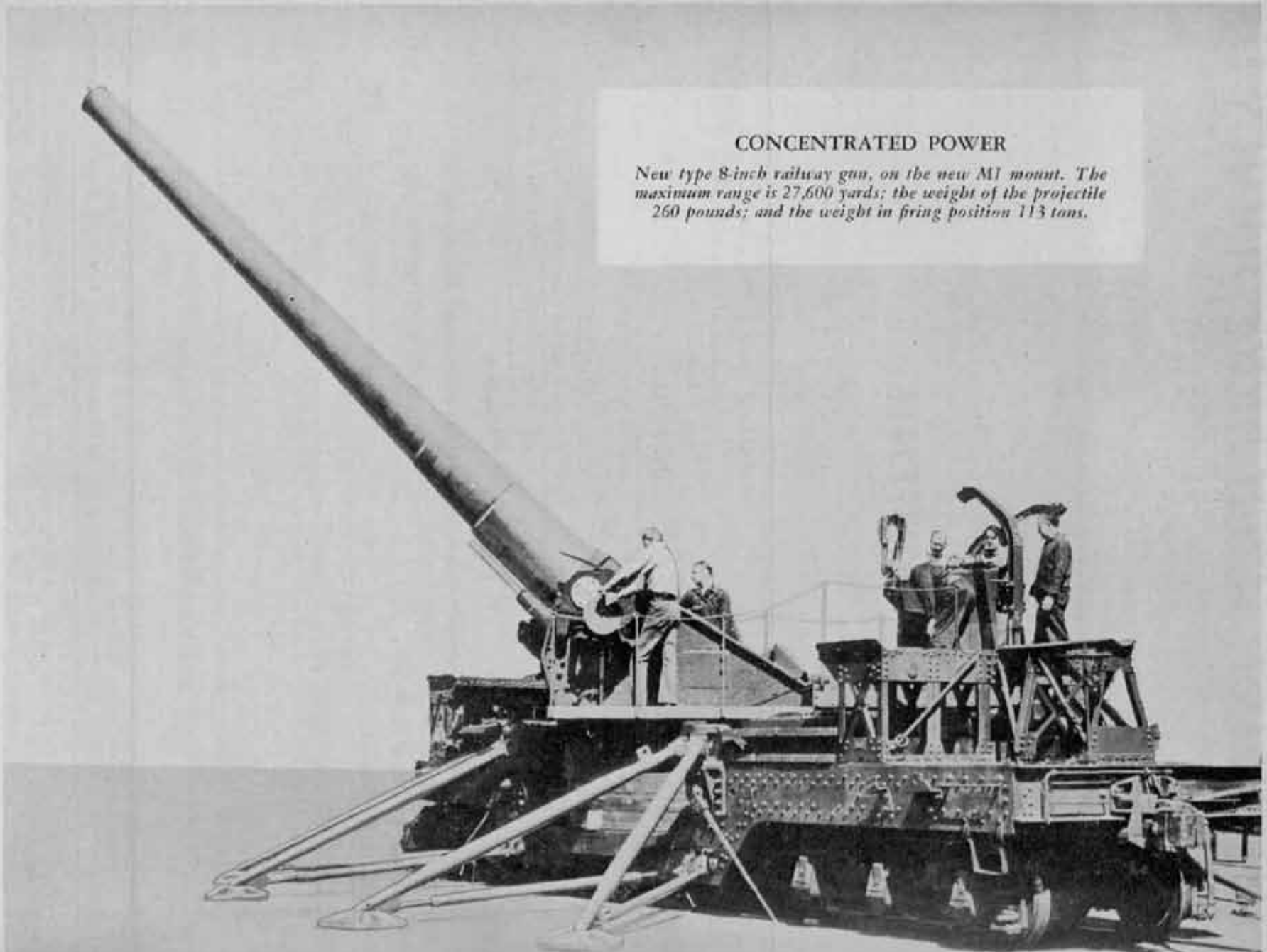
CONTRIBUTORS 328

BOOK REVIEWS 329

PUBLICATION DATE, AUGUST 1, 1938

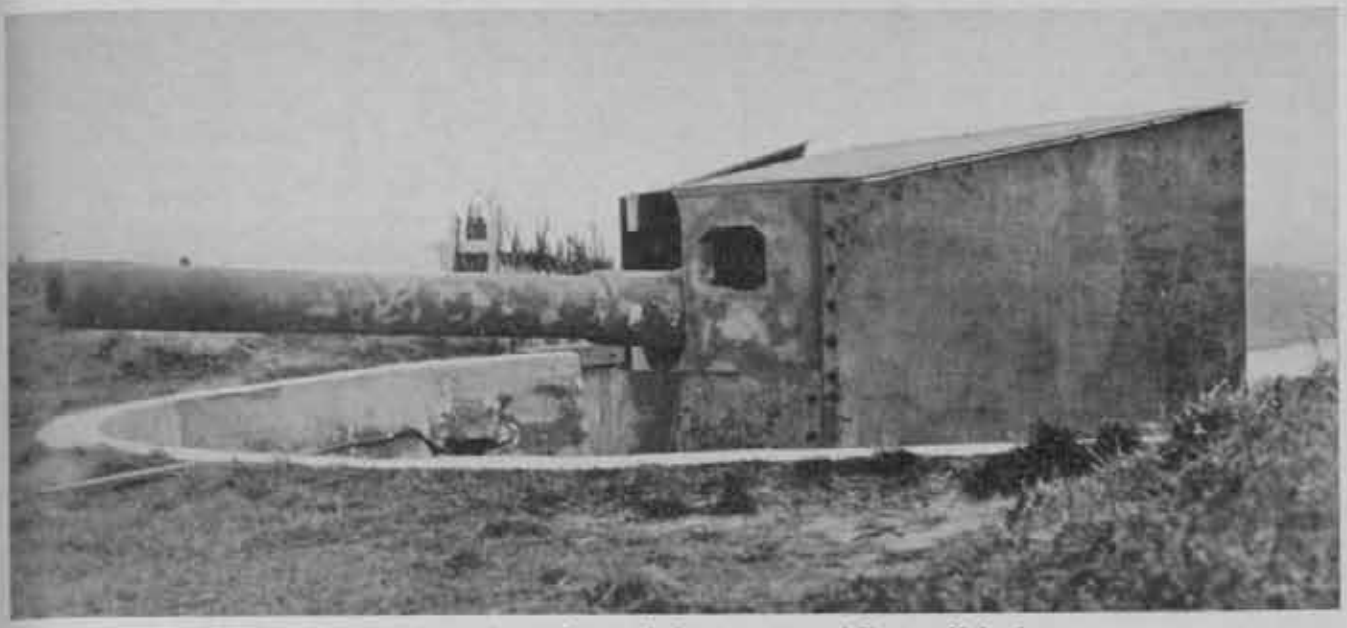
Opinions expressed and conclusions drawn in articles are solely those of the authors and are in no sense official. They should not be considered as those of the Chief of Coast Artillery or any branch of the War Department.

THE COAST ARTILLERY JOURNAL pays for original articles upon publication. THE COAST ARTILLERY JOURNAL does not carry paid advertising. Published bi-monthly under the supervision of the United States Coast Artillery Association for the information of the Coast Artillery personnel of the Regular Army, National Guard and Organized Reserves. Publication Offices, 1406 East Franklin Street, Richmond, Virginia; Editorial Offices, 1115 17th Street, N.W., Washington, D. C. Terms: $4.00 per year. (Coast Artillery Association members, $3.00 per year.) Single copies, 75 cents. Entered as second class matter at Richmond, Virginia, under the Act of March 3, 1879, for mailing at special rate of postage provided for in Section 412, Act of October 3, 1917. Copyright, 1938, by the United States Coast Artillery Association.



CONCENTRATED POWER

New type 8-inch railway gun, on the new M1 mount. The maximum range is 27,600 yards; the weight of the projectile 260 pounds; and the weight in firing position 113 tons.



This 17-cm. gun formed part of the armament of Battery Kaiserin one of the chain of German coast defenses near Zeebrugge

Defense of the Belgian Coast: 1914-1918

By Lieutenant Colonel Rollin L. Tilton, Coast Artillery Corps

THE GERMANS initiated the defense of the Belgian coast as soon as their forces occupied the shore from the Dutch Border to Nieuport. Their defensive measures began in October, 1914, and continued until the German withdrawal from Flanders in 1918 because of pressure in other areas.

For the greater part of the war the German defenses protected the important harbors and submarine bases of Ostende and Zeebrugge and guarded the right flank of the German Army; both vital considerations to the High Command. Although the Allied thrusts against them included many types of coastal attack, their security was never seriously threatened. Not once did they fail in their task of furnishing a stout seaward bulwark.

In peacetime the German naval forces were principally based in the Heligoland Bight. (Map 1) But now, at a bound, Germany found an invaluable and protected naval base for submarines and small craft some 300 miles nearer to and practically on the Straits of Dover. This was the Bruges-Ostende-Zeebrugge triangle. The Straits of Dover are the narrowest part, some twenty miles across, of the belt of water that protects England from invasion and have always been the bottleneck of the food supply of London and the main routes of oversea commerce. Approximately 100 ships a day passed Dover during the war.

The lines of communication of the British Expeditionary Force ran from Dover and Folkestone on the English coast to Dunkerque, Calais and Boulogne on the French coast. Over them passed a daily flow of men and supply. From Heligoland to Dover is 315 miles; from Ostende, Dover is but 60, Dunkerque, 23 and Calais, 50. Naturally, submarine operations against the channel traffic and the trans-Atlantic trade routes were greatly facilitated. Light forces found the Belgian coast an excellent advanced base for raids and operations against the channel traffic, British naval forces, and the English and French coasts. As a base for air operations the coast was invaluable.

The military reasons for the defense of the Belgian coast were equally important. As the right flank of the German line on the Western front, its defense was vital to the army. Early operations had shown that that line was enfiladed from the sea and if not adequately defended, a

The meagre results of the Allied bombardments show the futility of attack against seacoast defenses

source of weakness. The British superiority at sea made offensive operations along the coast or joint landing operations with a view to turning the German flank a strong possibility. Moreover, the German occupation and defense of the Belgian coast held a constant threat of invasion toward England.

The German Admiralty fully appreciated the usefulness of Flanders as a base for naval warfare. Toward the end of October, 1914, the Antwerp yards were in operation and small submarines were being assembled. Ostende, Zeebrugge and Bruges became operating bases by the end of November. The U-boat flotilla of the Naval Corps in Flanders was established March 15, 1915. At one time it operated as many as 37 U-boats, and up to April, 1918, was responsible for 23% of the damage done by the submarine campaign. In addition to the U-boats, some 25 to 35 destroyers and torpedo boats, as well as smaller craft, based on the coast and conducted operations in the channel.

Map 1

The English Channel-North Sea strategic area.

Belgian Coast

The Belgian coast from the Dutch to the French borders is only 40 miles long. The Germans occupied and defended the 30-mile portion from the Dutch border to Nieuport.

The coast is mainly flat country, barely above sea level, and cut up by a network of canals and small rivers. A line of sand dunes runs parallel to and within a few hundred yards of the shore, interrupted only by the towns and canal entrances. These dunes, which formed an enormous rampart along the coast, were about 12 yards high and varied in width from 75 to 1,000 yards. Back of the dunes the country is also very flat and sparsely settled between the towns. Few trees and nothing that could be called a wood is to be found near shore. Aside from the canal system, the Yser River flows generally north from Ypres and empties into the North Sea at Nieuport. It is the only stream of importance. The road and rail net was excellent.

The coastal waters abound with shoals reaching some 8 miles seaward. There is a tidal range of some 15 feet along the coast and strong tidal currents cause a constant shifting of the bottom. Navigation is difficult and hazardous, particularly in time of war when the aids to navigation cannot be depended upon.

Eastward of Nieuport there are three harbors, Ostende, Blankenberghe and Zeebrugge, while 8 miles inland from Zeebrugge is Bruges, connected by canals to both Ostende and Zeebrugge. All are artificial harbors. Ostende-Zeebrugge-Bruges thus formed a triangle with two sea entrances 12 miles apart. Ostende and Zeebrugge were ports of considerable importance and had numerous wharves, basins, and docks suitable for submarines and torpedo craft of all classes. Bruges was an entirely artificial harbor consisting of locks, basins and waterways built on the canal system. In addition to its canal connections with Ostende and Zeebrugge it was also connected by canal with Antwerp via Ghent. The Bruges-Zeebrugge canal was the largest and most important; 6¼ miles long, almost straight and could accommodate submarines and destroyers of the largest size. The Ostende canal was narrow, tortuous, and shallow and could not be used for such large ships.

By reason of its inland position and facilities Bruges became the main German base. Zeebrugge, because of the canal connection, the more difficult approaches, and the protecting mole, was used as the main sea base. At both ports the Germans located shelter for protecting submarines from aerial attack, docks, repair shops, stores and ammunition. Ostende was used as a subsidiary base. Seaplane bases were located at both Zeebrugge and Ostende. Blankenberghe was used for small craft.

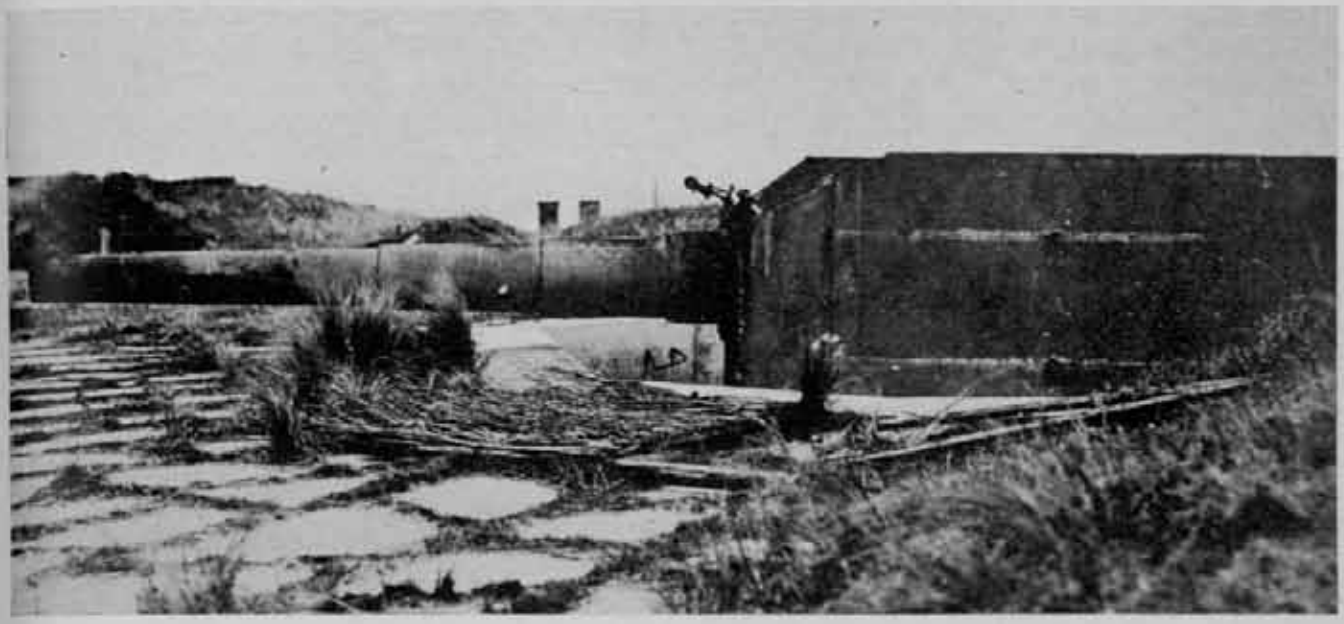
The German Naval Corps

The German Naval Corps had the responsibility for the defense of the Belgian coast. This was a special corps organized from marine infantry battalions and naval gunners drawn from various forts and garrisons, reinforced by certain army units. Elements of the Corps first appeared in the taking of Antwerp, October, 1914; it occupied the coast soon thereafter and remained until evacuation.

In March, 1915, the Naval Corps was organized as follows:

Corps Troops

Naval Cyclist Detachment
Signal Command
Searchlight Detachment
Labor Squadron
Artillery
  2 Trench-Mortar Battalions
Naval Aviation
  Land Flying Squadron
  Flying Station
  Balloon Squadron
  Airship Squadron



This is a photograph of Battery Bertha, near Zeebrugge, taken after the surrender of the coast. It shows one of the four 21-cm. guns that made up Battery Bertha's armament.

Engineer Detachment
Trains

NAVAL FORCES

Flanders U-boat Flotilla
Flanders Torpedo-Boat Flotillas
Harbor Companies
Patrol Forces
} Units assigned by navy as required.

1ST NAVAL DIVISION

Marine Infantry Brigade: 2 regiments of 3 battalions of 4 companies each, cyclist, machine-gun and howitzer companies.

1st and 2d Naval Brigades: 1 regiment Matrosen (seaman) infantry, 1 regiment Matrosen coast artillery, each.

Miscellaneous: One squadron of cavalry, two battalions of field artillery, engineer company and medical company.

2D NAVAL DIVISION

3d and 4th Naval Brigades: 2 regiments Matrosen infantry, each.

Miscellaneous: One squadron of cavalry, one field artillery battalion, engineer company, and medical company.

In April, 1917, the Naval Corps was reorganized into three naval divisions, the corps troops and naval forces remaining much as before. The divisions were then organized as follows:

1ST, 2D, AND 3D NAVAL DIVISIONS

One Naval Brigade: Three regiments of Marine or Matrosen Infantry. One Regiment of Matrosen coast artillery, except in the 3d Division. One battalion of field artillery, cyclist company, engineer company, signal detachment, medical detachment, and one squadron of cavalry.

The corps mission was the sea and land defense of the coast and for this it was responsible to the army command. However, the assignment of the U-boat and torpedo boat flotillas gave the corps also a naval mission for which it was responsible to the Admiralty.

The Naval Corps was commanded by Admiral von Schroder who had his command post in Bruges. The 1st Naval Division occupied the coast from the Dutch border to Raversyde and the 2d Division the remainder of the sea front and the land front to Schoorbakke. The two divisions occupied these fronts permanently and the infantry regiments alternated between the two sectors. After the 3d Naval Division was formed, it was used both on the coast with the other divisions and with the army on the land front.

HARBOR DEFENSES

The harbor defense personnel was furnished by the Matrosen artillery regiments (which were coast artillery troops), and certain other units of the naval corps.

The harbor defenses were first developed to provide effective harbor defense for Ostende and Zeebrugge. The construction of the coast batteries started shortly after the occupation of the coast and was continued up to 1918 by which time they had become so extensive as to form a complete seaward defense for the entire coast.

The principal batteries and their fields of fire are shown in Map 2. Altogether there were 37 guns of the primary armament (280-mm. or greater) and 70 guns of the secondary armament.

The primary armament was all well back from the coast in widely scattered positions, some 600-2,000 yards from the shore; in firing on these batteries, spotting on the shore as a reference was consequently impossible. Of

the secondary armament, a few of the larger batteries were back from the shore but the majority were located in the line of dunes or on the shore. Many of the guns were emplaced for indirect fire only; nearly all were emplaced to secure their maximum range and for all around fire.

Emplacements were of concrete and of varying design. Some of the batteries were arranged with guns in line equally spaced with parapets, traverses and parados; others, particularly the later railway batteries, were installed with the guns at the corners of a quadrilateral, so arranged that the battery could not be enfiladed. Nearly all guns had shields or were in turrets. Magazines, fire-control stations and quarters were massive and well constructed. Broad- and narrow-gauge railways were so constructed that it was possible to supply any battery with ammunition by rail from dumps well to the rear. All installations were well camouflaged and extensive arrangements made for the use of smoke.

The coast batteries were apparently organized into two groupments—Ostende and Zeebrugge—under the Artillery Commander of the North Sea whose command post was at Ostende. The Ostende groupment was divided into two groups, a North and a South, each under a separate battle commander. The general boundary between these groups was Ostende and the Bruges canal.

Antiaircraft Defense

The antiaircraft defense of the sector was strong. There were numerous batteries of antiaircraft guns, usually located back from the shore, except on the Zeebrugge Mole where there was a battery. Antiaircraft machine guns were located close to the coast batteries, virtually all the batteries having at least two antiaircraft machine-gun positions, usually on the flanks. British reports indicate that the German antiaircraft fire was very accurate and that the guns were kept manned whenever there was any air or naval activity.

Beach Defense

The beach defense covered the entire coast from Nieuport to the Dutch frontier in an unbroken line, closely interwoven with the harbor and antiaircraft defenses.

The beach defense artillery was, for the smaller calibers, well forward and in front of the line of dunes. In the area Westende-Middelkerke there were about 120 guns hidden in the sand dunes. This position, forming in itself a formidable earthwork, served the double purpose of protecting the left of the coast defenses and the right of the northern flank of the army. Along the remainder of the coast were numerous batteries, all disposed to sweep the beaches and approaches and protect from attack from flank or rear. All types of armament were employed; modern field guns, semi-mobile guns, fixed guns in the open and in turrets, and old guns of limited value.

The infantry positions covered the beaches with an almost continuous line of trenches along the coast. Additional works practically encircled each separate battery or group of batteries and protected the approaches. The machine-gun positions on the beach covered all approaches, the harbors, canal entrances, and batteries. There was apparently a machine-gun position (two or more guns) for every thousand yards of beach. In and around the harbors the machine-gun positions were even stronger. In addition, machine-gun nests protected the batteries and approaches inland.

The principal combat elements of the Naval Corps were all disposed well forward for defense at the water's edge. They appear to have varied little throughout the war.

Operations

The Allied operations conducted, or planned, against Ostende, Zeebrugge and the Belgian coast fall into three general classes: bombardments, landing operations (planned but never executed), and blocking attacks.

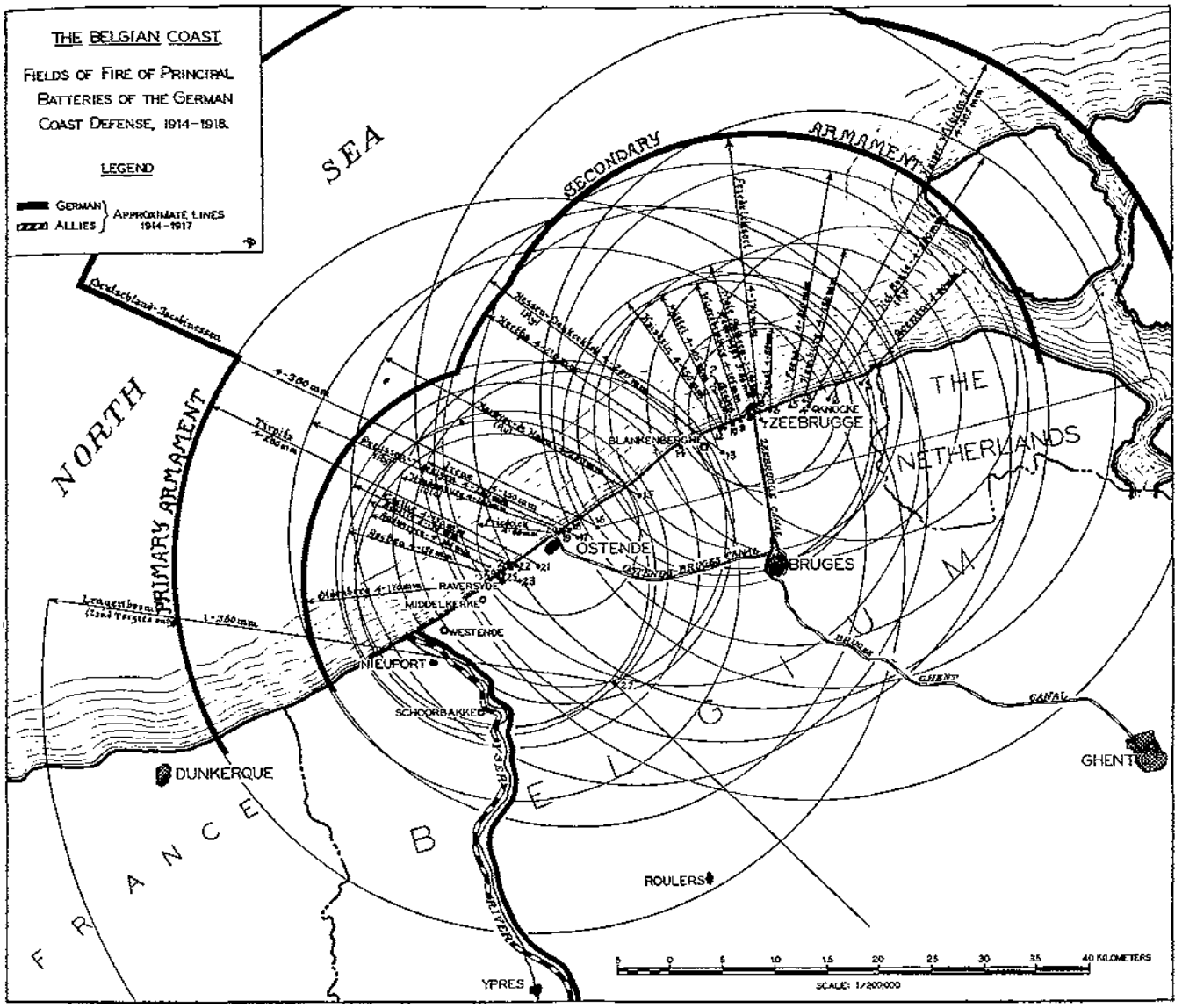
Aviation was employed more and more by both sides as the war went on. Observation aviation developed from an unsatisfactory auxiliary to a high state of efficiency, particularly in spotting long-range artillery fire. Bombardment and fighter aviation was used extensively, but had no decisive effect on any of the operations nor on the final outcome.

Constant naval operations off the coast kept the harbor defense batteries always on the alert. On one occasion (April 24, 1916), while supporting a German destroyer attack on some British destroyers, the coast batteries disabled one British ship and damaged three others.

Attacking Force

The operations against the defense were undertaken by the Dover Patrol, the British naval force based on Dover. In addition to the main mission of protecting the Straits of Dover and the channel traffic, it had a great variety of tasks. One of these was to damage or destroy the enemy organization along the Belgian coast. It was composed of a great number of classes of ships, many old or improvised units of limited power and action. The principal ships employed on the coast were the following:

Old Battleships:	*Majestic* and *Revenge*. 4 12-inch guns, range 16,000. Draft too great for coastal work, not much used.
Monitors:	3 *Severn* class. 2 6-inch and 2 4.7-inch howitzers. Employed initially.
	6 *Lord Clive* class. 12-inch guns, range 21,000 yards.
	2 *Marshal Ney* class. 15-inch guns, range 25,000 yards. Slow, handled badly.
	2 *Erebus* class. 15-inch guns, range 25,000 yards, some 6-inch guns, speed 14.
	7 *"M"* class. 9.2-, 6-, or 7.5-inch single-gun ships. Used to protect larger monitors and patrol.
Cruisers:	3 used for offshore patrol.
Destroyers:	Some 14 ships used for patrol, offshore and with monitors on coast.



Map 2

PRINCIPAL BATTERIES — BELGIAN COAST

No.	Battery	No. Guns	Caliber mm.	Range Meters Approx.	Remarks
1	Bremen	4	90	15,000	
2	Net Zoute	4	280	27,500	Ry guns
3	Hamburg	4	150	15,000	
4	Kaiser Wilhelm II	4	305	37,500	
5	Freya	4	210	23,000	
6	Kanal	4	88	8,000	
7	Friedricksort	4	170	27,500	
8	Mole Battery-Zeebrugge	3	105	14,000	
		3	88	8,000	
9	Wuerttemberg	4	105	14,000	
10	Groden	4	280	?	Howitzers
11	Mittel	4	105	14,000	
12	Kaiserin	4	150	15,000	
13	Hessen-Donkerklok	4	280	27,500	Ry guns
14	Hertha	4	210	23,000	
15	Hannover-de Haan	4	280	27,500	Ry guns
16	Deutschland Jacobinessen	4	380	55,000	
17	Preussen-Turkijen	4	280	27,500	Ry guns
18	Irene	4	150	15,000	
19	Hindenburg	4	280	16,000	Old guns
20	Friedrick	4	88	8,000	
21	Tirpitz	4	280	35,000	
22	Cecilie	4	150	17,500	
23	Oldenburg	4	170	21,000	
24	Beseler	4	150	15,000	
25	Antwerpen	4	105	14,000	
26	Aschen	4	150	15,000	
27	Lengenboom	1	380	55,000	Land targets only

NOTE: Table of English caliber equivalents and number of guns of all calibers emplaced.

mm.	Caliber Inches	Class	Total Emplaced	
380	15	Primary	5	
305	12		4	
280	11		24	guns
			4	howitzers
210	8	Secondary	8	
170	6.6		8	
150	5.9		24	
105	4.1		15	
90	3.5		4	
88	3.4		11	

Miscellaneous craft: Motor launches, gunboats, mine sweepers and layers, aircraft carrier and submarines.

Bombardments

During the fall and winter of 1914, the first Allied bombardments were carried out to assist the army west of Nieuport. Although the ships gave considerable assistance, the German seacoast artillery, the appearance of hostile submarines, and bad weather made the operations increasingly difficult, and they were discontinued. The small vessels could not face the shore batteries unaided, and the exposure of battleships to submarines was considered unjustifiable.

The first monitors, designed for coastal work, became available in 1915 and the first serious bombardments were undertaken in August. The details of the principal bombardments undertaken are shown in the table.

By late in 1916, the methodical bombardments, conducted as separate operations, were given up as impracticable. Admiral Bacon then assigned one or more large monitors to the forces which kept the coastal mine barrage under patrol and bombarded whenever wind and weather made it possible. On several occasions the bombardments caused some temporary damage.

The bombardments are interesting as examples of careful planning and methodical execution and the meager results also show the futility of this form of attack against coast objectives.

The main objectives were the locks and harbor of Zeebrugge and the dockyard and harbor of Ostende. These were the key points on the coast and Admiral Bacon planned to destroy them by prolonged and methodical bombardment. The defenses and German batteries themselves were secondary targets; for, as Bacon pointed out, ships should never fire at shore batteries of equal or superior range except for special reasons, the probabilities being against the ship. A further purpose of the bombardments was to create a diversion on the coast to draw reserves to the north when Allied offensives were in progress to the south.

The bombardments were rehearsed in a long period of training and experimental firing in English waters. Air observation, at first tried, failed because of communication difficulties. An attempt was then made to use observation platforms constructed on top of two tripods of railroad iron. These were planted in shallow water, some 10,000 yards from shore; their positions plotted and bilateral observation employed. They were fired on and lost in the first shoot. Beginning in January, 1916, combination air and terrestrial spotting from stations near Nieuport was used, found satisfactory, and employed. An analysis of each shoot eliminated errors.

The execution of each bombardment was an elaborate operation. Bombarding ships are peculiarly exposed to attack. German submarines, and the possible appearance of raiding forces made it necessary to protect the monitors with a covering force of cruisers and destroyers, to sweep the water area for mines and to give a close-in defense to each ship. Air protection was always necessary.

On account of the rapidity with which the seacoast batteries found the range and attacked the monitors, the bombardments were conducted at long ranges, 17,500 to 25,000 yards, and under a smoke screen. The defense used smoke to cover the targets and the batteries.

The bombardments caused some temporary damage but neither Zeebrugge, Ostende or Bruges were rendered untenable. The first bombardments were failures and did more damage to the ships than on shore. The most elaborate operation of all, that of May 12, 1916, against the Zeebrugge locks, was a complete failure. That of June 5, 1916, against Ostende did considerable damage to the dockyard and, together with the bombardments which followed, probably resulted in its abandonment as a repair base. Fire on the German batteries was ineffective; there is no evidence that a battery was ever put out of action. German submarine and destroyer operations were carried out from Ostende and Zeebrugge without serious interruption up to the evacuation in October, 1918. The blocking attacks on Ostende and Zeebrugge in April and May, 1918, were admittedly based on the failure of the bombardments to get results.

Landing Operations

The Allies never attempted land or landing operations against the Belgian coast, although the British Admiralty had frequently pointed out that permanent results could be secured only by land or a combined land-and-naval attack. While this was undoubtedly appreciated by the Army, the conflicting demands of the Allies and the preoccupations of the British Army elsewhere, as well as the known strength of the coast defenses, all combined to prevent any such operation.

In the late fall of 1914 the Admiralty proposed a joint expedition up the coast to recover Ostende and Zeebrugge but nothing came of it because of French disapproval, the requirements of army operations and the genesis of the Dardanelles affair. In 1915 Admiral Bacon proposed to force an entrance into Ostende and land in the harbor: this plan was considered for some time but finally given up because of the strength of the coast batteries.

In 1917 a joint plan for a landing on the coast was proposed and actually initiated. This plan contemplated the landing of a division between Middelkerke and Westende in specially constructed pontoons to be beached by the monitors under strong naval support. The attack, a part of the British 1917 Flanders offensive, was contingent on a successful advance by the army to Roulers, to the south. The British 1st Division was concentrated and trained at Dunkerque for the operation and certain preliminary operations were undertaken, but because of the failure of the Flanders offensive, the plan was abandoned. Considering the dispositions of the defense and that the Germans were forewarned, it seems likely that the operation, if carried out, would have resulted in disaster.

PRINCIPAL BOMBARDMENTS

DATE OF ATTACK	SHIP AND TARGET	REMARKS
1914. Nov. 21	*Majestic* and *Revenge*. Zeebrugge.	Fired 400 rounds on defenses and locks. Results: Unknown, but small.
Dec. 15	*Majestic*, *Revenge*, and 3 gunboats. Harbor defenses.	Results: None known.
Dec. 16	*Revenge*. Harbor defenses.	*Revenge* hit badly twice and had to be docked.
1915. Mar. 11	*Majestic* and *Revenge*. Westende positions.	To help Neuve Chappelle offensive by British. Results did not justify expenditure of ammunition.
Aug. 23	*Clive*, *Moore*, *Rupert*, 10 destroyers, and miscellaneous craft. Zeebrugge, canal, and locks.	Results: None. Matériel failures on monitors caused early withdrawal. Range: 17,500 yds.
Sept. 7	*Clive*, *Crauford*, *Rupert*, miscellaneous small craft. Two gunboats on enemy batteries. Ostende and dockyard.	Results unknown, probably none. Fire of German batteries very accurate. *Clive* hit 4 times and squadrons forced to withdraw. Ranges: 18,000-19,500 yds.
Sept. 19	*Clive*, *Ney*, and various attendant ships. French batteries near Nieuport. Battery Tirpitz and batteries near Raversyde.	To test out the fields of fire of Battery Tirpitz. Battery covered all the channels and followed ships. *Ney* broke down. No results on batteries.
Sept. 25	*Eugene* and *Crauford*, attendant ships. Coast target Knocke to Blankenberghe. *Clive*, *Ney* and *Rupert*. Ostende, coast and docks.	To assist offensives to the south. East squadron fired 78 rounds, west squadron 116. Results on shore unknown. Two attendant ships, one yacht, and one drifter sunk by batteries.
Sept. 26, 27 Nov. & Dec.	Miscellaneous firings on shore batteries and installations.	Results: Unknown.
1916. Jan. 26	Five monitors, attendant ships. Westende positions.	Air and terrestrial spotting developed from experience in previous firing used. Results unknown. Firing stopped for winter and because ships outranged by batteries.
Sept. 8-15	Various monitors on Westende positions and Zeebrugge.	As a part of a diversion on the coast to assist British offensive to the south. Reported to have caused movement of reserves to Bruges.
May 12	*Terror*, *Soult*, *Erebus*, *Moore*, *M24*, *M26*, 10 destroyers, 6 mine sweepers, 19 launches, and offshore covering force. Locks of the canal at Zeebrugge which controlled water level and destruction of which would stop traffic.	A carefully planned and deliberate bombardment. Two 15-inch hits, it had been decided, would destroy the lock gates. Probabilities of hitting at 25,000 yards required 252 rounds. Bombardment was to be a surprise conducted in early morning under smoke screen. After three false starts due to unfavorable weather for smoke, attack was made. Air observation protected by fighters employed. Firing began at 5 and ended at 6 AM. 250 rounds fired, 45 spotted. Germans attacked in air and with the batteries. 19 shell fell close to locks, no hits. Basin and dockyard slightly damaged. Operation did not succeed.
June 5	*Erebus*, *Terror*, 6 destroyers, 13 patrol boats and launches. Offshore covering force. Ostende dockyard.	A general repetition of the Zeebrugge bombardment on Ostende but with a much larger target. Weather conditions again caused several delays. Squadron anchored off Ostende at 3 AM and set up smoke screen. Bombardment started at daylight and continued from 3:30 to 4. Batteries replied at once and kept up a steady and accurate fire but did no damage.
Aug. 21, Sept. 22, Sept. 25, Oct. 19, 28	Repetition	115 rounds fired on Ostende, about 20 exploded in and around dockyard. Damage serious in yard. Owing to difficulties of operation, however, bombardment could not be repeated often enough to secure lasting results.

The British had considered blocking attacks on Zeebrugge and Ostende several times, but they had always given up the idea on account of the risks involved. Moreover, it was considered unwise to block ports which it was hoped might be recovered and which would then be valuable. But, in December, 1917, the bombardment failures and the abandonment of the landing scheme led the Admiralty to decide on such an attack.

The object was to block the canal entrances; seal up any submarines or torpedo boats in Bruges; damage the harbor works and defenses; free the Dover patrol for other work; and "relieve the military and economic communications of an intolerable menace."

The defenses of Zeebrugge and Ostende have been described. The harbors are shown in Maps 3 and 4.

The Zeebrugge mole calls for special comment, for it played an important part in the attack. Built as a breakwater forming an artificial harbor, it consisted of three parts. An iron railway viaduct, some 580 yards long and the width of one track, connects the shore end with main masonry mole. The mole proper curving to the northeast is 1,850 yards long and 80 yards broad. Its seaward face is built up as a parapet 16 feet above the mole surface. Beyond the main mole is the narrow mole extension 260 yards long with a lighthouse on the end. The mole was itself a small fortress. On the extension, the Mole Battery of three 105-mm. guns and three 88-mm. guns commanded the approaches with an unimpeded field of fire. About 150 yards from the end of the mole extension was a wired-in position containing two antiaircraft guns and a shelter trench across the mole. Toward land, along the mole were berths for torpedo boats, submarine shelters, and a seaplane base, all with concrete shelters for personnel and matériel.

The plan of attack finally adopted called for a simultaneous attack on both harbors.

At Zeebrugge, a specially trained storming party of seamen and marines, aboard the old armored cruiser *Vindictive* and two ferry boats, the *Iris* and *Daffodil,* was to storm and hold the mole until the block ships had passed through. For this purpose the *Vindictive* was fitted with special armament and an elaborate system of landing stages and grappling irons to secure to and land on the mole. The ferry boats were equipped with grapples and scaling ladders. The *Vindictive* was to land just west of the mole extension, the primary purpose being to silence the Mole Battery, thus permitting the block ships to pass.

The three unarmored cruisers, *Thetis, Intrepid* and *Iphigenia* were selected as block ships. Enough guns were left aboard to enable the ships to engage the batteries during the approach. The block vessels were fitted with additional steering gear, filled with cement blocks and bags of dry cement, and charges were arranged for blowing out their bottoms. The first ship was to enter the canal and sink herself in the lock gate; the two others to sink themselves in the canal entrance. The block ships were to follow the *Vindictive* at 20 minutes.

Two submarines, loaded with explosive, were designated to blow up the viaduct connecting the mole with the shore, making reinforcement to the mole impossible.

At Ostende, two unarmored cruisers, the *Sirius* and *Brilliant,* equipped as those detailed to Zeebrugge, were to sink themselves in the harbor entrance. No diversion, as in the case of the mole attack, was possible for Ostende.

The whole attack was preceded by an aerial bombardment and a one-hour bombardment of the coast batteries by the monitor force. Similar bombardment of the coast batteries by coastal motor boats were to be delivered during the weeks preceding the attack, whenever weather permitted, so that the enemy would consider the main attack a routine affair.

During the final bombardment the storming and blocking forces were to approach, covered by an unbroken curtain of smoke over the whole front.

To allow the block ships sufficient water to maneuver and the storm ships sufficient height to reach the mole parapet, the night for the attack had to be one with high tide at the time selected. The smoke screen was vital to success and it was therefore also necessary that the wind be generally north, to blow the smoke into the defenses.

One hundred and sixty-five vessels of all classes were assigned to the expedition. The personnel for the storming parties, the block ships and for other special purposes amounted to 86 officers and 1,698 men.

Attack of April 22-23, 1918

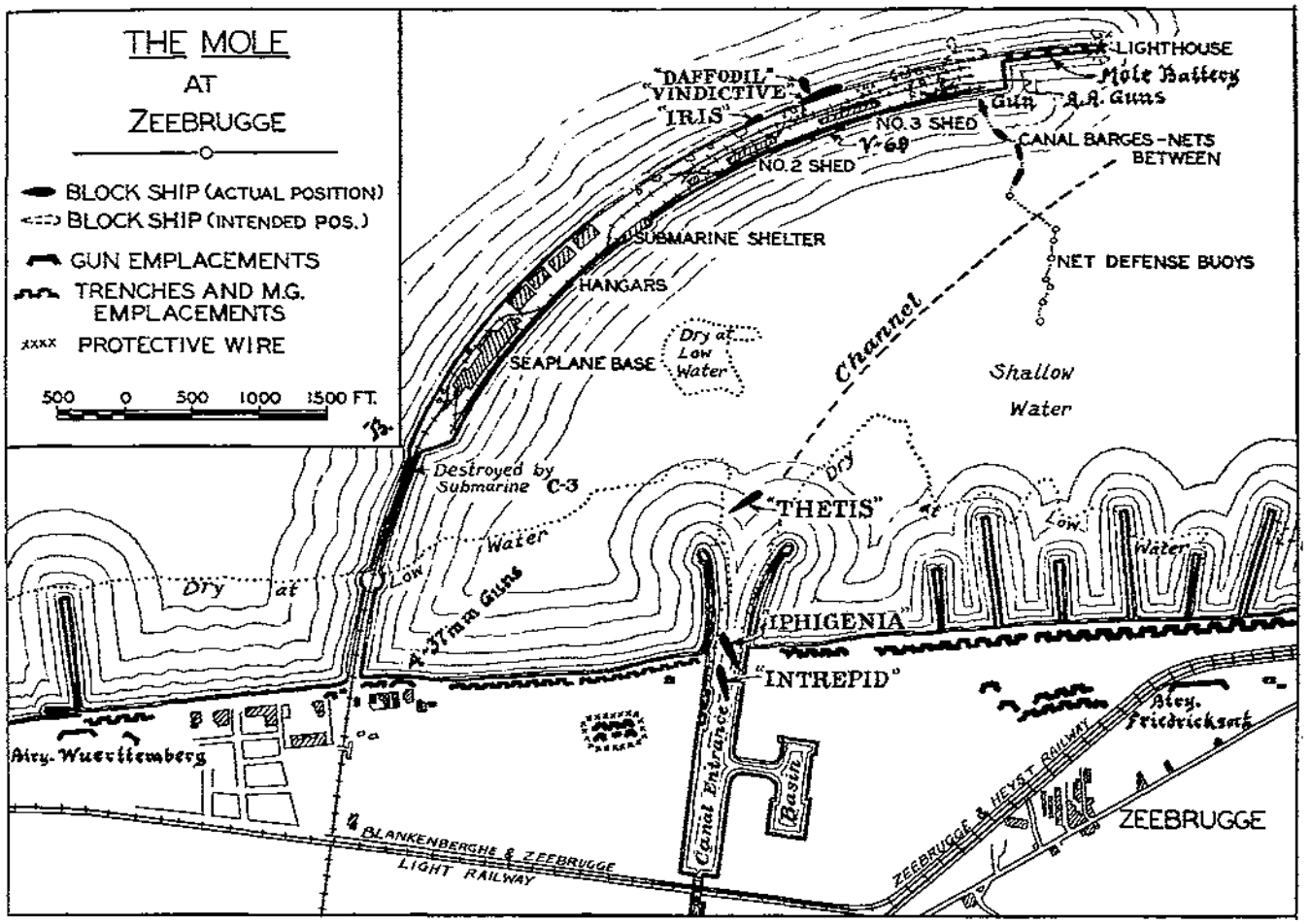
In April, after completion of the necessary details, the block ships, storm ships and storming parties assembled at the entrance to the Thomas. The other ships to be employed, of the Dover and Harwich forces, were in adjacent ports.

On April 11, the expedition sailed and the bombardments were executed. However, when off Zeebrugge, a change in the wind to the south forced Admiral Keyes to turn back as it was impossible to attack without smoke. When the expedition returned one coastal motor boat was missing; she had run aground and been captured. On her the Germans found some plans of the proposed operation, which caused them to take special measures. The British did not know this at the time.

On April 14, a second attempt was made but given up on account of rising sea and wind, although the bombardment was again carried out.

On April 22, high water again came at a suitable time, and as other conditions were favorable, the expedition started. At about 9:00 P.M. Admiral Keyes decided to attack. As it had started to rain no air attack was possible but the monitors started their bombardment at 11:10 P.M. at Ostende and 11:30 P.M. at Zeebrugge.

At the same time that the Zeebrugge bombardment began, the coastal motor boats started the smoke screens and delivered an attack on the mole and harbor. This attack was little noticed by the defenders. The batteries had been alarmed by the bombardment and the heavy batteries took the monitors under a slow and intermittent fire employing



Map 3
The attack on Zeebrugge.

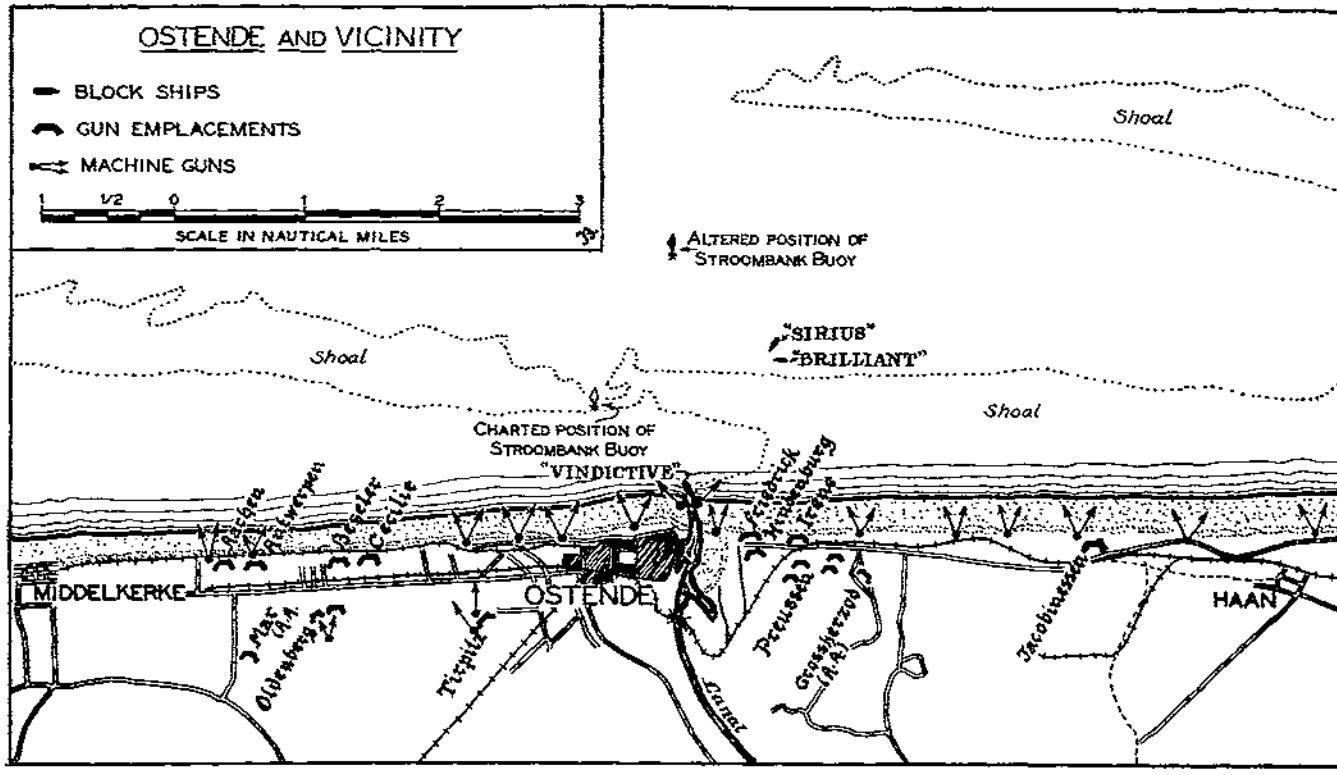
sound ranging; meanwhile the secondary batteries illuminated the offshore area, but the artificial fog was so dense they could find no targets and confined their operations to star-shell illumination and a defensive barrage.

At 11:50 P.M. the Mole Battery picked up the *Vindictive* heading for the mole at a range of about 2,000 yards. About the same time the wind shifted to the south and blew the smoke screen toward the attacking forces. The battery immediately opened and kept the *Vindictive* under fire until she reached the dead angle caused by the curve of the mole where she landed at midnight. The *Vindictive* was under fire for about 10 minutes and had suffered badly. The four senior officers of the storming party and many men were killed or wounded, part of her armament and all her flamethrowers put out of action with their crew killed or wounded. Twelve of her 14 landing stages were out of action, and she was seriously damaged in her upper works.

The *Vindictive,* assisted by the *Daffodil,* which had followed her in with the *Iris,* made fast to the mole some 300 yards to the westward of the battery defenses and of her intended position. The *Iris* attempted to secure further west but failed and finally went alongside the *Vindictive.* Few of the *Daffodil* or *Iris* parties ever reached the mole or got on the *Vindictive.* As soon as the *Vindictive* was alongside, as many as possible of her storming party landed on the mole, covered by her machine guns. The party tried to move toward the battery and westward. They succeeded in securing the ship to the mole and forming a small bridgehead but every effort to advance was broken up. The resistance came mainly from a detachment of 20 men from the Mole Battery, some miscellaneous detachments, and the crew of the German Torpedo boat *V-69* lying inside the mole opposite the landing place. At the same time the antiaircraft guns on the mole and one gun from the *V-69* kept up a heavy fire silencing the machine guns in the *Vindictive's* top, inflicting many casualties and much damage. Finally at about 12:40, having seen the block ships pass in, she withdrew with her consorts.

It is impossible to say how many of the 900 men in the storming force actually got on the mole; probably not over 100. The German garrison on the mole, at the time consisted of 60 men in the Mole Battery, 70 men in the Harbor Company, the crew of the *V-69,* and some 200 men of the Naval Air Station who were not engaged, being near the other end of the mole. The shore batteries took no part in the action on the mole because of the fog and the presence of their own people.

In the meanwhile at about 12:00 M. the leading block ship, the *Thetis,* came under the fire of the shore batteries and at 12:20 directly under fire of the Mole Battery which



Map 4

The attack on Ostende.

opened on her at once. She passed the mole, badly damaged, ran into the net defenses, missed the canal entrance, and sank in the harbor. In about 10 minutes she was followed by the *Intrepid* and *Iphigenia* who successfully passed in under a heavy fire from the batteries and were sunk in the canal entrance. The crews remaining alive were rescued by motor boats.

The submarine *C3* accomplished her mission and was blown up under the viaduct about 12:20 A.M., her crew also being rescued by motor boats.

During the withdrawal the *Vindictive, Daffodil* and *Iris* suffered further damage and many casualties and the destroyer *North Star* was sunk by a battery. This was at about 1:10 A.M. and may be taken as the end of the action.

Off Ostende, the block ships *Sirus* and *Brilliant* approached the harbor under a heavy smoke screen. A shift in the wind, and the fact that the Germans had moved the buoy off the entrance, made them lose their way and they grounded east of the entrance and were sunk under a heavy fire from the batteries.

The British losses in the attack were one destroyer, two motor launches, 214 men killed, 383 wounded, and 19 prisoners. The Germans lost one barge (sunk in the harbor), 10 killed, and 16 wounded.

Attack of May 10-11, 1918

The attack was repeated at Ostende on the night of May 10-11, employing the *Vindictive* and old cruiser *Sappho* as block ships. This attack was also preceded and covered by bombardment and the *Vindictive* (the *Sappho* having broken down) approached the harbor under a smoke screen. After difficulty in finding the entrance, she approached under the fire of several batteries which seriously damaged her and killed her commander at the critical moment. She grounded on the side of the entrance and was sunk in the channel, but did not block it.

Comments

The blocking attacks on Zeebrugge and Ostende failed in their primary mission—the blocking of the harbors.

In spite of statements made at the time and repeated since, Zeebrugge was not blocked. The two ships sunk in the canal entrance, did not block it, although they restricted its use. The locks were undamaged and at high water on April 24, torpedo boats used the canal and April 25, a large submarine traveled it. Thereafter movements were normal. Dredging operations were started at once and by May 15 there was a channel of 3.5 meters at low water.

At Ostende, after the first complete failure, the *Vindictive* was sunk in the canal entrance but parallel to and clear of the channel.

As with the American effort at Santiago in 1898 and the Japanese efforts at Port Arthur in 1904, Ostende and Zeebrugge again demonstrated that blocking attacks are difficult operations, and are not likely to succeed against fortified harbors.

The attack on the mole, planned primarily to silence the Mole Battery and create a diversion, failed. The *Vindictive,* probably because of the punishment received from the battery, passed it, leaving it free to deal with

the block ships. She was so damaged and the defense on the mole so determined that the landing accomplished nothing. As a diversion, the attack failed also because neither the Mole Battery nor the shore batteries paid any attention to the local situation on the mole.

The attack demonstrates that even when raids or blocking attacks come as a surprise and are pushed home they have small chance of success against a determined enemy. Although the Germans knew something of the proposed attack, and the bombardment had alerted the defense, the assault itself came as a surprise. Ten minutes after the *Vindictive* had been picked up by the Mole Battery she was alongside the mole, yet her attack failed. Some ten minutes later the first block ship came under the fire of the batteries and was unable to reach her objective. The last two vessels reached their objective but could not, because of the fire, accomplish their blocking attempt, a difficult operation even without opposition. The entire attack, less the bombardment, from the first appearance of the *Vindictive* to the sinking of the *North Star* in the withdrawal, lasted about one hour and twenty minutes. The attack was thoroughly planned and brilliantly and smartly executed. It would seem, in weighing all the factors and considering the advantage of surprise that if any such attack could succeed, this one should have. The defense, particularly the employment of the Mole Battery manned by but sixty men, was most determined and successful.

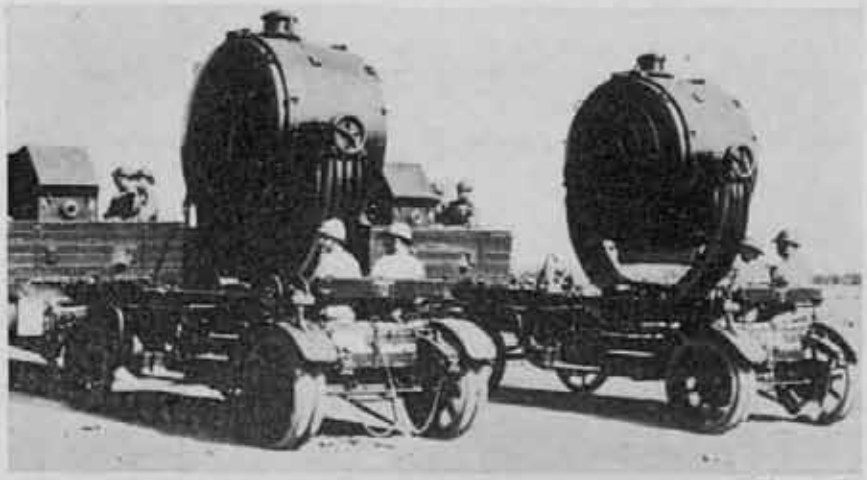
In commenting on this attack Admiral Scheer, the Commander of the German High Sea Fleet, remarks: "Complete safety from such surprises is impossible of attainment, for it is difficult for those in coastal fortifications lying farther back to be swift enough to overcome ships which come at night through the mist."

The attack also demonstrates the use of smoke to cover an approach. This was an essential part of the plan for without it surprise would have hardly been possible. It covered the initial dispositions entirely, and prevented the fully effective employment of the batteries. On the other hand, the change in the wind during the attack reacted on the attacker particularly at Ostende. It is a factor which must be reckoned with in future operations.

Conclusion

On September 29, 1918, the German Supreme Army Council decided withdrawal from Flanders was necessary. The German torpedo boats and submarines were destroyed or interned in Holland. The heavy armament, except the railway batteries which were withdrawn, was destroyed and the Naval Corps and air force turned over to the Army. The Allies reoccupied the coast in October, 1918.

For four years the coast defenses of the Belgian coast had faithfully performed their mission. They had successfully kept open and protected for their own Navy the important bases of Ostende, Zeebrugge and Bruges; protected the right flank of the German Army on the Western front and denied the enemy approach to the coast. Their effect on the conduct of the war in the North Sea, the submarine war and the war on the Western front reached far beyond the range of their guns. They remain an outstanding example of the inherent strength, power and security of adequate coast and harbor defense and their mission in war.



Pictures, Inc.

At Belgrade the Yugoslav Army displays its antiaircraft searchlights and control equipment.

The NAVY

THE NAVY'S fundamental purpose is to support our national policies, guard commerce, and protect our continental and overseas possessions.

On this and the following pages you see types of various craft that make up the United States Fleet. All pictures: Official U. S. Navy.

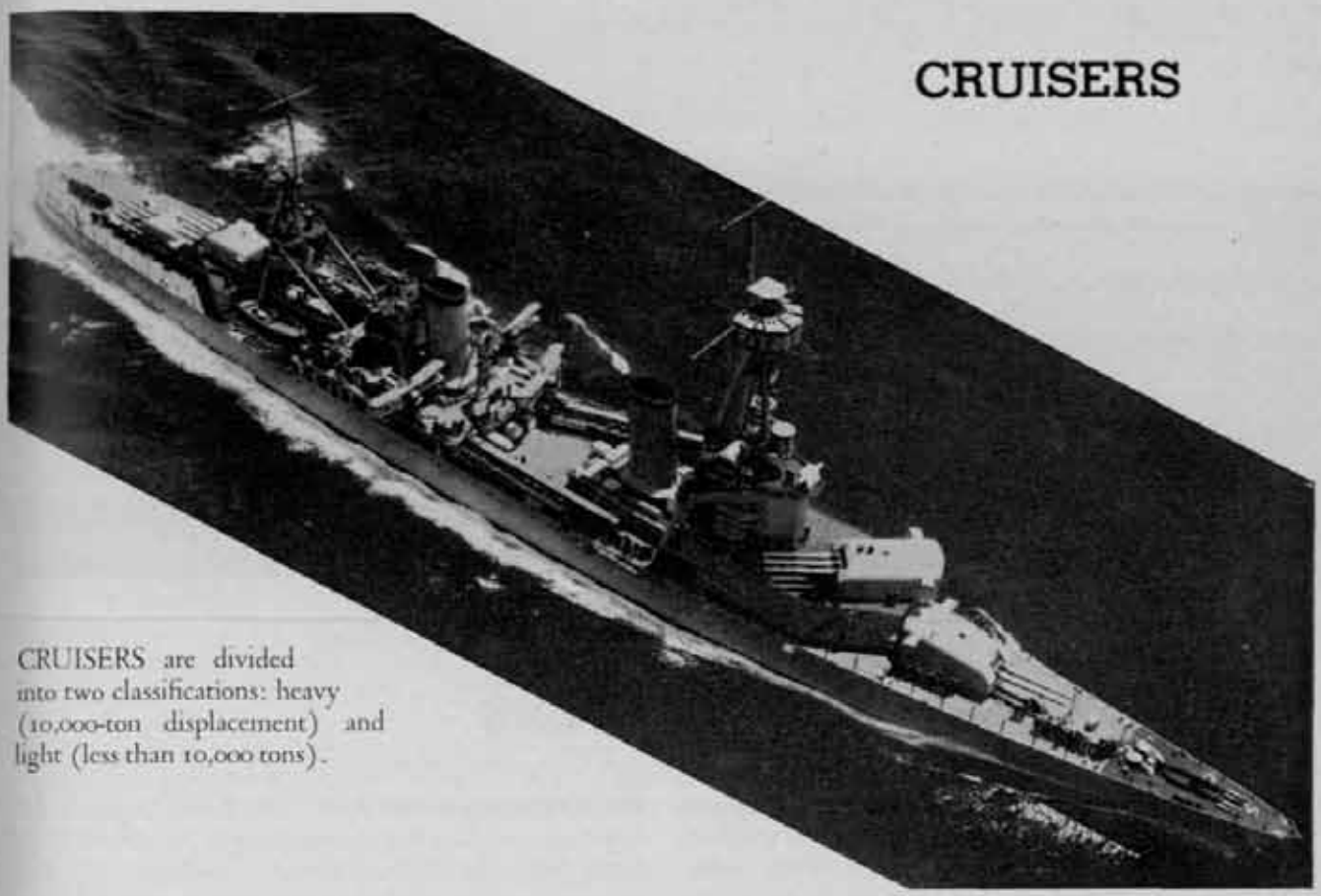
BATTLESHIPS

BATTLESHIPS are the backbone of a fleet. They have great offensive and defensive strength and mount guns as large as 16-inch. Although large and heavily armored, the modern battleship is capable of speeds up to thirty knots. The smaller types of warcraft exist only to enhance the fighting effectiveness of the battleship.

The *West Virginia* (below), flagship of the battleship squadron of the Battle Force, was completed in December, 1923. She mounts eight 16-inch guns, unofficially believed to have a range of 33,300 yards. Her other armament includes twelve 5-inch guns, eight 5-inch antiaircraft guns, a pair of 1-pounders, and eleven antiaircraft machine guns. The *West Virginia* carries two catapults for launching planes. Her standard displacement is 31,800 tons. She carries a complement of 1,407 officers and men.

The keel of a new 35,000-ton battleship—the *Washington*—was recently laid at Philadelphia. The *Washington* is the sister ship of the *North Carolina* building at the New York Navy yard since last October. These vessels are the first battleships laid down by the United States since the London Naval Treaty was signed. The *Washington's* contract time of completion is fifty-one months.

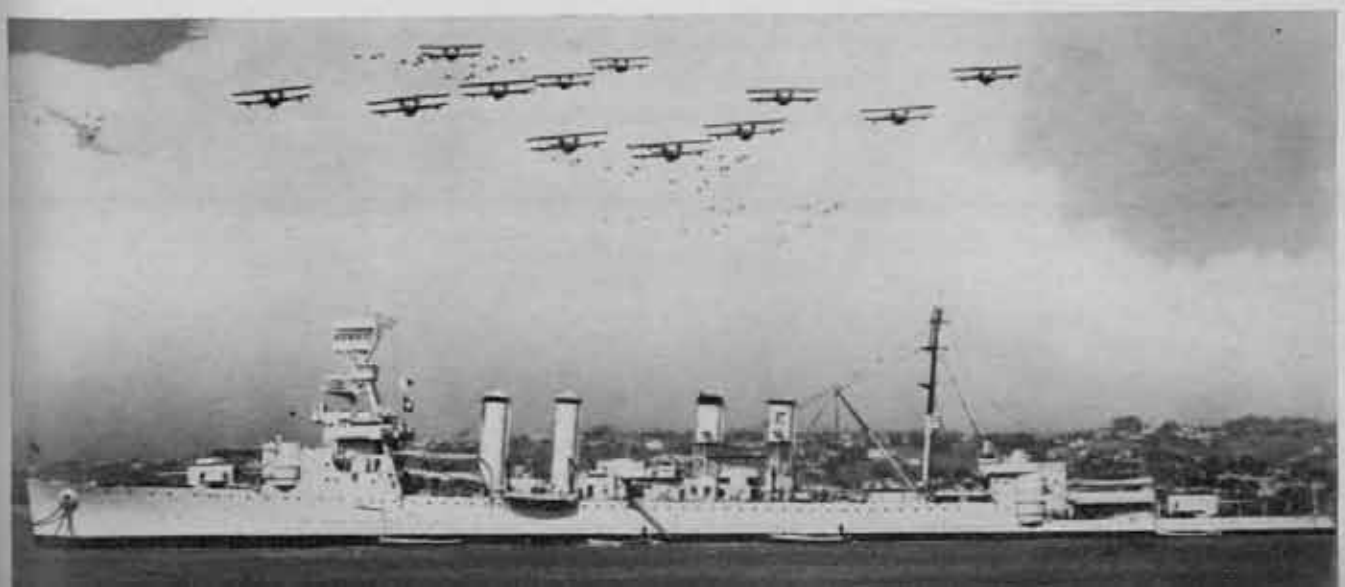
CRUISERS

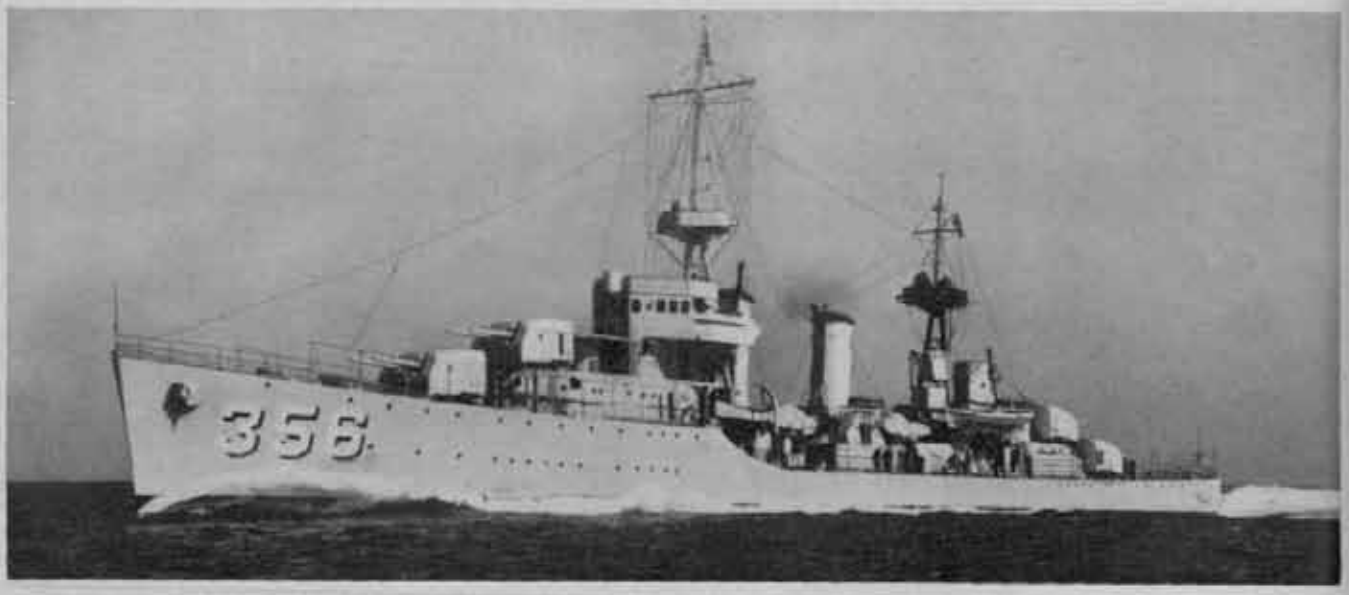


CRUISERS are divided into two classifications: heavy (10,000-ton displacement) and light (less than 10,000 tons).

The HEAVY CRUISER does not have much defensive armor and depends on maneuverability to elude superior enemy forces. It finds effective use against enemy cruisers and small craft, and is also employed as a commerce raider. The picture above shows the *Salt Lake City* under way. This vessel mounts ten 8-inch guns, four 5-inch antiaircraft guns, and two 2-pounders. It carries four airplanes, launched from catapults. According to *Jane's Fighting Ships* it has a cruising radius of 13,000 miles at 15 knots, and a top speed of 32.7 knots. The *Salt Lake City*, completed in 1929, carries a complement of 612.

The LIGHT CRUISER is the largest vessel in the fleet to carry torpedoes, hence its battle use differs from that of the heavy cruiser. In a fleet engagement, its guns would be used to break up attacks and drive off enemy light forces; with its torpedoes it would attack both battleships and battle cruisers. The light cruiser *Omaha* (below) is credited by *Jane* with a cruising radius of 10,000 miles at a 15-knot speed; top speed is said to be 35 knots. The *Omaha*, completed in 1923, mounts twelve 6-inch guns, four 3-inch antiaircraft guns, and six 21-inch torpedo tubes. It carries a crew of 458.



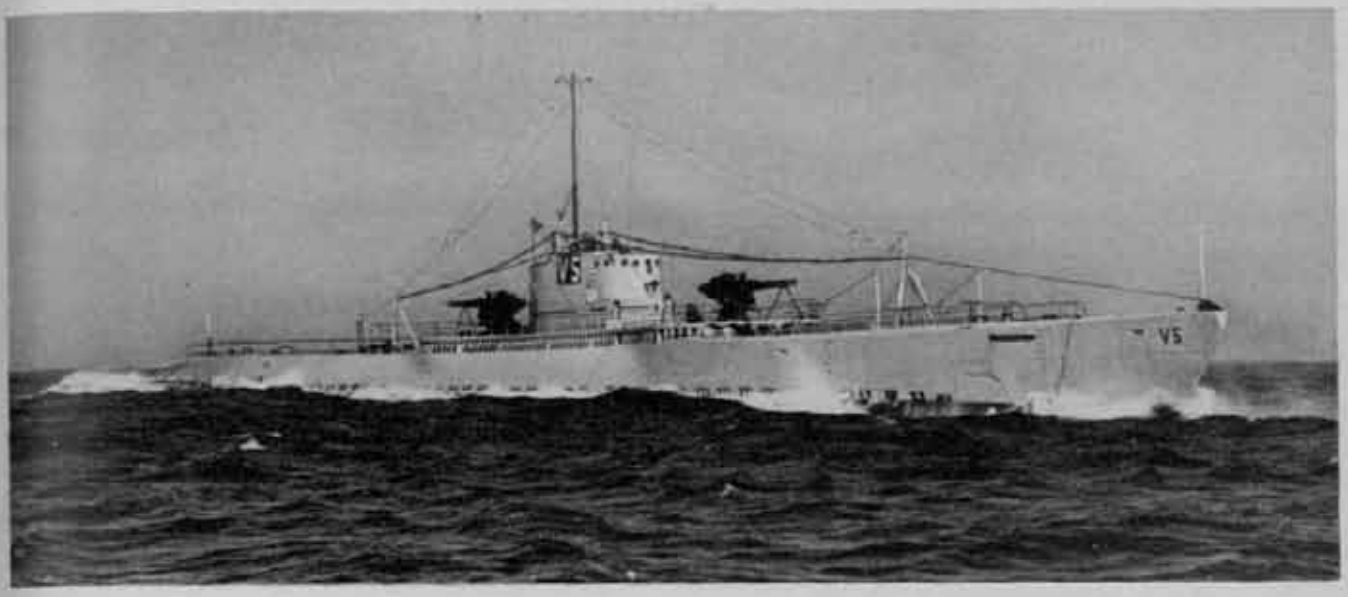


DESTROYERS

Although small in size, DESTROYERS play a large part in the operations of a fleet. They are equipped with torpedoes, depth charges, and guns of 5-inch caliber or less. They attack every type of ship from the largest to the smallest. Today's destroyers have speeds as high as 37 knots and a cruising radius of as much as 6,000 miles. Except when operating against vessels of the same size or smaller, the torpedo is its principal weapon.

Above you see the *Porter*, a destroyer flotilla leader from which a class derives its name. The *Porter*, completed in 1936, mounts five 5-inch guns, eight 21-inch torpedo tubes, and eight machine guns. It displaces 1,850 tons and has a complement of 175 men. Its 50,000-horsepower gives it a speed of 37 knots.

Below, a destroyer labors through heavy water and graphically illustrates the seaworthiness of this type of craft.

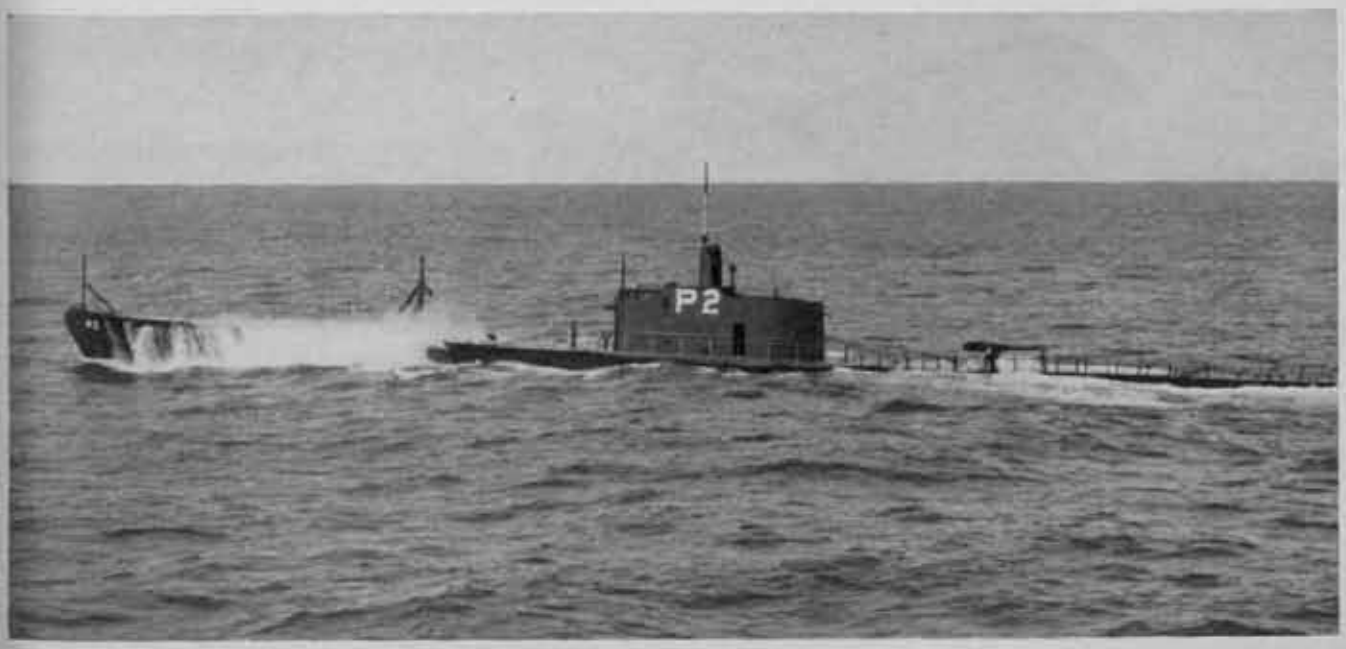


SUBMARINES

SUBMARINES find many uses in time of war. They locate enemy forces, observe off enemy ports and coasts, and raid commerce. In fleet engagements they attack major enemy ships. A strictly defensive employment would be the planting of minefields and patrolling of home coasts. The larger and more modern type of submarine has a cruising radius of 12,000 miles or more. The Submarine Force of the United States Fleet now numbers 46 craft.

The *Narwhal* (shown above), a fleet submarine of the cruiser type, was completed in 1930. It carries two 6-inch guns, six 21-inch torpedo tubes, and a crew of 88. Its surface speed is 17 knots; submerged it travels at 8.5 knots.

The *Pike* (shown below), also a fleet submarine, is smaller than the *Narwhal*. It carries six 21-inch torpedo tubes, one 3-inch antiaircraft gun, and a crew of 88. The *Pike* was completed in 1936.

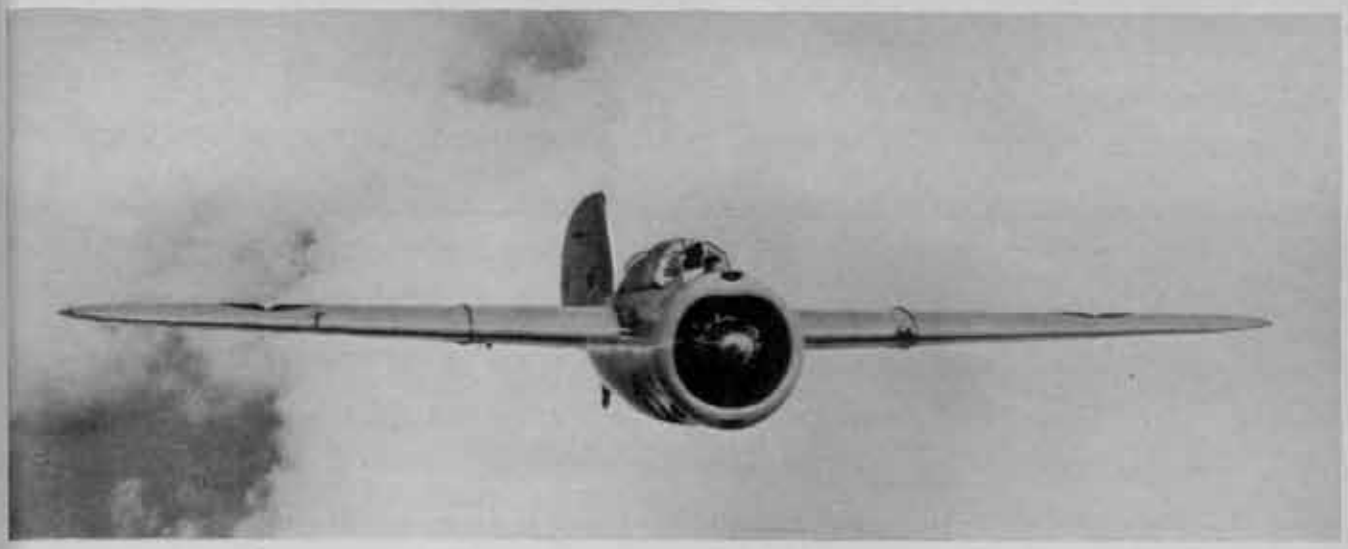


AVIATION

The aircraft carrier *Enterprise*, shown above, has just been commissioned, and is the last word in seagoing airplane transport. It carries more than 100 planes of varying types, displaces 19,990 tons, and mounts twelve 5-inch antiaircraft guns. Its complement, including flying personnel, numbers 2,072.

The *Enterprise* is a sister ship of the *Yorktown*, shortly to go into operation.

Shown below is an experimental long-range patrol bomber, now under test. This is the first 4-engine service experimental job. Details as to armament, crew, and cruising ranges are not available.



The wasplike ship above is a Brewster scout bomber—an experimental plane now under test. The Brewster scout bomber is an all-metal mid-wing cantilever monoplane, powered by a Wright "Cyclone" engine of 1,000 horsepower. It carries a crew of two: a pilot and a gunner-observer.

Below left, is a Brewster fighter, also an experimental ship now in the final stages of its trials. This is a single seater, all-metal monoplane. The Navy fighter corresponds in purpose and use to the Army pursuit ship.

Below right, is a torpedo bomber of the type carried by aircraft carriers. This is a low-wing monoplane powered by an 850-horsepower Pratt and Whitney "twin-wasp" engine. It carries a crew of three.

Bombardment Tactics

By

Brigadier General Henry C. Pratt,

Air Corps

THE WAR RECORD of bombardment aviation, as we know it today, has yet to be written. As the Flying Fortress has grown from the Breguet and D-H of the World War so have scope of operations and plans for employment expanded, progressed and developed. The results to be expected in operations will remain a matter of conjecture until the "modern" bomber has operated in "modern" employment and been opposed by "modern" antiaircraft artillery and pursuit over a reasonable period of time.

Precision bombing from high altitudes is new. Today's bombardment airplane is new. Bombardment effectiveness in a conflict between major nations is a matter of conjecture. However, the tactics and technique whereby our bombardment units expect to reduce the effectiveness of hostile pursuit and antiaircraft defenses and place the proper bomb on the carefully selected target are, by no means, solely matters of conjecture.

Bombardment tactics and technique have been developed through exhaustive maneuvers and exercises under simulated war conditions and against hostile pursuit and hostile antiaircraft artillery represented by those forces within our own service.

The sole purpose of the offensive tactics of bombardment aviation is to place the bomb at the proper point. This result may be obtained by dropping individual bombs or patterns of bombs. Patterns are formed by dropping one or more bombs from each airplane in a formation. Offensive tactics are designed solely to exploit bombing accuracy. Since the World War, bomb sight development has progressed to the stage where it is difficult to compare World War accuracy with modern accuracy. In the light of the latter, there was no bombing accuracy in the World War. The only general statement that may be made is that bombing accuracy has increased tremendously. Bombardiers now drop bombs on a precision target with the practical certainty of hitting.

Pattern bombing must be resorted to when attacking highly maneuverable targets from the higher altitudes. In the attack of a highly maneuverable target by pattern bombing, the end sought is the delivery of a solid bomb pattern in an area outside of which the target cannot maneuver during the interval between the time of release and the time of impact of the bombs.

Offensive tactics are the only tactics that need be considered in attacking undefended objectives. In air operations designed to deny rail transportation to an enemy, or to disrupt electric power transmission, or the like, there are numerous vital points in these systems. It is highly improbable that all vital points over wide areas can be defended. Hence, the chances are by no means remote that bombardment may be employed against objectives which are not defended by hostile antiaircraft artillery or pursuit aviation. In such cases, the only tactics employed by the bombardment commander are those of the offensive.

The defensive tactics of bombardment are designed to permit bombardment aviation to penetrate the most vigorous pursuit or antiaircraft artillery resistance. In the penetration of defense by hostile pursuit the primary con-

Bombardiers now drop bombs on a precision target with the practical certainty of hitting

sideration in the defensive tactics of bombardment is evasion. This is accomplished by planning routes to avoid the defended area or employing clouds or darkness for cover and concealment. If the enemy's fighter aircraft cannot find our bombardment, the enemy fighters do not comprise effective opposition. These tactics of evasion can be expected to result in a high degree of success.

When hostile fighters cannot be avoided, then the bombardment unit employs the tremendous fire-power of its massed defensive machine guns to make the approach of the hostile fighters most uninviting. With its great number of flexible machine guns the bombardment formation appears to be bristling with defensive guns as the cactus bristles with spines. Against hostile pursuit, bombardment, therefore, primarily plans to avoid the fighters. When impossible to avoid or evade pursuit, the proper bombardment formation presents a flying mass of machine guns most uninviting to approach, and at the same time a target distributed to be as unprofitable as possible to the fire of the enemy.

GENERAL PRATT
Commandant, Air Corps Tactical School

Against antiaircraft artillery, bombardment's defensive tactics are likewise designed to avoid the relatively small areas that may be covered by the range of the guns. Silent flight, high altitude operations, night attacks, camouflage and the use of clouds should frequently result in the inability of the hostile antiaircraft artillery to locate the bombardment unit. If the path of an airplane cannot be precisely located in space, the airplane cannot be taken under accurate fire.

When it is impossible to avoid being located, when it is impossible to avoid flying within range of these guns, then bombardment tactics are designed to exploit to the maximum bombardment's greatest ally under such conditions—"the time of flight of the projectile from the hostile antiaircraft artillery gun." For instance, bombardment airplanes may be attacking a precision target with accuracy from an altitude to which twenty seconds is the time of flight of a hostile antiaircraft artillery shell. If this airplane is flying at the relatively low speed of 180 miles an hour, the airplane moves one mile in distance and can turn, climb or dive a great amount in twenty seconds. If that airplane makes erratic changes in any one, in any combination of two, or in all three of its speed, direction and altitude, at intervals of less than twenty seconds, the airplane and the round fired from an accurately aimed antiaircraft gun should never arrive simultaneously at a predicted point in space.

In the face of hostile antiaircraft artillery, bombardment tactics also include operation in dispersed formations. An antiaircraft battery can fire at only one target at a time, hence, if a squadron is exposed to a battery and the squadron is in loose formation, only one airplane at a time can be taken under fire. The other airplanes have no antiaircraft artillery opposition. Bombardment tactics demand that this dispersed formation be flown with sufficient interval and distance so that no one burst can ever disable more than one airplane.

Thus the plans for the operation of bombardment have been developed to the point where sound tactics have been determined. The effectiveness of these tactics in reducing the efficiency of the hostile forces is a matter on which there is a wide divergence of opinion.

A factual statement of the effectiveness of these defensive tactics as well as the effectiveness of the offensive fire of modern bombardment aviation can be obtained only when the profit-and-loss report has been compiled after a series of properly conceived, planned, and executed bombardment missions in actual war between major nations with "modern" equipment.

These tactics are regarded as sound procedure for initial operations, with the realization that it is highly probable successive missions in war will produce material modifications in current initial bombardment tactics.

★ ★

There Was No Place Like Home

By Lieutenant Colonel A. C. M. Azoy, Coast Artillery Corps Reserve

Illustrated by Lieutenant D. L. Dickson, U.S.M.C.R.

This being the twentieth anniversary of General Pershing *not* saying "Lafayette, we are here," it is a logical open season for war memoirs. Little tots now need not bother their elders with their renditions of the Liberty Loan's prophetic slogan, "What did you do in the great war?" Let the moppets but look about them and they will see that the woods are fuller of martial memorabilia than ever the Bois de Belleau was of marines. To the inquiring mind, statistics are instantly available on how the chow didn't come up at Soissons and how it did while crossing the north Atlantic, the relative proportion of air to service in the Air Service, what the Allies thought of Lloyd George, what Lloyd George thought of everyone including Lloyd George, and other data of a more serious nature.

Trying out the second-in-command's pet theory: that skirts of the overcoat should be fastened back a la francais.

But there are two sides to every picture. While the cosmic canvas on which our war efforts were painted had a front, and a very active and glorious front it was, so also did it have a back. That this back was not particularly glorious, none are more aware than those frustrated individuals who were obliged to stand and wait while their brothers in arms did the serving overseas, but definitely it was active. Some day perhaps, that activity will be celebrated in song and story; someone else can write the song, but here is part of the story.

It began for at least one group of amateur warriors on a hot mid-August morning in '17 when we heard our names read out as commissioned officers of the Army, and realized that our three short months of training camp were over and that from then on we would have to return salutes as well as give them.

Those three months of training will live long in memory if for no other reason than that they provided national conversation with the phrase "Sears Roebuck soldiers."

We started off with a 30-day term at Fort Myer, Virginia, which because of its proximity to Washington served as a showplace for the edification of all distinguished foreign visitors. We grew to count that day lost that heard no saluting battery booming a welcome to somebody.

Although we were examined, inoculated, vaccinated, uniformed, equipped, and assigned to our companies in not much more time than it takes to tell it, the speed at which the camp had been put in commission left a few spare parts absent and unaccounted for. Until they caught up with us our accommodations were rather more casual than comfortable. When regular bunks and eating utensils *were* supplied we looked with ill-concealed scorn upon these tokens of Sybaritic ease and sourly wondered whether Uncle Sam was trying to make sissies out of us.

Though we didn't properly appreciate it at the time, we were being vouchsafed the last intimate view of the "Old Army." Our veteran company officers and noncoms were the pick of the Regular establishment, and a more understanding and helpful group of guides, philosophers and friends it would have been hard to find.

Major Koehler came down from the Point and lent us his own particular brand of dynamite to discover muscles we never imagined existed. He took the occasion to try out his cadence theories which eventually resulted in the current 128 steps to the minute. His most spectacular move in this direction was to seize the band leader's baton at parade one evening and shoot us breathlessly back to quarters at what he optimistically considered a correct marching tempo—140 beats every 60 seconds.

One day Secretary Baker appeared on the post, and when the resident cavalry regiment turned out in the old dress blues to escort him, we were all so dazzled that we came politely to the salute every time we met even the lowliest buck private.

Another visitor was the recently-returned military attaché from our Vienna embassy. This gentleman took as the text of a lecture to us the rather depressing fact that the war was killing off entire regiments on both sides as fast as they could be enlisted, and he hoped we would hurry over there as fast as we could. We failed to appreciate his enthusiastic interest in our foreign travels; in fact, wholesale desertions to the Navy were prevented only by a relative of death's messenger, who happened to be a fellow candidate, soothing us with the assurance that the officer was noted as the family liar.

As an antidote, a gang of us got passes to Washington

> *Young officers should be seen and not heard; whenever seen, they should be hard at work*

and there visited Keith's. One number on the varied program was a singer billed as "Sailor Reilly," who pounded the piano in a frenzy and tried his best to get the audience to join him in a new song, seemingly dedicated to the wartime spirit. We didn't think much of it, but later grew to regard it as a second, and much more singable, national anthem. It was called "Over There."

By the time our month was up, our civilian shoulders were almost used to the hollows worn in them by the Springfield trigger guard. We could shift from right to left shoulder arms without knocking our hats off, and when we were reviewed by President Wilson we had progressed so far that only one man stuck himself with his own bayonet. A notable point about this parade was that in our preparatory march to Washington we exhibited to the awed eyes of our Army instructors the sight of 1,200 troops marching in column—"That's more men than I ever saw together in this man's army," sighed one officer who had spent the formative years of his military career at Eagle Pass, Texas.

Shortly after this the first contingent of Regular troops suddenly vanished for an unannounced but easily guessed destination, and soon we received our own lesson in the military art of quick movement. One afternoon we turned out for retreat under the admiring glances of the local belles. Twenty-four hours later some eighty of us swathed in blanket rolls and lugging suitcases—one individual implausibly carried a guitar as well—began what we fondly imagined was the first leg of our trip to Berlin. An unromantic trolley car bumped us to a wharf in Washington, and thence we sailed grandly down through the Potomac twilight with Fort Monroe the next port of call.

As we left astern the calm serenity of Mount Vernon, an ominous rumble smote our ears, instantly identified by the Man Who Knew It All as the fire of naval guns. This could only mean that a German sub, or perhaps a German fleet, was forcing an entrance into Chesapeake Bay and our own warships had sallied forth from Yorktown to do battle. It was a thrilling thought until Someone Else Who Knew Better proved that it was only the firing at the proving grounds at Indian Head. The discussion was terminated at length by the noises resolving themselves into a thunderstorm which drove us all into the cabin. Here a singularly pretty girl from the civilian passenger list played the piano while we sang, until Captain Eglin, our official chaperon, ordered us all to bed. It was believed that he spent the rest of the evening on deck with the pretty girl.

The night was not particularly calm as many of the bunks were already occupied when we turned in. The query "What's biting you?" addressed to a restless roommate, found a ready and accurate answer. However, the morning coffee was hot and the eggs palatable and we debarked upon the Fort Monroe dock in great good humor. This was heightened by the report that we were the first of the training contingents to arrive and therefore could have our choice of the recently vacated Regulars' barracks. We chose the 8th Company Barracks because the grapevine telegraph, as always instantly and incomprehensibly in action, reported that those barracks had shower baths on every floor. It was only after we were settled that we learned that while the shower baths were indeed located as advertised, there was no running water on any floor.

Distraction from such mundane matters was furnished by the arrival of the final shipment of embryo officers, this time from Plattsburg. Now the Plattsburg camp had been receiving the lion's share of newspaper publicity, and the representatives of the other camps had worked up a very fine case of professional jealousy on that account, so when the Plattsburgers came on the scene it was indeed balm in Gilead to note that an apparent confusion of orders had caused them to stagger along under enough superfluous equipment for a world cruise. Each man was adorned with rifle and full pack, complete with spare parts, and in addition they struggled with tents, tent stoves—of doubtful necessity in a Virginia summer—cots, and field ranges. Being veterans of the post of some four hours' service, we were not slow to remark upon these incomprehensible evidences of rookie stupidity.

An entente cordiale being thus established, we then answered mess call. Ordinarily, there would have been nothing unusual about this; there had been many mess calls answered before, and there will be many answered in the future, but it is doubtful if any group of soldiers ever answered a call to just such a mess as ours. It marked the beginning of a series of probably the worst meals ever prepared and eaten by civilized man. The more optimistic advanced the comforting theory that the cooks hadn't hit their stride as yet, and we could look for a change for the better in succeeding menus; in this they were half right. As our cooks really got down to work, the changes they effected were increasingly evident, but they were not for the better. Bad as that first, never-to-be-forgotten meal was, those that followed were worse. No fresh milk, no fresh vegetables, no fruit, meat that could only have come from the most despondent animals, sand mixed with a little sugar, leaden bread, and no butter—just melted oleomargarine, and very inferior oleomargarine at that.

It was all very well to die for one's country, but we shied at achieving such a patriotic martyrdom through starvation. Therefore, after one particularly revolting dinner we decided to do something about it. As a matter of fact, we did many things. We mixed the oleo with gravy; we interchanged the contents of the coffee pitchers and the meat platters; the bread was of the general consistency of clay, so it made excellent material for modeling vain idols embellished with match sticks; in short, we made a shambles of the mess room and then walked over to the Post Exchange for crackers and pop. Word of this sophomoric but supremely satisfying gesture was not slow in reaching the ears of the authorities, and the usual investigation at once got under way. The mess was inspected by Colonel Wallace, the commanding officer, and his findings were to the effect that under similar circumstances he would probably have done just as we did. After which, the mess improved.

"To arms!" could never be mistaken for anything else.

Through what must have been one of the hottest summers on record we sweated our way through the intricacies of advanced artillery and infantry work, with only occasional respites.

One afternoon, following the last formation of the day, the drowsy air was blasted by a sudden bugle call. Although we had never heard it before we knew instinctively its import—To Arms could never be mistaken for anything else. Other bugles excitedly echoed the first one, members of the Regular garrison were doubling across the parade in all directions and finally a breathless orderly reported that a German sub had been sighted coming past the Capes. As no one seemed to have any orders for us, we did some doubling on our own account and streaked it for the ramparts that would give us a grandstand seat for the show. From our exalted position we could see the batteries being manned, and in the bay various outbound steamers dashing back for the safety of Hampton Roads under forced draught. A destroyer slid from her moorings in the Roads and snaked her way to sea; over towards Yorktown smudges of smoke indicated constructive activity among the navy ships berthed there. It was distinctly an anticlimax when Recall was sounded and we learned that the hostile periscope had turned out to be a stray fish weir pole, kept upright on the incoming tide by the weight of barnacles on its lower end.

To offset this false alarm we did have an actual enemy visitation later on, but the trouble with this was that nobody knew about it until long afterward. Under the aegis of the War Department, a Belgian showed up with an illustrated lecture on the war and the entire post turned out as audience to do him honor. His offerings were not especially noteworthy, except for one rather indistinct movie of what he said was the actual demolition of a Zep over London. But we were hungry for entertainment of any sort and cheered the lecturer roundly when he had finished. Months later every garrison in the country received a "Secret and Confidential" message from Washington, warning one and all to be on the lookout for a German spy at large in the U. S., who was wont to gain access to military establishments by masquerading as a Belgian with an illustrated lecture on the war that featured a picture of the demolition of a Zep over London. So far as we knew, he was never caught.

The strategic location of Fort Monroe for both arms of the service made us privy to many of the undercover goings-on of the Army and Navy and we soon realized that we were really part of something pretty important. One night our barracks were invaded by hilarious Regulars who had just received their sailing orders for the next morning, and who regaled us with vivid recitals—with gestures—of what their arrival in France would mean to the Heinies as well as to the feminine population of France. The following day their campsite on the beach, which we had last seen as a populous tented city, was a smooth and barren waste with not even a scrap of paper to show that anyone had ever inhabited it. (We policed our own quarters with a little more avidity after that object lesson.) We saw a boatload of interned German sailors brought ashore, we saw Colonel "Dusty" Rhoades depart hurriedly to join Pershing's staff and we witnessed the last dockside conference of naval bigwigs—all in civilian clothes—ere Admiral Mayo set sail for European waters.

Target practice with the big guns was particularly popular because for the first time seacoast batteries were fired with data suppled from airplanes. A great gathering of Washington staff officers assembled for the occasion and we treated them to some effects that must have been unique in the history of gunnery and ballistics. The usual misfire occurred right at the start of the session and em-

The Regulars regaled us with vivid recitals.

bittered by this tragedy, we set out to make up for lost time thereafter. Of course, one of the range detail promptly misread his deflections and when the gun fired, the shell geysered into the water not more than twenty feet ahead of a schooner that was innocently bowling along in that part of the seascape that should have been entirely out of the field of fire. The staff went back on its heels, the schooner went back on its stern and then scooted for home, and all of us learned a lot about ourselves that we had never before suspected.

Saturday afternoons there was swimming either in the bay or in the pool at the old Chamberlin Hotel, followed by a Chamberlin dinner with the inevitable crab-flake cocktails and a prohibition drink called champagne cider that made up in bubbles what it lacked in authority. Also, there was dancing at which we could watch our instructors perform and compare notes on their skill and deportment—and partners.

As at Fort Myer, we were favored with the pick of the Regulars, or perhaps it was merely because all Regulars looked good to us. At any rate such tutors as Meade, Wildrick, Baird, Jarman, Eglin, Pendleton, and the grim Swedish staff sergeant who taught us mapping and was known only as "Alidade," practiced and preached the military art with enormous success.

What the instructors really thought of us, of course we never knew. Certainly we were a group of enough heterogeneity to give unlimited scope to any student of human nature. In our midst was the battery of the Harvard varsity nine, the stroke of the Yale crew, the head of a big department store in Cleveland, a member of the male staff of *Vogue*, a mechanical genius who had invented an adding machine of great fame, the nephew of the Secretary of War, a Princeton halfback, and so on.

So June passed into July and July into August, and the final examinations were upon us. This meant increased activity and longer hours for those responsible for the proper functioning of our latrinogram bureau, and be it said to their credit that they proved worthy of their trust. Fresh rumors came out every hour, but the most inspired flight of fancy, alleged as coming from the highest authority, was that a new rank of third lieutenant was to be created to take care of the men who failed to get a second lieutenancy. We had spies posted in the Chamberlin every night, nervously trying to eavesdrop on officers who might be discussing our cases. We all went to our last test in an advanced state of pernicious jitters and with the firm conviction that nobody would pass it. It is still a mystery that anyone did; the day was the warmest of that torrid season and to cool ourselves, we spent the rest period at the P. X. partaking of a nauseous compound known as "Apple-O." The "Apple" was for the taste of the drink and the "O" was for our ejaculations about half an hour after we drank it. We were promptly seized with all manner of intestinal distress and our papers were finished in a semi-coma composed of equal parts of *mal de mer* and the symptoms of actue appendicitis.

Oddly enough no one died. The following day we heard a lecture by a French artist who used such strange words as *camouflage* and *camoufleur*, Colonel Maskeller gave us some hints on what the well-dressed soldier took to France, a leathery-faced old-timer summed up our training with the succinct advice to "keep your mouth shut, your bowels open, and don't volunteer," and we took the oath that clinched our long-sought jobs with Uncle Sam.

Then we were given ten days' leave with the promise of speedy transportation abroad immediately thereafter, got our pay, ate one last crab-flake cocktail, sat up most of the night making dates to meet in Paris, shook hands all 'round and sprinted for the boats, trains, and trolleys that were to take us home for the last farewells before France.

None of these dates were kept as scheduled, but during the last days of August eighteen of us foregathered at Fort Hancock, N. J., and entered upon our army assignments in various stages of bashfulness. We were quartered in tents sans floors, sans electric lights. This seemed odd, with any number of quarters standing vacant along Officers' Row but the adjutant explained that it was only a temporary measure, since we should receive our overseas assignments within a couple of weeks.

Fort Hancock is on the tip end of Sandy Hook, bounded on three sides by water and on the fourth by poison ivy, so we were subjected to few distractions. Our duties were many and varied as the nine Regular companies (they call

A new rank of third lieutenant was to be created.

them batteries now) on the post were almost destitute of officers. Upon our arrival the entire commissioned personnel consisted of colonels, 1; lieutenant colonels, 0; majors, 1; captains, 3; lieutenants, assorted, 2, accordingly there was no dearth of opportunity for us to earn our pay, it being the firm conviction of the C.O. that young officers should be seen and not heard and that whenever seen, they should be hard at work. Fortunately we were blessed with veteran first sergeants who could take morning reports, ration returns, and green officers in their strides. After a bit we were better able to stride with them.

The post commander was the late Colonel Harris, suddenly called to active duty from a ten-year retirement. Famed as an expert artillerist in his active days he did not allow his seventy-four years to dim his military alertness; like Mr. Farley's postmen he permitted neither snow nor rain nor gloom of night to keep him (us) from the swift completion of his (our) appointed rounds. He proved this most conclusively on one memorable occasion when he had been suddenly called away from the post. Whoever was second in command seized this opportunity to try out a pet theory that troops wearing overcoats could march better if the skirts of the coats were fastened together in the back, à la français. Orders thereupon went forth for a retreat parade with our coats so draped and we fell in looking for all the world like a convention of bob-tailed chickens. Some skirts were buttoned back, others were pinned, and a few inventive souls had made the necessary arrangements with the help of pieces of twine. Just as Adjutant's Call sounded, the car of the absent colonel came roaring up the road, careened around the curve in front of Headquarters and the old gentleman whisked into his office. Almost at once orderlies began to explode therefrom and the parade died a-borning. After that, there were no more sartorial sallies with the uniform. Or with Colonel Harris.

Besides the Regular garrison, there was also on the post a full regiment of the New York National Guard, at first prone to look upon us with understandable hauteur. After all we had only been in service three months. These Guardmen must certainly have been one of the paradingest outfits that ever wore O.D. Every morning they held formal guardmount. Every afternoon we had to join them either in a retreat parade or review, or both; and at least once a week all hands turned out for Escort to the Colors. All of this was actually more a pleasure than a pain because of the organization's magnificent band. There was only one objection—the field music included fifes as well as drums and bugles, and held forth regularly right behind our tents in the old fife and drum reveille and tattoo routines.

Within a week our social status changed and we became excessively sought after, thanks to the War Department suddenly ordering all the Guard officers to Fort Monroe to take the course we had just finished. At all times our tents were filled with seekers after information as to just what the course consisted of: Was there much algebra? How about ballistics? What was the course in trig like? What was trig? Could drinks be obtained easily in Virginia? Did we have any notes we cared to lend? Every one was one jump ahead of the screaming meemies except a doughty captain who flatly refused to go to Monroe, stating frankly that he had forgotten all he ever knew about math which only included long division anyhow; he went to Department Headquarters to make this statement, and returned with a transfer to the Intelligence Section where he was conspicuously successful. In due course his brother officers came back from school and eventually took their regiment to France where they proved they were just as good fighters as paraders.

Meanwhile we waited our orders to go abroad. We moved a battery of 12-inch mortars from the fort to a hidden emplacement in the Atlantic Highlands, we drilled on the 12-inch rifles, we dragged some aged 6-inch siege guns down to the beach for a target practice marked chiefly by the unpredictable actions of equally aged shrapnel —and no orders came. As infantry we sweated all over the sandy landscape, and when someone discovered two forgotten Gatling guns we simulated horses and maneuvered about the parade ground in a spectacular but unconvincing imitation of a regiment of field artillery. And still no orders. In between—and in addition to—our company duties we rotated among assignments as post exchange officer, judge advocate, athletic officer, amusement officer and assistant adjutant, but the war went on without us. We knew it was going on, and we knew Americans were going to it, for it was one of our chores to stand watch on twelve-hour shifts at the mine control station on the end of the Hook. From this vantage point we had the doubtful pleasure of watching the transports slipping out to sea, their decks and superstructures outlined in olive drab during the day, and at night their lightless silhouettes looming darkly against the glare of Coney Island's lights across the bay.

September went by uneventfully, and then October and it began to look as if we were doomed to an existence of innocuous desuetude, when the fort was suddenly attacked! At least we thought it was, and for the time being that was all that was necessary. Glumly huddled in our tents one night, we were startled by an excited messenger who warned us to get to our companies as the enemy was invading the post. Hardly daring to believe him, yet wondering what to do if his report proved accurate, we raced for the parade ground whence undeniable sounds of tumult were issuing. Arrived there, we seemed to have stumbled on some sort of Walpurgis Night; lanterns and torches flashed hither and yon, dark shapes flitted about, things that apparently were motor trucks mounted with machine guns came and went, and demon-driven motorcycles frisked around under foot.

When some semblance of order had been secured it turned out that this unearthly visitation was the result of the members of a motorized home guard unit, formed by the moneyed residents of nearby Rumson, going out for a practice spin and losing their way. The fact that they had previously dined at a hostelry that was the capitol of New

Jersey's applejack belt may have been a contributing factor to their geographical bewilderment, and no one was more surprised than they when they suddenly debouched onto our drill grounds.

Then winter shut down on us—that record-breaking winter of '17. Snow and more snow, coonskin caps and wool-lined jackets, the bay frozen over and the road to the mainland impassable, and always a biting wind and a thermometer that was doing well whenever it touched zero, reading from the bottom up. All fall we had faced the approaching cold season with dire misgivings about our continued residence under canvas, but Headquarters was deaf to our pleas for transfer into permanent quarters. Were we not soon to go "over there?" We admitted that, theoretically, we were, but that you couldn't believe all you heard and anyhow, there would be little point in shipping us over as frozen beef. The argument was finally solved by a sudden storm which leveled our tents one night; while we struggled to save them, one of our number who was working in the office of the Q.M. remarked that there were no more tents in reserve on the post and if ours were ruined, the authorities would have to put us into quarters in lieu of anything worse. We then struggled even harder with the recalcitrant canvas and when morning broke our camp was something that had to be seen to be believed. As the adjutant said, "It looks as if you fellows had tried to tear the tents down, instead of trying to keep them up." We said nothing but briskly moved into real houses, as prophesied.

Draftees and additional officers began to be shipped to us, and from a garrison of some 300 troops, Fort Hancock buzzed with the activities of over 5,000. Overseas orders still evinced a shyness towards us but there were portents that even if our own government had forgotten us, another government had not. The first sign of this was the discovery of a brand new wireless outfit in a dilapidated and long vacant house on the Seabright beach. Some of us were assigned to undercover work in this matter, and that began a series of events that were both silly and serious.

First of all, a recently-arrived field officer was found to have a wireless set in his quarters which he had not reported as required, and in addition it was learned that he was a frequent visitor to the home of a widow living off the post. Her house was high on a hill overlooking Hancock and miles of sea beyond it and the Secret Service had been secretly sharing the view with her for some time. She had a telescope on her porch, and the habit of sitting near it and carelessly snapping a flashlight. All of which was duly reported as discovered. Colonel Harris forbade the dubious Delilah the post, where she was wont to come to dances under the escort of the field officer aforesaid. What happened after that we never knew, for we were taken off the case and put on another one much nearer home.

This had to do with Captain G, one of the most popular officers on the post. He bore a highly Germanic name —which, by the way, did not begin with "G." In appearance and military bearing he might have been one of E. Phillips Oppenheim's mystery men from Vienna. As we later discovered, he did come from Vienna. "There's something about G that's phoney," said our Intelligence chief, "and we've got to find out what it is." So one of our number was put into civilian clothes and sent to New York to wander around G's home neighborhood. It lay in the center of the East Side's foreign district; casual chatting in the local bistros and more concentrated conversation in the precinct police station developed little of interest. G was well known thereabouts; a few people wondered at a man of his Teutonic lineage holding a U. S. commission, but that was all. So the operative decided on a bolder stroke, and called at the G family home. Here he met the captain's mother and representing himself as an out-of-town acquaintance of her son, inquired his whereabouts. In broken English, Mrs. G replied that he was in the Army, but did not expect to remain there long, for she had just heard from the captain and he had assured her that the Germans would soon be victorious.

To follow this clue further, a girl operative was next assigned to the work. She also called on Mrs. G in the rôle of a housemaid looking for a job; she explained that she was unable to secure employment because of her German name, and had been recommended to Mrs. G as a possible source of help. Mrs. G was most sympathetic. She assured the young lady that she knew what it was like to bear the onus of living in an enemy country, but her pride made it easier for her; her husband, General G, was a high staff officer in the Austrian army! She added that she also had a son in the American forces but that caused her no worry, as it was simply his means of getting back to fight for the Fatherland. He, together with German agents in this country, had worked out a scheme whereby he would switch his allegiance as soon as he got overseas. "To me he has said," explained Frau G with complete naïveté, "that as soon as his men are in the front line places—to surrender and 'Kamerad!' to shout, he the first will be! And then—Ach!"

This blew the case wide open, but no action was taken against G at the time. Through him, enough evidence was secured against a German woman in New York nicknamed "the Baroness" to place her in jail for the rest of the war. But G himself was permitted to go his way unhindered—though not unobserved. Eventually, he received a special overseas assignment and by the time he landed in Brest, sufficient evidence had piled up against him to place him in custody. He was freed after the Armistice, came back to New York, and is probably still wondering what went wrong with his plans.

In between the more serious periods of this game of hide-and-seek, the icebound monotony of our existence enjoyed considerable comic relief. Came one day an irate civilian who reported that while traveling down from New York on one of the few trains that served as an alternative to the usual water route to the Hook, he had overheard two of our officers openly uttering disloyal, not to say treasonable, sentiments about the President. They had

We made a shambles of the mess room.

remarked that the President was unreliable, no good, ought to be removed, taken out to sea and sunk, was in short a disgrace to the service. The two officers were easily identified and calmly admitted that they had made the remarks quoted. They had, it seemed, been discussing the vagaries of the government boat that was scheduled to make regular trips between Hancock and New York, but had the aggravating habit of breaking down and being laid up for repairs more often than she plied the briny deep. This whimsical vessel's name was *President*.

As spring thawed out our long-frozen fortress, further credence was given to the idea that the Central Powers thought of us with longing, if not with love. One Sunday evening those of us who had wangled week-end passes were comfortably bound back to the Hook on the celebrated *President* when the searchlights of every fort in the harbor defenses suddenly blazed into life. Wadsworth and Hamilton at the Narrows, Tilden at Rockaway and our own Hancock home turned loose with everything they had, and reflected in the sky we could see the blue-white beams from Totten and the other posts on Long Island Sound. Naturally we were entertained by this lavish display of illumination and considered it a pleasantly dramatic, though perhaps elaborate gesture on the part of the authorities. We couldn't help, however, wondering what it was all about. We found out as soon as we docked.

Instantly we were ordered to get under arms and report to our battle stations. When we finally caught up with the trend of events we learned that a German sub had been located off Fisher's Island. We slept at the batteries that night and were returned to quarters in the morning with the news that the Navy had forever removed that U-boat from our list of things to worry about. I wonder ——.

But the worry about what was to become of us still remained. The Guard regiment had sailed forth to glory; other units came through the post en route to their transports but we stayed put. Our distress at this had long since passed the stage of thwarted patriotism or shattered dreams of valor on the field of battle; it had resolved itself into the question of what was the point of being with the Regulars if the only regular thing we did was draw pictures in the sand. Even the similar predicament of the "regular Regular" officers who had now joined us—gallant gentlemen with West Point commissions dating back fifteen years and more—did not make us especially content with our lot, nor were our feelings entirely assuaged by the gold bars suddenly permitted second lieutenants, followed by a summer crop of promotions.

Then, in September, 1918, it happened! The 37th Heavy Artillery was to be formed on the post and we were all in it. After having had more than a year to get ready for this event, we were naturally unprepared for it, but two weeks of forgetting all about sleep fixed that and, tearing up all memorandum receipts we couldn't otherwise untangle and transfering to the permanent post garrison as many as possible of the lackwits in our own personnel, we trekked south to Camp Eustis, Virginia. Here we were joined by the rest of the command.

Three weeks of Eustis and overseas caps were issued. Then we joyfully moved over to Camp Stuart, the embarkation point for Newport News. Things were at last looking up. We were the first heavy artillery outfit to have actually drilled upon the type of armament we would use on the western front, and it seemed inconceivable that anything could now keep us from active service.

In two weeks we knew that there was nothing more to

worry about, for headquarters had been told to get us ready to sail on November 10th. We drew tin hats, packed our heavy baggage which was carted off to the docks, slept in our packs, and on the morning of the 10th got word that our departure had been postponed until the 11th!

You know what happened on November 11th. The first news we had of it was furnished by a gang of civilian camp employees who staged an impromptu parade at reveille, and at breakfast Colonel Steele confirmed the report that the war was over. We found it hard to believe, and refused to think that we were never going to get across after all. An adjacent field artillery regiment booked for our same transport had joyously pulled out of camp late the night before, and it was not until they marched dispiritedly back again at noon that we knew the door had been slammed in our faces after all. Our bitter disappointment may seem a bit fatuous now, but then it could not be discussed coherently. And to put the icing completely on the cake, everybody was ordered into a big parade in Newport News that afternoon.

Glumly we trudged through the streets of that grimy metropolis, trying not to notice the snickers and jeers of a transient civilian population, who hid their own chagrin at seeing their wartime profiteering boom explode in their faces, by calling us "tin soldiers," and "home guards." Upon our return to camp, overnight passes were given to all hands, but by six o'clock the Newport News police were frantically phoning to shut down on the passes, and to rush all available M.P's into town.

Frustrated in their legitimate martial pursuits, the troops were bent on engaging in some sort of fight, and the actions of the parade spectators gave them the excuse they needed. The remembrance of varied gougings the town had practiced on the military also rankled and one and all set out to avenge a long list of real and fancied insults from the dollar ham-and-eggs in the Greek restaurants to the trolley conductors' omissions of "Sir" when addressing anyone in uniform.

In practically nothing flat, the main streets of Newport News were shambles. The city police disappeared under a wave of olive drab, and the M.P's were adroitly divested of their insignia of authority. Pawnbrokers' signs came down and were used as bowling balls on the sidewalk; barbers' poles were bodily uprooted from their concrete bases and became battering rams against restaurant doors that did not open quickly. As the soldiers entered the front of these places, the customers evaporated out the rear exit—and there was no use in their coming back after the soldiers had left, because there was little that was worthwhile coming back to. All trolleys were halted and volunteer signallers on their roofs dotted and dashed messages to each other by the flashes of the trolley pole being swung against the overhead wire; one car only was permitted to move, in order to give a tow to a gob who was sitting proudly in an old bathtub he had tied to the rear coupling. A great fire was built on the main square, fed by anything inflammable that could be obtained, the climactic contribution being an old hearse which, as it was rolled on the flames, disgorged from its sable interior a varied assortment of sailors, soldiers and marines. In actions the men were determinedly riotous, but in spirit they were the soul of geniality. Subterfuge rather than force was at length resorted to in quieting them. A major who brought up a reserve battalion of M.P's circulated the rumor that a group of soldiers were being beaten up by some civilians at the far end of one of the bridges that separate the business and residential sections of the city. At once the rioters swept across the bridge, whereupon it was closed after them. Then having nowhere else to go except back to camp, the troops docilely went there. Thus ended the Battle of Newport News, our first—and only—major engagement. Ironically enough, the only punishment meted out to anyone went, not to an enlisted man, but to an officer who had been a non-participant in the carousing. When the local newspaper excoriated the soldiers for their actions, a group of indignant subalterns drafted a stinging letter of rebuke to the paper and to Newport News in general; to this ill-conceived epistle the name of one of the group, drawn by lot, was signed. This the paper was only too glad to print as further evidence of the sad lack of discipline among the troops, and then the fur flew. The commanding general of the port of embarkation called upon the brigade commander for disciplinary action, and the latter promptly put the offending officer under arrest for breaking the Army Regulation forbidding the publication of signed communications unless approved by higher authority. The subaltern countered with the assertion that as that particular regulation had recently been rescinded, he had not broken it. This further confused the issue, and before the affair had been satisfactorily terminated there was vouchsafed the unusual spectacle of a brigadier acting as courier between a major general and a first lieutenant. Finally the lieutenant apologized to the paper, the paper apologized to him and the brigadier and his subordinate shook hands over a crab-flake cocktail at the Chamberlin.

The play was rapidly nearing its closing scene. Whistles blowing in the three o'clock darkness of a winter morning, the creak of packs being slung, the tramp of feet again through Newport News streets—silent, this time—the boarding of the transport, the last fluttering gasp from the rumor department as we swung past the Virginia Capes that we were destined for the Army of Occupation, the towering skyline of New York in the next day's sunshine. Docked at Hoboken, there was a quick transfer to ferryboats, and by dusk we were back at Fort Hancock.

Before Christmas all the discharges had come through, and the 37th Heavy Artillery, A.E.F. (almost) was a memory to live, if at all, only in such rueful reminiscenses as this. And even then perhaps it is, to quote another who was not devoid of military maunderings, merely "a tale full of sound and fury, signifying nothing." To the critic who may here arise and point out that the rest of the quotation is "told by an idiot," the reminder is offered that fools have habitually rushed in where angels were chary of treading.

Thunder in the East

Ten Months of the War in China

By Lieutenant Jack W. Rudolph
Infantry

PRELUDE

Just outside the insignificant village of Lukouchiao, about ten miles southwest of the former Chinese capital of Peiping, an ancient marble bridge spans the rolling waters of the Yungting River. Because it appeared in the memoirs of that fabulous Venetian adventurer at the court of Kublai Khan, the viaduct has been known for centuries as the Marco Polo Bridge. Last summer this venerable arch took its historic place beside Sarajevo as a tinderbox which struck the spark of war.

On the night of July 7, 1937, Chinese and Japanese troops collided in the darkness near Marco Polo's bridge. Each blamed the other for the day-long clash that followed. Whoever was at fault, the Japanese army made it the excuse for operations which precipitated one of the most savage conflicts of the past generation.

Like the conflagration ignited at Sarajevo, the Sino-Japanese clash resulted from causes much deeper than an accidental outpost collision. The two nations had been approaching each other along the path of war ever since the triumph of the Nanking regime as the central Chinese government. That they had not met sooner was due to the artful dodging of Generalissimo Chiang Kai-shek, who had no intention of fighting until he had a chance to win.

Japan's military leaders and responsible statesmen have never made a secret of their Asiatic ambitions. An "Asia for the Asiatics," led by a militant Dai Nippon, has been a Japanese dream ever since the islands emerged from isolation at the point of Commodore Perry's guns three-quarters of a century ago. It was a dream only possible of fulfillment, however, at the expense of a weak and divided China.

The Nipponese policy of encouraging chaos in China was wrecked on the stiffening front of an awakening Dragon. Napoleon once said that China was a sleeping giant, best left alone. The stirring giant's breath was getting hot on the back of Japan's neck, as the rise of Chiang Kai-shek threatened not only the dream of Japanese hegemony but the very life of the island nation. Even Asia is not big enough for two strong empires.

In December, 1936, Chiang's policy of procrastination was sabotaged by the Sian coup, which resulted in a union of all Chinese factions on a program of anti-Japanism. Foreign observers believe that Japan, surprised at the display of Chinese unity and aware of its implications, struck while there was yet time. Gun flashes stabbed the North China darkness.

A local truce finally separated the belligerents. Withdrawing to opposite sides of the river, they glared at each other while peace negotiations and war preparations proceeded simultaneously. A rapid Japanese concentration began at Tientsin before the Chinese could augment their Peiping garrison.

Reinforcements from Manchukuo poured in until Japanese strength around Tientsin reached 16,000 men within three weeks. The port of Tanku was seized preparatory to the arrival of transports from Japan, while rail traffic from the north reached the staggering proportions of 130 troop trains in four days.

Two divisions of the Chinese 29th Route Army garrisoned Peiping. This poorly equipped but violently anti-Japanese force, numbering between twenty and thirty thousand men, was scattered about the surrounding area, strategically placed to command the communications with Tientsin, the south, and Mongolia to the northwest. Japanese reports claimed that an additional 100,000 troops were assembling south of Peiping, where they constituted a menace to the Japanese forces.

The Japanese plan of campaign was as follows:

(1) Seizure of the Peiping-Tientsin area as a base for extended operations.

(2) An advance northwest, seizing Nankow Pass and spreading out into Suiyuan and Shansi Provinces.

(3) A quick concentration, followed by a simultaneous advance to the Yellow River along the north-south railroads of North China.

Fighting broke out again near the now famous bridge and quickly spread to the outskirts of Peiping. On July 26th and 27th clashes occurred at Langfang on the railroad and at Tungchow on the Tientsin-Peiping highway. Virtually annihilating the Chinese garrisons, the Japanese occupied these important points and attacked Peiping. After two days of bitter fighting, during which the almost surrounded defenders endured a terrific air and artillery bombardment, the Chinese evacuated Peiping and withdrew west of the Yungting River.

On the 29th of July the Chinese surprised the weak Tientsin garrison with a sudden and dramatic raid that nearly recaptured the city. The supposedly friendly Peace Preservation Corps, reinforced by soldiers who had slipped into the zone in civilian clothes, revolted at Tientsin and Tungchow. The Japanese suppressed the attack only after two days of vicious street fighting. In a whirlwind campaign of three days they had seized the area necessary as a base for operations in North China.

The theater of the brewing conflict, although it has an area of over 400,000 square miles, comprises but four per cent of the sprawling bulk of China. This vast expanse between the Manchukuan border and the Yellow River, extending west to the frontier of Outer Mongolia, embraces some of the most remarkable country in the world.

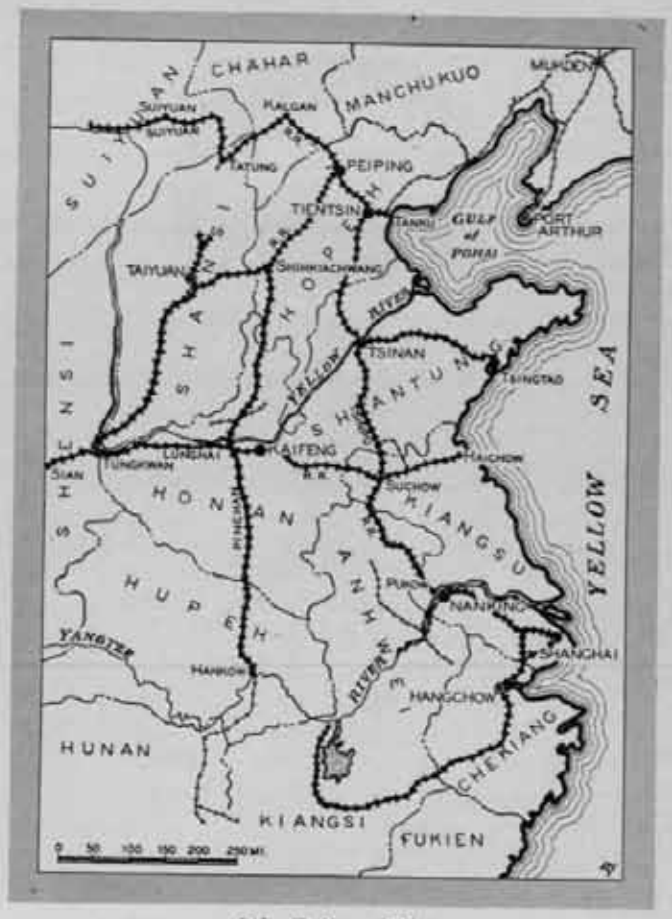
The eastern section of the territory cradled in the wide arc of the Yellow River is part of the Great Plain of China, a gently rolling, treeless tableland of spacious prairies and rushing rivers. Summer rains and spring thaws annually churn the light, fertile soil into an almost impassable sea of mud. The rivers are useless for transportation and overflow their banks regularly. Transport, away from the railroads, is dependent upon mule or horsedrawn vehicles over few and extremely primitive sandy roads.

The western half is a jumbled hill mass, ranging from 6,000 to 12,000 feet altitudes, separating the plain from the Mongolian plateau. These wild and forbidding waste lands are pierced forty miles northwest of Peiping by a narrow defile called the Nankow Pass. Since very ancient times, the pass has been a principal highway between the interior and the coast.

The natural southern boundary of this huge territory is the Hwang Ho, or Yellow River. Traditionally known as "China's Sorrow," this muddy, yellow torrent rises deep in the Mongolian hills, swings in a great curve to the south, and then sweeps east across the plain to the sea. Periodically subject to devastating floods, the Yellow River is one of the most formidable military obstacles in China.

The weather is temperate, with severely cold, dry winters and hot summers. Strong winter winds lash the plain with heavy dust storms and choke the deep and narrow mountain passes with drifting snow. Summer rains drench the country during their short season and transform it into a spongy morass. In spite of its severity, winter is the best time for military operations, since only then is the frozen ground firm enough to support heavy traffic.

The backbone of any campaign in North China is the



The Railroad Net

railroad net, the only adequate communications system in the northern provinces. All Japanese offensives of the war have utilized these roads as axes. No movements can be prolonged at any distance from them.

Four strategic railways knit together the Chinese plain. The Peiping-Suiyuan line, extending west through Nankow Pass, connects Suiyuan, Shansi, and Outer Mongolia with the seacoast. Four hundred miles to the south, beyond the Yellow River, the Lunghai links central China with the vast interior. At Sianfu, the Lunghai's western terminus, a modern highway follows the medieval "Silk Route" of Marco Polo's time into Mongolia and northern Europe.

The Tientsin-Pukow Railroad is the eastern line between the Yangtze basin and the north. It spans the Yellow River at Tsinan in Shantung, crosses the Lunghai at Suchow, and connects Tientsin with Nanking. To the west, the Peiping-Hankow Railway joins northern and southern China. From Tungkwan on the Lunghai, just across the Great Bend, another steel ribbon pushes north through Shansi to the provincial capital at Taiyuan. From Taiyuan a good highway runs farther north to Tatung on the Suiyuan Railroad, while a lateral narrow guage line crosses the mountains to a junction with the Pinghan at Shihkiachwang.

Although heavily outnumbered, the Japanese army enjoyed from the beginning the advantages of careful preparation, superior training, and modern equipment. The

Generalissimo Chiang Kai-shek, China's man of the hour. He remains at the helm because all parties recognize him as the only man behind whom all China will fight.

General Shunroku Hata, who commands the Japanese forces in central China. He relieved General Matsui, whose drives lacked the power to bring about an early decision.

exact size of the regular Imperial establishment was a closely guarded secret, but it was known to include at least seventeen divisions and an air force of close to 2,000 planes. The standing army was estimated at 280,000 men, with two million trained reserves.

According to foreign sources, the Japanese division was composed of two brigades of two infantry regiments, a cavalry and an artillery regiment, communications, engineers, and tank battalions. The division was heavily armed with automatic weapons, having a total of 615 light and heavy machine guns. The artillery had 75-mm. guns and field howitzers. A further organization was a mobile, motor-carried division of two infantry regiments, a mechanized regiment, and an artillery regiment. Its strength was 10,500 men and it had over one thousand motor vehicles. Accounts of rapid flanking movements indicate that these mobile divisions were extensively used in the campaigns that followed.

Apart from its technical strength, the Japanese army is one of the most remarkable instruments of national policy in the world—an instrument which, by virtue of its unique position, frequently determines the course of Japan's foreign relations. Acknowledging allegiance only to the Emperor in a country where all political and military sovereignty is embodied in the Imperial Person, the army has often acted without regard to the plans of the civil government, taking matters into its own hands where Japan's interests are concerned.

Whatever people may think of their actions, nobody doubts the sincerity and patriotism of the Japanese armed services. Both the army and the navy are imbued with an absolute devotion to duty, a sacrificial loyalty to the Emperor (and the State as symbolized by the Emperor), and the dream of a mightier Japan. When more enthusiastic and radical officers sometimes kick over the traces they are usually forgiven because of the unquestioned purity of their motives.

Both officers and men of the army are drawn from neighboring levels of Japanese society, all think amazingly alike, and all are moulded by the feudal military traditions of the samurai code. The result is a closely knit entity which puts patriotism above self, demanding only that Japan be made great and powerful.

Theoretically an army career is open to all Japanese on the basis of competitive examination. The wealthy and educated are rarely attracted to the hard and frugal military life, however, while the lower strata cannot meet the educational requirements. Consequently, most of the officers come from the lower middle class—the small shopkeepers, factory owners, and petty land owners. Many of the highest officers of the Imperial army have risen from humble beginnings. The peasantry supplies fully eighty per cent of the conscript enlisted men.

The education of future army leaders begins at the plastic ages of thirteen or fourteen years. It is a strictly limited education, wherein economics, international relations, and unbiased history have no part. Unquestioned obedience to orders is its aim, rather than intellectual curiosity. Japanese history teaches that Nippon's soldiers never have been and cannot be defeated in battle, a belief that almost reaches a state of religious fanaticism. Such faith, strengthened by the oriental disregard of death, gives the military machine a tremendous moral power, not easily broken by fire and steel.

Armed with moral strength as well as a preponderance of artillery, the Japanese army added to its enthusiasm for the Chinese venture a profound contempt for the military prowess of its enemies. It had succeeded so often against apparently overwhelming odds that it took victory for granted. Flushed with success and eager for the glory of the Empire, the army never expected serious resistance.

The Chinese decision to fight Japan was one of desperation rather than inclination. China, which had suffered for years from an inferiority complex, a moral resignation to Japanese invincibility, had at last reached the breaking point. In spite of fear of the superior Nipponese military machine, the Chinese felt that resistance was the only alternative to fatal encroachment on their sovereignty.

The armies of China, particularly the divisions of Chiang Kai-shek, were no longer comic-opera forces. Their nucleus, at least, was organized for modern warfare and equipped with some of the modern technical appliances. The equipment was inadequate but it was a start.

Except for the fatalistic belief in the power of Japanese ordnance the Chinese soldier was individually equal in courage to the Japanese. In 1932 at Shanghai the poorly equipped 19th Route Army had fought the Japanese to a standstill, demonstrating that, given leadership, training, and equipment, the Chinese was a first-class fighting man. Like his enemy, he had an indifference to death that was to make the Sino-Japanese conflict one of the bloodiest of modern times.

When the war broke out, China's armed forces consisted of about 160 poorly organized, illy equipped divisions, ranging in size from 7,000 to 15,000 men in all stages of training. They varied from the few, well-equipped, German-trained divisions of Chiang Kai-shek's personal army to hordes of provincial warriors armed with ancient, two-handed "bigswords." Their total strength was estimated at nearly two millions, of which only six or seven divisions—about 100,000 men—came up to western standards. There were no trained reserves. To this poorly prepared, polyglot mass were later added 100,000 Communists under famed "Red Napoleon" Chu Teh, inadequately equipped but past masters of guerrilla tactics.

Until the spectacular kidnapping of Chiang Kai-shek at Sian late in 1936, the world had hardly known of the existence of this Communist army. It was destined to become one of the most vital factors in the defense of China, both as a fighting force and as an organizing center for the guerrilla units that later assumed such importance. The guerrilla warfare to which the Chinese reverted after Nanking was a Communist method, highly developed by them during a decade of civil war, which they had carefully studied out in its application to a Japanese invasion. The full story of this remarkable organization has been graphically told by Edgar Snow in *Red Star Over China,* perhaps one of the most significant books of this decade.

The average Chinese division had the familiar two-brigade organization, with three-battalion regiments. They were deficient in artillery and almost totally lacking in mechanized units. Tanks were practically non-existent. Antitank and antiaircraft equipment was scanty and antiquated. The air force consisted of about 400 planes, only some 250 of which were suitable combat machines.

North China

Early in August a Chinese provincial army, reinforced by Central Government units, occupied Nankow Pass and fortified the twelve-mile defile through the mountains. They menaced the Japanese base area, effectively halting any southward move until they could be driven out. Most of the rapidly concentrating Nipponese army, now close to 50,000 strong, was dispatched to liquidate this threat.

Two columns converged on the pass on August 11th. One came down from Jehol, while the other, reinforced by tanks and heavy artillery, advanced up the railroad. The city of Nankow was set on fire but was not captured until after thirteen hours of close combat.

Retiring to prepared positions in the mountains where they had the advantage of every ridge and canyon in the rugged country, the Chinese could not be dislodged by furious and repeated frontal assaults. On the 28th of August a Japanese column, by a brilliant forced march over almost vertical trails, appeared unexpectedly on the Chinese rear.

Three days previously a Mongolian force under Prince Teh had advanced from Chahar and occupied the rail city of Kalgan, eighty miles northwest of Nankow. Surprised, their line of retreat cut off, and apparently trapped, the defenders nevertheless eluded pursuit and escaped west into Suiyuan. The capture of Kalgan and Nankow eliminated the danger to the Japanese rear, cut an important supply artery, and provided a springboard for a push toward the Mongolian frontier.

Prince Teh's Mongols quickly over-ran Suiyuan, seizing the entire length of the railroad. They encountered only feeble local resistance and occupied the capital about the end of September. The subjugation of sparsely settled Suiyuan and Chahar drove a wedge between China and sovietized Outer Mongolia.

Troops streamed into North China until an estimated quarter of a million men, strongly supported by artillery, planes, and mechanized units, were in the area. A military district was created under the supreme command of General Count Juichi Terauchi, former War Minister. The Kwantung Army in Manchukuo, under General Uyeda,

was heavily augmented and assigned the job of guarding the Russo-Manchukuan border.

Preliminary to a general offensive, the column which had cleared Nankow Pass advanced down the railroad to Tatung, which was captured on September 13th. This city where the Suiyuan Railroad met the highway leading into Shansi province, was the jumping-off place for a descent on Taiyuan, 155 miles to the south.

Terauchi divided the 220-mile front between four armies. The eastern force, commanded by General Katsuki, was based on the Tsinpu Railroad, the central army had the Pinghan for its axis of advance, and the western column was poised to move into Shansi via the Tatung-Taiyuan highway. Prince Teh's Mongol cavalry, stiffened by a small contingent of Japanese regulars, was operating into Suiyuan along the railroad. By mid-September the offensive was under way in all sectors.

The northern Chinese forces consisted of provincial troops, interspersed with a few second-rate Central Government units. About 140,000 were defending the Tsinpu sector, while an estimated 200,000 barred the way down the Pinghan. Han Fu-chu, the Shantung warlord, had about 75,000 men east of the Yellow River. Three armies, including the famed Red Army, which had declared allegiance to Nanking, opposed the Japanese in Suiyuan and Shansi. Nearly 800,000 Chinese, virtually devoid of artillery and planes, with neither mechanized forces nor defenses against them, were pitted against a third their number of well-trained, completely equipped, and highly mechanized Nipponese.

The eastern army jumped off on September 10th and encountered little resistance north of Tsangchow, where the Chinese were strongly intrenched in an elaborate defense position running southwest to the Pinghan railroad. Tsangchow, key to the right flank of this "Hindenburg Line," was attacked on September 24th, outflanked, and occupied next day. Katsuki swept on to the Shantung border, where he halted on October 3d. Throughout this advance, Han Fu-chu's army stood idle while Chinese defenses, pulverized by artillery and aerial attacks, were turned by swift, motorized flanking movements.

General Nishio's Pinghan army, 60,000 strong, moved forward on September 14th. The crossings of the Yungting were forced in three places behind a heavy screen of cavalry. After fifteen hours of futile counterattacks, the defenders fell back before the converging threat of a double envelopment to the Tsao River, behind which they halted at Paoting, the Hopei capital.

The Japanese attacked on September 23d but were stopped by stubborn resistance in the center and on the left. Their right column, however, swung west and crossed the Tsao above Paoting. When the Chinese discovered their left flank had been turned they made an orderly withdrawal, blowing up the railroad bridges as they retreated. Nishio entered the deserted city next day after an advance of fifty miles in ten days.

The central army's next objective was Shihkiachwang, eighty miles south of Paoting and key to the left flank of the previously mentioned Chinese defense line. A narrow-gauge railway, running west toward Taiyuan, made Shihkiachwang not only a vital link in the defensive system but the pivot for a flank march into Shansi.

The main Chinese position astride the Pinghan was about forty miles long, extending twenty-three miles to the east and seventeen to the west. It was covered by the Huto River, which flowed through a wide channel, with high, steep banks. Fords were few and all of them breast deep. Some twenty Chinese divisions were reported to have occupied this strong, heavily fortified line.

The Japanese, after resting nearly a week at Paoting, arrived before this position on October 8th. The three colums spread out fan-wise and attacked both flanks. Progress in front of the line was slow in face of strong resistance. During the night of the 10th of October, a flank column marched through difficult mountain country, crossed the river several miles west of the position, and surprised the rear of the left wing. The defenders were thrown into confusion and fled.

The collapse of the Chinese flank enabled the main Japanese column to force the river slightly west of Shihkiachwang, driving the Chinese back in disorder. By the afternoon of October 10th, the city was in Japanese hands. Having smashed the widely advertised line, the invaders stopped to consolidate their gains and to push a flank column west into Shansi.

From Tatung the western army pushed forward rapidly about the same time. Lieutenant General Seishiro Itagaki's force, a highly mobile corps, was headed for the Yenmen Pass, an opening through the Matoushan Mountains debouching into the Shansi plain. A motorized column sped down the highway while a large detachment swung away to the east. This division was to cross the Great Wall east of Yenmen and close in on the Chinese rear.

The advance of Itagaki's army barely escaped catastrophe. The right column, outnumbered by two armies whose pride had been stung by the loss of Tatung, was trapped and all but surrounded. The Chinese attacked bravely, losing an army commander, a division commander, and a brigadier in their eagerness to overwhelm the Japanese. The latter held their ground desperately until the arrival of reinforcements saved them from being wiped out.

Proceeding on their way, this detachment crossed the Great Wall unopposed about fifty miles east of Yenmen Pass, struck west, and reached the rear of the main defense position on October 2nd. The Chinese, who had hitherto repulsed every attack of the main column, again withdrew. Increasing guerrilla activity, however, had so disrupted communications that the southward advance was temporarily halted to deal with this threat.

Throughout the advance the Japanese employed what they termed "fan tactics" to turn the inadequate Chinese defenses. Flank columns swung to the right and left, coordinating their attacks with a frontal assault, usually preceded by heavy artillery and aerial bombardment. These maneuvers achieved considerable surprise effect in spite of

the inferior numbers with which they were executed. The Chinese, apparently unable to fathom where these turning movements would strike, folded up when the Japanese appeared in their rear. The defense systems apparently lacked depth and proper flank protection.

The use of airplanes to bomb front-line positions was a trend strikingly similar to tactics of the Spanish Civil War. Lack of medium artillery may have been the reason for it. The Japanese advanced so rapidly that their heavier ordnance was unable to keep up; consequently, the air force was used as a mobile artillery reserve. Whatever the reason, the practice is worth watching.

A swift, coördinated campaign of less than three months had accomplished half the Japanese program in North China. Suiyuan and Chahar were over-run, and the northern and eastern parts of Hopei were in the hands of the invaders. The eastern army was on the Shantung border, a short distance from the Yellow River, while the central forces had completed half their job of occupying Shansi and western Hopei.

Then, however, events took an unexpected turn. Far beyond their Yellow River goal, the invaders became involved in an imbroglio that was destined to change the entire course of the still undeclared war. The flames of Chapei cast lurid shadows across the eastern sky.

Shanghai and the Great Retreat

It is now generally accepted that the creation of the Shanghai front, where hostilities broke out in mid-August, incidental to the killing of two Japanese navy men at the city airport, was a Chinese inspiration. Chiang Kai-shek did not care to send his best troops north of the Yellow River under generals whom he did not trust; for the same reason, he did not intend to go himself. He deliberately provoked battle at Shanghai against the advice of his foreign staff and gambled on embroiling Japan with foreign powers in the city.

Shanghai, sixth largest city in the world, principal port of China, and gateway to the Yangtze basin, is situated on a low, flat, and spongy delta formed by the junction of the Yangtze and Whangpoo Rivers forty miles from the sea. The surrounding plain, dotted with numerous villages and interlaced with a network of marshy creeks and canals, is ideal for defense against frontal attack but may be easily turned by landings on either side of the peninsula.

The Japanese sailors had been killed on August 9th. Two days later a flotilla of four cruisers, ten destroyers, and an aircraft carrier arrived at Shanghai and put 4,000 marines ashore in the Japanese section of the International Settlement. This naval advance guard was continuously increased until nearly seventy warships were anchored off the city.

Chiang Kai-shek sent his crack 88th Division to Shanghai. The Chinese occupied the native quarter of Chapei and fortified the North Station area. Both sides dug in facing each other just north of the barricades of the International Settlement, to which the Chinese anchored their right flank.

The storm broke on August 13th. Fighting began which continued with increasing ferocity for thirteen weeks. The spectacular struggle horrified the world, wrecked one of its great cities, produced a series of incidents that threatened to involve western nations in the hostilities, and eventually became the main theater of Japanese operations.

Japanese warships hurled tons of explosives into Chapei and their planes dropped thousands of bombs. The closely packed native section, pounded into a charred mass of rubble and ashes, became the graveyard of uncounted thousands. Under the intense rain of destruction the narrow, twisted streets were gradually converted into an impregnable defense system, from which the defenders emerged periodically in close and bloody hand-to-hand forays.

An early Chinese assault nearly swept the landing party into the Whangpoo. The soldiers and marines maintained a narrow foothold with extreme difficulty. Their planes and ships repeatedly punished the Chinese lines and were themselves targets for enthusiastic but inaccurate Chinese batteries in Pootung, on the right bank of the Whangpoo.

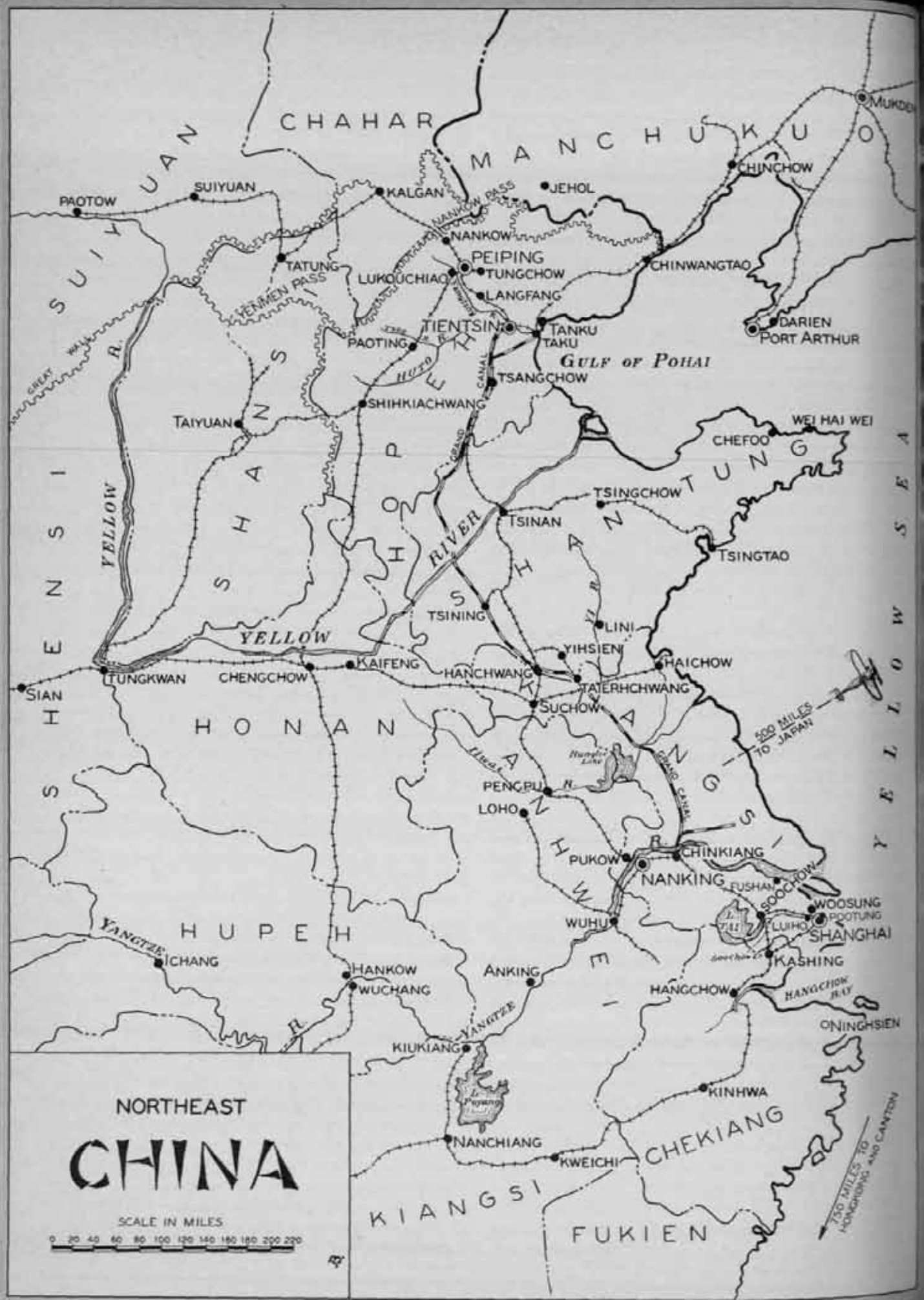
A Japanese force gained a foothold at Woosung, nine miles north of Shanghai, on the 23d. Five days later the maneuver of 1932 was repeated and a landing effected near Liuho, twenty miles up the Yangtze. This contingent fought its way through strong resistance to a junction with the Woosung force. A joint attack on September 13th forced the Chinese to withdraw to a much shorter line about four miles from the river, extending from Liuho to Shanghai, where they resisted repeated frontal assaults and methodical hammering until near the end of October.

The Chinese crowded over half a million men into the area under one of their ablest commanders, General Feng Yu-hsiang. General Iwane Matsui, a highly rated officer, was placed in command of the Japanese force, which was steadily increased until it totalled nearly 250,000 men. By the first week in October 120,000 Japanese were containing 350,000 defenders in the bottleneck.

A spectacular press coverage completely overshadowed the sweeping Japanese successes on the northern front and created an unforeseen situation. The Japanese soon became more involved at Shanghai than they had intended. General Matsui was getting restive under world-wide criticism of his failure to crack the amazing resistance of the defenders.

Several divisions were transferred from the north until the Shanghai army numbered about 225,000. Late in October, Matsui launched a tremendous attack which at last broke the Chinese line, necessitating a withdrawal. Setting fire to what remained of battered Chapei, the Chinese army broke contact and retreated about five miles to a position behind Soochow Creek. Although suffering heavy losses, the Chinese handled the difficult movement so admirably that it was heralded as the most orderly withdrawal in the history of oriental warfare.

One Chinese battalion of 500 men remained behind in a barricaded warehouse a few yards from the British sector of the International Settlement, where they defied the en-


NORTHEAST
CHINA
SCALE IN MILES
0 20 40 60 80 100 120 140 160 180 200 220
CHAHAR
MANCHUKUO
SUIYUAN
SHENSI
SHANSI
HOPEH
SHANTUNG
HONAN
HUPEH
KIANGSU
ANHWEI
CHEKIANG
KIANGSI
FUKIEN
YELLOW SEA
GULF OF POHAI
YELLOW RIVER
YANGTZE
GREAT WALL
YENMEN PASS
NANKOW PASS
PAOTOW
SUIYUAN
KALGAN
JEHOL
CHINCHOW
MUKDEN
NANKOW
PEIPING
TUNGCHOW
LUKOUCHIAO
LANGFANG
TATUNG
CHINWANGTAO
TIENTSIN
TANKU
TAKU
DARIEN
PORT ARTHUR
PAOTING
TSANGCHOW
SHIHKIACHWANG
TAIYUAN
WEI HAI WEI
CHEFOO
TSINGCHOW
TSINAN
TSINGTAO
TSINING
LINI
YIHSIEN
HAICHOW
KAIFENG
HANCHWANG
TAIERHCHWANG
SUCHOW
TUNGKWAN
CHENGCHOW
SIAN
500 MILES TO JAPAN
PENGPU
LOHO
PUKOW
CHINKIANG
NANKING
FUSHAN
SOOCHOW
WOOSUNG
POOTUNG
LUIHO
SHANGHAI
WUHU
KASHING
ICHANG
HANKOW
WUCHANG
ANKING
HANGCHOW
HANGCHOW BAY
NINGHSIEN
KIUKIANG
KINHWA
NANCHIANG
KWEICHI
750 MILES TO HONGKONG AND CANTON

ture Japanese army for the three days. After a spectacular stand in which they absorbed everything the Japanese could throw, the survivors abandoned their courageous but futile gesture and broke for the Settlement where they were enthusiastically received, disarmed, and interned.

As November opened, a general assault crossed Soochow Creek in several places. On November 6th, following a series of feints along the Yangtze and Hangchow Bay, two divisions landed on the bay shore under cover of a dense fog, thirty miles behind the Chinese lines. Brushing aside local resistance, they pushed rapidly forward. The Chinese flank, bent back and extended, lost contact with the International Settlement.

The northern sector of the front collapsed on November 13th when the Japanese landed troops above Liuho. The Chinese began a general retreat to a previously prepared "Winter Line" about fifty miles west of Shanghai. Except for another last-ditch stand by 10,000 Chinese trapped in the ancient walled city of Nantao, which ended in massed flight into the French Concession, the three-month Battle of Shanghai was over.

The line to which the Chinese were withdrawing, reputedly strong in concrete pill-boxes, machine-gun nests, barbed wire, and natural obstacles, extended south from Fushan through Soochow to Kashing. A switch position had also been constructed farther west between the Yangtze and Lake Tai.

A swift dash carried the Japanese behind the right flank of the line even before the retreating Chinese had reached the position. A labyrinth of lakes which had been expected to slow up the attack actually accelerated it. Failure of the Chinese to remove or destroy the boats on these lakes provided the Japanese with plentiful means of crossing the obstacles.

On November 20th, according to Japanese reports, a handful of scouts trailed a Chinese column through the darkness into the walled town of Soochow, the center of the entire defense line. Surrounded by Chinese troops, the party penetrated to the heart of the city. As day broke they hoisted the Japanese flag, its appearance so unnerving the garrison that it fled by every gate. The report fails to state where the plucky scouts got the flag, but it credits them with holding the town for three hours until the arrival of the advanced guard. The vaunted "Winter Line" had crumbled in three days with scarcely a shot fired.

By now it was evident that the new objective was Chiang's capital, Nanking. The Japanese pursued the retreating army closely into its final defense line. Again the failure of the Chinese to remove the lake boats enabled the attackers to cross Lake Tai and turn the position, which was smashed on November 25th.

With the collapse of the last line, Chinese resistance ceased. The beaten army withdrew rapidly and in considerable disorder to Nanking where it intended to make a stand. Moving in four columns, the victorious Japanese swept to within range of the capital in three weeks.

Scarcely 140,000 survivors of the huge Shanghai force reached Nanking. Japanese reports, probably exaggerated, claimed that in the last week of the advance they captured 10,000 prisoners, 150 field guns, 3,200 machine guns, 120,000 rifles, and enormous quantities of ammunition, in addition to counting 84,000 dead on the field. An item of six airplanes and ten tanks in the mass of captured matériel was a revealing sidelight on Chinese preparedness.

Gunboats destroyed the obstacles blocking the Yangtze and steamed up-river. The pursuing army closed in on the doomed city from three sides. A flying column swung away to the south and occupied Wuhu, up-river from Nanking, cutting the logical line of retreat and making the city untenable.

The Japanese captured Purple Mountain, where China's sainted Sun Yat-sen is buried, planted batteries that swept the city, and attacked Nanking on the 12th of December. Inside the thirty-foot walls, which were slowly crumbling under the hail of fire, the wildest scenes of panic and disorder reigned. Ranking Chinese generals and their staffs deserted the army, fled across the river, and left no one to direct the defense of Nanking.

On the 13th the Japanese entered the city. A few isolated units, not knowing they had been left to their fate, fought until wiped out, while others escaped across the river. Thousands discarded weapons and burned their uniforms in a desperate attempt to escape among the civilian population. Those who surrendered were promptly shot. All men of serviceable age in the city were hunted down and most of them killed on suspicion of having served the Chinese government. According to press reports, an estimated twenty thousand perished in the sack of the city.

In the North

Meanwhile the northern front was relatively quiet. The advancing armies, which exercised no control out of sight of the railroads, were experiencing difficulty with guerrilla bands which struck at communications and isolated detachments, disappearing before they could be cornered. Many garrisons, cut off from supplies, were fed by rations dropped from airplanes.

The advance on Taiyuan was resumed in November from the east and north. Since early October the Japanese had been unable to cross the Huto River where it tumbled through deep gorges in the jagged hills. At length, pressure from the east, where the Shihkiachwang column was advancing slowly in the face of stubborn resistance through the eastern mountains, forced the Chinese to retire.

Taiyuan was the scene of bloody hand-to-hand fighting which raged for twenty-four hours before the use of white phosphorous bombs so demoralized the defenders that they fled in panic. The capture of the city broke the back of organized resistance in Shansi. Itagaki pushed on beyond Taiyuan as the year ended but failed to destroy the Chinese armies, which dissolved into the hills.

Late in December the eastern army crossed the Yellow River and invaded Shantung following the destruction of enormous Japanese industrial holdings in Tsingtao and

other cities. Tsinan, the provincial capital, was taken on December 27th. Two weeks later marines landed at Tsingtao, pushed forward to meet the army advancing from the west, and brought most of the province under control. The unreliable Han Fu-chu, who had put up no resistance, was court-martialed by Chiang Kai-shek and shot.

Between the Acts

The fall of Nanking and the rout of its defenders precipitated a sweeping change in the Chinese conduct of the war. Chiang Kai-shek had tried to hold Shanghai and Nanking against the counsel of his German adviser, General Alexander von Falkenhausen. He had gambled, lost his capital and almost destroyed his army, but he had not yet lost the war. He now reverted to the "fading defense" favored by his foreign aides and gave his Communist allies a free hand to carry on the guerrilla warfare at which they were so spectacularly adept.

Howard R. Ekins, United Press writer, says in his recent book, *China Fights For Her Life*, that a surprising shake-up took place in the Chinese high command. The generalissimo, nominally still supreme, actually lost control of all but a third of the army. The Communists gained the right to appoint one third of the generals in the field, while the powerful southern faction, led by the Kwangsi strategists, Pai Chung-hsi and Li Tsung-jen, also controlled a third. Chiang remained at the head because all parties recognized him as the only man behind whom all China would fight.

Incompetents and diehards were weeded out. Han Fu-chu was but one of many commanders who were tried and convicted of military malfeasance. Pai Chung-hsi became Chiang's Chief of Staff, while his lifelong friend, Li Tsung-jen, took command of the central front. Chiang himself resigned his political offices to devote his unquestioned military talents to the battlefield. Significant political developments were the appointment of Chou En-lai, leading Red diplomat and political organizer, to the Ministry of Mass Organization and the resignation of Madame Chiang as head of the air force.

Under the direction of von Falkenhausen and his staff, half a million recruits were trained, organized into thirty-one new divisions, and placed in reserve as fast as they became available. Russian technicians and flyers arrived in increasing numbers. The air force, which had failed miserably in the early months of the war, revived and began to give the Japanese flyers some competition.

A stream of munitions poured over China's three remaining supply routes. Russian equipment came across the long highway through Mongolia to the Lunghai Railroad. Fast planes and munitions came from French Indo-China and through Hong Kong. The Hong Kong-Canton-Hankow Railroad maintained a steady and vital service in spite of almost daily bombing.

The Communist 8th Route Army converted the entire theater of war into a vast guerrilla hunting ground in which operations increased in numbers and boldness. Chinese morale, equipment, and discipline began to improve.

Chinese strategy after the Great Retreat became that of the so-called "fading defense." Forced back by weight of superior armament which pulverized positional defenses, the Chinese abandoned the principle of holding fortified areas. Instead, their armies retreated rapidly before the Japanese, drawing them deeper and deeper into the interior until the Nipponese lines of communication became precariously overextended. Breaking up into highly mobile columns, the Chinese turned on the invaders and launched a series of harassing flank attacks. At the same time guerrilla units descended on the long supply lines and played havoc with the communications system.

This guerrilla warfare, a highly developed tactical doctrine which had enabled the Communists to resist Chiang Kai-shek for years, was far from the sporadic banditry usually associated with the term. The irregular forces operated under an increasingly effective and apparently controlled system. Long before the outbreak of hostilities the Reds had studied its possibilities in case of a war with Japan.

The guerrilla bands were organized military bodies, trained and partially supplied by the Chinese government. Their nuclei were cadres of regular or Communist soldiers who filtered into Japanese-held areas and filled their ranks with residents of the occupied zones. The peasant recruits were given a few hours of military training every day and were aided in turn by the soldiers who lived among them as farmers and coolies. Children were trained to act as spies —a very vital cog in a system whose success depended upon a highly organized intelligence department.

Acting on information received through their agents or upon orders from a central headquarters, the bands assembled suddenly, swooped down on isolated detachments, supply depots, and trains, destroyed their objectives, and disappeared before hastily dispatched reinforcements could intercept them. Large mobile units even formally occupied cities and towns far behind the Japanese lines. Their attacks were well conducted, tactically sound, and frequently so well coördinated with operations in other sectors as to indicate highly efficient staff work.

Guerrilla activities were absolutely unpredictable and struck in the most unexpected places. The dangerously overextended and constantly lengthening Japanese communications were particularly vulnerable to this hit-and-run warfare.

At the present writing (May 22d) the Chinese had delayed Japanese progress for nearly six months and accounted for the first major military defeat in Japan's modern history, chiefly by use of this strategy. There is much that is yet unknown about guerrilla organization, training, and tactics as practiced by the Chinese, but there is no denying that it is one of the most effective means of defense yet applied to modern war. Admitting the special conditions of the Chinese war theater, the policy of "fading defense" may yet revolutionize modern strategy.

The Lunghai Corridor

The advance into Shantung completed most of Japan's original military program in North China, while the cap-

ture of Nanking gave the invaders control of a large strip of the Yangtze River basin—more than 300 miles long—which contained China's principal port and her capital city. Between the conquered areas lay a belt of land, approximately two hundred miles wide, soon to be the battle ground of one of the most remarkable campaigns in modern history.

The next objective became the Lunghai Corridor, so called because of the Lunghai Railroad which traversed it along the ancient course of the Yellow River from the seacoast westward beyond the Great Bend. Its conquest would unite the occupied zones and give Japan control of the seaboard as far south as Shanghai. Success of the operation was universally believed a matter of days early in 1938, yet it was nearly six months before the Japanese reached their goal.

The backbone of the Chinese defenses, as well as the best line of retreat to the west, was the Lunghai. The junction city of Suchow, where the two principal railways of North and Central China intersect 175 miles north of Nanking and 330 miles northwest of Shanghai, is the nerve center of the zone.

Between the railroad and the Yellow River, extending 300 miles westward from the 700-year old Grand Canal to Chengchow, the Chinese had constructed over a period of years an elaborate defense system. Four hundred thousand revitalized Chinese troops poured into the corridor defenses between the converging Japanese armies.

Early in January the latter began their drive to pinch out the corridor. The northern armies drove slowly but steadily southward along the Tientsin-Pukow Railroad, while Matsui's divisions resumed their interrupted pursuit. Freezing weather, accompanied by bitter winds and snow, hampered operations during the early weeks.

The northern forces encountered little resistance north of the Grand Canal. Here they piled up on the strong defenses behind the ancient waterway as the new Chinese strategy began to bear fruit in a series of flanking attacks which disorganized the supply services. The advance stalled eighty miles short of its objective. An attempt to swing to the southwest and outflank Suchow was halted at Tsining on the Canal.

The southern army advanced north in three columns. One pushed along the bank of the canal, the central force moved up the railroad, while a western column came up a parallel highway. Pengpu on the Hwai River was captured, but further advance was frustrated when the Chinese cut the Hwai levees and flooded the Japanese out.

According to reports, the main reason for the failure of Matsui's army was in its own ranks. The troops were largely reservists; they got so badly out of hand in Nanking that the breakdown of discipline amounted almost to mutiny, and they were still in a disorderly mood when they resumed the march. Their ranks were honeycombed with disease—aftermath of the sack of the Chinese capital.

After his failure to force the Hwai River, Matsui was relieved by General Shunroku Hata, former War Minister, who reorganized the army. His difficult task was increased by a vicious guerrilla campaign which flared up all over the Nanking-Wuhu-Hangchow-Shanghai quadrangle. Operations up the Yangtze from Wuhu and south from Hangchow were brought to a standstill.

In the middle of February the Japanese shifted their main effort from the Tsinpu area to the Peiping-Hankow axis. The second offensive began when a strong column struck off from the railroad to the southeast and drove the Chinese back toward the river. The Chinese retreated in good order to Kaifeng, where the Lunghai first approaches the Yellow River 200 miles west of Suchow. This column got as far as the north bank opposite Kaifeng but was unable to cross the river.

Another force proceeded directly down the Pinghan. The Chinese withdrew sullenly beyond the great water barrier, dynamiting the longest steel bridge in China and destroying all river transportation behind them. Courageous Japanese attempts to cross the wide, muddy torrent in rubber boats and inflated rafts were repulsed bloodily. Mobile units struck at the railroad behind the advance, seriously disorganizing Japanese communications.

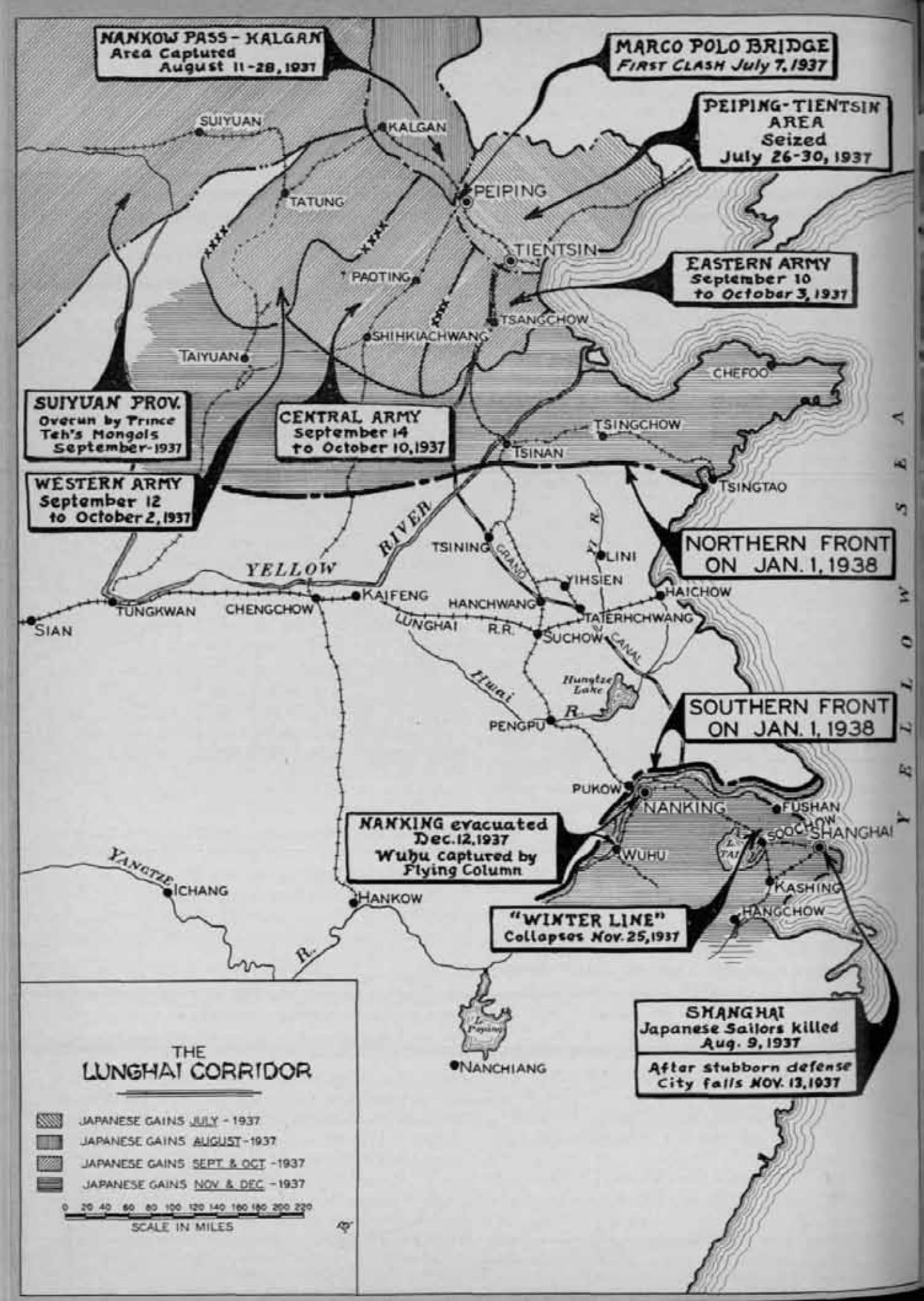
To liquidate the threat to their flank and rear, the invaders faced west and moved to clear out the rest of Shansi Province, driving the 8th Route Army from its craggy stronghold along the Hopei-Shansi border. A coördinated movement from the north and east penetrated the difficult Shansi country to the Great Bend of the Yellow River. The slippery Reds eluded the net, however, filtered between the converging columns, and resumed their game of hide-and-seek. An attempt to cross at the Bend had to be abandoned. By the end of February the western offensive had bogged down on all fronts.

The guerrilla forces in the inaccessible Shansi mountains became so active that Japanese control throughout Shansi and Hopei was non-existent out of sight of the railroads. Even the rail lines were not immune to lightning raids that rained swift, darting blows at small garrisons and trains. It has been reported that not a train or convoy moved in the Pinghan area without suffering casualties before reaching its destination—if it got there at all. The Japanese did not have enough men to protect their long supply lines, which were constantly being ruptured, to the increased undermining of their positions and morale.

Taierhchwang

Having failed to force the Yellow River in the west, the Japanese returned to earlier battlefields for a decision. On the 14th of March another big Tsinpu offensive got under way when the eastern army, reported reinforced by four fresh regular divisions, struck on a fifty-mile front east of the Grand Canal. Some of Japan's most distinguished commanders, including Generals Isogai, Itagaki, and Doihara, led the attack.

The Chinese held up the eastern flank near the city of Lini but fell back rapidly and in excellent order along the rest of the front until they reached the railroad crossing of the canal about twenty miles north of Suchow. Here they dug in and threw back all attempts to cross the water way.


NANKOW PASS - KALGAN
Area Captured
August 11-28, 1937
MARCO POLO BRIDGE
FIRST CLASH July 7, 1937
PEIPING-TIENTSIN
AREA
Seized
July 26-30, 1937
SUIYUAN
KALGAN
PEIPING
TATUNG
TIENTSIN
PAOTING
EASTERN ARMY
September 10
to October 3, 1937
TSANGCHOW
SHIHKIACHWANG
TAIYUAN
CHEFOO
SUIYUAN PROV.
Overrun by Prince
Teh's Mongols
September-1937
CENTRAL ARMY
September 14
to October 10, 1937
TSINGCHOW
TSINAN
TSINGTAO
WESTERN ARMY
September 12
to October 2, 1937
YELLOW
RIVER
TSINING
GRAND
LINI
NORTHERN FRONT
ON JAN. 1, 1938
YIHSIEN
HAICHOW
KAIFENG
HANCHWANG
TUNGKWAN
CHENGCHOW
SIAN
LUNGHAI
R.R.
TATERHCHWANG
SUCHOW
CANAL
Huai
R.
Hungtze
Lake
PENGPU
SOUTHERN FRONT
ON JAN. 1, 1938
PUKOW
NANKING
FUSHAN
SOOCHOW
SHANGHAI
NANKING evacuated
Dec. 12, 1937
Wuhu captured by
Flying Column
WUHU
YANGTZE
ICHANG
HANKOW
KASHING
HANGCHOW
"WINTER LINE"
Collapses Nov. 25, 1937
R.
NANCHIANG
SHANGHAI
Japanese Sailors killed
Aug. 9, 1937
After stubborn defense
City falls NOV. 13, 1937
YELLOW SEA
THE
LUNGHAI CORRIDOR
JAPANESE GAINS JULY - 1937
JAPANESE GAINS AUGUST - 1937
JAPANESE GAINS SEPT. & OCT. - 1937
JAPANESE GAINS NOV. & DEC. - 1937
0 20 40 60 80 100 120 140 160 180 200 220
SCALE IN MILES

aided by counter-attacks further north against the Japanese right flank. Guerrilla units moved out of their hiding places, raided the Tsinpu from the canal to the river, and demoralized Japanese communications. The push down the railroad was completely stopped.

In the center a heavily mechanized force, reputed to total 60,000 men, smashed through to the north bank of the canal, some forty miles northeast of Suchow. Chinese resistance brought it to a halt at Taierhchwang, a hitherto unknown town destined to gain world fame in the next three weeks. A bitter eighteen-day battle raged within the brick walls of the old city, which was reduced to a heap of ruins under incessant shelling and savage hand-to-hand fighting in the streets.

As the Japanese communications disintegrated, the situation at Taierhchwang became serious. Fuel and food supplies began to give out. The air force tried to drop rations but was unsuccessful. Tanks and trucks stalled on empty gas tanks and had to be abandoned. Then artillery fire slackened and finally ceased as the supply of shells became exhausted. The embattled Nipponese infantry tightened its belts and anxiously counted its dwindling cartridges.

Lieutenant General Kenji Doihara, known as Japan's "Lawrence of Manchuria."

Sensing the critical condition of the besieged column, the Chinese stormed across the canal and closed in on the town from three sides. The 31st Division of the 26th Route Army, a fresh and well-trained unit from Kwangsi, threw itself on the Japanese barricades in a series of reckless night attacks. The hungry Japanese drove back one assault after another, each harder to repel than the one before. Still the inspired Chinese kept coming.

The virtually surrounded Japanese watched the vise tighten with growing alarm. All their lives the Japanese soldiers had been told that they were unbeatable, until the belief had become a basic principle of their military faith. But the impossible was happening—and to them! The realization was too much even for Japanese regulars. They broke and ran, committing the unprecedented sin of leaving their dead and wounded behind them.

An exulted and vengeful horde hunted them down as they fled for twenty miles back along the way they had come. At length, its panic subsiding, the beaten force halted and dug in at the town of Yihsien, halfway back to the railroad. Yihsien, soon completely cut off, became the scene of an heroic defense as the desperate remnants fought to avert annihilation. After holding off the Chinese for a fortnight the survivors broke through and joined a relief column rushing down from the northeast.

For the first time in modern history a Japanese army, containing some of Japan's finest divisions, had been beaten. The defeat, while not tactically decisive, was a major military disaster and it shook the Japanese war machine to the core. More important, it had shattered the legend of Japanese invincibility. The boost to Chinese morale was tremendous. Nathaniel Peffer says that Taierhchwang was worth more than three army corps to China; that the Chinese, having tasted the miracle of victory over their ancient and dreaded enemy, will never again bend before Japan. They will have to be broken.

According to Hallet Abend of the *New York Times*, scarcely 20,000 were left alive of the Japanese force of 60,000 men. Foreign observers estimated the Japanese losses at nearly 10,000 killed and 20,000 wounded, most of whom were captured. Grimly significant Chinese reports stated that most of these prisoners were so weak from starvation that nearly all died.

The Fall of Suchow

Rankling under the Taierhchwang defeat, the Japanese struck back swiftly to wipe out the disgrace. Face saving demanded revenge on the same ground; consequently, the blow was aimed at the same front. This time, in an effort to reduce danger from flank and guerrilla attacks, the Japanese widened their eastern front on the Yi River at Lini and placed two full divisions along the Grand Canal to protect their right flank.

Thus protected the advance pushed the Chinese slowly back. In spite of precautions, guerrillas popped up in the rear areas and harassed the supply lines. By the first of May the now familiar story had once more been reenacted. The exhausted armies lay panting, face to face, upon almost the same battlefields.

In the meantime, however, the Japanese were preparing a knockout blow. All the men and equipment that could be spared were rushed to the Suchow front until a force of more than 300,000 was concentrated on the embattled corridor. Large contingents were transferred from Japan, while other fronts were stripped of all available men. Naval planes were added to the air force to assure superiority over a revitalized Chinese air arm that had signalized its come-

back with a rousing victory in a great air battle over Hankow. Troops were drawn from Manchukuo, Jehol, Hopei, Shansi, and the Wuhu-Hangchow front.

The weakening of the western forces necessitated a general withdrawal in Shansi and Hopei. Alert Chinese regular and mobile columns closed in on isolated skeleton garrisons, regained control of important river crossings, and pushed north. In a few days they wiped out gains won only after weeks of bitter fighting.

While the central front lay temporarily quiet, a diversion occurred at Amoy in southern China, where a Japanese contingent landed and established what was believed to be a base for bombing raids against the Canton-Hankow Railroad. At the same time a storm of guerrilla raids broke out all over the theater of operations. Fighting raged within earshot of Shanghai, Peiping, and Nanking. These attacks kept the Japanese busy for several days beating off threats to their vital supply bases.

During the second week in May the long-awaited Japanese offensive opened with a converging advance on Suchow. Twelve columns moved from the north, south, and east in a supreme effort to trap and annihilate the Chinese army. Motorized units forced the hitherto impregnable Hwai River positions against almost no resistance, swung northwest, and raced to cut the Lunghai behind Suchow. The northeastern columns over-ran the Taierhchwang battlefields and reached the railroad east of their objective. From the north, units turned west and sped to a junction with the columns advancing from the other side of the railway. Suchow was occupied about the 18th of May.

The geographical objective of nearly half a year had been reached in slightly more than a week. The real objective, however, had again escaped. The Chinese army was not in the noose. Only a few courageous suicide units remained to fight delaying actions as the main armies slipped away to the west. The jaws of the Japanese trap snapped on an empty salient.

The capture of Suchow joined the northern and southern Japanese armies; otherwise it gained no great advantage. No really important facilities had been wrested from the Chinese, who not only retained control of their main supply routes but had forced Japan to advance deeper into the interior to seek a decision. Actually the battle for Suchow had weakened the threat to China's vital communications.

As the *New York Herald Tribune* pointed out editorially some days before the final attack, the withdrawal of troops from Shansi, Hopei, and Wuhu had sacrificed strategic advantages for the sake of a hollow victory. From Wuhu the Japanese had been in a position to move directly up the Yangtze against Hankow, while a thrust down the Pinghan against Chengchow would have cut Chiang's line of retreat, severed his supply arteries, and menaced Hankow at the same time.

When Terauchi stripped his western armies he handed these advantages back to the vigilant defenders. In spite of the capture of Suchow the Japanese were still over a hundred miles from a vital spot in China's defenses. To menace them would require that much more stretching of their already overextended lines of communication.

Chiang's five-month defense of the Lunghai corridor, spectacular though it had been, was only a gigantic diversion. By inducing Japan to squander men and supplies in the battle for Suchow, Chiang was bleeding Japan white. Every week that slipped by drained away so much more of Japan's strength and chances for ultimate victory.

Having achieved all and more than he could possibly have hoped for, Chiang Kai-shek evaded the elaborate net spread to crush him. Although it is still too early to know exactly how or when the withdrawal took place, it is possible to hazard a guess. Chiang undoubtedly knew all about the tremendous Japanese preparations; consequently, he could not have been surprised. What apparently happened was that the Chinese armies, under a smoke screen of official optimism and elaborate guerrilla activity slipped out of Suchow before the blow was launched.

After ten months of war, Japan had seized nearly one million square miles of China, including both the old and the new capitals, two great ports, two railroads, and parts of two more. The cities had been devastated by war, the land deserted, and the railways badly damaged by heavy use, intense bombing, and guerrilla raids. The Chinese armies—the true military objectives—were still at large, growing more powerful and confident every day. These gains had cost Japan 400,000 casualties, including 90,000 dead, half her gold reserve, and one-third of her foreign trade. Her economic structure and credit were reported in danger of collapse.

Japan's only hope of victory was to quickly annihilate Chiang Kai-shek and his armies. To catch them she had to push deeper into an already precarious interior. The thoroughly aroused Chinese people, having lost their fear of Japan, could not be frightened by a show of might. They had to be smashed by Japanese power, a task many believed to be beyond the capabilities of Japan. Now there can be no stopping; no turning back. China has forced Japan into a desperate gamble for her military prestige and perhaps even for her life. The destiny of 500 million people depends on the outcome.

★

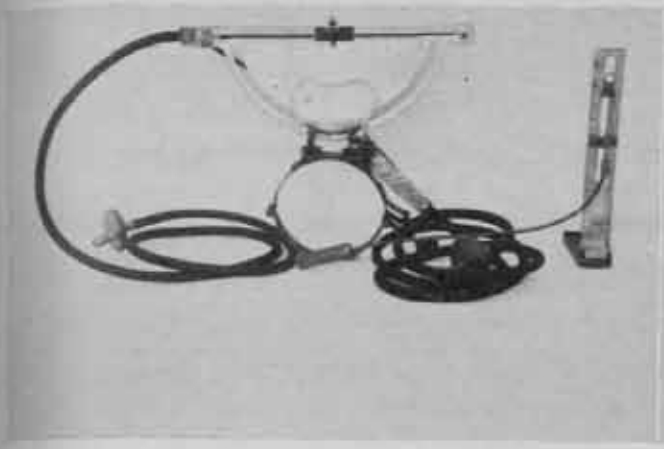


Figure 1 *A* *B*
Front view of elements of sight.

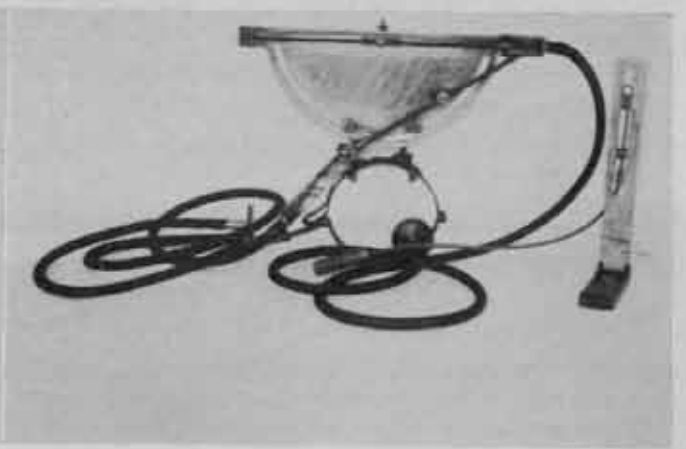


Figure 2 *A* *B*
Rear view of elements of sight.

Morgan Machine-Gun Sight

By Major Maurice Morgan, Coast Artillery Corps

THE MACHINE-GUN SIGHT described in this article was developed for the use of the 59th Coast Artillery in the 1936 target practices. It was originally designed to give a large number of hits on an aerial target flying over a limited variety of courses. Although the results obtained in 1936 were generally satisfactory, those obtained in 1937, with an improved sight, lead me to believe that the sight is worthy of consideration for adoption as standard for our Corps.

The discussion which follows gives an account of the construction of the sight, its theory, and the various firing tests it has received not only in the 59th Coast Artillery, but also in three other regiments.

In the Morgan Sight, the rear sighting unit takes care of the superelevation element while the front sighting unit takes care of the target lead in an inclined plane. In other words, the rear sight takes care of ballistic data while the front sight takes care of the geometric data necessitated by the target movement. This separation of ballistic and geometric data is a distinct advantage, especially so since the geometric data is expressed as a single item—a measurement in the direction of the target's apparent movement.

Figures 1 and 2 show the two sighting units separately. Figures 3 and 4 show them attached to a machine gun. The rear sight is a modification of the standard machine-gun rear sight. Its principal feature is a lead screw, turned by a flexible cable, which permits an operator to change the rear sight setting while the gun is firing. The front sighting unit is a mechanism for moving the front sight bead along a straight line. When this line is tilted so that it appears to coincide with the line on which the

Figure 3
Sight attached to machine gun—front view.

Figure 4
Sight attached to machine gun—rear view.

target is moving, then the lead set on the front sight is in the inclined plane. The tilting of the front sight and the setting of the lead in the direction of flight are both controlled through flexible cables, so that they may be changed during firing.

The rear sighting unit is shown in figures 1-B and 2-B. It consists of an aluminum sight leaf mounted on the standard rear sight movable base and it is slotted to guide the rear sight slide which carries a circular peep sight. The graduations on this sight leaf are in multiples of ten mils. The lead screw which controls the movement of the slide is threaded so that one turn gives one mil change in elevation. The windage scale of the standard rear sight element is used to provide a zero setting for bore-sighting.

The front sighting unit shown in figures 1-A and 2-A consists of a semicircular aluminum disc mounted so as to permit it to move as though it were pivoted at the front sight bead when that bead is in its central position. Parallel to the straight edge of this disc is a slot which guides the front sight rider bracket. This bracket is moved by a lead screw whose pitch is such that one turn gives one mil on the target lead scale. The position of the front sight is indicated by the reading on a scale which is graduated in multiples of ten mils. To tilt the line of lead the disc is rotated by a lead screw shown in figures 2-A and 3. This movement is guided by two lugs in a circular slot. The cables that control the movement of the front sight are speedometer cables, about five feet long, fitted with handwheels, and encased in rubberoid tubing to prevent kinking. The mounting is secured to the gun by a band which passes around the water jacket, just in rear of the standard front sight. Two prongs, one on each side of the standard front sight, add to the stability of this mounting. A small vertical movement on the front sight bead gives an adjustment for bore-sighting.

Various fire control methods can be employed with these sighting units. For individual gun tracer control they may be used with the usual vertical and lateral leads but their best promise lies in their ability to use a single lead in the direction of flight. This is true, because the slant plane lead is easier to compute and does not change as rapidly as its vertical and lateral components.

The organizations which used these sighting units tried different methods for computing the data necessary for their operation. The 59th Coast Artillery used the tables shown. They employed a short horizontal baseline and a plotting board to give them a projection of the target onto a horizontal plane with readings every five seconds. This enabled them to read the target's speed and to predict the horizontal range at the normal to the course. A measurement of angular height assisted in estimating altitude, and these data gave the slant range at the normal. The tables are accurate over the values of altitude expected, and with speed, slant range at normal, and the angle between the line of fire and the normal, the tables give the required leads.

I stated above that the front sight takes care of the geometric data while the rear sight is used to take care of the ballistic data. This is true in principle, but the sight as actually built does not do this under all conditions. On incoming courses, it is necessary to set both superelevation and lead on the rear sight. The second set of tables give the required data.

The officers of the 60th Coast Artillery did not use the plotting board and horizontal baseline. They experimented with a short self-contained range finder to get data similar to that used by the 59th. In the 91st and 92d Coast

TABLES USED BY 59TH COAST ARTILLERY

LATERAL DEFLECTION TABLES (Mils)

CROSSING COURSES

MODEL 1917
172 Grain.

Speed in Miles Per Hour	Slant Range at Normal	Angle of Future Position from Normal, Measured in Inclined Plane: Approaching Normal 600 m	Approaching Normal 300 m	Normal	Past Normal 300 m	Past Normal 600 m
60	800	42	46	47	47	44
	900	44	48	50	49	47
	1,000	46	51	52	52	48
	1,100	48	52	55	54	51
65	800	45	50	51	51	47
	900	47	52	54	53	51
	1,000	49	55	56	56	52
	1,100	52	57	59	59	55
70	800	48	54	55	55	51
	900	51	56	58	58	55
	1,000	53	59	60	60	57
	1,100	56	61	63	63	59

This table extends to 120 mi. per hr.

RANGE DATA

Slant Range at Normal	Superelevation in mils: Normal to ± 300 mils	At 600 mils
800	9	12
900	11	15
1,000	13	18
1,100	15.3	21.5

VERTICAL LEAD TABLES (Including Superelevation)

MODEL 1917
172 Grain.

INCOMING COURSES

Speed in M.P.H.	Altitude in Yards	Angular Height of Future Position (Mils): 400	500	600	700	800	900	1,000
50	600	45	39	37	35	37	37	37
55	"	48	42	40	38	40	40	40
60	"	51	44	42	40	42	42	42
65	"	53	46	44	43	45	45	45
70	"	55	49	46	45	47	47	47
75	"	57	51	48	47	50	50	50
80	"	59	53	50	49	52	52	52
85	"	60	55	53	53	55	55	56
90	"	62	57	55	56	57	58	59
95	"	64	59	57	58	60	61	62
100	"	66	61	59	60	63	64	65
105	"	67	62	61	62	66	67	68
110	"	68	64	63	65	68	70	71
115	"	70	66	65	67	71	73	74
120	"	72	68	67	68	73	76	77

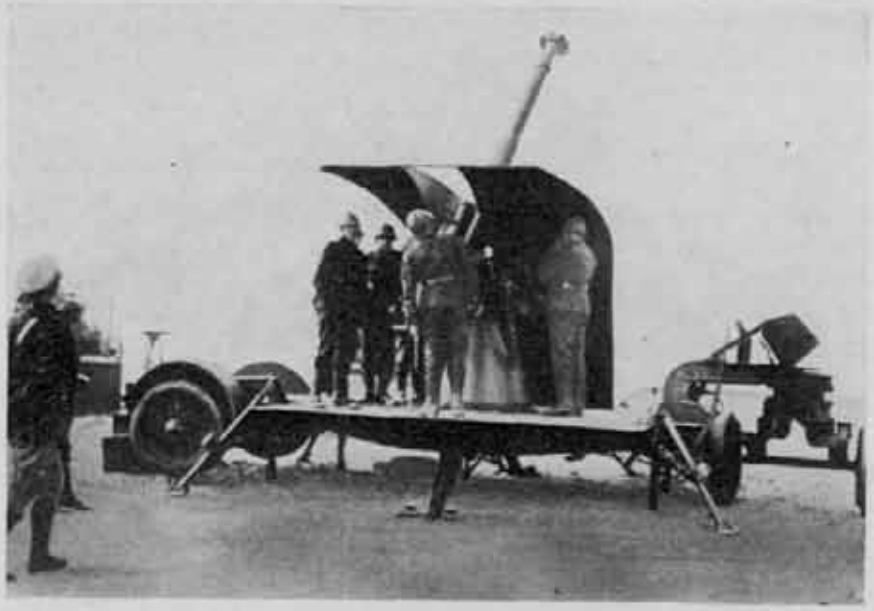
This table shows also 650 and 700 yd. altitude.

TABLE OF COMPARATIVE RESULTS 59TH, 60TH, 91ST AND 92D COAST ARTILLERY

Battery	Caliber	Average Slant Range	No. of Rounds	No. of Holes B-9-A Target	Target Practice Hits	Percentage of Hits	Score	Remarks
A-59	.30	954	2,048	311	248.8	12.1	192.2	No Tracers Used
B-59	.30	1,106	2,337	311	248.0	10.6	225.8	
D-59	.30	1,001	2,189	438	350.4	16.0	242.0	No Tracers Used
F-59	.30	934	2,240	190	152.0	6.8	128.4	
G-59	.30	906	2,488	314	251.2	10.1	146.9	
E-60	.30	1,409	1,857	124	99.2	4.9	196.8	1st Platoon
E-60	.30	1,489	2,300	140	22.4	4.7	187.2	2d Platoon
E-60	.50	1,888	1,824	71	56.8	3.4	239.1	1st Platoon
E-60	.50	1,927	1,897	31	24.8	1.3	164.6	2d Platoon
F-60	.30	1,369	1,972	45	36.0	1.8	101.4	1st Platoon
F-60	.30	1,352	1,976	157	125.6	6.3	242.7	2d Platoon
F-60	.50	1,732	1,837	63	50.4	2.8	209.0	1st Platoon
F-60	.50	2,126	1,727	59	47.2	2.7	293.0	2d Platoon
C-91(PS)	.30	1,001	2,466	210	168.0	6.8	139.3	
D-91(PS)	.30	937	2,470	359	287.2	11.6	168.0	
F-91(PS)	.30	968	2,698	315	252.0	9.3	154.6	
G-91(PS)	.30	981	2,828	61	48.8	1.7	62.9	
A-92(PS)	.30	1,134	1,973	38	30.4	1.5	66.4	
B-92(PS)	.30	1,189	2,299	73	56.0	2.4	101.2	
D-92(PS)	.30	1,203	2,484	142	113.6	9.4	142.4	

Artillery (PS), not all of the batteries used these sights, and those that did use them treated them mostly as a means for individual gun tracer control. A comparison of the results obtained by the various organizations is shown in the accompanying tabulation.

Colonel George Ruhlen, 59th Coast Artillery, pointed out in his annual report of target practices that a complete system of fire control for antiaircraft machine guns must be able to meet several, essentially different situations. Some of the targets will be distant and will require deliberate methods of fire control; some will be at short ranges and will require instant fire action. No system is complete unless it meets both of these requirements. To condemn a method that is good for distant targets, simply because it is too elaborate for close-up ones is as short-sighted as to condemn tracer control because its range is limited. What we actually need is a flexible system that will change quickly to meet the needs of the moment. The sight described above promises a great deal in this direction.



This is the latest Belgian antiaircraft automatic cannon on a trailer mount. Note the barrel brake and the shield for protection of gunners.

Discipline in the National Guard

By Lieutenant Alfred D. Haigh, 243d Coast Artillery (HD)

It is probably more difficult for the National Guard company commander to obtain that mixture of respect, willingness, obedience and *esprit* which we call discipline, than for any other military leader. To prove the truth of this assertion let us use as a yardstick the problem that confronts various military commanders in their character building efforts.

The Regular Army. The professional soldier is exactly the same material as the National Guardsman—the least plastic human material in the world. The average regular recruit has courage, intelligence and stamina as only young America can have these attributes. But, until the Service sets its seal upon him, he, by his birthright of freedom, is not the most fertile soil in the world in which to nurture discipline. But our Regular officer, has the advantage in that, for 24 hours a day—year in, year out—at play or work, he can take every opportunity to guide the apprentice aright. Moreover, he can exercise the careful restraint and control that the disciplinary situation calls for. If sterner measures are needed, all the power of the military system is at his disposal to impress his will upon the recruit. Contrast this with the 1½-hours drill per week of the National Guardsman and its more or less voluntary status. There is no comparison.

Continental Armies. It almost goes without saying that the European officer has an easy task. The citizen of his country is subject to discipline from birth; restraint and control are in the very air he breathes. By the time he is ready to serve his compulsory term with the colors he is plastic material for the hard, bullying type of instructor sergeant which abounds in conscript armies.

The British Army. "Britons," says one of the most popular of Albion's martial airs, "never, never shall be slaves." Although the Englishman is freer, by a wide margin, than any other citizen of Europe, the wide gulfs between the social classes have their effect on the national character. One result is that an Englishman can accept and carry out an order promptly and cheerfully without feeling that he is losing caste. The only problem an English officer has is to counteract the influence of the Trade Union and proceed to instruct his raw material. The writer can testify how well that is accomplished—mainly because he spent the time between 1914 and 1919, in providing one guinea pig for the British laboratory.

The Japanese Army. The Japanese Army has no disciplinary problem. The reason is that their system transcends discipline, *esprit de corps*, or any earthly consideration. With them, to fight for their country is a part of religion; nay, it is all their religion. For all that, Sir Ian Hamilton mentions a Japanese gunner—who apparently did not have these high ideals. While digging a gun pit in front of Port Arthur, this gunner complained, "In Osaka I would get 5 yen for digging this gun-pit, here I only get criticism." The shock with which his companion heard this outburst showed that he was no true Japanese.

How, then, does the National Guard leader weld 60 men, who (in New England at all events) have different racial characteristics, religions, home life, and ideals, into one homogeneous whole? Let us try to show some of the methods available to him.

Patriotism

Certainly the foundation stone in the structure is patriotism. The National Guard leader must carry on from where the public schools leave off. Since the *Einjahriger* in Germany has his *Vaterland*, the French *bleu* his *la Patrie*, and the Nipponese his Heaven-guided Mikado, by all means let us give the American recruit his "Columbia the Gem of the Ocean." Love of country has always been and will always be the inspiration for the sacrifices and deeds of war. The battery commander here finds a potent help.

Example

Fortunate indeed is the National Guard officer who broke the New England record for the quarter-mile or almost made the All-American football team while in college, for his problem is well on the way to solution. However few of us are of the stuff of which champions are made. We are usually ordinary mortals and must try by example and hard work to encourage men to accept and enjoy our leadership because we are worthy of it. A few years ago a couple of campaign medals would have been as good a help as any, but now we have a generation that knew not St. Mihiel and Belleau Wood, so we cannot rely too much on ribbons for use as morale-building material.

Tradition

In European armies the history and tradition of a regiment are sacred and concrete things. The recruit upon joining becomes heir and guardian to all the honors that his regiment has earned. Thus many regiments have powerful means of stimulating the imagination of the right type of recruit. In our own case, it is rather a pity that it has not been found possible to preserve the identity of all the Colonial groups who banded together in defense of their homes. Some of our National Guard regiments could well use a little of the prestige that goes with the ability to trace a history in an unbroken line back to the

. . Two bars and a loud voice do not make a man a good captain . .

War of Independence. Yet, let our battery commander take heart, for his organization can go forward and earn tradition even though the accolade of federal recognition was not bestowed until, say, 1926. The Coast Artillery Association Trophy, the National Rifle Matches, the Knox Trophy, and other awards are among the many honors and trophies that live organizations may strive for.

Our friend, the battery commander, still has left the legal methods of punishment and coercion. While not as drastic as the lashings and imprisonments which have been inflicted upon the recalcitrant soldier in times past, these today's methods still carry a sting that will deter the ne'er-do-well who occasionally finds his way into a military organization. The Articles of War are still in effect, and a visit to any military post will soon convince the visitor that armies can not yet dispense with the "iron tent."

But no National Guard commander, avails himself of such stern weapons except as a last resort. He wants to put his battery at the top of the list by fanning the flame of patriotism, by the force of example, and by the help of the traditions of his corps, rather than by the big stick. Moreover, the commander who did act drastically would soon find his chickens coming home to roost in the form of poor attendance and stagnant recruiting.

Obviously, the type of man we seek to enlist will select a unit of the happy family type rather than one commanded by a synthetic Simon Legree. After all is said and done, our potential recruit is free, white, and though he may not be 21, he is an American and entitled to all the privileges that go with Americanism. There are so many amusements awaiting his spare time that we cannot hope to induce him to sacrifice his evenings by showing him a friend in jail for absence from drill.

The first thing that the intelligent battery commander must realize is that two bars and a loud voice do not make a man a good captain. He soon finds out that he wins or loses on his ability to study his men as individuals, discovering what makes the dull man hang back and the sullen one obstructive. He must be able to handle all sorts and conditions of men, while he strives to be cheerful, soldierly, and just. His objective is to be the type of officer that he himself wants to serve under.

French sound locators and guns go into action near Paris. Especially worthy of note is the plotting device, which is an integral part of the sound locator.

mount similar to our 75-mm. wartime AA self-propelled mount. Note the ammunition carrier.

This is a late type mob cooling de

GREAT

A 3-inch AA gun. Of special interest are the type of lifting jacks, the supports, and the absence of outriggers.

This set-up displays a machine gun

ight with improved
treads.

This is the Armstrong-Whitworth "Whitley" heavy bomber.

BRITAIN

searchlight, an AA
devices.

This shows the installation and method of contr
for a fixed AA searchlight.

What About Military History?

By MAJOR JOHN H. BURNS, Infantry

The study of history of any kind is always difficult, not only because the human factor is so pronounced, but because the atmosphere of past events is not the atmosphere we breathe today.

—MAJOR GENERAL J. F. C. FULLER, British Army.

There is only one weapon that is common to all wars. That is *man*. So far as recorded history goes we can see no change in him. It is amazing how hieroglyphic and cuneiform writings, millenniums old, echo the thoughts and feelings of today. Some of them might have been clipped from a late magazine, so modern they are. The cautious Will Durant says, "The basic masses of mankind hardly change from millennium to millennium."[1] Perhaps man may have evolved from primeval slime, but so far as we know him as *man* he has always been the same. The caveman's infant brought up in modern surroundings would react and be exactly like his friends in the same apartment building.[2] We like to think that we are better than the Stone Age man, but that is based on smugness, not science. We have not changed and, furthermore, cannot be changed. It is easier by far to knock an electron out of an atom than to eliminate one basic trait from man. Fundamentally his nature is fixed, fast, firm.

A people's ideology is more important than its armament

On the other hand, any system of society permits and even encourages the development of certain fundamental traits while, at the same time, inhibiting or suppressing others. The result is, that when faced by two individuals processed by two antithetical social organizations we often think we have two different types of mankind. This is not so. We must repeat: they are the same beneath the veneer.

We can sum the matter up by saying: all men are basically alike, though the processing of social institutions will make an apparent change in fundamental composition, by suppressing certain basic traits and developing others, but it never has eliminated and never will eliminate any fundamental characteristic. For instance, all men faced by death are frightened. The tendency to flee the danger is present in all; but certain individuals moulded by their society will stand fast while others flee. Hence, courage is not lack of or elimination of fear but the temporary conquest of fear. Yet it must be understood that too much contact with fear-producing stimuli will sooner or later crack the veneer that society has overlaid on the natural nature of man. Eventually he will slough off this purely artificial crust and flee the danger.

But the most important point of all is that this fear-resistant attitude—called courage—is a product not of military training alone but of the entire social processing that the individual has undergone. *Other soldierly qualities evolve in the same manner.* Thus, the time necessary to make a soldier out of a civilian and the value of the soldier so produced depends almost entirely on the prior social training of the recruit. If he comes from a society that prizes the virtues of a soldier—duty, honor, self-sacrifice and the like—a society that is willing to defend by force of arms the ideals for which it stands, then the soldier develops quickly from the civilian — in fact he is largely made before he joins the colors.

From the foregoing it can be seen that the military historian should give careful attention to the social system which produces the armies he is studying. For, since different societies produce different soldier material, manifestly no two armies are exactly alike. Even troops from different parts of the same nation will be quite different.[3] But the historian completely ignores this. He is content, for the most part, to count the noses in the contending armies; carefully note how the troops were placed on the battlefield; and then decide how the placing or moving of certain organizations led to victory or defeat. Yet, in all probability, the victory in a great measure may be attributed to the social processing one army received before it ever donned the uniform. Why is this so? Let us investigate a bit further.

The history of warfare may be divided roughly into two parts. There is the narrow specialist concept of the military technician. This includes all affairs that concern handling and directing an army as an engine of force. It involves supply, administration, security, maneuver, intelligence, and the like. It deals solely with what appears

[1] Will Durant: *The Story of Civilization.*
[2] Gardner Murphy: *A Briefer General Psychology.*
[3] Von Schell: *Battle Leadership.*

to be a mechanism, but since it is composed of humans it is anything but a mechanism. The second and most important section of military history is the socio-economic part which endeavors to integrate the development of armies and warfare with that of the state, industry, and the ideology of the people. This second part must be known in order to understand the conduct of battles and campaigns. For it is the conditioned men of a particular society, armed with the weapons of that society, that make an army, determine to a great extent its method of fighting and, in the main, secure its victories.

There are many excellent histories on the technical aspect of war. The better ones deal with the particulars of war—such as *Infantry in Battle*. When an effort is made to generalize or evolve abstract and general truths then trouble occurs, for these generalities are deduced wholly from the field of technical military history. This fault taints von Schlieffen's *Cannæ*. One cannot give a rounded picture of war, or analyze any campaign or battle, and definitely and with assurance ascribe victory to any factor without considering the whole basis of military power—technical and socio-economic. This, however, is seldom done, and error is the consequence.

For instance, without knowing the socio-economic factors of war no one can explain why the Army of the Potomac did not go to pieces under repeated beatings; or why it should come back to take frightful losses at Spottsylvania and Cold Harbor and still keep boring in. Nor can anyone explain why the South did not surrender when Vicksburg and Atlanta were captured. Their case was hopeless then. Yet Germany in 1918 collapsed before its borders were crossed. We must know more than the technical handling of an army if we are to apprehend these things. In short, *we must know the people if we are to understand that which grows from them and is part of them—the army*.

Whatever helps to secure victory, be it a piece of terrain, industry, social mores, or national psychology, is military history. To concentrate on any part of this history and slur the rest will produce a distorted picture. Today military history suffers from a bad case of elephantiasis, developed because of our passionate concentration on the pure technique of handling military forces.

If we are to correct this, we must learn to consider that any battle or campaign can be understood only by intimately knowing the following:

(1) What is the essential nature of man?

(2) How have the social systems of the combatants moulded this particular human material for good or ill?

(3) How did the army receive this socially prepared material and process it?

(4) And finally, how was this material led and directed in battle?

Check any military history closely. You will find that the manner in which the armies were led and directed is considered in minute detail, but not much else. Few military historians ever enter deeply into the primal, basic nature of man, and none into the effect of the social processing of this elemental man and how it produced good or poor soldier material. Thus, looking on the military problem in its broadest aspect, it can be seen that the military historian is dealing with only a fragment of it. As a consequence, the larger part of military history is distorted and askew. It is thoroughly unscientific and a total failure in helping to interpret the present or to foresee the future.

The great misfortune is that there is no connecting link between the civilian social historian and the military chronicler. The soldier historian takes with little comment the soldier as produced by the age and recounts his exploits, leaving all other details to the conventional historian. The scientific military historian (if we had any) would be struck by the fact that the civilian authorities have charge of the soldier's training for some twenty years—infancy to manhood—and that this vital training period has a powerful effect on the type of soldier that will eventually enter battle. Therefore, he would study the social institutions of the times to ascertain their effect on this human material. Only by such an approach can we make military history truly scientific.

Along these lines, let us investigate the subject a bit further: Of the four essentials we might well concentrate on the military significance of social factors. The "essential nature of man" needs a complete study by itself as does the military processing received by this socially prepared human. How humans are led in battle has been described *ad nauseam*. But the effect of social processing has been too often neglected.

How remiss the military historian has been about such matters is indicated by the following example: For centuries the Swiss infantry was the finest in Europe. Today the Swiss Guard of the Vatican is a memorial to its old-time fame. The hurricanes of heavy cavalry that one reads about became a gentle breeze before the Swiss. No knightly commander would lead his steel-sheathed men-at-arms against a bristling hedge of Swiss pikes—not more than once anyway. It was the Swiss pikeman and not the English bowman who reduced cavalry from the basic arm of battle to a supporting one. Bowmen, unlike pikemen, were helpless in an open field against heavy cavalry. Strange how the English-speaking people pass over that point.

So the Swiss were cock-of-the-walk for a few centuries and hired themselves out in compact companies to anyone who had the money and needed a job of fighting done. The French relied on them greatly, once they found that native infantry trained in the Swiss manner was worthless. So French kings sighed and paid out good, red gold for surly Swiss pikemen; the French generals shrugged their shoulders and gladly accepted the compact Swiss columns. The commentators and military thinkers of the time came forward with the plausible explanation that after all the stolid work of a pikeman was not suited to the native genius of the French race. And the military historian hurried on to the next chapter.

But the question naturally arises: Why were the Swiss

so good? Here, the glib military historian is ready with a flood of detail on tactics, drill, equipment, maneuvers, and the like. Then one wonders why other peoples did not follow the Swiss lead in equipment and tactics. But, strange to say, some people did and with no success, although the German *Landsknechte* were a fair second to the Swiss. The military explanation, therefore, despite its detail is far wide of the mark.

The real military problem here, and one completely neglected, is, to repeat, just why were the Swiss so much better than those around them? The racial theory falls flat since the Swiss are racially very little, if any, different from their neighbors in France, Austria, Germany, or North Italy. Yet something caused these Swiss to fight better than their neighbors—no doubt of that. The military historian should have tracked that down. Naturally he evaded it, for to do this meant a serious study of the Swiss people, their life, manners, institutions, industry, customs; the moulding effect this entire physical and psychic environment had on the people, and how all this made for better soldiers. There is little glitter to such work and no fighting; nevertheless, it was a military problem.

Surely, a great opportunity was lost here, for the Spaniards about the same time also developed a first-class infantry soldier—though the Spanish methods of fighting differed from the Swiss. A close study of both cultures leading to a determination of the socially moulding factors of each culture and then the elimination of all factors not common to both, would have given a few basic social factors that enter into the pre-military moulding of good foot-soldier material.

If such a study had been made the military historian would have been able to say that it was this factor, or factors, which produced a certain effect on the character of the human living in the Alps. It was this character—using the word in its broadest sense—that made the Swiss a good infantryman. Then to the soldier he could have said, "You have no such type individuals in your country. You cannot duplicate Swiss accomplishments no matter how closely you ape their drill and equipment. Therefore you had better hire Swiss." And to the statesman, he could say, "Swiss life produces Swiss soldiery. If you want such soldier material you must start at the bottom and change national institutions until they approximate the Swiss."

From this example it is plain to see that true military history does not begin with the armies; nor in the council chamber or legislative halls. It begins with the people—the culture—if you wish. And no battle, ancient or modern, can be understood without this background. No general can be properly evaluated without understanding his cultural and emotional background and that of his troop material. Battles are not fought *in vacuo* but by products of a certain system of life. The task of the military historian is to show this connection. Otherwise, it is impossible to understand fully or clearly the significance of military events.

For instance to understand Caesar without knowing Rome, its institutions, religion, law, industry, folkways, and how all these converged to produce a certain type military organization—the legion—is a sheer impossibility. The legion was excellent not simply by virtue of its mechanical organization, because that could be easily copied and the ancient world was full of intelligent soldiers capable of doing it. It was something else, for we may be sure that the ancients saw the tactical virtues of the legion far better than we can today across the gulf of two thousand years. They could reproduce the legion pattern but no soldier could reproduce the men that entered the legion. They were the product of Roman culture. The legion organization exploited this material to the utmost. Therein lay its strength. To explain the power of the legion as due to its flexibility, its armament or other physical or mechanical factors is superficial and completely fallacious.

It was with this legion that Caesar fought. Caesar's wars become intelligible only when we realize that his battles were not won by adroit maneuver so much as by skillful utilization of simple humans as Rome had processed them and the legion polished them. Often, according to modern opinion, Caesar placed himself in a precarious situation; often he went against great odds; often, lacking essential troop components—as at Pharsalus—he took the offensive. Yet no matter how skillfully the enemy arranged his roops, Caesar won. We have no right to criticize him by modern standards for Caesar was not fighting with or against modern soldiers. He was fighting with a Roman legion—the product of Roman culture.

Parenthetically we might say that to draw tactical lessons from Caesar's campaigns that can be applied to all warfare is, at the best, a dubious procedure.

So far we have only discussed the breadth of military history—how an army is but the projection of the culture of the nation. But another factor intrudes here. *What is the depth of the subject?* How far back do we go in amassing our material? How authentic is this material; what value has it in deriving principles of combat and what effect has it had on military instruction? If we are to make a fair analysis of military history in its present form then the "time-depth" factor needs analysis. For this purpose we cannot do better than to consult one of the greatest of modern military scholars, Marshal Foch.

Foch in directing the École de Guerre said he proceeded "from the facts which history delivers us. . . . Our models and the facts on which we shall base a theory we shall draw from the Revolution and the Empire." This was an arbitrary choice, neglecting later wars and thousands of years of prior warfare. Surely this is a narrow and unscientific foundation on which to base any scheme of battle instruction; but the arbitrary selection of periods is even a grosser error. If a person can select his own period of history and exclude all others he can prove almost any military absurdity sound. If military history is to form any basis of instruction, then, it should be *all* military history, not a selected part.

Despite this, most military history is written about

certain glamorous periods of warfare—periods when great figures were striding on the world's stage, when nations shook and melodrama and romance were abroad in the land. The soldier proves himself a romanticist, not a scientist. So each nation selects its own period, makes its own heroes and twists the facts of history in order to indoctrinate all. This is not science, it is not art, it is nothing but claptrap—claptrap which has within it the seeds of great evil, because it is thought to be of value in preparing military minds to wage war.

That may sound like harsh criticism but let us read what General Hoffmann of the Imperial German Army had to say of the truthfulness of military history: "I have now for the first time during the whole war observed a 'history' from nearby and know that it takes place in an entirely different manner than that which posterity learns. Since this is so, some trifles or false descriptions more or less do not matter."[4]

Thus Hoffman indicates that even our latest history is distorted.

And Clausewitz—what does he say about the doctrines and principles gleaned from history? Just this: "Theory must educate the future leader or rather guide him in his education, but not accompany him to the battlefield. . . . *As things are, there exist no laws at all for warfare.*" [Author's italics.][5] But Clausewitz was a scholar; let's see what a man of action has to say—one closer to the American scene and mind:

"They [the Union generals] were always thinking what Napoleon would do. Unfortunately for their plans, the rebels would be thinking about something else. I don't underrate the value of military knowledge, but if men make war in slavish obedience to *rules* they will fail. No rules will apply to conditions of war as different as those which exist in Europe and America. Consequently, while our generals were working out problems of an ideal character . . . practical facts were neglected. To that extent I consider remembrances of old campaigns a disadvantage. . . ."[6]

That was the considered opinion of General U. S. Grant. This practical soldier stands not so far from Clausewitz the theorist.

From all that has gone before it is not difficult to see that our present military history lacks breadth—fails to show the all-important connection between the soldier and the social state. It does not cover all the field of war but only a restricted portion arbitrarily chosen; its facts are difficult to get at, and when obtained, as Hoffmann cynically indicates, are then distorted. It can give no rules to the eager student, so Clausewitz states, and Grant goes even further by stating that it had become an actual handicap to a large group of generals. If one-tenth of that indictment is correct then it is manifestly impossible to consider the subject in its present form as a basis for training leaders in warfare. It certainly is not a science but a sort of dogma—the foundation for a military theology as one keen civilian historian aptly points out.[7] And so on this matter the scientific historian lines up with the military theorist and the practical soldier.

Yet despite everything there are certain similarities between ancient and modern combat that need explaining. Our mistake lies in attributing these similarities to logical principles of war; it is simpler and sounder to attribute them to *man*—the common, unchanging instrument of war—and to recognize that these logical principles, so-called, are but simply the manifestations of humans reacting to combat. One stout fighting soldier of modern days has phrased it admirably: "In fact, there is a certain danger in the study of military history if we seek to obtain from it more than the eternal verities of leadership, morale, psychological effects and the difficulty and confusion which battle entails. We cannot visualize war of the future merely by studying wars of the past."[8]

On the whole, it is simpler and more practical to accept this attitude than to try to interpret war—past, present and future—in accordance with an abstract, mechanistic pattern. Perhaps the latter can be done, but it has not been done yet—certainly not in a scientific manner—and there is more important work for the historian to do.

This work is to evolve a new kind of military history. A history that will show how men and organizations are fitted—or not fitted—for battle by their social and military training. The study must be broadened to include all war and all military history.

In a sketchy way, perhaps, we can outline this broad and unorthodox conception of the subject.

We want to know, for instance, not simply how Napoleon maneuvered his armies, but in addition the raw material that went into those armies. It is a strange thing that no one has yet adequately analyzed the effect the French Revolution had on French soldier material, and then carried the study one step farther and shown how these qualities were superbly exploited by Napoleon.

But that is not all; we have here a curious and wondrous thing, if we could but see it. The French soldier who was unfitted to form thick columns and face the Swiss pikeman in the 16th Century, in the early 19th Century formed these thick columns of attack and then proceeded to crack every line in Europe and march victoriously into every capital on the continent. Thinking of Waterloo and their thin red lines, the British may cavil at this, but a second thought will reveal that even at Waterloo a young untried French Army had the Iron Duke desperately praying for night or Blücher.

This historic change in the French people and soldiers requires careful, precise analysis; for without such an analysis our study of the armies alone is likely to lead us far astray. For example, Napoleon's first Italian campaign is studied as a military classic, but the student who comes away from his studies with a mental picture of the mechanism of the campaign and tries to apply the so-called

[4] Max Hoffmann: *Aufzeichnungen.*
[5] H. Rothfels: *Carl v. Clausewitz.*
[6] William C. Church: *Ulysses S. Grant.*
[7] Alfred Vagts: *A History of Militarism.*
[8] Von Scheli: *Battle Leadership.*

lessons on another field is due for a rude awakening. For the campaign did not depend simply on Napoleon's brilliant schemes of maneuver, but largely on his leadership and his adroit exploitation of the French soldier, aflame with ideas released by the French Revolution. Napoleon, himself, thought "so fine an army never had existed before," and adds significantly that the soldiers came from classes of society that had not usually furnished soldiers.[9]

For the same reason—if for no other—one should not try to emulate General Lee in his vicious and victorious assaults at Chancellorsville against a vastly superior force, unless one has the same sort of troops that Lee had; nor should one copy Grant's hammer blows in the last days of the Civil War. To be sure these blows won the war but an army of softer fiber would have disintegrated under the punishment.

From all this one can see that it is all-important to know the troops that are fighting. But to know these troops we have to know thoroughly the society from which they are drawn. For the military technician that is the unexplored field of military history; therein lies the information which, with his military technique, gives him the secret of waging successful war—past, present, and future.

Let us take from this field an example or two which may illuminate our idea. The greatest of all ancient soldiers, Hannibal, despite a succession of magnificent victories, could not conquer the Roman people led—if we except Scipio and Claudius Nero—largely, by inept generals. The decisive battle of Zama when analyzed reveals it was the steady quality of the Roman troops that enabled Scipio in desperation to snatch local supports from his central mass to extend his wings—an unheard of maneuver—and so prevent the disaster of a double envelopment which faced him.[10] Hannibal was at his old tricks. True, the Roman horse had defeated the weak Carthaginian horse, but both were far from the scene, and in any event it was the heavy foot that decided ancient battles. Scipio's desperate expedient succeeded although he was clearly outmaneuvered by Hannibal. Had the Roman common soldier wavered when he saw his supports withdrawn another Cannæ would have ensued. This war was won not by generals but by the Roman people.

Coming to recent times we find the same idea exemplified. The greatest modern soldier, Napoleon, failed to understand the Spanish people, and though he overwhelmed Spanish armies he could not conquer the country. Thus, there ensued years of futile warfare. Some of the best troops in the Empire were wasted in Spain when they should have been concentrated in Poland against the Russians. The demoniac resistance of the Spanish civilians at the terrible siege of Saragosa showed the temper of the Spaniards. Napoleon had misjudged them, as he himself sadly acknowledged, and was forced to make war on two fronts—Madrid and Moscow. A fatal error.

All of which leads up to this: Say what one will, the abstract principles of tactics and strategy must be practically applied with and against humans conditioned by a certain environment. There is no pure science of war. Therefore, instead of trying to show the immutability of certain principles of tactics we should be trying to show how at any particular period the conditioned human of that period was converted to the purpose of war. And at the end, very likely, we will find that the leader of the day was no fool but used his material as best he could to solve his battle problems.

Confronted by the same problems and with all our knowledge of today we would probably make a miserable failure with the same human material. It is knowledge of the people that is necessary and that we would lack. For example, no one in the Middle Ages could have trained and used in battle a Greek phalanx or a Roman legion, as excellent as those formations were, for the people were not Greeks and Romans but something quite, quite different. They did not come out of the same sort of social mould. Thus, the war harness had to be fitted to their mental contours and not cut on a theoretically better pattern.

General Bullard had this conception years ago. In 1906 he said, "Napoleon taught us that if we must fight with untrained men, being unable to adapt the men to the tactics, we must try to adapt the tactics to the men. . . . Without regard to prescriptions of tactical systems, try to suit your battle formations to the character of your men. . . ."[11]

In the World War, Lawrence realized that the Arabians could not, and would not, fight according to Western standards so he adapted his campaign methods to their make-up, not to a standard concept of war and soldiering. His results were astonishing.

Today we live in a world of national states, not amorphous empires, city states, or feudal kingdoms. If we draw illustrations and lessons from the armies of such national states we approximate reality, but only so far as these states approximate one another in social environment. Here we must be cautious and not theorize too far. For example, the Prussians of Frederick the Great were far different from the Prussians of today. The American Civil War soldier mentally had more in common with the French revolutionary soldier or even Scipio's farmer soldier than with Frederick's Prussians. Yet Frederick's army of long-service soldiers were highly successful and his heirs were content. Then came the French Revolution which broke down doors, shattered all precedents, and released a store of tremendous energy—psychic and physical. France was remoulded and from this France erupted the French nationalist soldier who overran Europe and swept the Frederician army into the discard.

It should be recognized that a social revolution or a long war will always produce such changes in warfare—irrespective of new weapons developed—since both shake society to its foundations and so condition the human that

[9]Barry E. O'Meara: *Napoleon in Exile.*

[10]James H. Breasted: *The Conquest of Civilization.*

[11]Major Robert L. Bullard: "The Citizen Soldier, the Volunteer," *Journal of the Military Service Institution of the United States*, Vol. XXXIX, 1906.

he is a different instrument of war—for better or for worse. The difference that develops will be great or small depending on the change in the social structure. These matters need study.

Moreover, all this study is the soldier's job. We cannot expect civilian historians, even if they knew the military problem, to do this for us. They are not interested. It is a basic military job, and at this particular time in the history of the world, when all things are changing with great rapidity—particularly the social state—it is a vital matter.

The reason for this ceaseless change in modern life is not abstruse. Late in the 18th century the Industrial Revolution struck the world first in Western Europe. Tremendous changes were created. As the late Professor James Harvey Robinson says, "Material civilization has changed more since the days of Jefferson than it had between Jefferson's age and that of Tutankhamen."[12] These great changes pressed against the social structure and steadily, sharply modified it and the individual it contained.

In the 19th century this tremendous revolution, deftly manipulated by the classes in power, shaped a certain type of society characterized on the political side by representative democracy and on the industrial side by a policy of *laissez faire*. The whole was enveloped in a strong spirit of nationalism. But the Industrial Revolution was a continuing process—it is still going on—and always the pressure became greater. The result was a tremendous upheaval called a World War followed by two decades of radical social remoulding which is still continuing. Democracy, formerly in the ascendancy, is now under heavy assaults; *laissez faire* in industry seems to be passing away, but nationalism is blazing up with greater heat and fury. Furthermore, several nations conceive they have a holy world mission that will be accomplished only by force of arms. They are regimenting and moulding the people beginning with the youth and reaching out hands to people in other nations who have the same political philosophy. Before the coming Armageddon we find the war being initiated on internal fronts.

Communism, Fascism, and even a type Militarism, compared to which Imperial Germany was as innocuous as a New England town meeting, are all challenging Democracy. And still the Industrial Revolution goes on spawning countless machines and causing unemployment, depressions, recessions, and unbalanced budgets in a land of plenty. We are in a veritable vortex. We live in an unbalanced world characterized by rapid and sweeping changes. These changes have a marked effect on the people and it is from these people that armies will be drawn—those we fight with and against. And why are we not studying these things? What blind groping beings we soldiers are!

To be sure, it is beyond the province of the soldier to decide which of these political, economic and social systems is the best. But it is strictly within his province to study them in order to ascertain what effects they are having on the people and what these changed people are worth in war. For instance, it is plain to see that a people under a dictatorship will be initially welded together and ready for war. But dictator-led people enter war on order, and think about it afterwards; this is ominous. Democracies enter war after considerable thinking and talking—even squabbling—but once in, will very likely be steady and stand up under defeats. Since no one has investigated the matter from the military side, these are at best but estimates, although Marshal Foch thought a republic was the strongest in war.[13] However, accepting them as sound for the nonce, we can say that a nation under a dictatorship had better make sure to win its war quickly, and a democracy must be certain not to be completely defeated in the early days of war. We might draw another conclusion to the effect that a dictator-led nation would be wise not to expect too much initiative or build its tactics on this quality, for initiative does not thrive under a dictatorship; democracies, on the other hand, can expect initiative but must guard against too much of it.

These are but a handful of the countless things that are awaiting study. As soldiers of democracy it is our task to investigate everything affecting the human, even going so far as to study modern trends of thought and ideals taught in schools, for these schools are producing potential soldiers. Years ago Charles M. Bakewell, professor of philosophy at Yale, analyzed this vital and neglected socio-military problem.[14] The irony of it all is that we are doing nothing about it and know nothing for example of John Dewey's educational philosophy which is profoundly modifying the product of our schools.

Not that we advocate or even desire military training in all the schools, but we should expect an inculcation of love of country, a sense of duty, a feeling of something bigger and better than mere self, a willingness, a zeal, to preserve the nation even if it means taking up arms. Are the schools doing this? Who knows? Yet without such basic feeling there is no core to the nation, and the product of the schools, no matter how brilliant intellectually, will never make soldier material. And without soldier material —not necessarily trained soldiers—there is no safety in this harsh modern world.

To many, it will seem that this study is the task of the high command, but that belief is unsound. All officers should know the modern social problems and have a modern perspective. Right now it is a lack of such perspective that keeps our eyes riveted on the military training in higher schools and colleges—a training that in great part becomes obsolete as weapons, doctrines, and organizations change—and leaves us oblivious to the effect that the ordinary school subjects may have on youthful minds. Perhaps the school is training a vast mass of youngsters to receive with alacrity the Oxford Oath (an oath never under any circumstances to take up arms). We

[12] *The Human Comedy.*

[13] Monteilheir: *Institutions Militaires de la France.*

[14] "Moral Training in Preparation for War," *U. S. Naval Institute Proceedings*, Vol. 40, 1914.

can say nothing about all this because we have never investigated it.

Moreover, there is a strictly military side to this matter that any tactician must know. For instance: one must never expect to reproduce with modern Americans, Stonewall Jackson's tremendous marches, because the modern American is not a walker but a motor-rider. Even if we were able to harden him to make such marches, psychologically he would resent it and fight less vigorously than Jackson's men. Nor can we expect any modern army to bore through wooded swamps as did Sherman's army in the Carolinas. Sherman led an army of frontier farmers to whom an axe was a common tool with which they were expert. Working in water up to their waists, they quickly felled trees, cut the trunks into proper lengths and promptly rolled them into place to form corduroy roads. The speed with which these roads were constructed and the celerity with which the army moved was amazing. "When I learned that Sherman's Army was marching through the Salk swamps . . . at the rate of a dozen miles a day or more . . . bringing its artillery and wagons with it, I made up my mind that there had been no such army in existence since the days of Julius Caesar." Thus spoke General Johnston, Sherman's erstwhile opponent. But the modern who tries Sherman's tricks will only come a cropper. We haven't the axemen today and it would be a slow or impossible task to bring power tools to the center of a semi-equatorial swamp.

Yes, our modern social system produces certain military defects; and yet we may have compensating military advantages if one only knew what they were and how to exploit them. That is the task of the military man studying the contemporary scene. We must know what human material our present culture produces so that we can compare it with the past and draw our lessons for future war. For armies fight in accordance with their environment and not in accordance with a set of abstract rules. As Clausewitz phrases it: "We must embrace the view that war, and the shape it is given, rises from ideas, feelings, and conditions prevailing *at the given moment*. . . ."

Despite this, nowhere have we given any great attention to the basic factor of war—*man*, yet, strangely enough, we have an intensive course of study to familiarize officers with the industrial and economic factors of war and how to utilize them. Meanwhile, the surroundings of a mechanical and urban civilization are making great changes in the modern human's reactions to certain mental stimuli and in his physical ability. But we go calmly on believing that the lessons gleaned from the actions of the agricultural soldier of the Civil War can be applied *in toto* to the urban soldier of today.

Without investigation we think we have progressed; but have we? Granted that there is more wealth, power, ease, luxury, lavishness; granted that modern man has increased in height, weight, size, and symmetry; yet the words "wealth" and "luxury" have an ominous ring; and a bigger body does not mean a greater heart, or a finer brain. In fact, this physical bigness may be a sign of degeneracy as Alexis Carrel, a great scientist and a Nobel Prize winner, points out.[15] All in all, we are faced by a gigantic problem which we solve by ignoring it.

The democracies of the world are paying little attention to the potential soldier; not so the autocracies. They are frankly training their youth and people for war. They are remodeling the very background of life itself so that it will produce soldiers—and little else. How pernicious this practice is needs no elucidation. A soldier civilization is a sterile one. We want none of it. All we wish is an environment that produces a solid core of human qualities about which we can build a soldier in time of emergency. Nothing more. We do not wish to develop a modern Sparta.

But to accomplish this vital task we must know more than the geometry of war now so assiduously studied. We must investigate, delve, study, and advise with civilian historical, economic, and educational experts. The task is only half military and we are not doing our part. Truly, the military historian has a long and strange road to travel before he can be rated competent on his subject of prime importance.

The hour has struck for the military historian to turn his myopic eyes from the study of the geometric form of ancient wars. He must contemplate entire peoples and civilizations as a prelude to an exhaustive analysis of the peoples and cultures of today. In this must be included a study of the trends of development, particularly in the field of thought. Nothing is more explosive than an idea, and to understand a people one must understand its ideology which essentially is far more important than its armament. Our historian must recognize that the Industrial Revolution is still going on, creating rapid and revolutionary changes—changes which are of vital importance, since the war we fight will be tomorrow, not today. And nothing is surer than that tomorrow's men and materials will differ from those of today.

Furthermore, he must fully realize that his wars will be fought by humans—conditioned by the age—and not by robot soldiers. Consequently, he must understand that it is exceedingly risky to generalize from old battles without knowing what sort of mental processing the old-time soldier received during his lifetime.

The historian must put aside his puttering with archaic jigsaw battle puzzles and raise his eyes to the broad horizon, the interminable ages of history, the flux of nations, the flow of life, the rise and fall of institutions, the mass moulding of humans by social institutions, industry, religion, and folkways; the processing for war—all the great broad sweep of human activity. Only then will he become a real historical craftsman who will receive a respectful hearing from the masters in the craft.

In short, what military history needs is not more study of battles; but more study of the peoples who fight them.

[15]Alexis Carrel: *Man the Unknown.*

The Spanish War

A review of the best foreign opinion

By Captain Wendell G. Johnson, INFANTRY

Wars are the only laboratories in which the military profession can evolve new applications of fundamental principles and see how future wars may be won. Two such laboratories, Spain and China, are now turning out data that well may shape the course of wars to come. Of these, the Spanish laboratory is the one that European armies scrutinize most thoroughly for technical and tactical lessons. There is indeed a plethora of studies by European military critics, many of whom have gone to Spain for first-hand information.

Among these studies are three in particular that have attracted much attention abroad: the articles of General Armengaud of the French Air Force in *La Revue Militaire Générale* and other French periodicals; Major Wanty's "Une Année de la Guerre en Espagne" in *Bulletin Belge des Sciences Militaires;* and the book, *Les Leçons Militaires de la Guerre en Espagne,* by Dr. Helmut Klotz, a former officer of the German Navy and the author of several military works. This book is reviewed at length in *La Revue d'Infanterie,* March, 1938, by Major Cailloux, French Army. This article is a summary of the observations of these and several other military commentators in close touch with Spanish events.

Maneuver

Major Wanty says that frequency of maneuver is the one conception which stands out above others in the first year of the Spanish civil war:

> For this there were several reasons. The disproportion between the length of fronts to be held and the forces available to hold them compelled the defending Loyalists to concentrate their defense around strong points—roads, bridges, hills, and villages—and to occupy the intervals between these points very weakly. Such a procedure was aided by the mountainous character of most of the theater of operations. But this system—the only one, perhaps, to which the untrained *milicianos* were adapted—failed time after time before the early operations of the Nationalists when they carried out an offensive of maneuver.
>
> Maneuver, mountain fighting, and the tactics of separate columns are nothing new to Franco's veterans from Africa or, for that matter, to the Italian "volunteers," the Navarrese, Galicians, and Castilians in his armies. Thus, time after time throughout the war, we see the successful application of wide envelopments and of the German *Schwerpunkt* (switching the principal effort from one zone to another to exploit weak points).
>
> Maneuver does not consist merely in choosing a place to strike and there assembling means superior to those of the enemy. If this does succeed, fine; then the success should be exploited in the same direction. But if the exploitation is only partly effective, it must be given up. Better by far to move a part of the means (by surprise) to another part of the front. For this gains several advantages: it distracts the adversary, makes him suffer the entire weight of the initiative of the attack, and deceives him as to the destination of reserves.

Motorization, and mechanization (including aircraft), facilitate moving offensive elements rapidly. Thus the astute spacing and alert commander can achieve the utmost flexibility in executing his plan.

The most complete form of strategic maneuver—the threat against communications—was the basis of every idea put into effect by both high commands during the first year of the war—and often during the past year also. In these thrusts at communications the Nationalists have made much use of their air forces.

Oftentimes, it is true, these attacks failed, and only rarely did they gain any decisive result. The defenders were able to slow down the attack so that they could evacuate their troops and matériel with only minor losses. Yet cutting communications stands out as the primary objective in almost every major operation.

Surprise

Surprise may be achieved in several ways, says Major Wanty. It may be gained by assembling large forces in secret, by attacking at an unexpected hour, and by suddenly employing means of which the enemy knows nothing.

It may be said that so far unknown means have not appeared in the Spanish civil war. There has been no use of gas, at least not in any quantity. Tanks caused some

demoralization, at first, but the combatants quickly became accustomed to them and found means to oppose them. Thermite bombs have been used in several instances to fire the areas in rear of strongpoints and thus cut off retreat. The Nationalists did this before Bilbao. But otherwise technical surprise has not been a factor.

By contrast, it has often been possible to assemble large forces without detection by the enemy. Three things in particular contributed to secrecy during the early stages. There was little observation aviation and the theater of war was great. Existing means of signal communication were extremely limited. And large parts of the civil population were apathetic.

Though most big attacks have begun at dawn, surprise has often been gained through night attack. The Loyalist V Corps advance on Brunete began about ten o'clock, overran the weakly held Nationalist position across a nine-mile front and penetrated several miles before it was stopped.

During the second year of the war night attacks have been common. Some observers point out that the shortage of artillery for preparation fires, especially on the Loyalist side, made daylight attacks too costly. General Armengaud, who has visited Government Spain and its lines, says of the Loyalist offensives at Brunete, Belchite, and Teruel—

> These offensives were all similar, night attacks made in general between strongpoints to outflank them, while second-line units and tanks tried to push a little farther. The initial attacks succeeded; the strongpoints of the front line were surrounded and left behind. But the advances slowed down and quickly stopped. Vigorous counterattacks were made which retook half of the conquered terrain. These counterattacks were supported by artillery, but even more by numerous aircraft.

Preparation and Support by Attack Aviation, Artillery, and Tanks

Shortage of artillery is pointed out by many as one reason why attack (or assault) aviation has often and vigorously taken part in the preparation for attacks. In most of the large attacks the artillery action has been supplemented—or preceded or continued—by airplanes, which have bombed and machine-gunned the defenders. Unprepared attacks have been rare, and those made have usually failed at heavy cost. The use of tanks, says Major Wanty, has in no way eliminated the necessity of a strong preparation. Colonel Canevari, Italian Army, Retired, is emphatic. He insists that the war has shown that without powerful artillery support infantry simply cannot advance.[1]

General Armengaud and other observers give aviation much credit for the rapid Nationalist advance on Madrid. All seem to agree that it was primarily aviation which blasted out the intrenched defenders of Bilbao and brought its capture. Nationalist superiority in the air was made possible during the Bilbao offensive by the scarcity and inadequacy of Loyalist air fields in the northern theater, and the shortage of planes available to the Basque army. General Armengaud quotes a Loyalist colonel as follows:

> With equal air forces, I am convinced that we would have held (before Bilbao) despite the numerous disadvantages in our military situation and despite the inferior quality of our troops. No enemy attack of any importance could have succeeded with the artillery preparation alone. This did not succeed in destroying our trenches and accessory defenses. It had to lift its fire as soon as the infantry was within 300 yards of our trenches—too soon to prevent the hostile infantry from being destroyed by our automatic arms if it tried to assault with only its own means. It was the aviation primarily which prepared the attack. It produced enormous moral and material effects. . . . I had two companies completely buried by aerial bombs. The bombers usually operated by groups of twelve in two platoons, flying at an average altitude of 5,000 feet, on two circles tangent to each other above the objective. . . . These were relieved by a similar group—and thus it went throughout the whole day. . . . In addition, pursuit planes and light bombers . . . came over to machine-gun and destroy with explosives or set fire to all targets which appeared on the routes of communication to the front, and likewise bombard munitions depots and people in the cities and towns in the rear.
>
> After several days of violent bombardments, the occupants of our front lines being almost all buried, killed, or worn out and immobilized, the hostile infantry took possession of the ground.
>
> There was, in fact, no infantry attack.
>
> About thirty of them (planes), however, were shot down during the operations in the North.

Dr. Klotz comments that because modern planes go so fast, bombing small objectives, such as bridges and crossroads, is largely a matter of chance. On the other hand bombers operate most effectively on areas at least 500 to 600 yards long by 150 to 200 yards wide. It is then, he believes, "at least equal to artillery."

In this regard General Armengaud writes:

> Up to 200 planes were counted in the air at Brunete (250 according to Loyalist General Miaja) and at Belchite, for several days. During the investment of Belchite there were forty-six bombing flights, each by twenty to forty Nationalist planes. Fifteen of these flights took place in a single day.
>
> The greater part of the men killed or wounded at Belchite (September, 1937) were hit by bombs or bullets from planes. . . . Many planes were shot down on both sides by ground fire and by planes. The Loyalists claim to have downed 27 planes at Brunete and 22 at Belchite.
>
> At Teruel (December-February, 1937-38), where over 100,000 men were engaged on each side, the Nationalist counterattack was supported by a comparatively large artillery concentration, but it was helped even more, perhaps, by the air forces which pounded positions and trenches unceasingly—even under a rather low ceiling. . . . The air fields of the Government pursuit ships were covered with frozen rain and take-offs were prevented.

General Armengaud adds that "the close combination in battle between air forces and the forward echelons of the ground troops holds one's attention," but thinks it would be unwise to come to conclusions without first considering an estimate of the armies and their military situation.

[1] *Army Ordnance*, March-April, 1938.

Estimate of the Armies

He says the two armies are equipped chiefly with automatic weapons and have few tanks and little artillery in proportion to their infantry strength—though the Nationalists are better off in this respect. There is roughly one battalion of artillery in each division, and also a general reserve. There is little heavy artillery; it is mostly 75-mm. and 100- or 105-mm. cannon. The efficiency of the batteries also varies considerably. Some are familiar with modern methods of preparing, conducting, and controlling fire; others only know how to fire by direct observation from OP's close to the batteries.

Both tank and artillery units suffer from lack of instruction. For that reason liaison between the various arms is poor, especially the liaison hardest to get—in the last phase of the attack. This is another reason for the failure of daylight attacks when the artillery is not strongly augmented by aviation.

General Armengaud regards Spanish aviation principally as "a fifth arm," though it is also used in mass against the enemy rear areas as "an army of maneuver."

> Thus aviation is a general reserve of artillery. But it is an extremely valuable reserve because of its great mobility. This mobility is of importance on such an extended front (roughly 1,000 miles). It can meet surprise attacks with utmost rapidity, as in the Government attacks at Brunete, Belchite, and Teruel. It is no less valuable for the rapid preparation of an offensive, because the rapid concentration of forces is indispensable in achieving surprise.
>
> In fact, for numerous reasons, aviation is the best element of ground offensive power. Despite the losses it incurs in this rôle, aviation is chiefly employed as a fifth arm of the ground army upon the front line of battle. . . . It is as indispensable to armies as artillery is to infantry.
>
> . . . It is also employed outside of battle, principally upon rear areas before an offensive or counteroffensive. The Loyalist high command largely attributes the postponement of their enemy's [spring] offensive to the Loyalist air attacks on the Zaragoza region early last December. These attacks caused heavy losses in men, matériel, munitions, and planes.

Rear Area Bombing and Aerial Combat

As for totalitarian warfare à la Douhet, Dr. Klotz believes that it has failed. Civilians have shown such spirit under bombardment that there is no longer hope of bringing future wars to a quick end through terror. Major Wanty is of the same opinion, though he concedes that nowhere in Spain has nearly the mass of planes been used that Douhet visualized. Major Wanty points out also that totalitarian warfare far from destroying the morale of a people, seems rather to arouse an implacable hatred and an indestructible will to resist.

Dr. Klotz thinks that the increased speed of the bomber, its greater armament, and its fewer dead angles, make this type of plane almost equal to the pursuit plane in combat.[2] Moreover, the increase in top speed from 115 miles per hour to 300 and better (for pursuit planes) often makes air combat impossible—especially for planes armed only with machine guns. Explosive projectiles are necessary to down modern airplanes—except when a gunner can pour a heavy stream of bullets into the vital parts of a plane at close range. The cannon, therefore, has become the normal weapon of the plane.

It is Major Cailloux's belief that if air power is to lose its force, and if attacks on rear areas fail to demoralize noncombatants as envisaged by General Douhet, the importance of the air army as an independent arm is considerably lessened. "On the other hand," he continues, "if the intervention of aircraft by fire and bombing over the combat zone brings about important military results, aviation has gained a new importance as an auxiliary of the fighters on the ground." Yet, says Dr. Klotz, "The Spanish civil war has conclusively shown that the final decision of the war takes place on the ground and not in the sky. . . . Aviation, and even bombing aviation, must be associated (with infantry) as an auxiliary and subordinate arm. An arm, important, irreplaceable, extremely efficacious, but nevertheless an auxiliary arm and nothing more."

Vulnerability of Aviation and Air Defense

Major Wanty ascribes aircraft losses to three causes: aerial combat, bombing of air fields, and ground antiaircraft defense. He says that air combat is by far the most important cause, a view somewhat contrary to that of Dr. Klotz. Dr. Klotz thinks that improved methods of fire, the use of excellent guns, and the impracticability of plane vs. plane combat have enabled ground fire to account for four out of five planes shot down; whereas in the World War ground fire accounted for one out of five.

The proportion which Dr. Klotz gives may have prevailed for a brief period early in the war, when planes flew low and were of slower, obsolescent types. But certainly it is incorrect if applied to the whole war. Actually, the World War proportion was about one plane in seven downed by ground fire. Currently in Spain the proportion is no doubt higher—perhaps one in four or five. A communique of Radio-Salamanca (Nationalist Spain) of April 22, 1937, gave 56 planes brought down by ground fire against 256 by aerial combat—roughly one in six.

One thing is certain: the attrition from all causes is tremendous.

Dr. Klotz studies Franco's antiaircraft weapons—88-mm. cannon, 37-mm. cannon, 20-mm. cannon, and a "light machine gun." He points out that at the front, against troops in position, a plane must come below 3,300 feet to make a successful attack. If defenders on the ground are to meet such an attack advantageously, they must be able to "adjust fire rapidly, follow the target rapidly . . . and have adequate rapidity of fire." All these conditions demand a light automatic weapon. "The 20-mm. German cannon has been satisfactory."

But in rear areas, against planes attacking at high altitude, a heavy gun supported, if necessary, by several

[2] Major Wanty does not incline to this view. He comments: "Among other deductions, it appears that the bomber of today, built like a flying fortress with many machine guns, is highly vulnerable to attacks from the flanks or rear. It must be escorted by numerous planes."

light weapons has all the advantages. The 88-mm. gun has filled this requirement very well. The 37-mm. cannon, however, does not have the qualities of the 20-mm. or the 88-mm. gun.

The Air Situation on the Coastal Front

General Armengaud gives considerable space to the maritime and coastal situation. He says the Loyalists should strike at the Nationalist docks, shipping, and air bases in the Baleares, and try to sink a few of the best Nationalist cruisers or destroyers, in order to open up the vital sea communications and free the Loyalist coastal cities, munitions plants, and civilians from repeated attacks coming from Majorca Island.

> Holding the bases in the Baleares, the Nationalists force the Loyalists to defend 500 miles of coastline on which are large centers of population, and the biggest war munitions plants, ports, and bases for commercial and naval shipping. Large numbers of planes and antiaircraft cannon must be consigned to the defense of Perthus, Gerona, Barcelona, Reus, Tarragona, Sagunto, Valencia, Alicante, Murcia, Cartagena. . . . One of these points, for example, is defended by 8 batteries of 100-mm. guns, firing to a height of 24,000 feet and a range of 8½ miles; 14 sections of projectors; and a squadron of planes.
>
> Moreover, at certain points, at 9 to 13 miles from the coast, there are stationary fishing boats which give the alarm with Bengal fires and radio.

General Armengaud points out that Franco has not embarked on a form of aerial warfare that would cause terrific damage to the riches of Spain and to a population all of which is not hostile, or entirely hostile, to him. It has appeared, in fact, that Franco would not countenance devastating attacks during, say, the first year and a half of the war. But during the past few months, the frequency and intensity of air attacks seem to have increased.

Writing early in 1938, General Armengaud said that there were only mediocre Nationalist air forces in the Baleares: one German and two Italian squadrons of hydroplanes, three squadrons of modern Savoia tri-motor bombers, and a powerful squadron of Fiat pursuits.

The Loyalists have been severely handicapped in the maritime theater. Since the outset of the war, the situation has in reality been more pressing on sea than on land, but they have placed reliance upon land communications across the Pyrenees and have therefore concentrated their air efforts on the military theater of operations. "The primary reason for the maritime inactivity," says General Armengaud, "perhaps lies in the inadequacy of aviation elements for the great number of missions they have to perform. They are largely absorbed by the needs of the army on land."

Tanks

Major General Temperley, British Army, who has been in Spain observing operations and has written numerous articles on the war, agrees with Dr. Klotz that German tanks have proved to be mediocre, and Italian tanks worse. The Russian tanks, he opines, have been superior to the others but have not obtained successes comparable with those of the World War. "Everywhere that tank attacks have encountered defensive elements of sufficient number and quality, the attacks have been broken up or immobilized without accomplishing the mission. If, on the other hand, these elements of defense have been lacking or no longer are intact—owing to neutralization or destruction by an artillery preparation—the tanks habitually reach their objective with almost mathematical certainty."

GENERAL CHARACTERISTICS OF TANKS USED IN SPAIN

(*Data as given by Dr. Klotz*)

	Weight (tons)	*Maximum Speed (mph)*	*Armament*	*Crew*	*Armor (in.)*	*Radio*
German (Nationalist)	6	31	2 MG in turret	2	.3—.5	None, at least at first
Italian (Nationalist)	3.3	26	1 or 2 MG in hull	2	.2—.5	.....
T26 Loyalist ..... (Russian)	8.5	16-18.5	1 45-mm. cannon and 1 MG dual in turret	3	Maximum of .50 or .64, depending on type	Yes
T28 Loyalist ..... (Russian) Few in number	20	25	Same as T26 plus 2 MG in lateral turrets (sponsons.)	5 or 6	1.0	Yes

Dr. Klotz thinks that tanks of less than 8 tons are of little effectiveness and are even dangerous because they have an insignificant fire effect, weak armor, and poor cross-country mobility. He maintains that effective firepower and adequate armor and mobility cannot all be obtained in a machine weighing under 8 tons. Here Dr. Klotz is in agreement with Major General Fuller, British tank expert, whose dictum is that baby tanks are only of value as reconnaissance vehicles. Dr. Klotz also says that it must have a cannon mounted in a rotating turret, and easily capable of surmounting terrain obstacles, and that it must have a cannon mounted in a rotating turret. To oppose modern antitank weapons at least .60 inch of armor is indispensable, he further contends. This, however, appears far too moderate an estimate—at least 1.0 inch on vertical parts of the front, sides, and rear would be preferable. For adequate cross-country mobility, there must also be great spanning ability—that is, a long track.

Employment of Tanks

General Temperley and Dr. Klotz agree that tanks have often been employed in small groups and without liaison with other arms—this was certainly true during the first year of the war. Whenever thus separated from infantry they have been unsuccessful. Tanks should not go beyond the hostile front line until friendly infantry has arrived and established itself. Armored attacks, moreover,

should be prepared by artillery and should be accompanied by motorized cross-country artillery to protect the tanks against hostile antitank weapons. General Temperley favors tanks that carry antitank guns for this support.

Dr. Klotz believes that the utility and possibility of great speed in combat have been exaggerated. The Spanish war seems to have shown that speed does not protect tanks from enemy fire. The reason for this may be that the tanks in use had to move slowly most of the time owing to their poor capability for traversing terrain obstacles. Or it may be that all tanks are more limited in this regard than has commonly been thought.

Major Cailloux adds further that tank armament must include a cannon capable of destroying nests of resistance and capable also of attacking hostile machines, the cannon to be in a turret with all-round traverse. Of speed this writer says: "The obstacles inherent in combat terrain, the necessity of locating the enemy and of adjusting fire, oblige tanks to advance slowly from the time they come into their fighting zone." Major Wanty agrees with this: "A tank in combat cannot exploit its speed, owing to the terrain obstacles over which it is obliged to move slowly, and to the need of frequent halts for locating and engaging hostile resistance. This item is less important for tanks of great stability and capacity for crossing obstacles—that is, the larger tanks."

Defense Against Tanks

The weapons and methods used for antitank defense in Spain have been variously covered. There are, however, certain new ideas brought out by Major Cailloux and Dr. Klotz which merit consideration.

The latter believes that a tank will not ordinarily be visible soon enough to be taken under fire beyond a range of 500 yards from the front line of combat, and says that so far as known one inch is the maximum thickness of armor on medium tanks. Only the heavy French tanks carry thicker armor—a maximum of about two inches, and on these the large tracks are especially vulnerable. He therefore advocates an antitank gun having requisite penetrating ability within a range of 500 yards, and for an angle of incidence as much as 30 degrees away from the normal 90-degree impact; the gun to be capable of rapid fire and easy to transport, handle, and camouflage (low silhouette); the projectile to be explosive so as to cause serious damage inside the tank. There must be one gun, he says, to each 275 yards of front.

Some students of antitank defense claim there must be an average of one gun to every 100 yards of front—counting all guns sited in depth. With a division holding 15,000 yards of front this would be 150 antitank guns, which seems like a great many unless some of them are on the order of antitank rifles.

Dr. Klotz concludes that of the five antitank guns used in Spain—Hotchkiss 13-mm. and 25-mm., Oerlikon 20-mm., German (Rheinmetall) 37-mm., and Bofors 40-mm.—only the Oerlikon has really given satisfaction. Not all observers agree to this, for many have spoken highly of the Rheinmetall 37-mm. gun.

Dr. Klotz eliminates the 13-mm. (Cal. 0.50) Hotchkiss because of its solid shot, the 25-mm. Hotchkiss because of its excessive power *(sic)* and the German 37-mm. because of its slow rate of fire. He says the 20-mm. gun penetrates the one-inch armor of medium tanks within a range of 500 yards, and its rate of fire is practically double that of the 25-mm. Hotchkiss, while its weight is but a third.

Both Dr. Klotz and his reviewer, Major Cailloux agree that antitank defense must be principally a matter of cannons using direct fire, and that the front line of defense should have antitank weapons capable of providing protection at least against the more lightly armored machines; that without such local means of defense, the front-line riflemen will be demoralized by even light hostile tanks. Since a front-line weapon must above all be invisible, even the 20-mm. cannon appears unsuitable to Major Cailloux, who therefore approves the idea of an antitank rifle as the equipment for small front-line units.

Since these rifles cannot stop all light and medium tanks and since the present one-inch armor may be exceeded by the tanks of tomorrow, Major Cailloux proposes a heavier weapon for the battalion support line—a gun such as the 20- or 25-mm. cannon. Then, to meet heavy and ultra heavy tanks and all others that may penetrate the forward defenses, he says there should be a few heavy guns—inferring 47-mm. or 75-mm. pieces—on the reserve lines of a position.

The idea of antitank rifles seems to be gaining in favor as a means for protecting units too far forward to be covered adequately by the regimental or divisional antitank cannons. The same weapon seems also to be highly desirable for antimechanized defense during offensive action when antitank-cannon elements are likely to be well to the rear and when there will be little or no protection from mines and antitank obstacles. The British, for example, expect to have their rifle platoons or companies equipped with caliber 0.50 antitank rifles, and to have their 40-mm. antitank cannons in the divisional echelon. The problem with antitank rifles, of course, is to obtain adequate power without excessive weight.

Conclusions Drawn from the War

Major Wanty, Major Cailloux, and Dr. Klotz arrive at similar conclusions from their study of the Spanish civil war.

1. The stabilized form of warfare was not an accident limited to the war of 1914-1918. As soon as equilibrium between the opposing forces is reached, stabilization automatically takes the place of mobile operations. "Accordingly," says Major Wanty, "a decision must be sought during the brief period when the aggressive side has manifest superiority."

2. The power of a defensive carefully prepared and adjusted to the terrain is such that it compensates, at least

temporarily, for an initial inequality of forces.—*Wanty.*

The current possibilities of antiaircraft and antitank defense denote a marked advantage for the defensive.—*Cailloux, Klotz.*

3. The tank no longer can count on technical surprise; it fights on an equal basis with the antitank defense, and the theories proclaimed for the devastating power of Panzer divisions and other armored formations used independently are refuted by actual events.—*Cailloux, Klotz.*

4. Regardless of their characteristics, tanks do not seem capable of carrying through an independent combat. Their success must be exploited, confirmed, and maintained by infantry. Infantry should be brought by rapid means directly in the tracks of the break-through tanks. It would not be surprising, therefore, to see the appearance of mixed units combining reconnaissance elements, attacking and penetrating tanks, and motor-carried infantry destined to occupy the strongpoints.—*Wanty.*

5. The preparation of the attack by artillery is more necessary than ever because the hostile antitank means and the machine guns which prevent the infantry from following the tanks must be neutralized.—*Wanty.*

6. The commanders of all echelons must be capable of conducting flexible maneuvers.—*Wanty.*

7. The effective intervention of aviation in ground combat has become a reality which a defender must take into consideration.—*Wanty.*

8. Aircraft and tanks are only auxiliary arms of the infantry, which remains "the queen of battles." It is the presence of infantry that is responsible for the advance or retreat of the enemy—that is responsible for success or defeat.—*Cailloux, Klotz.*

AN ANTIAIRCRAFT TRAINER

By Lieutenant Colonel Charles I. Clark, CA-Reserve
and Lieutenant Colonel Hazen L. Hoyt, CA-Reserve

AN ANTIAIRCRAFT training device which will simulate firing under service conditions, with actual bursts occurring at any desired rate and correctly spaced throughout the three-dimensional ladder of dispersion, is described below. Observers at the battery position and on the flank can measure deviations, which, when applied as corrections will move the center of burst on to the target. Each burst may be recorded separately and later duplicated so that an accurate check can be maintained on the state of training of all personnel.

The device is installed at Headquarters Coast Artillery Reserves, in New York City, and is being used for the pre-camp training of antiaircraft officers in the conduct, observation, and adjustment of fire.

Description of Base

As a base for the system, it was found necessary to reproduce a portion of the trajectory suspended in air. The base may be supported from above or below. We provided this part of the device by using a discarded piece of medical equipment consisting of a vertical shaft mounted on a caster three-legged base as shown in Figure 1. A bracket casting slides up and down this shaft. This bracket casting carries a horizontal shaft capable of adjustment for length and can be rotated to any desired angle vertical to the horizontal axis. The shaft terminates in a casting with a vertical face. To this face we attached a wooden extension arm three feet long. Where ceiling permits, the length of the extension arm should be increased. At the upper end of the arm is fastened a six-foot strip of wood carrying on its top surface a strip of miniature railroad track. The track represents a portion of the trajectory between fuze settings 17 and 21. By means of sheaves, a movable block supporting a light aluminum angle iron which forms a base for eight light sockets is mounted on this track. The angle iron slants up and to the right through a distance, to scale, of eight probable errors laterally and vertically. It represents the diagonal drawn through the three-dimensional dispersion zone. A miniature target is suspended from an independent source and should be illuminated by a small searchlight.

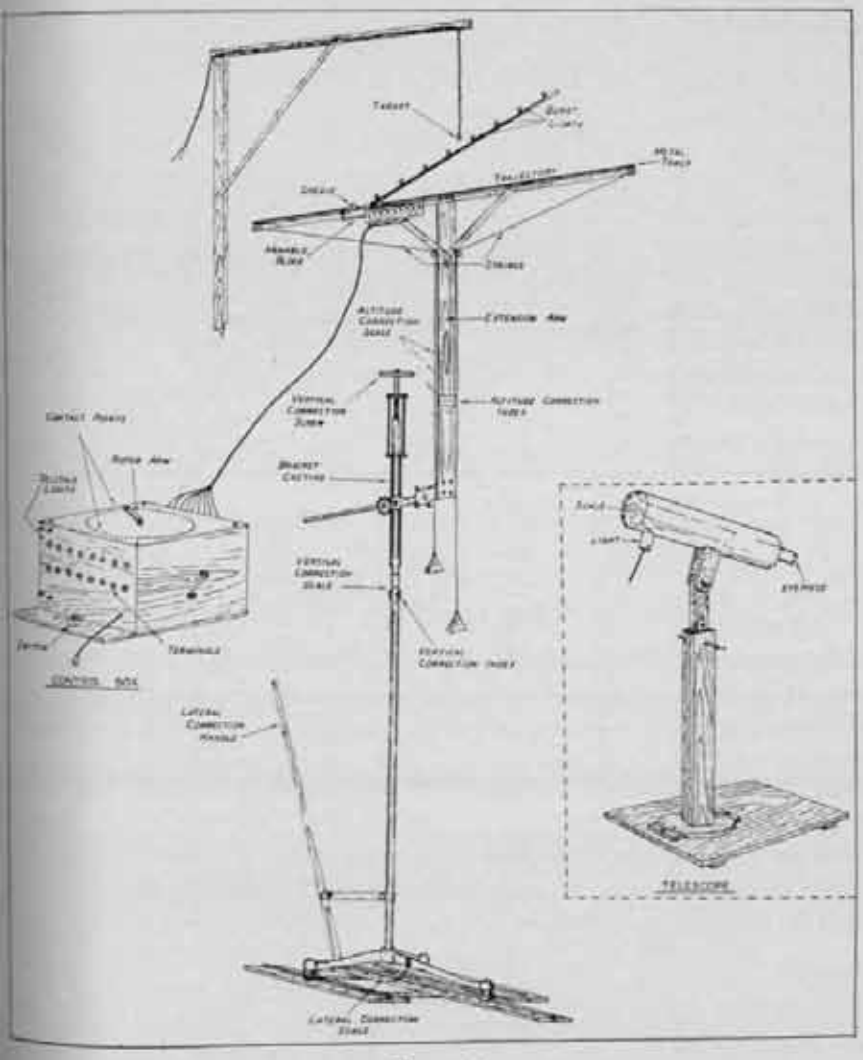


Figure 1

Applying Corrections

The casters rest on supporting tracks, and lateral corrections are applied by moving the whole apparatus right or left. By raising or lowering the bracket casting along the vertical shaft corrections are applied for vertical deviations. Both these deviations are observed by the range officer at the battery position and the correction will place the center of bursts (midway between lights 4 and 5) on the line of postion through the target. The movable block, carrying the burst lights, is rolled along the track by means of strings, running through pulleys at each end of the track. These strings are brought down to the center of the extension arm which has on its face an orienting line. The strings are marked in 100-yard graduations, and when an altitude correction is ordered the pulling of the string causes the

block to slide along the line of position, bringing the center of bursts on to the target.

Description of Burst Lights

The zones of dispersion, based on the given data, will form a parallelepiped measured by 8 probable errors in three dimensions, or a lateral zone of 80 yards, a vertical zone of 160 yards and a range zone of 480 yards. A diagonal through this zone is 516 yards long. We represent this diagonal by the angle iron which is 2.6 inches long. If eight lights are equally spaced along this iron then from the battery position will be seen 8 flashes laterally and also 8 vertically. Viewed at the same time from the flank will be seen 8 flashes occurring along the trajectory. Each light represents one of the 8 dispersion zones and enables us to represent that space in the air around an actual target, and to reproduce bursts according to their true dispersion.

Dispersion Motor

In the firing of a great number of shots at a fixed point, impacts will occur, forming a pattern which is broken down into eight zones, each one probable error long. We may expect bursts to appear in each of the zones in the ratio of 2%, 7%, 16% and 25% SHORT, and 25%, 16%, 7% and 2% OVER, or out of 100 shots fired we would expect them to fall so that 25% of them would land in the space represented by light number 4, likewise 2% of them would fall in the last zone over, which we represent by light 8. To duplicate these events and to cause the lights to flash in accordance with the above percentages, we constructed a simple hand-operated motor, the wiring diagram of which is shown in Figure 2. This motor can be operated to cause the rotor arm, shown in Figure 3, in two revolutions, to pass over 100 contacts simulating the normal battery rate of fire. These contact points are wired to the eight burst light terminals in the correct ratio. Figure 3 shows the details of the layout and the contact arm assembly.

Reproduction of Bursts

To check on the accuracy of the personnel being trained we can reproduce any series of flashes by means of the tell-tale lights on the control box, Figure 1. Each of the lights is numbered and they are wired in series with the overhead burst lights. If we record the numbers of the tell-tale lights that we have used we can later reproduce the firings they represent. We can also check observers, if we hold a pencil at the contact point starting the run and record the number of shots fired. To duplicate the run all we have to do is to bring the rotor arm back to the starting point and cause it to pass over the number of contact points corresponding to the number of shots recorded.

Training the Battery Commander

The flank observer is connected by telephone with the battery commander and deviations are received as in actual firings. The battery commander estimates the deviation of the center of burst, converts this into an altitude correction and orders the adjustment. By recording the actual bursts the supervisor may at all times check on the proficiency of officer training and readiness for target practice.

Observing Instruments

For both observing instruments we used a short length of 4-inch metal tubing as shown in the insert in Figure 1. In one end, we mounted a disc of transparent material on which is inscribed a lateral and vertical mil scale, and the other end an eyepiece. Because of the short distance involved no magnification is required. Inside illumination for reading the scales when the trainer is used in the dark is provided by means of dry cells. The tube is mounted on a wooden frame which allows movement laterally and vertically. The observer sits on the floor.

Cost

The entire apparatus, except the medical frame, was made with odd bits of material and cost about $20.00. It can be constructed for less, because we bought certain parts which were discarded, after experimentation.

Data Assumed

Although various data conditions may be assumed, we set up the apparatus to utilize the following:

Quadrant angle of elevation	900 mils
Fuze setting	19
Horizontal range	5,743 yards

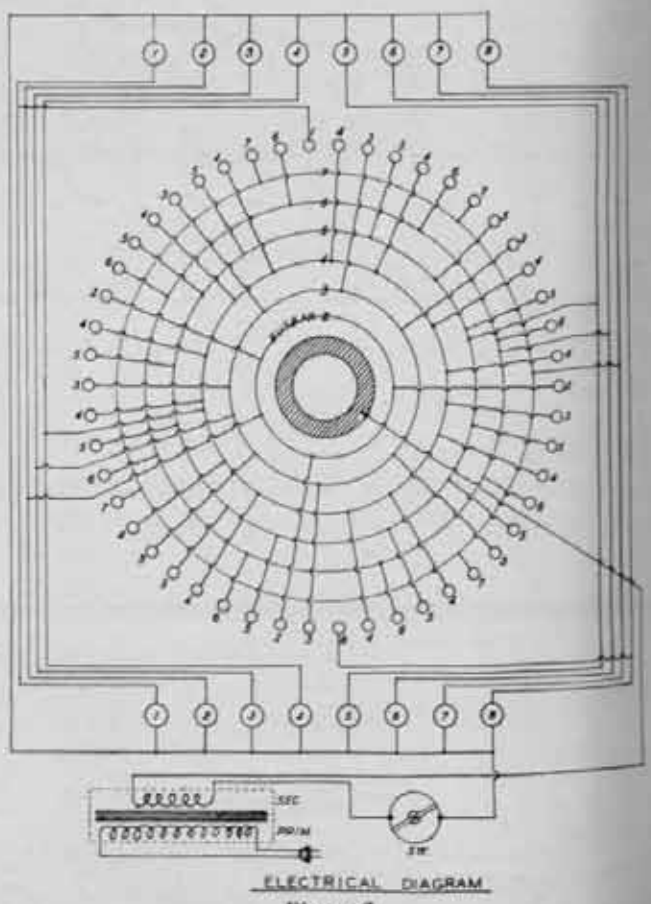
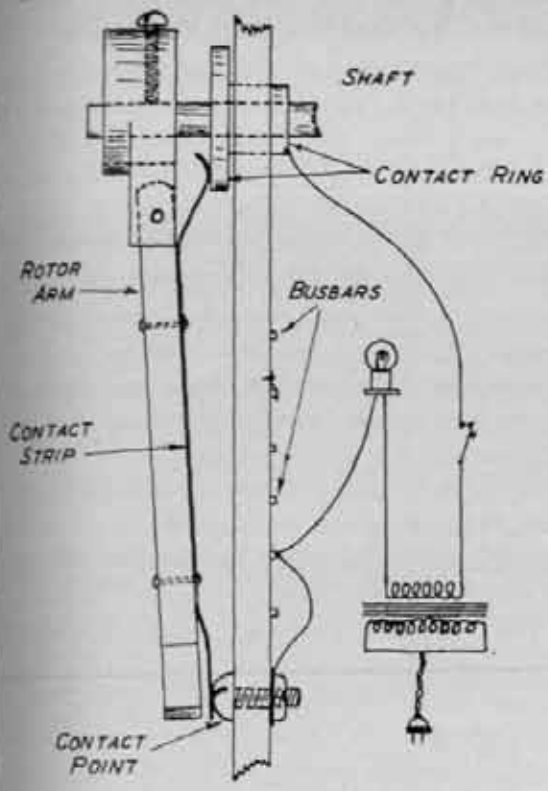
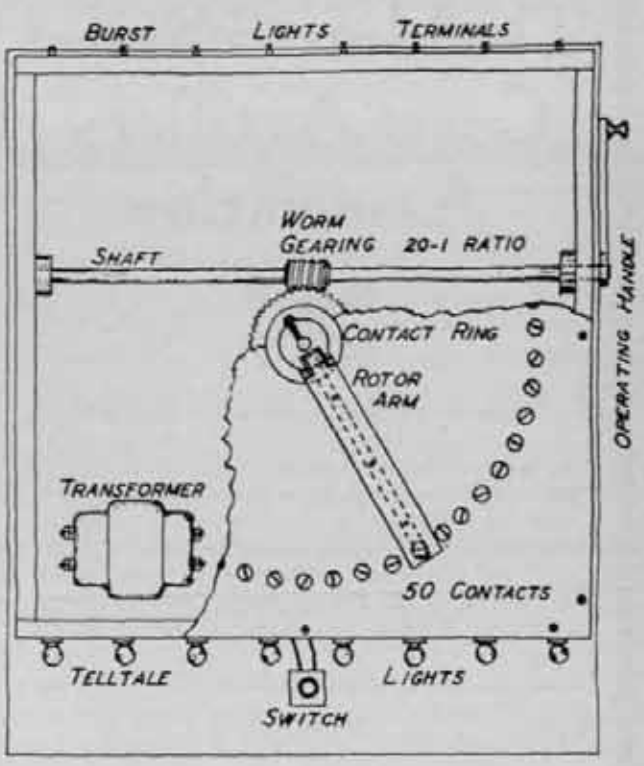


Figure 2



CONTACT ARM ASSEMBLY.



LAYOUT OF CONTROL BOX

Figure 3

Altitude	5,122 yards
Probable error, range	60 yards
Probable error, vertical	20 yards
Probable error, lateral	10 yards

Data to Scale

Trajectory between Fuse Settings 17 and 21	1,072 yds. or	5.4 ft.
8 probable errors, range	480 yds. or	2.4 ft.
8 probable errors, vertical	160 yds. or	.8 ft.
8 probable errors, lateral	80 yds. or	.4 ft.
Diagonal of dispersion	516 yds. or	2.6 ft.
Observer range	6,000 yds. or	30. ft.

Suggested Improvements

In installing the wiring 6 circular rings of bus-bar wire should be affixed to the under side of the box cover. Short connections may then be made to each common ring from the contact points, and from the ring to both outputs. Special care in installing the wiring should permit removal of the top cover without disconnecting the wires and will keep short circuits to a minimum.

If possible, the trajectory arm should be raised to 25 feet which corresponds to an altitude of 5,000 yards. This will permit better portrayal of the bursts from the battery position, and the use of the correction tables normally used in target practice. If conditions force the use of shorter altitudes it will be necessary to provide altitude conversion tables.

In order to prevent the target from striking the moving lights, it should be suspended from a cross-arm which will lift it vertically when corrections are being applied.

In armories or large rooms, the entire device, except the telescope, should be mounted on a movable platform which when towed will simulate tracking and observing on a moving target.

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.

OFFICERS

MAJOR GENERAL A. H. SUNDERLAND
PRESIDENT

COLONEL AVERY J. COOPER
VICE-PRESIDENT

MAJOR AARON BRADSHAW, JR.
SECRETARY-TREASURER

ADDITIONAL MEMBERS OF THE EXECUTIVE COUNCIL

BRIGADIER GENERAL WILLIAM OTTMANN
COLONEL W. S. POLLITZ
COLONEL CLIFFORD JONES
COLONEL E. C. WEBSTER
COLONEL E. W. THOMSON
LIEUTENANT COLONEL R. M. PERKINS
LIEUTENANT COLONEL J. P. HOGAN

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.

Ranks of the One Hundred Percenters

In the May-June number we said that two new acquisitions per issue to the units that subscribe one hundred per cent to the JOURNAL would help solve some of our circulation difficulties. A glance at the list below will show that we were more than taken at our word, for the current posting of the list shows eight additional organizations that now take the Corps' magazine *en masse*. This is the sort of coöperation that editors dream about.

The recruit one hundred percenters span the country from coast to coast and even reach down into Panama. Not only do they include National Guard and Regular Army organizations but there is also one senior ROTC unit.

We should like to mention the leadership in the eight additions to the élite. The 248th Coast Artillery (Washington National Guard) is headed by Major Edward C. Dohm. The 1st Coast Artillery at Fort Randolph, Panama, came in under Lieutenant Colonel O. L. Spiller; while Captain G. F. Nichols rounded up that portion of the members of the 7th Coast Artillery stationed at Fort Dupont, Delaware. At Fort Preble, Maine, we are indebted to Colonel O. H. Schrader for the 8th Coast Artillery. The 9th Coast Artillery at Fort Banks, Massachusetts, is commanded by Lieutenant Colonel M. J. Hickok. In the 63d Coast Artillery at Fort MacArthur, Lieutenant Colonel C. M. Thiele did the good work. Especially worthy of note is the fact that Major Don Norris signed up every member of the Advanced ROTC in the University of California at Los Angeles. The 206th Coast Artillery, Arkansas National Guard, is commanded by Colonel Elgan C. Robertson.

As yet unrealized is our ambition to bring at least one Reserve regiment into the fold. But we have no doubts on the score—some day such a unit will be carried on the one hundred per cent roll. If any Reserve colonel or unit instructor feels the urge to bring his outfit more in touch with current military thought, we'll be glad to coöperate. Just send us a roster of your organization. We'll check the list against the circulation files and will then give you the names of the non-subscribers. The rest is up to you.

100% ORGANIZATIONS

1st Coast Artillery, Fort Randolph, Panama; 7th Coast Artillery, Fort Dupont, Del.; 8th Coast Artillery, Fort Preble, Me.; 9th Coast Artillery, Fort Banks, Mass.; 60th Coast Artillery, Fort Mills, P. I.; 63d Coast Artillery, Fort MacArthur, Cal.; 64th Coast Artillery, Fort Shafter, Hawaii; 202d Coast Artillery, Illinois National Guard; 206th Coast Artillery, Arkansas National Guard; 243d Coast Artillery, Rhode Island National Guard; 248th Coast Artillery, Washington National Guard; 250th Coast Artillery, California National Guard; University of California, Los Angeles.

News and Comment

Regular Army Reserve

In accordance with legislation passed by the last Congress creating the Regular Army Reserve, our National Defense establishment will be provided with a reservoir of qualified, able bodied soldiers, to take the place of the enlisted reserve which has been filled in the past largely by World War veterans.

This legislation authorizes voluntary continuation of the services of Regular Army enlisted men on an inactive status with very little expense to the Government. Many splendidly trained Regular Army soldiers have had little or no opportunity in the last two decades to remain in official contact with the Army after they have been given honorable discharges.

Only former Regular Army soldiers who have been honorably discharged within the past three years, are unmarried, and are less than 36 years old are eligible for the Regular Army reserve. No military duty will be required from those who are accepted but all are subject to call to active duty during an emergency declared by the President. While on inactive status, a Reservist will be paid at the rate of $24 a year, payable every four months in installments of $8.

If called to active duty during a national emergency declared by the President, the Reservist will be paid an immediate cash allowance upon reporting of $3 for each month he has been enlisted in the Regular Reserve, but not more than $150. His pay while in active service will be the same as that of other members of the Regular Army of corresponding grade.

The new Regular Army Reserve differs from the prewar Regular Army Reserve in that enlistment for the new organization is purely voluntary and is made only after the soldier has been separated from the U. S. Army by honorable discharge after termination of his enlistment contract.

The creation of the Regular Army Reserve marks another step toward the goal of an adequate National Defense. Should this country ever become involved in war, the wisdom of the act will be amply demonstrated.

✓ ✓ ✓

Seacoast Fortifications

Unusual features of seacoast fortification construction occupied the major part of the June, 1938, *Royal Engineers Journal*. The British fortifications at Hong Kong, Singapore and those in Australia are discussed.

The feature article, entitled "Stanley, Hong Kong—The First Three Years," contains many interesting photographs and gives the details of the rearrangement of the armament of the coast defenses of Hong Kong and the means employed to move some of the guns to new positions at the south of the island. The problems encountered were indeed difficult because the Hong Kong Government would not allow loads greater than five tons on the roads outside the city. This necessitated water movement of all heavy items such as gun mountings. Because of official restrictions, many constructional details are not mentioned, but numerous general points of interest are touched on.

The article "Singapore—The Founding of the New Defenses," is a complete discussion of the installation of the defenses for the Imperial naval base. The problems met with from the time that a commission was sent to investigate and make recommendation for the installations, to the completion thereof are included.

The third article is entitled "Unusual Fixed Coast Defence Construction in Australia." This is an account of the unusual methods used to construct the permanent works for fixed coast defenses on an island off the coast of Australia. The works discussed include gun and defense electric-light emplacements, magazines, observation posts and facilities for a tent camp. The problem here was difficult because the island is composed entirely of sand and is covered with dense undergrowth and trees of little value. A range of hills, 900 feet high, runs down its center. The beaches on the western side are straight and have no sheltered bays or boat harbors to protect small craft from the short high seas which rise during the strong westerly winds which prevail in winter. With the exception of lighthouse-keepers the island is uninhabited.

The island is infested with white ants—termites with a voracious appetite for wood.

Therefore the design and construction of the new fort presented some problems out of the ordinary. Briefly, these are as follows:

1. All building materials had to be brought by sea and landed on an exposed beach, fortunately one of hard sand.
2. No local materials were suitable or available. The sand was too fine for use in concrete. The local timber was unsuitable. No stone existed.
3. To reduce the cost of transport, timber-framed buildings were largely used. These had to be carefully protected from the white ants.
4. The humidity and high summer temperatures preclude the use of iron except when covered with concrete or other material. Even galvanized iron will not withstand the cutting action of wind-driven sand.

These three articles are interesting and contain valuable information for the Coast Artillery officer.

German AA Defenses

German antiaircraft defenses excel all others in the world, says Karl H. von Wiegand, veteran American war correspondent, writing in the *New York Journal*, for June 26, 1938. Extracts from Mr. von Wiegand's article are reprinted below:

* * *

Germany, it is generally conceded, has developed the largest, most extensive, and it is believed, the most effective antiaircraft defense system of any country in the world.

Foreign military observers in Berlin estimate that Germany has anywhere from 350 to 500 batteries of antiaircraft artillery of four guns each.

This means that Germany has from 1,400 to 2,000 antiaircraft guns, both mobile and fixed.

In each battery there is an operating staff of 120 specially-trained officers and men.

These batteries are placed strategically where they will be most effective in defending Germany's skies from would-be invaders, and its people from bombs dropped by hostile aircraft.

Vital centers also are heavily guarded from air attacks.

Berlin, Munich, Hamburg, Bremen, Cologne, Frankfort, the Krupp gun works in Essen, the Zeiss optical works in Jena, the industrial plants in the Ruhr region, all are fairly studded with these antiaircraft guns.

It is a moot point how many enemy bombers could get through the terrific barrage that these centrally-directed, fast-firing guns would put into the air.

If the figure of Germany's antiaircraft guns is 2,000, it would be one such gun on the ground for about every first line military plane now in her fleet. That gives some indication of the importance the German military chieftains place on the ground weapon of aerial defense.

Range, speed and accuracy of fire of these antiaircraft guns with the latest optical range finders and "directors," "predictors," or what the Germans call "kommandostelle," are amazing.

Modern aerial defense comes under four main categories:

Pursuit squadrons of fast fighting planes.

Antiaircraft guns.

Sound detector and searchlight detachments.

A highly organized intelligence and signal corps.

Fast fighting planes constitute the "first line of air defense." They go up to meet, attack and shoot down enemy bombers before they reach their objective.

The "second line of air defense" is the antiaircraft guns. They engage hostile planes from the ground if and when they break through the "first line"—the pursuit fighting ships.

Detectors are huge "ears" of air defense which detect any sound of approaching enemy squadrons when still many miles away. Gigantic and powerful searchlights make them visible to antiaircraft batteries at night.

Intelligence and signal corps men flash news of oncoming enemy planes, their route and course.

Antiaircraft guns are of two classes, mobile and immobile or in fixed positions. They are of three sizes or calibre—3.7, usually mounted on motor trucks and rapidly movable from place to place; the 8.8s and 10.5s. These latter are generally in fixed positions on the ground or on warships. Their range of fire varies from 18,000 to nearly 30,000 feet altitude. That is from three and one-half to five and one-half miles in the air.

Railway Artillery Field Training

The 52d Coast Artillery, less detachments and inactive units, moved from Fort Hancock, New Jersey, to Lewes, Cape Henlopen, Delaware, on May 9th, in several sections. The organization included the following armament train: two 12-inch mortars, two 8-inch guns, two plotting cars, 1 passenger coach for personnel and four ammunition cars.

While at Lewes tactical exercises were conducted. Battery "E" fired a service practice with 8-inch railway rifles and Battery "C" fired the 12-inch railway mortars.

This movement is the first made by the regiment since the World War. The report of the overland movement and the lessons learned from it and the firings are very valuable. It is especially interesting to note that the 8-inch guns required 1½ hours after arrival at their designated firing positions to report ready for service, and the mortars required only two hours. Plotting cars were spotted and reported ready within an hour.

Field exercises such as this not only give excellent training but also provide a service test of equipment that is possible in no other way.

Antiaircraft Defense of the Field Force

Brigadier A. A. S. Younger, D.S.O., Commander of the 1st Antiaircraft Group, British Royal Artillery, brilliantly summarizes the antiaircraft defense of a field force in the May, 1938, number of the *Journal of the Royal United Service Institution*. He prefaces his arguments with the following statement:

> The threat from the air has reached such proportions that every possible means of combating it must be explored to the full. Hence the more lively interest now being taken in gun defense from the ground, the potentialities of which have long been generally regarded with considerable scepticism. The need for this interest is specially indicated in the case of the field force, not only on account of the progressive growth in the size and capabilities of the Air Arms of the nations but also because of the increasing tendency to employ the medium of the air in almost every phase of modern war.

He makes a strong appeal to overcome a faulty conclusion that the work of specialized antiaircraft troops is a species of "black art." He argues that this feeling is akin to that held years ago by an old type of battalion commander in regard to his supporting artillery. He points out that the action of antiaircraft artillery is, in relation to the enemy in the air, much the same as that of other

artillery with respect to the enemy on the ground. He also stresses the important relation that must exist between antitank and the antiaircraft gun.

He includes a description of the allotment of antiaircraft groups and a comprehensive account of the task of antiaircraft artillery. His description of the varying gun densities, and the flexibility of the antiaircraft defense deserve the attention of all antiaircraft artillery officers.

His conclusions, which are quite conservative, are given in full below. They are worthy of consideration:

(a) Antiaircraft defense troops are becoming an increasingly important component of a field force, but their handling must be constantly studied if the best value is to be obtained from them in war.

(b) Antiaircraft defense troops have reached a high standard of equipment and technical efficiency, and are fully mobile.

(c) The functions of antiaircraft artillery do not differ greatly, in general principles, from any other artillery of the field force, and their "art," though skilled, is not "black" but perfectly simple and straightforward.

(d) Successful defense against reconnaissance may have far-reaching effect upon the action desired by an opponent.

(e) The rôle of antiaircraft defense troops should not be confined to semi-static action at bases and railheads; they can be quickly moved to any focus of activity which requires shielding.

(f) An Air Raids Precautions organization is now a necessary adjunct to a field force.

(g) The plan of defense against air action must entail equal consideration of both active and passive measures.

(h) Active and passive measures of defense, A.R.P. being included in the latter, need to be organized in separate branches coördinated by a senior officer at G.H.Q.

Staff College Reorganization

The June, 1938, *Fighting Forces* announces that the British War Office is about to reorganize the procedure by which officers are selected to attend the staff college, and that the new system will go into effect in January, 1939.

The main feature of the reorganization is the division of the staff college into two sections: a junior section and a senior section.

The junior section course, one year in length, will train officers to fill appointments up to and including second-grade staff appointment. Each year approximately 120 officers will attend, of whom about 100 will be officers in the Regular Army. The Regular officers will be selected by *competitive examination*, about twenty-five vacancies being allotted to those who obtain the highest marks; the remainder being filled by nomination from among those who have reached the necessary qualifying standard. The age of entry to the junior section is to be reduced by stages, so that for the examination in 1941 and subsequent years candidates will have to be under thirty years of age.

The senior section course will train officers to fill first-grade staff appointments and will qualify them for command. This course will also be one year in length. About fifty-five officers will attend this course, of whom about thirty will be Regular Army officers. The Regular officers will be selected by the Army Council without entrance examination. Normally admission will be confined to officers who previously graduated from the junior section course.

Advantages of the reorganization are claimed to be

1. Provision for an adequate number of staff officers for the Army. Consequently, officers lacking staff training will not have to be appointed to the staff as they were in the past.
2. A reduction of five years in the graduating age of the officers, when the system is in full operation.

Antiaircraft Defense and Materiel

The May-June issue of *The Military Engineer* carries an article, "Antiaircraft Defense and Matériel," by Major W. R. Gerhardt, Ordnance Department. Major Gerhardt, now on duty in the Artillery Division of the Office of the Chief of Ordnance, is in close touch with AA methods and matériel developments both past and projected. Therefore he is qualified to speak authoritatively.

The article is non-technical and general in its scope. It is written for the individual who is more or less unfamiliar with methods and matériel employed by antiaircraft artillery. It outlines the problems involved in firing at aerial targets and indicates the instruments employed. Although only general descriptions of these instruments are attempted, the article should serve a useful purpose in enlightening those members of our civilian components who are not familiar with recent developments along antiaircraft lines.

Trophies

There appears to be some misunderstanding regarding the method of award of the Association Trophy for merit in the Army Extension Courses. The rules for the 1937-1938 competition are stated on page 521, COAST ARTILLERY JOURNAL, November-December, 1937.

Multi-Barrelled Pom-Pom

The following extract from a report on "The King With His Fleet in Weymouth Bay," carried in the June 30, 1938, *United Services Review* is of interest. This is because the conclusions in the report are, in part, much at variance with other reports previously received, especially those from Spain:

> One of the amazing features of the programme was the comparative lack of success attending the multi-barrelled pom-pom and machine-gunners in repulsing attack by a "Queen Bee" controlled aircraft.

In contrast, the results of fire from cruisers' 4 in. and 4.5 in. high-angle guns were astounding. The pom-poms failed to bring down a target 1,000 feet distant, whereas the heavier weapons attained success—without the same intensity of barrage fire—at a range of about 9,000 feet.

Their accomplishment, in fact, was the one which caused sober reflection among those inclined to underestimate the progress of antiaircraft defense in the Fleet, for at that distance was attained what appeared to be a direct hit on the target.

Philippine Army Coast Artilllery

In preparation for the time when the defense of the Philippine Islands will devolve entirely upon the government of the Commonwealth, a coast artillery training center for the Philippine Army has been established at Fort Wint, P. I. Twelve to fifteen officers of the Philippine Army will be assigned for duty and the trainees are expected to number around 250. The enlisted detachment of the instructional department will be composed of twenty-five to thirty Philippine Scout soldiers, from the Harbor Defenses of Manila and Subic Bays.

The Government of the Commonwealth is now remodeling a building for use of the American officers on duty at Fort Wint, and is also working over another building to be used as Philippine Army bachelor officers' quarters. Work is also being done on three new sets of quarters for married officers, and the barracks are being reconditioned. Remodeling is being carried out on a building to serve as a combined headquarters and post hospital. The post utilities are being put in shape and Fort Wint will shortly be the delightful station it was in its early days.

Now on duty at Fort Wint are Major W. F. Marquat, Captain John Harry, and Lieutenant R. L. Anderson, all of the Coast Artillery Corps.

Former German Officer in Spain

The following extract from the book review section of the *United Services Review*, April 28, 1938, deals with a book that should not be overlooked. It is understood from a reliable source that the book is receiving thorough study at the L'École Supérieure de Guerre:

LES LECONS MILITAIRES DE LA GUERRE CIVILE EN ESPAGNE. By Helmut Klotz. (Published by the author in Paris.)

"Dr. Klotz, who was formerly an officer in the German Navy, has already been responsible for several works dealing with modern armaments and war, and specially in so far as Germany of today is concerned. . . . But, unlike certain of our newspaper writers who instruct us on lessons of the war in Spain, Dr. Klotz has been there with the Government forces, with which he is in warm sympathy.

"In the tactical sphere he deals with aviation, aerial defence, tanks, and anti-tank defence, and in the strategical with the effects of Spain becoming a base for the dictator Powers of Italy and Germany. In affirming that, in spite of the tank and aeroplane, those two great modern offensive weapons, the attack today is more difficult than ever, he is certainly in the fashion which holds that machines are now more important than men. But he does not overlook the question of morale, attack on which has always been, and must always be, the most deadly of offensive weapons, and he makes the apt point that it has been the morale of the Madrid population that has played the chief part in preventing Franco from subduing the capital by air action.

"It is noted that Spanish experience shows that the number of 'planes shot down by anti-aircraft artillery has been far larger than those destroyed in aerial combat, the reasons being partly in the improvement in ground defence since the Great War—although neither side in Spain is as well equipped as other European nations—and partly because the high speed of the modern 'plane has made aerial duels more difficult.

"The conclusion is drawn that the machine-gun is insufficient armament for the fighter 'plane and should be replaced or supplemented by an automatic gun of about 20-mm. calibre. It is considered, too, that the Spanish war has proved the claims of the air enthusiasts to have been exaggerated. The decision must be sought and obtained on the ground by the infantry, to whom the air arm is auxiliary and subordinate. In the space devoted to tanks, the writer shows himself strongly of opinion that light tanks of less than eight tons have very little value in the attack in that their fire power is insignificant and their armour too weak; moreover, their ability to move freely is unduly dependent on the terrain."

Antiaircraft

The article appearing under the above heading in the July, 1938, *Army Quarterly*, by Robert Rax, is especially worthy of note. The article traces the development of antiaircraft from the days of the Great War to the present. The language and manner of presentation should be especially attractive to the layman. Mr. Rax begins his article with the following statement:

> Antiaircraft batteries were born in the great war. Now, as at the end of the struggle, they form a definite and recognized unit of defence, the importance of which grows more vital every day.

The discussion of the capabilities and limitations of antiaircraft artillery is clear cut and well balanced. The article should be of interest to all beginners and students of this form of defense.

Coast Artillery Activities

OFFICE OF CHIEF OF COAST ARTILLERY

Chief of Coast Artillery
MAJOR GENERAL A. H. SUNDERLAND

Executive
COLONEL JOSEPH A. GREEN

Personnel Section
MAJOR CLARE H. ARMSTRONG

Matériel and Finance Section
MAJOR H. B. HOLMES, JR.
MAJOR J. T. LEWIS
MAJOR S. L. MCCROSKEY

Organization and Training Section
MAJOR D. D. HINMAN
MAJOR AARON BRADSHAW, JR.
MAJOR W. H. WARREN

Plans and Projects Section
LIEUTENANT COLONEL JOHN L. HOMER

Notes from the Chief's Office

A text entitled *Tactical Employment of Antiaircraft* has been prepared at the Coast Artillery School. This is a school text and consists of a series of illustrative problems involving the use of antiaircraft artillery units under various tactical situations. The problems and the accompanying discussions are based on the tactical principles and doctrines that are enunciated in the new Coast Artillery Field Manual Volume II, Antiaircraft Artillery, Part One, Tactics. This text is for sale by the Book Department, Coast Artillery School.

* * *

Major Dale D. Hinman, C.A.C., reports for duty in the office in August, and will take over the duties of chief, Organization and Training Section. Major Hinman is a graduate of the Battery Officers' and Advanced Courses, Coast Artillery School, the Command and General Staff School and the Army War College. Prior to attending the Army War College he served as instructor in the Department of Tactics, Coast Artillery School. Major Hinman has just completed a detail in the General Staff with troops, during which he served as G-3 of the Eighth Corps Area.

* * *

Upon completion of his course at the Army War College on June 22, 1938, Major John T. Lewis reported for duty in the Matériel and Finance Section, Office, Chief of Coast Artillery. Major Lewis' service has been such that he is well qualified for his new assignment. In addition to the usual troop duty assignments, he has served as an instructor at the Coast Artillery School and as a member of the Coast Artillery Board. It is a pleasure to welcome Major Lewis to the office.

* * *

The following is an extract from the Statement of the Managers on the part of the House appearing in the Conference Report on Military Establishment Appropriation Bill, 1939:

> Amendments Nos. 36 and 37, relating to the Ordnance Department: Appropriates $38,232,034, instead of $32,232,034, as proposed by the House, and $48,038,259, as proposed by the Senate, and increases the amount by which the Secretary of War may enter into contracts to be satisfied by subsequent appropriations from $2,900,000, as proposed by the House, to $12,900,000, as proposed by the Senate. It was the sense of the conferees on the part of both Houses that not to exceed $1,200,000 of the additional amount thus made available would be employed on account of tooling and machinery for the production of semiautomatic rifles, and that all of the remainder would be devoted to antiaircraft material for use with seacoast defense or otherwise.
>
> Amendments Nos. 38, 39, 40, and 41, relating to seacoast defenses: Appropriates a total of $6,748,558, as proposed by the House, instead of $23,539,305, as proposed by the Senate, and adheres to the geographical distribution proposed by the House of the amount agreed upon.

★

Fort Monroe

BRIGADIER GENERAL JOHN W. GULICK, U. S. Army, *Commanding*

COLONEL W. E. SHEDD, JR.
Commanding Harbor Defenses of Chesapeake Bay and 2d Coast Artillery (HD)

COLONEL EUGENE B. WALKER
Commanding 51st Coast Artillery (TD)

LIEUTENANT COLONEL FREDERIC A. PRICE
Commanding 52d Coast Artillery (Ry)

By Lieutenant W. J. Worcester

PERSONNEL

The post is pleased to learn of the promotion of 1st Lieutenants W. H. Hennig, R. T. Frederick, and E. D. Peddicord to the grade of captain. Captains Hennig and Frederick are students in the Coast Artillery School, and Captain Peddicord commands Headquarters Battery, 51st Coast Artillery.

The graduation exercises of the Coast Artillery School Class of 1938 were held on June 25th, Major General Sunderland, Chief of Coast Artillery, addressing the class. The General visited Forts Monroe and Story on an inspection tour while the troops were at Story for spring training.

On Tuesday and Thursday evenings, the residents of the post and visitors enjoy the concerts played by the 2d Coast Artillery Band under the direction of Warrant Officer McKean. The concerts are held in the waterfront bandstand.

First Class Cadets from the United States Military Academy will visit the post from August the 12th until August the 16th. Their time will be well filled with drills and entertainment. They will pay a one-day visit to Langley Field before returning to West Point.

New arrivals on the post are Lieutenants Wilford E. H. Voehl, Yale H. Wolfe, Harry S. Tubbs, Joseph S. Piram, and K. R. Kenerick, Lieutenants Voehl, Tubbs, and Kenerick came from the Hawaiian Department and are assigned to the 2d Coast Artillery. Lieutenant Wolfe came from Panama and is assigned to the 2d Coast Artillery. Lieutenant Piram, who came from the Hawaiian Department, is assigned to the 51st.

TROOPS

On May 6th the 51st Coast Artillery went to Fort Story, followed on the 12th by the 52d Coast Artillery for the spring firing by the students of the Coast Artillery School and for their own service practices. 155-mm. guns, 8-inch guns, 12-inch railway mortars, and antiaircraft guns were fired by the troops at Fort Story. All firings were well conducted and went off smoothly. At this time, the scores are not known.

The student officers returned from Fort Story on June 3d, and were followed by the 51st and 52d Coast Artillery on June 9th. Battery "C," 2d Coast Artillery, will remain at Virginia Beach State Rifle Range until June 30th.

The 213th Coast Artillery (AA) Pennsylvania National Guard, is now at Fort Story for its training. One hundred newly commissioned second lieutenants of the Officers' Reserve Corps and 265 members of the ROTC arrived on June 17th for their summer training.

Troops participating in the celebration of the 75th Anniversary of the Battle of Gettysburg were Battery "D," 52d Coast Artillery, a detachment from Battery "A," 2d Coast Artillery, and Battery "F," 52d Coast Artillery. The troops were organized as a provisional battalion, under the command of Lieutenant Colonel L. B. Weeks, 2d Coast Artillery. They took with them five AA searchlights with complete equipment, one 8-inch railway gun, and one 155-mm. gun.

ATHLETICS

The annual Fort Monroe Horse Show was held on May 26th. Approximately 100 residents of the post participated. The hunt teams and jumping were feature attractions, with the ladies' and children's equitation furnishing interesting sidelights.

With the return of the troops from Fort Story, the baseball schedule was resumed. Battery "B," 51st Coast Artillery, fell from the top into fourth position, with the Coast Artillery School Detachment and Headquarters Battery, 2d Coast Artillery, leading the league. The two leading teams have, up to this time, won all their games.

Swimming occupies a prominent place in post life now. The Officers' and the Noncommissioned Staff Officers' Beach Clubs are open and their beaches are always crowded.

★

Panama Canal Department

COLONEL EDWARD A. STOCKTON, JR.
Department Artillery Officer

COLONEL FORREST E. WILLIFORD
Commanding Harbor Defenses of Balboa and 4th Coast Artillery (AA & HD)

COLONEL WILLIAM T. CARPENTER
Commanding Harbor Defenses of Cristobal and 1st Coast Artillery (AA & HD)

LIEUTENANT COLONEL OLIVER L. SPILLER
Commanding Fort Randolph

Fort Amador

By Captain I. H. Kochevar

All record practices for the 4th Coast Artillery (AA), have been completed and the garrison is now preparing for the annual inspection in July.

During the month of May, Batteries "G," "E," and "I" completed firing their primary assignments. Battery "G," under Captain R. H. Grinder, made a score of 128 with the 14-inch railway battery at an average range of 44,000 yards. It had been hoped to fire this battery using a high-speed target, but the length of the tow line had to be shortened, because of the constant parting of the line. In order not to sacrifice range, the speed of the target was reduced to fifteen miles per hour.

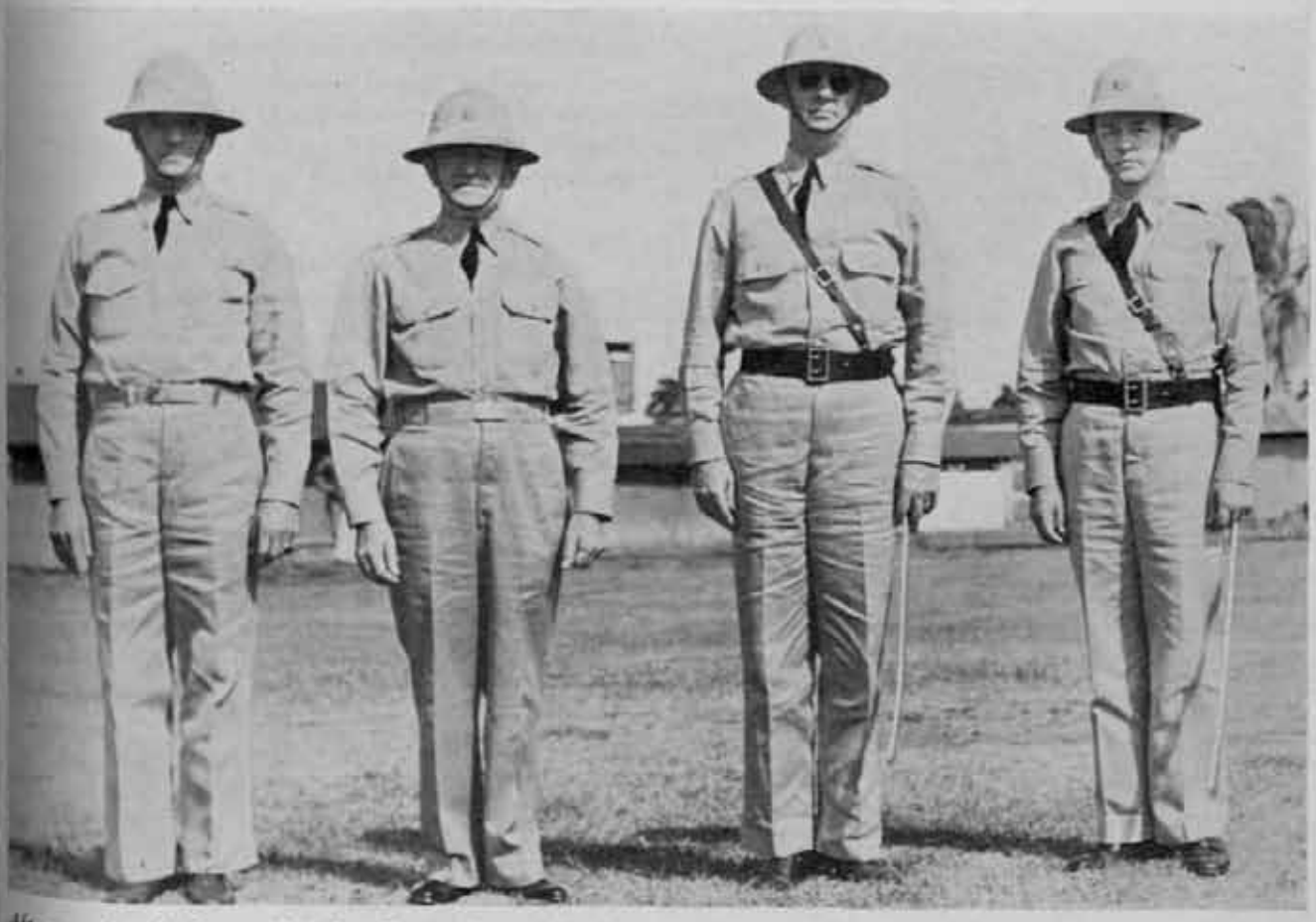
Battery "E," commanded by Captain M. A. Hatch, ran into some hard luck during their record antiaircraft machine-gun firing. With the .30-caliber guns the first platoon made a score of 55.6; two of the courses were lost, as the targets were shot down and could not be retrieved. The second platoon came through with a score of 58.6. In the night practice an average score of 34.8 was made.

Battery "I," under Captain R. L. Miller, completed the firing of the 14-inch disappearing guns with a score of 158.5.

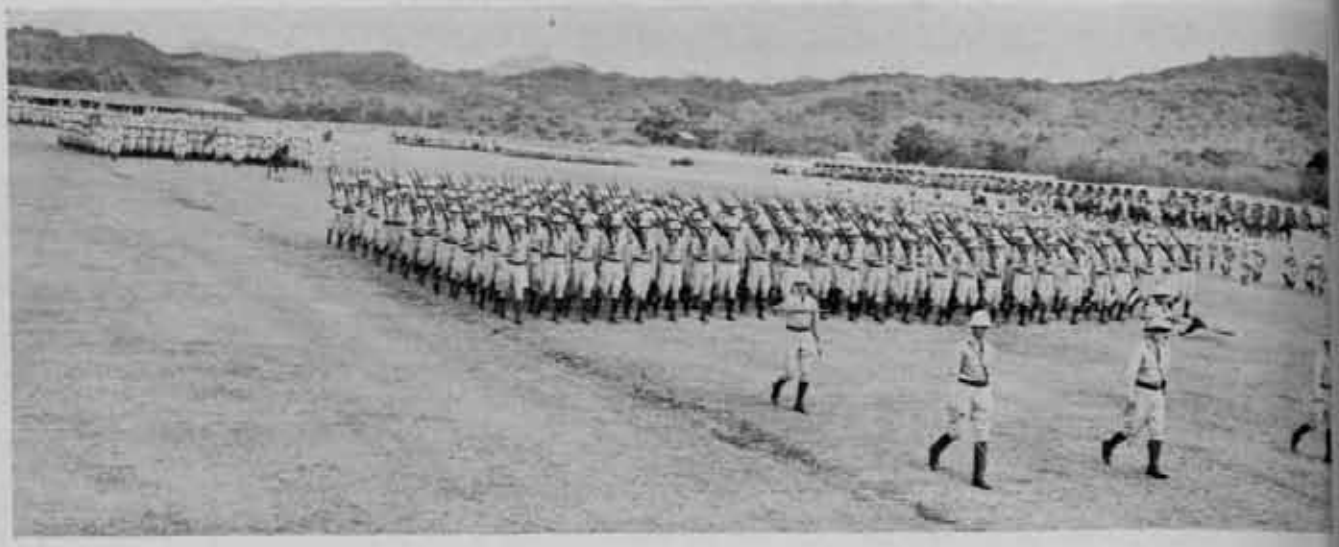
To date, all firings have been completed as scheduled with only a few secondary practices remaining. By maintaining its firing schedule in Panama, the garrison feels that it has established a record.

SPORTS

On June 16th, the inter-battery basketball schedule was completed. Battery "I" won all of the eighteen scheduled games and was declared the post champion. The basketball trophy was presented to the battery by General F.



After a review in honor of Major George W. Whybark, prior to his departure for the United States and retirement. Left to right: Major Whybark, Colonel William T. Carpenter, Lieutenant Colonels Oliver H. Spiller, and William C. Washington.



The 2d Battalion, 4th Coast Artillery (AA), passes in review for General Frederic H. Smith.

H. Smith, at a review. Corporal Gans was voted the most valuable player on the "I" Battery team and was presented with a watch.

Harbor Defenses of Cristobal

By Captain Warren C. Rutter

Harbor Defenses

The 1st Battalion from Fort Randolph and the Band from Fort Sherman participated in the Memorial Day Parade and exercises in Cristobal on May 30. The ceremony in the Mount Hope Cemetery was very impressive.

The 1st Coast Artillery swimming team took first place in the swimming and diving events of the Atlantic Sector Swimming and Water Polo Meet by a close score. Fort Davis won the water polo tournament and the sector championship.

During the past month the sector commander has been making artillery inspections of all the antiaircraft and seacoast installations of the harbor defenses. On June 27 and 28 the Sector Commander will conduct his infantry and administrative inspection of the 1st Coast Artillery, to consist of a garrison review followed by an inspection of all administrative and post activities.

Fort Sherman

Major George W. Dunn, Jr. and his family left here on May 11 for their new station at Fort Moultrie.

Major Louis Farnsworth, who comes from Fort Totten, and Captain George Guiteras, from Fort Jay, arrived at Fort Sherman on May 6. Major Farnsworth takes over the duties of commander of the 2d Battalion, while Captain Guiteras replaces Captain Stephen Berardinelli as assistant surgeon. Captain Berardinelli has returned to his permanent station at Fort Clayton.

Captain Gerald Gibbs and Lieutenant James A. Scott arrived on May 26. Captain Gibbs has relieved Captain George Ford as commanding officer of the Mine Planter *Graham*. Captain Ford has been transferred to the 1st Battalion at Fort Randolph where he will relieve Captain Halvor Myrah of the command of Battery A upon the latter's return to the United States. Lieutenant Scott has been assigned to Battery "F."

The post basketball season ended in a grand tie for various places. Batteries "C" and "F" tied for first place with seven victories and two defeats. Similarly, Headquarters Battery, 2d Battalion and Battery "H" tied for third place. A play-off series of three games between the tied teams has been scheduled. "C" Battery won the first game of the series from "F" and Headquarters defeated "H." The remaining two games promise thrills and excitement.

Fort Randolph

The target practice scores obtained by Battery "B" and Battery "E" 1st Coast Artillery are as follows:

Battery "B" — *3-inch AA Guns*
- 93.0—1st Practice (Day)
- 155.0—2d Practice (Day)
- 44.4—3d Practice (Night)

Battery "E" — *105-mm. Guns*
- 123.6—1st Practice (Day)
- 175.6—2d Practice (Day)
- 489.5—3d Practice (Day)

With reference to additional assignments, Battery "E" has completed its machine-gun firings, while Battery "A" and Battery "B" are preparing to fire machine guns in the near future. All batteries are giving intensive instruction in preparation for small-arms firings.

At the present time Battery "E" is busy on the small-arms range and will complete its work about June 20th.

Headquarters Battery, 1st Battalion, 1st Coast Artillery, is now moving into its new quarters. The old theatre has been converted into a suitable squad room with sufficient space to house seventy-five men.

Hawaiian Separate Coast Artillery Brigade

BRIGADIER GENERAL PHILIP B. PEYTON, *Commanding*
COLONEL ROBERT ARTHUR, *Chief of Staff*
MAJOR F. A. MACON, *Adjutant General & S-1*

CAPTAIN W. H. DUNHAM, *S-2 & Gunnery* — LIEUTENANT COLONEL W. D. FRAZER, *S-3*
LIEUTENANT COLONEL A. E. ROWLAND, *S-4 & War Plans*

CAPTAIN L. D. FLORY
Com. and Engineer Officer

CAPTAIN W. H. KENDALL
Sec. Ath. Officer

CAPTAIN S. E. WHITESIDES, JR.
Chemical Warfare Officer

LIEUTENANT W. A. CALL
Ordnance Officer

COLONEL H. C. MERRIAM
Commanding Harbor Defenses of Pearl Harbor

COLONEL RALPH M. MITCHELL
Commanding 64th Coast Artillery (AA)

COLONEL G. A. WILDRICK
Commanding Harbor Defenses of Honolulu

By Captain Paul B. Kelly

GENERAL PEYTON ARRIVES

Brigadier General Philip B. Peyton arrived on the *Chateau Thierry* to take command of the Hawaiian Separate Coast Artillery Brigade. General Peyton comes from Fort Sheridan, Illinois, where he commanded the 12th Infantry Brigade and the garrison which includes the 61st Coast Artillery. He was met at the dock by Colonel H. C. Merriam, and by Colonel Robert Arthur, the chief of staff. General Peyton then called on the Department Commander, Major General Charles D. Herron, and was later welcomed by the commissioned personnel of the brigade at a reception at the Pavilion Club, Fort DeRussy. General Peyton was accompanied by Mrs. Peyton and his aide, Captain Paul B. Kelly.

On May 24, General Peyton reviewed the command at an impressive ceremony on the parade ground at Fort DeRussy, and thereafter reviewed the component parts of the brigade at the various Coast Artillery posts. He was much impressed with the appearance of the men and the high standards of the command, complimenting the unit commanders upon the excellence of their organizations.

On May 25 the Honorable Joseph B. Poindexter, Governor of Hawaii, returned General Peyton's call at Fort DeRussy and was met by a guard of honor from the harbor defenses of Honolulu. On May 29 an enjoyable brigade picnic was held at the Officers' Beach at Fort Weaver. Swimming, volleyball, baseball, an abundance of fried chicken, sandwiches, cold beer, and ants all combined to enhance the pleasure of the occasion, and to strengthen the *esprit de corps* of this happy family.

The Regular Army contingent in the Memorial Day parade held in Honolulu came from the harbor defenses of Honolulu and the appearance of this representative battalion of Coast Artillerymen received very favorable comment from the reviewing party and the press.

MATÉRIEL INSPECTIONS

The period from the 1st to the 20th of June has been used for the annual matériel inspection. This included a detailed nine-day inspection of all the armament, fire-control equipment and transportation of the 64th Coast Artillery (AA), the harbor defenses of Pearl Harbor, and the harbor defenses of Honolulu. The new brigade commander was favorably impressed with the excellent condition and readiness for combat of all matériel and again expressed himself as being proud to command such a fine and efficient body of troops.

Brigadier General P. B. Peyton, who recently assumed command of the Hawaiian Coast Artillery Brigade, inspects the command at a review held in his honor at Fort DeRussy.

Future Activities

With these ceremonies and inspections behind them, the units of the brigade now look forward to target practice and field maneuvers. The harbor defenses of Honolulu has already held a three-day field maneuver, and has completed its seacoast target practices. The target practice scores are as follows:

A-16 (modified service practice with 155-mm. GPF) ..... 97.5 and 139.4
C-16 (8-inch Ry) 32.1
D-16 (6-inch DC) 116.4

The harbor defenses of Pearl Harbor has completed its antiaircraft target practice and is preparing to fire its annual seacoast practices. Of particular interest this year will be the firing of Battery Williston's two 16-inch BC guns using aircraft for position-finding and adjustment of fire. The 64th Coast Artillery (AA) is taking to the field for 3-inch antiaircraft gun firing at high-altitude targets and for record searchlight practice.

Sports

Track and field contests and baseball games have held the interest of the sport fans for the past two months. During a series of three inter-post dual meets the Honolulu Green Wave squad, coached by Lieutenant Paul Elias of Fort Ruger, came out with flying colors. Undefeated in three meets, they took the honors by a decisive margin.

Fort Kamehameha, Fort Shafter, and Luke Field finished in the order named, after a close race for second place.

George Monlux, big Shafter high- and low-hurdler, was the outstanding individual of the meet, as he set records only to break them again. Several other records were lowered in the meets, in both the track and field events.

At the end of the three meets the coaches from the various organizations, headed by Captain William H. Kendall, sector athletic officer, determined the winners of the first, second, and third places and awarded gold, silver, and bronze medals.

On May 7 the Redlander trackmen from Schofield Barracks, journeyed down to Fort DeRussy for the annual individual department track and field meet. Some 2,000 spectators were on hand to witness the performances of the cream of the Hawaiian Department track and field men and see George Monlux, Shafter, again break a record in the 120-yard high hurdles event. Many other outstanding performances, too numerous to mention, were turned in by several of the men both from Schofield and Sector.

Soon after the track season was over, a new set-up in baseball was inaugurated by Captain Kendall. The interbattery champions from the three posts of the brigade, the inter-squadron champions from Luke Field, and the 74th Ordnance, champions of the Staff League, played one round to determine the Sector interbattery champions. Each team played each other team, making four games for each. Battery G, 64th Coast Artillery, interbattery champions from Fort Shafter, downed their opponents one by one, winning four games and losing none to win the title. Second place was a tie between the Staff team and the Fort Kamehameha squad—two wins and two losses each. The Harbor Defenses of Honolulu's team and the Luke Field Fliers were tied for last with one win and three losses each.

With the interbattery season over, the regular Sector-Navy baseball league got under way on June 25 with seven teams entered. There will be two rounds of play, each team playing twelve games before the close of the season. At the end of this season, the Army champions will meet the Army champions from Schofield Barracks for the Department championship. Should the Navy win the Sector-Navy league, as they have for the past twelve years, they will then play the Army champions for the Island Service title. If the title is won by an Army team this team will play Schofield champions and then play the Navy.

Arriving and Departing Officers

Sailed May 2: Major E. R. Crowell, Capt. C. O. Gunn, Capt. W. G. Holder, Capt. N. A. McLamb, 1st Lieut. T. J. Dayharsh, 1st Lieut. V. H. King, 1st Lieut. R. M. Nelson, and 1st Lieut. H. S. Tubbs.

Arrived May 13: Brig. Gen. P. B. Peyton, Capt. Paul B. Kelly, and 2d Lieut. T. D. Neier.

Sailed May 17: Capt. B. E. Cordell, 1st Lieut. H. W. Ebel, 1st Lieut, K. R. Kenerick, and 1st Lieut. J. S. Piram.

★ ★

Corregidor

Brigadier General Walter K. Wilson, *Commanding*
Colonel T. A. Terry, *Executive*

Colonel George Ruhlen
Commanding 59th Coast Artillery (HD)

Colonel J. H. Cunningham
Commanding 60th Coast Artillery (AA)

Lieutenant Colonel William C. Koenig
Commanding 91st Coast Artillery (PS) (HD)

Lieutenant Colonel Albert H. Warren
Commanding 92d Coast Artillery (PS) (TD)

By Major R. E. Phillips

This news letter covers the months of April and May. Thanks to generous grants of detached service at Camp John Hay, our officer personnel have come through the hot season in fine shape and are now launched on an ambitious program of schools and indoor sports that can be carried on without regard to the rainy season so close at hand.

Soldier baseball has contributed a great deal to the pleasure and entertainment of the garrison the past two months. Who won and how, is a regimental story told below. Fort Mills is making a promising bid for the service baseball championship of the department.

The three battalions of the 31st Infantry visited us during the period. They were in search of a place to fire their weapons at water and aerial moving targets and went into camp at Ordnance Point in the Kindley Field area.

Since last report the U.S.A.T. *Grant* has come and gone. The harbor defense staff line-up changed considerably as a result. We have a new surgeon, Colonel A. E. Schlanser; a reinforcement for the Quartermaster Corps, Major G. C. Pilkington; a new finance officer, Captain McFall; and again a Signal Corps representative is present, Captain H. G. Miller. A considerable number of officers, having accumulated leave and DS credits, have said good-bye to Corregidor friends and departed on trips that will occupy the days until the next trip of the *Grant* takes them back to the States. Lieutenant Colonel Hemenway, AGD, and Lieutenant Peca are among them. Major Christian G. Foltz, assistant adjutant left on the May transport and was succeeded by Major Joseph Hafer—called in from the 59th Coast Artillery. Colonel Hemenway's departure and the absence of any AGD replacement has thrown a double burden on Major Hafer so General Wilson has loaned his aide, Lieutenant Mattern, to assist in the adjutant's office. The departure of Lieutenant Peca resulted in the detail of Lieutenant H. J. Harrison to command the AMP *Harrison*. Other staff changes are the detail of Lieutenant L. L. Ingram as assistant post exchange officer in place of Lieutenant Cooper, and Lieutenant J. C. Moore as assistant harbor defense athletic and post school officer, succeeding Lieutenant E. W. Moore.

Older officers will be interested to learn that Fort Wint, on Grande Island in Subic Bay is having its face lifted, after many years of genteel poverty. Major William F. Marquat, Captain John Harry, and Lieutenant Robert L. Anderson have been detailed to Fort Wint for station. Quarters for their families are under construction and trainees of the Commonwealth Army to the number of about 150 have moved in and begun coast artillery training—the first to be undertaken under their army development program.

Friends of Lieutenant Colonel J. B. Crawford should hasten to congratulate him on his golf prowess. His "hole in one" average for 1938 is two per quarter so far and we are preparing to cable Ripley.

59th Coast Artillery

The past two months bring us to the end of another dry season. As usual for this time of the year, greater emphasis has been placed on recreational activities. Leaves, furloughs, and recuperative detached service have been liberally granted, and officers and men have been enjoying the mountain air of Baguio, or sightseeing in the southern islands.

Inter-battery baseball finished with Headquarters Battery under Lieutenant F. B. Reybold, out in front. The regimental team, also under Lieutenant Reybold, took four straight games from the 60th Coast Artillery to win the post baseball championship for American troops. Pitching honors for this series go to Staff Sergeant Wade H. Ingle, Headquarters Battery, Private First Class Poley H. Allen, Battery "D," and Private Woodrow W. Burton, Battery "G." Sergeant Ingle starred, with two of the four games to his credit. Allen took more than a fair share of the glory that goes to those who smack out bingles; he connected thirteen times in seventeen times at bat—a new record for this post. This team is now in Manila, defending the championship it has won for the past two years in the department tournament.

The softball season is nearing its close; the bowling season is just opening. In volleyball, swimming, and tennis, this regiment has divided honors with the 60th Coast Artillery. Our opponents took volleyball, 2 to 1; we took tennis, 6 to 3; and in swimming we tied.

Lieutenant Edward W. McLain joined on May 11th, the only new arrival on the May transport to be assigned to this regiment. He is now in Battery "D."

60th Coast Artillery

The *Grant* arrived on May 11th, bringing Major Joseph H. Gilbreth and Lieutenant H. Bennett Whipple to the regiment. Major Gilbreth was assigned to command the 1st Battalion and Lieutenant Whipple was appointed regimental supply officer. The regiment lost Captain William L. Richardson and Captain Forrest J. French who returned to the United States on the *Grant* leaving Manila May 19th.

The 60th also lost the services of Major William F. Marquat who has been placed on duty at Fort Wint, as instructor for the Philippine Army.

Under Lieutenant Romlein, the 60th's swimming team had a close match with the 59th Coast Artillery with a final tie score of 31 to 31.

The American troops' volleyball championship for Corregidor was a different story. The 60th won two out of three matches thereby clinching the volleyball cup for this year. In the inter-battery volleyball series, Battery "B" won the regimental championship by defeating "A" Battery in a playoff for first place.

The inter-battery softball season ended with top honors going to "D" Battery. The regimental softball team is now being organized for the annual series with the 59th Coast Artillery.

With the rainy season fast approaching, bowling is in full swing. The 60th has a strong officers' team and won its first three games from the 59th.

Since the end of the war condition period (April 1st) the regiment has been occupied with routine training, care and preservation of matériel and other preparation for the rainy indoor season.

On May 16, a regimental parade was held for the "oldtimers" who were leaving the department on the USAT *Grant*, May 19th. Immediately after the parade the regimental commander and Mrs. Cunningham gave a reception at their quarters honoring the newly joined officers and their families.

91st Coast Artillery (PS)

Lieutenant Colonel Koenig, Majors Bowering and Lavery, Captain Morrow, Lieutenants Pohl, Hartman, and Routh have recently enjoyed detached service at Camp John Hay with their families.

Lieutenant Thomas McG. Metz, arrived on the May boat and is assigned to Battery "B."

Captain Denson has returned to Fort Mills and has assumed command of Battery "D" formerly commanded by Captain Kreuger, who has left post on detached service and terminal leave.

Captain Newman is now commanding Fort Frank.

Batteries "A" and "G" completed excellent mine practices during April.

Lieutenant Harry Harrison, is commanding Mine Planter *Harrison* vice Lieutenant Peca who is due to return to the States on the July transport.

Battery "E" with a percentage of 800, captured the 91st Coast Artillery (PS) baseball trophy for 1938. Batteries "B" and "G" were timed for second place, each with percentages of 600.

May 16 brought the newly organized regimental volleyball league to a close. Battery "A" decisively drove through their opposition for a score of 1,000, and Battery "B" placed second with 800. Volleyball is quite popular in the 91st, as it is well adapted to the supervised athletic periods provided for in the regimental training schedule.

In the first match of the inter-regimental volleyball series, the 91st won from the 92d in straight games with scores of 21-18, 21-16. In the second and concluding match, the 91st won in straight games with scores of 21-16 and 21-17, giving the 91st the Scout troop championship in volleyball for 1938.

The 91st swimmers and divers defeated the 92d tankmen to win the 1938 post swimming championship for Scout troops. The 91st team took first place in all events, except the 50-yard dash and the 200-yard free style swim, netting a final score of 41-21.

The 91st regimental tennis tournament for 1938 was won by Espinosa (Battery "G") in singles, and by Altarejos (Headquarters Battery) and F. Gines (Battery "E") in doubles. Interest in tennis within the 91st has shown a marked increase evidenced by a turnout of 30 entries for the 1938 tournament.

In the 91st-vs-92d championship tennis matches, the 91st singles team won their six matches, while the doubles team dropped only one of their three matches, giving the 91st the scout troop tennis championship (score 8-1) for the third consecutive year.

At the halfway mark Battery "G" led the inter-battery ten-pin league with 900 while Battery "E" followed with 667.

To date Battery "B," Captain E. A. Merkle, commanding, leads as contender for the 1938 91st Coast Artillery athletic supremacy trophy by holding a score of 775. Battery "E," Captain S. H. Morrow, commanding, follows closely with 700.

92d Coast Artillery (PS)

The 92d was defeated in a number of athletic events by the 91st; the latter taking a series in volleyball, another in tennis, and a swimming meet. The regimental bowling league is now under way and the Guard Battalion is off to a flying start that may not be stopped.

Captain Olaf H. Kyster, Jr., and Lieutenant Robert H. Kessler arrived on May 11th and have been assigned to Battery "C."

Captain Douglass G. Pamplin, Lieutenants Samuel McF. McReynolds, Jr., and Edward W. Moore left on the *Grant* on May 19th and Captain Marvin J. McKinney left the same date to spend two months at Baguio before boarding the July transport. Captain John Harry has been sent to Fort Wint to be with the newly established training center for the Philippine Army.

The regiment was well represented at Camp John Hay during April by Lieutenant Colonel Warren, Major McMorrow, Captain Pamplin, and Lieutenants McReynolds, Moore, Hardy, and Cordes.

With the advent of the rainy season, troop schools and gunners' instruction became the order of the day. Preparations are under way to establish vocational and technical schools within the regiment in orientation, communication, motor transport and general education.

New York National Guard Coast Artillery Brigade

BRIGADIER GENERAL WILLIAM OTTMANN, *Commanding*
MAJOR R. V. LEE, *Executive*
CAPTAIN V. R. POGUE, *Plans & Training*
LIEUTENANT J. E. LANG, *Aide*

COLONEL MILLS MILLER
Commanding 244th Coast Artillery (155-mm) (TD)
MAJOR J. L. CRAIG, *Instructor*

COLONEL E. E. GAUCHE
Commanding 212th Coast Artillery (AA)
MAJOR F. A. HAUSE, *Instructor*

COLONEL C. S. GLEIM
Commanding 245th Coast Artillery (HD)
COLONEL L. L. PENDLETON, *Instructor*
MAJOR A. L. PARMELEE, *Instructor*

By Captain V. R. Pogue

Of interest to Coast Artillerymen who are located outside of New York State will be the fact that there is but one brigade of Coast Artillery in the continental United States. This organization is the Coast Artillery Brigade, New York National Guard. The only other similar organization is the Hawaiian Separate Coast Artillery Brigade.

The New York organization has an added distinction: It is composed of three regiments which are assigned different types of armament. The brigade was organized in 1929 to combine all the Coast Artillery of the State into one administrative unit. It has a highly diversified organization, the three regiments representing not only different types of armament but also different missions and organization. For instance, the 244th Coast Artillery is a 155-mm. (tractor-drawn) gun regiment; the 212th Coast Artillery is an antiaircraft regiment; and the 245th Coast Artillery a harbor defense organization.

As the JOURNAL goes to press the regiments will have completed their summer training in accordance with the following schedule:

245th Coast Artillery, Fort H. G. Wright, N. Y., June 18 to July 2.
244th Coast Artillery, Fort Ontario, N. Y., June 26 to July 10.
Brigade Headquarters and Headquarters Detachment, Fort Ontario, N. Y., July 3 to 17.
212th Coast Artillery, Fort Ontario, N. Y., July 10 to 24.

No prophecies regarding the results of target practices will be made, but judging from the results of past years, highly satisfactory performances should be turned in by all three regiments. One of the most surprising things about the National Guard is the rapid conversion of its part-time citizen soldiers into full-fledged "old-timers" by the beginning of the second week in camp. Their own mothers would hardly recognize them as the pale, listless fellows who left home the week before. They march like veterans; look the part; and, more to the point, know how to shoot.

Colonel Mills Miller, commanding the 244th Coast Artillery, who has a host of friends in both the regular service and the National Guard, retires for age on July 11, the day after his regiment returns from camp. And, "as Mrs. Fisher used to say" (one of the Colonel's pet expressions) the brigade loses a valued officer, whose service has been long and faithful.

Fort Barrancas

By Captain J. E. Harriman

Summer camps are in full swing in the Harbor Defenses of Pensacola, with what is believed a record attendance. At the time of writing, 574 CMTC trainees, 168 ROTC cadets and 148 Reserve officers are being trained. A total of 522 Reserve officers—a larger number than at any other Coast Artillery station—are scheduled for training this summer.

Upon completion of the CMTC, Organized Reserve Basic Camp, and the ROTC, now in progress, most of the troops of the garrison will depart for Mississippi, to participate in the Third Army Maneuvers. Fort Barrancas will furnish the bulk of the personnel for Headquarters and Headquarters Company, Brown Corps.

When the maneuvers are over, summer training activities will again become paramount. The 203d Coast Artillery (AA) Missouri National Guard, will conduct its field training at this station during the period August 21-September 3. Moreover, 278 Reserve officers of the following units will be on active duty during the same period:

67th Coast Artillery (AA)
525th Coast Artillery (AA)
540th Coast Artillery (AA)
925th Coast Artillery (AA)
Headquarters, 34th Coast Artillery Brigade
Headquarters, 38th Coast Artillery Brigade
Headquarters, 202d Coast Artillery Brigade
Southern Coastal Frontier
Gulf Sector
Carolina Sector
Florida Sector
623d Coast Artillery (HD)

The total number to be training during the summer is 2,078.

Fort Barrancas has been thoroughly renovated and now presents a spick and span appearance. Facilities at Fort Pickens have been also greatly improved. The many and

varied activities carried on throughout the year and the improved living conditions make Fort Barrancas a most desirable station.

Hartford

Early in June, Hartford Coast Artillerymen held their semi-annual dinner at the University Club. The meeting served a dual purpose: it celebrated the fifteenth anniversary of the organization of the Coast Artillery Corps reserve units in the Connecticut and Western Massachusetts Area, and marked the end of a successful inactive training season.

Several guests were present; two of whom are well known to the Corps: Brigadier General George A. Nugent, U.S.A., Ret., and Colonel Robert C. Eddy, U.S.A., Ret. General Nugent gave an interesting talk on "Forty Years With the Coast Artillery." Colonel Eddy spoke of his experience in organizing the Coast Artillery reserve units in this area. Colonel Eddy was ordered to New London, Connecticut, in 1923, to organize the World War Coast Artillery officers into Organized Reserve Units.

The principal speaker of the evening was Major Lucas E. Schoonmaker, Unit Instructor, Coast Artillery Reserve units in Boston. Major Schoonmaker ably presented his subject, "The Development of the Antiaircraft Artillery," and there were many favorable comments. His wide experience with AA artillery enables him to put across many interesting and instructive points.

Forty Reserve officers attended the dinner; several of them coming from considerable distances. Arrangements for the guests and dinner were handled by Colonel Allyn D. Stoddard, C.A.-Res., commanding the 543d C.A. (AA).

Colonel Lloyd P. Horsfall, C.A.C., commanding officer, 1st Coast Artillery District, read General Orders No. 1, issued upon the death of Master Sergeant Harry A. Ryan, DEML, Chief Clerk, 1st Coast Artillery District.

Maryland

By Captain Jesse J. Hinson

The "Coast Artillery Reserve Officers of Maryland" is the name of a newly formed organization that has been functioning in the Free State since early spring. The group was formed as the result of a joint meeting of Washington-Maryland officers held in March under the sponsorship of Lieutenant Colonel R. S. Atwood, CAC, instructor of Washington Reserve units. The first joint meeting began with a dinner, followed by lectures by Colonel J. B. Bentley, 622d Coast Artillery, and Lieutenant Colonel R. R. Hendon, 913th Coast Artillery.

The group held a second meeting in April at which it was addressed by Major C. L. Lloyd, Infantry of Headquarters 3d Corps Area, and Captain Hugo P. Wise, USA, Retired. Captain Wise, who spoke on "The Personnel Problem of the Future," was asked to repeat his lecture for the benefit of an active duty group meeting at Headquarters 3d Corps Area in July.

The Maryland officers will start their fall and winter season in October with a meeting to be addressed by Colonel Earl W. Thompson, 916th Coast Artillery, on the subject "Aviation Trends of 1938."

The following officers head the Coast Artillery Reserve Officers of Maryland: President, Captain Jesse J. Hinson; Vice-President, Captain Gordon T. Bowles; Secretary, Lieutenant W. B. Bergen; Advisors, Colonel J. B. Bentley, Colonel E. W. Thompson, and Lieutenant Colonels R. R. Hendon and R. S. Atwood.

AS LONG AS MEN AND WOMEN *cherish honor and liberty they must be prepared to defend them with their lives if need be. When our people are unwilling to pay that price they will have no more war—but they will also have no more country.*—SUMMERALL.

Coast Artillery Board Notes

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

THE COAST ARTILLERY BOARD

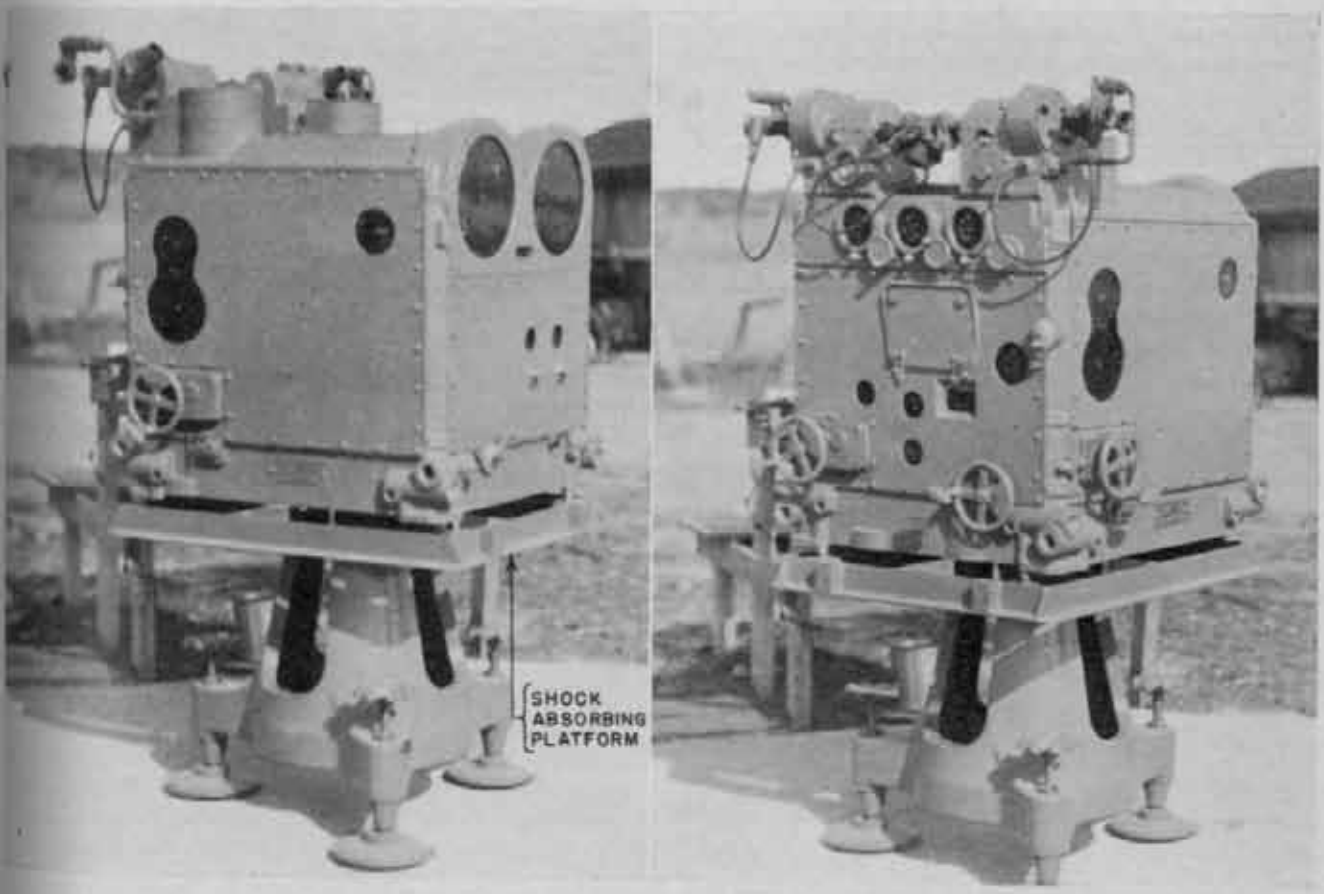
COLONEL WILLIAM S. BOWEN, C.A.C., *President*
MAJOR GORDON B. WELCH, Ordnance Dept.
MAJOR FRANKLIN E. EDGECOMB, C.A.C.
MAJOR HUGH N. HERRICK, C.A.C.
CAPTAIN HOBART HEWETT, C.A.C.
CAPTAIN CORTLANDT VAN R. SCHUYLER, C.A.C.
CAPTAIN CHARLES E. SHEPHERD, C.A.C.
CAPTAIN EDWIN W. CHAMBERLAIN, C.A.C.

General. Since the publication of the May-June issue of the COAST ARTILLERY JOURNAL the Board has been actively engaged in field tests of several types of fire control equipment for antiaircraft automatic weapons. Extensive firings were conducted with caliber-.50 machine guns and 37-mm. guns on antiaircraft mounts. These tests were completed as this issue of the JOURNAL went to press, hence there has not been sufficient time to analyze the results obtained. Information that is not of a restricted or confidential nature, based on the results obtained, will be published at a later date.

Numerous other subjects studied by the Board during the past two months, because of their secret or confidential nature, cannot be reported at this time.

ANTIAIRCRAFT DIRECTOR M4 (PROJECT NO. 1102). As reported in the preceding issue of the JOURNAL, the tests of this instrument were completed in April. The following extract from the report of this project is a comparison of this instrument with existing directors:

Considerations affecting employment. From the point of view of its employment, the Director M4 is a distinct



Director M4

Front view *Rear view*

improvement over the previous types of modern directors. It is smaller, and lighter than all but the M1A1 type and requires fewer operators. On the other hand, its use of automatic rate mechanisms requires a somewhat greater degree of skill on the part of the operators than is required with earlier types of directors. It is constructed so as to permit firing at modern high speed targets. It has one undesirable, though probably unavoidable, feature; namely, its complete dependence upon electrical power, a feature which is common to all modern instruments in our service except directors of the M1A1 type. Even with this latter director, a power failure, though not interfering with the computation of firing data, prevents transmission of the data except by emergency means of data transmission. Of particular importance is the design of the stops, interlocks, and automatic switches which make the instrument fool-proof to all intents and purposes. During the entire period of the tests, no jams were encountered even though no special precautions were given to the operators. On incoming targets, the interlocks on the present and future horizontal range functioned automatically when the future horizontal range decreased to about 300 yards. The operations to release the interlocks were simple and became automatic after one or two operations.

Considerations affecting maintenance. Experience with the director during the test has been too brief to form an accurate estimate of maintenance problems. The only maintenance performed during the tests was the cleaning of one pair of contacts, requiring perhaps ten minutes. Certainly many of the maintenance problems of earlier Sperry type directors have been avoided. It is possible that it may require no more maintenance than the average M1A1 director though this will not be known definitely until directors of this new type have been in service for some time. No difficulties in maintenance can be foreseen at this time.

Considerations affecting procurement. It is probable that in this one respect more than any other, there has been a tremendous improvement over previous models. There has been a marked reduction in the time required for the assembly and test of the director through the use of unit assemblies. While the Board has no definite knowledge of the subject, it is understood that director procurement, of the M4 type, can keep abreast of, if not exceed, the rate at which guns can be manufactured.

3-INCH ANTIAIRCRAFT GUN T-9 ON ANTIAIRCRAFT MOUNT T-4 (PROJECT NO. 1128). The purpose of the test of this matériel was to determine its suitability for adoption as standard in place of the present standard gun on the four-wheel mount. The subject mount was designed to provide a light, single axle mount carrying a gun of the same ballistic qualities as the M-3. Several changes in design of both the gun and mount were made before the T-9 gun on the T-4 mount was available for test on May 18, 1938.

The following tabulation shows a comparison of certain important characteristics of the new gun and mount and the standard gun and mount.

	T9 Gun, T4 Mount	M3 Gun, M2A2 Mount
Weight, gun and mount, in traveling position, pounds	11,420	17,144
Weight, gun and mount, in firing position, pounds	8,835	13,000 (approx.)
Approximate weight on rear axle, pounds	11,000 (dual tires)	8,500 (single tires)
Approximate weight on front axle, pounds	None	8,500
Approximate weight on pintle of prime mover, pounds	305	Negligible
Approximate weight on each tire, pounds	2,750	4,250
Height of trunnions above ground, firing position, inches	56	69
Height of platform above ground, inches	17.5	16
Width of tread, inches	86¾ (outside tires)	66
Maximum elevation, degrees	80	80
Minimum elevation, degrees	—1	—1
Normal recoil at minimum elevation, inches	43 (approx.)	32 (approx.)
Normal recoil at maximum elevation, inches	23 (approx.)	32 (approx.)
Diagonal length of outriggers, feet	38	52
Turning radius	(mount can be traversed by hand about a point)	23 feet.

3-Inch AA Gun T9 and Mount T4

Left: *AA gun mount T4 being towed through a mud hole.* Right: *The gun at the end of test after 117 rounds in fourteen minutes elapsed time. Note the paint on the gun tube. Waste in the muzzle was charred by heat.*

During the road test the action of the gun and mount, while being towed a distance of approximately 270 miles, was entirely satisfactory.

The following extract from the report of this project is a comparison of the new gun and mount with the present standard matériel:

Considerations affecting employment. The new gun has the same ballistic qualities as the present standard gun. It is capable of being fired at the same rate and its mount is at least as stable as the old mount. Hence the new gun and mount possesses the same fire power as the standard gun and mount. Being lighter and smaller, the new mount is somewhat more mobile and maneuverable and will probably require a smaller and less expensive prime mover. The new mount can be emplaced and returned to the firing position in considerably less time than the standard mount.

The lower trunnion height and shorter outriggers will probably make the new mount less conspicuous and easier to camouflage than the standard mount.

The standard gun has a removable liner but the entire tube of the new gun can be removed when the gun is worn out. Hence, without any sacrifice in fire power, the new gun and mount represent a considerable improvement over the standard weapon.

Considerations affecting maintenance. It is believed that the maintenance problems of the new gun and mount will be approximately the same as those of the present standard gun and mount. The flexible air hose of the present braking system probably will be damaged frequently. The installation of electric brakes will eliminate this particular item of maintenance.

Considerations affecting procurement.

a. Procurement of the new gun will be easier than the standard gun because no liner is required.

b. It is believed that procurement of the new mount will not present any more difficulty than procurement of the standard mount.

The Board concluded that the T-9 gun and T-4 mount, subject to minor modifications will be a very satisfactory weapon and recommended that the gun and mount be adopted as standard items of antiaircraft matériel. However, due to delays in manufacture, caused by design changes during the development of the mount, the test was not completed in time to permit quantity production with current appropriated funds.

Present plans contemplate the manufacture, at an early date, of eight guns and mounts for issue to two antiaircraft gun batteries for an extended service test.

ANTIAIRCRAFT SEARCHLIGHT (1937) WITH ZERO READER (PROJECT NO. 1133). The Board tested the new M1937 searchlight equipment during June in order to determine possible modifications which might be desirable in future models. While most of the features of the new equipment are of standard design certain improvements have been made. The most important of these improvements are discussed below.

a. Control station. The control station is of new design and departs from standard design in the following particulars:

(1) *Method of control of searchlight.* The standard self-synchronous method of data transmission between sound locator and searchlight has been replaced by a self-synchronous zero reader system. This zero reader system employs the same type of selsyn transmitters and receivers as formerly have been employed in the standard repeat-back data transmission system, differing from that system chiefly in the fact that no transmitters are required at the control station. Thus two transmitters and two receivers (one each for elevation and azimuth) are saved per searchlight unit. The operation of the zero reader system may best be described by comparing it with the type of data transmission used in the M1934 equipment.

(*a*) In the M1934 equipment movement of the sound locator in azimuth or elevation is transmitted through selsyn transmitters to the control station where pointer carrying dials are driven through selsyn receivers to a position corresponding to that of the sound locator. By means of the distant electrical system the searchlight is then traversed, elevated or depressed until its position corresponds to that of the sound locator, this condition being indicated at the control station when the pointer of a dial, concentric with that driven by the sound locator and positioned by the movement of the searchlight transmitted through a second and independent set of transmitters and receivers, matches that of the sound locator dial.

(*b*) In the zero reader system movement of the sound locator is transmitted, through a selsyn transmitter, directly to a corresponding receiver at the searchlight. The power leads of this receiver are then connected into a simple phase detecting circuit (instead of being connected back to the power source as in the normal selsyn system) and the lead or lag of the position of the searchlight with respect to the sound locator is indicated by a zero reader voltmeter at the searchlight. A parallel circuit containing a similar voltmeter indicates this same lead or lag at the control station. The searchlight is set to sound locator data (after it has been properly oriented and synchronized) when these voltmeters read zero. It will be noted that the light may be set on sound locator data either by moving the light by means of extended hand control until the voltmeter at the light reads zero or by moving the light by means of distant electrical control until the voltmeter at the control station reads zero. Synchronism of the system, when making a new set-up, is effected simply by rotating the housing of the selsyn receivers at the light until the voltmeters read zero when both light and sound locator are pointed in the same direction.

(2) *Method of mechanical search.* The M1937 searchlight equipment has machine-driven search in elevation only. Search in azimuth is provided through a

manual means of displacing the pointer of the azimuth zero reader. The pointer matcher, in traversing the light to re-zero his pointer, causes the light to lead or lag sound locator data. The amount of this lead or lag is varied by the amount by which the pointer of the voltmeter is displaced. Means are provided for varying the amount of vertical search.

(3) *Binocular mount.* An improved binocular mount, which may be removed to facilitate transportation of the control station, has been provided. Features worthy of note in the new binocular mount are improvements in the movements of the horizontal axis of rotation of the binocular, so as to provide easier use of the binocular at high angles of elevation, and the provision of friction devices in both the elevation and azimuth drives of the binocular mount so that the controller operator may direct his binoculars to any point either along or to one side of the beam while searching, without disturbing the operation of pointer matching.

b. Searchlight. The M1937 searchlight does not differ essentially from other models. Minor points of difference are:

(1) The provision of ballasting resistors in the main power leads to compensate for shorter power cables.

(2) The provision of a phase detecting circuit and two zero reading voltmeters as a part of the zero reader data transmission system.

(3) Provision for arc operation on 150 and 195 amperes only.

c. Power Plant. The power plant does not differ materially from the power plant supplied with portable models of the M1934 equipment. The power plant is mounted on a chassis and may be transported as a trailed load.

d. Cables. Two 100-foot power cables are provided, for connecting the power plant to the light, in place of the two 600-foot cables provided for the old equipment. One 700-foot cable is provided for connecting the light and the control station. Cables for connecting the light and sound locator (normally a part of sound locator equipment) are unchanged from those supplied with M1934 equipment. It should be noted, however, that since the receiver has to do no work in the zero reader system of data transmission, currents in the leads of the sound locator cable are small and hence smaller cable may be used and the separation between sound locator and light may be considerably increased without adverse affect upon accuracy.

The M1937 searchlight equipment functioned excellently throughout the tests. Considering the difficulty of picking up a high altitude target (practices were conducted at altitudes up to and including 14,000 feet) when using but a single light for the search the frequency of pick-up obtained with the M1937 equipment appears to be highly satisfactory. The M1937 control station is believed to be slightly superior to older types of control stations in so far as ease of operation is concerned. The provision of slippage in the elevation and azimuth motions of the binocular mount, is believed to be a distinct improvement. The zero reader data transmission system is sufficiently accurate for the purpose for which it is used, adapts itself to simple and easy orientation and apparently is not subject to loss of orientation during operation of the unit.

The Coast Artillery Board believes that certain modifications are desirable in future procurement of searchlight equipment of this type. Chief among these modifications is the elimination of any provision for mechanical search. As has been noted above machine-operated search is provided in elevation only, search in azimuth being provided for by a manual means of displacing the pointer on the azimuth zero reader. The Coast Artillery Board believes that mechanical search not only is no longer necessary but is undesirable. Loose matching of pointers provides a controlled search and allows the controller operator to maintain a more positive control of his light. In the subject tests, while using mechanical search, it was noted that numerous flicks were made but, before the controller operator could take over the light and bring the beam onto the target the target would be lost, thus requiring further search. Loose matching of pointers obviated this since, when the controller operator called "target" pointer matchers kept their pointers matched in the same relative position thus keeping the beam close to the target while the controller operator was reaching for the controls.

a. The binocular mount on the control station is an improvement over prior types. However, the inclusion of the mount as a part of the control station is open to certain objections. The vision of the controller operator is considerably restricted particularly when the control station is displaced the maximum distance from the searchlight. Under such circumstances the target will not appear to be at the end of the beam but will be some distance down the beam due to the greater parallax angle. Furthermore, under certain conditions the position of the target may be betrayed by its silhouette, either against clouds or against the beam. While searching, therefore, the observer must be able to move his glasses both up and down the beam and to either side of the beam. The present binocular mount permits this but such movement must be accomplished by hand so that the observer is not entirely free to assume control of the light instantly.

b. The ideal binocular mount should be one which will give the observer, as nearly as possible, the same freedom which he would have were he observing with the naked eye. This freedom is not obtained in the present mount nor is it believed that it can be obtained in any mount fixed to the control station. The Coast Artillery Board believes that steps should be taken to develop an experimental mount, capable of supporting an adequate binocular, which could be worn on the head and shoulders of the observer. Such a mount should provide a considerably greater freedom of vision while leaving the observer's hands free to control the light.

c. The development of a suitable binocular mount, of the type described above, would permit a further simplification of the control station. In addition such a mount

would be extremely valuable for other antiaircraft purposes. Machine-gun fire control is one such purpose.

d. The displacement between power plant and searchlight is limited to 100 feet in the M1937 equipment by the lengths of power cable now provided. While the reduction in the lengths of power cable from a total of 1,200 feet to a total of 200 feet (two power cables being required for each unit) represents a considerable saving in cost the Coast Artillery Board is of the opinion that the smaller displacement, now possible between power plant and light, makes this equipment less flexible than is desirable. Considerations such as terrain and cover may, in many instances, require that the power plant be located some distance from the light and it is believed, therefore, that a possible displacement of 200 feet should be provided for.

The Coast Artillery Board concluded that:

a. The M1937 searchlight is adequate and is superior to older types of equipment.

b. The zero reader system of data transmission should be retained on all future equipments.

c. All means of mechanical search should be eliminated in future models, entire reliance being placed on loose matching of pointers.

d. Effort should be made to develop a binocular mount which can be worn on the head and shoulders of the controller operator and will be independent of the control station.

e. Sufficient power cable should be provided to permit the power plant and searchlight to be separated by a maximum of 200 feet.

Suitable recommendations were submitted covering these conclusions.

Coast Artillery Orders

(Covering the period May 1 to June 30, 1938)

Colonel L. C. Brinton, Jr., to home, and await retirement.

Colonel G. W. Cocheu, from General Staff Corps, Washington, D. C., to 1st C.A. District, Boston.

Colonel A. J. Cooper, from General Staff Corps, Washington, D. C., to 2d C.A. District, New York.

Colonel J. H. Cunningham, from the Philippines, to Org. Res. 9th Corps Area, Los Angeles.

Colonel P. H. Herman, from 10th, Ft. Adams, to Org. Res. 9th Corps Area, Portland, Ore.

Colonel Allen Kimberly, from 69th, Ft. Crockett, to duty with the U. S. Military Mission to Brazil, Rio de Janeiro, sailing New York, July 2.

Colonel E. D'A. Pearce, retired, June 30.

Colonel M. G. Spinks, retired, June 30.

Colonel F. E. Williford, from Panama, to 7th, Ft. Hancock.

Lieutenant Colonel E. E. Bennett promoted Colonel, April 30.

Lieutenant Colonel R. D. Brown, to report to American minister, American Legation, Bern, Switzerland, for duty as military attaché.

Lieutenant Colonel F. P. Hardaway, from Hawaii, to 11th, Ft. H. G. Wright.

Lieutenant Colonel J. H. Hood, from the Philippines, to Org. Res. 9th Corps Area, Los Angeles.

Lieutenant Colonel J. H. Lindt, to Hawaii, sailing San Francisco, Nov. 1.

Lieutenant Colonel F. A. Mountford, from Org. Res. 9th Corps Area, Portland, Ore., to San Francisco Port of Embarkation, Ft. Mason.

Lieutenant Colonel H. R. Oldfield promoted Colonel June 1.

Lieutenant Colonel J. T. H. O'Rear, to 65th, Ft. Winfield Scott. Previous orders amended.

Lieutenant Colonel F. A. Price, from 52d, Ft. Monroe, to the Philippines, sailing New York, Sept. 9.

Lieutenant Colonel C. J. Smith, from Hawaii, to duty with recruiting, New York.

Lieutenant Colonel J. S. Smylie, from Panama, to Inspector General's Department, Chicago.

Lieutenant Colonel C. M. Thiele, from 63d, Ft. MacArthur, to the Philippines, sailing San Francisco, Oct. 1.

Major R. T. Chaplin, from 2d Corps Area, Governors Island, to 1st C.A. District, Boston.

Major W. J. Gilbert, from 16th, Ft. Ruger, to McKinley High School, Honolulu.

Major A. W. Gower, from duty with recruiting, New York, to Panama, sailing New York, Oct. 20.

Major J. L. Hayden, from U.S.M.A., West Point, to Panama, sailing New York, Aug. 25.

Major D. W. Hickey, Jr., from student, C.&G.S. School, to 65th, Ft. Winfield Scott. Previous orders revoked.

Major A. M. Jackson, from Panama, to 65th, Ft. Winfield Scott.

Major J. R. Lowder, from Hawaii, to 5th, Ft. Wadsworth.

Major R. E. McGarraugh, from 2d, Ft. Monroe, to Georgia School of Tech., Atlanta.

Major H. C. Mabbott, from Hawaii, to duty as C.A. representative, Engineer Board, Ft. Belvoir.

Major C. G. Riggs, from 5th, Ft. Wadsworth, to University of Kansas, Lawrence.

Major William Sackville, from Engineer Board, Ft. Belvoir, to duty with U. S. Military Mission to Brazil, Rio de Janeiro, sailing New York, July 2.

Major F. L. Topping, from 1st C.A. District, Boston, to Hawaii, sailing New York, Sept. 1.

Major G. W. Whybark, retired upon his own application, Aug. 31.

Captain W. I. Brady, to Hawaii, sailing New York, Sept. 1. Previous orders amended.

Captain L. R. Bullene, from 62d, Ft. Totten, to Panama, sailing New York, Oct. 20.

Captain W. R. Carlson promoted Major, June 1.

Captain J. W. Davis, from 63d, Ft. MacArthur, to Panama, sailing San Francisco, Aug. 30.

Captain T. J. Davharsh, from 6th, Ft. Winfield Scott, to 65th, June 1.

Captain C. S. Denny, from Washington, D. C., to Governors Island, Finance Department. Previous orders amended.

Captain J. H. Fonvielle, from 69th, Ft. Crockett, to the Philippines, sailing San Francisco, Oct. 1.

Captain J. R. Goodall, from 11th, Ft. H. G. Wright, to Panama, sailing New York, Oct. 20.

Captain R. H. Grinder, from Panama, to 2d, Ft. Monroe.

Captain N. T. Haakensen, from Panama, to 6th, Ft. Winfield Scott.

Captain J. I. Hincke, from Hawaii, to 51st, Ft. Monroe.

Captain J. L. Hogan, from 62d, Ft. Totten, to the Philippines, sailing New York, Sept. 9.

Captain W. G. Holder, from 6th, Ft. Winfield Scott, to 65th, June 1.

Captain David Hottenstein, from student, Department of Justice, Washington, D. C., to office, Judge Advocate General, Washington, D. C.

Captain L. S. Kirkpatrick, from 8th, Ft. Preble, to the Philippines, sailing New York, Sept. 9.

Captain E. A. Kleinman, from the Philippines, to 6th, Ft. Winfield Scott.

Captain Dean Luce, from 6th, Ft. Winfield Scott, to the Philippines, sailing San Francisco, Oct. 1.

Captain H. E. Magnuson, transferred to Quartermaster Corps, April 29.

Captain E. G. Martin, from the Philippines, to 51st, Ft. Monroe.

Captain J. E. McGraw, from Signal Corps, Philippines, to 14th, Ft. Worden.

Captain R. L. Miller, from Panama, to 62d, Ft. Totten.

Captain J. E. Mortimer, from Panama, to student, C.A.S.

Captain W. F. Niethamer, from Panama, to 13th, Ft. Barrancas.

Captain G. W. Palmer, from Hawaii, to 8th, Ft. Preble.

Captain M. G. Pohl, from the Philippines, to 65th, Ft. Winfield Scott.

Captain J. E. Reierson, from Panama, to 2d, Ft. Monroe.

Captain L. G. Ross, from Hawaii, to 2d, Ft. Monroe.

Captain J. A. Sawyer, from USAMP *General J. Franklin Bell*, Ft. Worden, to Signal Corps, Aug. 11.

Captain P. W. Shunk, from student, C.A.S., to student, Mass. Inst. of Tech., Cambridge.

Captain J. F. Stiley promoted Major, April 1.

Captain Raymond Stone, Jr., transferred to Adjutant General's Department, April 26.

Captain H. P. Tasker, from U.S.M.A., West Point, to 52d, Ft. Hancock.

Captain C. F. Tischbein, from Hawaii, to 2d, Ft. Monroe.

Captain T. B. White, to 65th, Ft. Winfield Scott, amended.

Captain C. M. Wolff, from USAMP *General Edward O. C. Ord*, Ft. Hancock, to 65th, Ft. Winfield Scott.

Captain F. J. Woods, from 52d, Ft. Hancock, to 7th, Ft. Hancock.

First Lieutenant J. G. Bain promoted Captain, June 9.

First Lieutenant J. T. Barber, from Hawaii, to 11th, Ft. H. G. Wright.

First Lieutenant E. N. Chace, from 11th, Ft. H. G. Wright, to student, C.A.S., Sept. 9.

First Lieutenant H. C. Donnelly, from the Philippines, to 6th, Ft. Winfield Scott.

First Lieutenant Paul Elias, from Hawaii, to 61st, Ft. Sheridan.

First Lieutenant R. T. Frederick promoted Captain, June 9.

First Lieutenant E. E. Hackman, from 52d, Ft. Hancock, to student, C.A.S., Sept. 9.

First Lieutenant R. M. Hardy, from the Philippines, to 63d, Ft. MacArthur.

First Lieutenant A. R. Hartman promoted Captain, June 9.

First Lieutenant E. F. Heidland, from Hawaii, to USAMP *General Edward O. C. Ord*, Ft. Hancock.

First Lieutenant W. H. Hennig promoted Captain, June 9.

First Lieutenant M. M. Irvine, from student, Mass. Inst. of Tech., Cambridge, to the Philippines, sailing New York, Sept. 9. Previous orders amended.

First Lieutenant D. B. Johnson, from student, C.A.S., to U.S.M.A., West Point. Previous orders revoked.

First Lieutenant Franklin Kemble, Jr., from student, C.A.S., to Ordnance Department, Springfield Armory, Springfield. Previous orders revoked.

First Lieutenant R. J. Lawlor, from 14th, to USAMP *General J. Franklin Bell*, Ft. Worden.

First Lieutenant R. C. Leslie, from student, C.A.S., to U.S.M.A., West Point. Previous orders revoked.

First Lieutenant F. M. McGoldrick, from Hawaii, to 11th, Ft. H. G. Wright.

First Lieutenant W. F. McKee, from the Philippines, to 65th, Ft. Winfield Scott.

First Lieutenant E. D. Peddicord promoted Captain, June 9.

First Lieutenant R. A. Pillivant, from Hawaii, to 62d, Ft. Totten.

First Lieutenant M. B. Raymond promoted Captain, June 9.

First Lieutenant F. B. Reybold, from the Philippines, to 62d, Ft. Totten.

First Lieutenant D. B. Routh, from the Philippines, to 62d, Ft. Totten.

First Lieutenant S. C. Russell, from student, to instructor, C.A.S., revoked.

First Lieutenant A. W. Schermacher promoted Captain, June 9.

First Lieutenant K. R. Schweidel, from Air Corps Training Center, Randolph Field, to 65th, Ft. Winfield Scott.

First Lieutenant A. J. Stuart, Jr., from Panama, to Ordnance Department, to student, Ordnance School, Watertown Arsenal. Previous orders revoked.

First Lieutenant L. K. Tarrant promoted Captain, June 9.

First Lieutenant A. R. Thomas promoted Captain, June 9.

First Lieutenant R. F. Tomlin promoted Captain, June 9.

First Lieutenant Robert Totten, from Hawaii, to 65th, Ft. Winfield Scott.

First Lieutenant H. F. Turner, from Hawaii, to 65th, Ft. Winfield Scott. Previous orders amended.

First Lieutenant H. P. vanOrmer, from Panama, to 52d, Ft. Monroe.

First Lieutenant W. M. Vestal, from San Francisco Port of Embarkation, Ft. Mason, to C.A.S. Previous orders amended.

First Lieutenant L. T. Vickers promoted Captain June 9.

First Lieutenant M. G. Weber, from student, C.A.S., to 4th C.A. District, Ft. McPherson. Previous orders revoked.

First Lieutenant G. J. Weitzel, from the Philippines, to 11th, Ft. H. Wright. Previous orders revoked.

First Lieutenant D. M. Wilson promoted Captain, June 9.

Second Lieutenant John Alfrey promoted First Lieutenant, June 12.

Second Lieutenant Alfred Ashman promoted First Lieutenant, June 12.

Second Lieutenant W. H. Baynes promoted First Lieutenant, June 12.

Second Lieutenant R. C. Boys promoted First Lieutenant, June 12.

Second Lieutenant K. I. Curtis promoted First Lieutenant, June 12.

Second Lieutenant J. M. Donohue promoted First Lieutenant, June 12.

Second Lieutenant S. W. Foote promoted First Lieutenant, June 12.

Second Lieutenant R. E. Frith, Jr. promoted First Lieutenant, June 12.

Second Lieutenant H. R. Greenlee, Jr promoted First Lieutenant, June 12.

Second Lieutenant H. R. Hale promoted First Lieutenant, June 12.

Second Lieutenant H. J. Harrison promoted First Lieutenant, June 12.

Second Lieutenant C. W. Hildebrandt promoted First Lieutenant, June 12.

Second Lieutenant J. N. Howell promoted First Lieutenant, June 12.

Second Lieutenant R. M. Miner promoted First Lieutenant, June 12.

Second Lieutenant J. C. Moore promoted First Lieutenant, June 12.

Second Lieutenant J. B. Morgan promoted First Lieutenant, June 12.

Second Lieutenant Robert Morris promoted First Lieutenant, June 12.

Second Lieutenant W. R. Murrin promoted First Lieutenant, June 12.

Second Lieutenant N. T. Perkins, from Panama, to 62d, Ft. Totten.

Second Lieutenant A. D. Robbins promoted First Lieutenant, June 12.

Second Lieutenant W. G. Root promoted First Lieutenant, June 12.

Second Lieutenant N. A. Skinrood promoted First Lieutenant, June 12.

Second Lieutenant H. H. Spengler, from 63d, Ft. MacArthur, to the Philippines, sailing San Francisco, Oct. 1.

Second Lieutenant O. B. Steely, from 61st, Ft. Sheridan, to Hawaii, sailing New York, Sept. 1.

Second Lieutenant E. H. Walter promoted First Lieutenant, June 12.

Second Lieutenant B. S. Waterman promoted First Lieutenant, June 12.

Second Lieutenant S. L. Weld promoted First Lieutenant, June 12.

Second Lieutenant G. R. Wilkins promoted First Lieutenant, June 12.

Second Lieutenant P. H. Wollaston promoted First Lieutenant, June 12.

★

At the Schools, 1938-1939

THE COAST ARTILLERY SCHOOL

COMMANDANT

Brig. Gen. John W. Gulick

Staff

Lt. Col. Richard F. Cox, *Assistant Commandant*
Lt. Col. Randolph T. Pendleton, *C.O., C.A.S.D.*
Captain George A. Chester, *Librarian*
Major Porter P. Lowry, *Secretary*

INSTRUCTORS

Tactics

Lt. Col. H. F. Nichols
Lt. Col. E. L. Poland (Inf.)
Major G. B. Robison
Major O. B. Trigg (Cav.)
Major D. M. Griggs
Major M. C. Handwerk
Major D. E. Morrison
Major F. M. Paul (A.C.)
Captain L. L. Lemnitzer

Artillery

Lt. Col. R. V. Cramer
Major P. W. Lewis
Major L. C. Dennis
Captain F. B. Kane
Captain C. W. Holcomb

Engineering

Lt. Col. R. V. Cramer
Major H. McC. Cochran
Major O. D. McNeely
1st Lt. Sam C. Russell

Enlisted Specialists

Lt. Col. R. T. Pendleton
Captain N. E. Hartman
Captain D. G. Pamplin
Captain V. C. Stevens

Extension Courses

Major C. G. Foltz
Captain W. B. Merritt
Captain G. A. Chester
Captain H. J. Vandersluis

STUDENTS

Regular Course

Captain J. F. Sturman, Jr.
Captain D. M. Wilson
1st Lt. R. W. Moore
1st Lt. E. C. Mitchell
1st Lt. C. E. Green
1st Lt. A. J. Sutherland, Jr.
1st Lt. R. M. Nelson
1st Lt. M. L. Ogden
1st Lt. H. A. Gerhardt
1st Lt. E. N. Chace
1st Lt. R. D. Glassburn
1st Lt. R. L. Williams, Jr.
1st Lt. S. M. Mellnik
1st Lt. D. D. Edison
1st Lt. F. W. Ebey
1st Lt. W. H. Ball
1st Lt. E. O. Taylor
1st Lt. L. C. Ratcliffe
1st Lt. R. L. Matteson
1st Lt. S. F. Giffin
1st Lt. H. S. Tubbs
1st Lt. E. E. Hackman
1st Lt. J. F. Thorlin
1st Lt. W. G. Fritz
1st Lt. R. W. Hain
1st Lt. G. H. Crawford
1st Lt. S. McF. McReynolds
1st Lt. A. J. Cooper, Jr.
1st Lt. V. H. King
1st Lt. R. E. Gallagher
1st Lt. C. W. Powell
1st Lt. E. W. Moore
1st Lt. W. E. H. Voehl
1st Lt. P. S. Peca
1st Lt. R. R. Moorman
1st Lt. T. F. Hoffman
1st Lt. J. S. Piram
1st Lt. J. duV. Stevens
1st Lt. Y. H. Wolfe
1st Lt. H. W. Ebel
1st Lt. R. G. Finkenaur
1st Lt. K. R. Kenerick
Capt. J. W. Earnshaw (USMC)
Capt. W. F. Parks (USMC)
Capt. E. O. Price (USMC)

Advanced Technical Course

Captain J. E. Mortimer
1st Lt. W. M. Vestal
1st Lt. A. C. Peterson
1st Lt. T. V. Stayton
1st Lt. W. M. Skidmore
1st Lt. R. A. Turner

COMMAND AND GENERAL STAFF SCHOOL

Instructors

Lt. Col. G. R. Meyer
Lt. Col. C. E. Hocker
Major E. M. Benitez (Staff)
Major W. W. Irvine
Major T. R. Phillips
Major J. H. Wilson
Major H. F. E. Bultman
Major B. L. Milburn

Students

Major J. R. Townsend
Major C. S. Harris
Major E. R. Crowell
Major Samuel McCullough
Major W. D. Hohenthal
Major W. W. Scott
Captain R. E. Dingeman
Captain R. A. Ericson
Captain N. A. Burnell, 2d
Captain F. L. Hayden
Captain L. W. Bartlett
Captain Edward Barber
Captain W. S. Lawton
Captain E. B. Thompson
Captain G. H. Stubbs
Captain W. L. Richardson
Captain J. F. Howell, Jr.
Captain W. L. Wright
Captain F. F. Scheiffler
Captain A. H. Bender
Captain J. R. Lovell
Captain R. T. Frederick

ARMY WAR COLLEGE

Instructor

Major G. DeL. Carrington

Students

Lt. Col. J. L. Homer
Lt. Col. L. B. Weeks
Lt. Col. H. F. Loomis
Major C. D. Y. Ostrom
Captain R. E. Starr
Captain B. F. Fellers
Captain Hobart Hewett
Captain J. E. Harriman

THE NAVAL WAR COLLEGE

Student

Major C. W. Bundy

THE ARMY INDUSTRIAL COLLEGE

Students

Lt. Col. J. C. Ruddell
Captain W. L. Weible

AIR CORPS TACTICAL SCHOOL

Instructor

Major F. G. Epling

Students

Major D. L. Dutton
Captain C. Q. Shelton
Captain A. B. Nicholson
Captain D. D. Martin
Captain M. K. Deichelmann

INFANTRY SCHOOL

Instructor

Major R. E. Turley, Jr.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Student

Captain P. W. Shunk

The Contributors

Lieutenant Colonel A. C. M. AZOY, Coast Artillery Corps Reserve, is a professional writer living in New York. His current essay will give the younger officer a picture of what life is like on a home front during a major war.

Major JOHN H. BURNS, Infantry, entered the Army from New York, August 15, 1917, and is a graduate of Columbia University, class of 1916. He is a graduate of the Infantry School, the Command and General Staff School, and the Army War College. He has recently taken over the job of editor of our contemporary, the *Infantry Journal*.

Lieutenant Colonel CHARLES I. CLARK, Coast Artillery Corps Reserve, is president of the Coast Artillery Club of New York. After service with the Corps in the United States and France during the World War, he affiliated with the Officers' Reserve Corps in 1923. He is active in reserve affairs and has devoted considerable time to the development of reserve units. Colonel Clark is a graduate of the Command and General Staff School, 1932. In civil life he is engaged in the insurance business in New York City.

First Lieutenant ALFRED D. HAIGH, 243d Coast Artillery (HD), Rhode Island National Guard, was born in England. He came to the United States in 1922, and enlisted in the 243d Coast Artillery two years later. After three years of service as private and corporal, he won his commission as second lieutenant in 1927. Promotion to first lieutenant came in 1931. At present Lieutenant Haigh is adjutant of the 243d Coast Artillery.

During the World War he saw service in the British Army, as a member of the Duke of Wellington's Regiment (infantry). Enlisting in April, 1915, he served in France with the 62d Division from October, 1917 to November, 1918. He participated in the Battle of Cambrai, the German break-through of March, 1918, and the action at Rheims in July, 1918. He served with the Army of Occupation for five months after the Armistice. All in all, Lieutenant Haigh has seen military service at its best and at its worst—his reactions can best be gauged by a reading of his current essay "Discipline in the National Guard."

Lieutenant Colonel HAZEN L. HOYT, Coast Artillery Corps Reserve, is a mechanical engineer by profession. He graduated from Columbia University with the class of 1909. During the World War he served overseas with the 11th and 21st Engineers, and became a member of the Coast Artillery in 1925. A graduate of Leavenworth (class of '33), he is now serving a tour of active duty with the War Department General Staff.

Captain WENDELL G. JOHNSON, Infantry, a native of Illinois, graduated from the Military Academy with the class of 1923. He has an authentic background for his résumé of foreign opinion on events in Spain for he served a language detail in Madrid some years ago. Captain Johnson is now en route to Leavenworth for duty as a student 1938-1939 course.

Major MAURICE MORGAN, Coast Artillery Corps, was born in Kansas. Appointed a second lieutenant of Cavalry June 5, 1917, he transferred to the Coast Artillery Corps on March 10, 1921. Since that date all his service has been as a Coast Artilleryman. Major Morgan reached his present grade on October 1, 1934. He is a graduate of the Coast Artillery School Battery Officer's Course ('22), Advanced Course ('34), and the Chemical Warfare School Field Officers' Course ('34). He is now on duty with the Civilian Conservation Corps at Fresno, California.

Brigadier General HENRY C. PRATT, a native of New Mexico, graduated from the Military Academy in 1904. His early service was with the Cavalry, from which he transferred to the air arm in 1920. He has served a four-year tour as assistant Chief of Air Corps and at the moment commands the Air Corps Tactical School at Maxwell Field. General Pratt is a graduate of the Air Service Bombardment School, the School of the Line, the General Staff School, and the Army War College. He is rated as an air pilot and air observer.

1st Lieutenant JACK W. RUDOLPH, Infantry, makes his début as a JOURNAL author in this issue. He hails from Wisconsin, is a graduate of the United States Military Academy, Class of 1933, and at the moment is on duty with the 17th Infantry, Fort Leavenworth.

Lieutenant Colonel ROLLIN L. TILTON, Coast Artillery Corps, who contributes the lead article, hails from Illinois. Appointed a second lieutenant, Coast Artillery Corps in 1909, he reached his present grade in 1934. With the exception of a four-year detail in the Inspector General's Department, all his service has been with the Coast Artillery Corps. Colonel Tilton is a graduate of the Coast Artillery School Advanced Course ('29), the Command and General Staff School ('35), and the Army War College ('38). He is now en route to Panama for duty with the General Staff with troops.

Book Reviews

WHAT ABOUT THE AIRSHIP? THE CHALLENGE TO THE UNITED STATES. By Commander C. E. Rosendahl, U. S. Navy. New York: Charles Scribner's Sons, 1938. 431 Pages; Illustrated. $3.50.

The impression of prejudgment, that this is just another enthusiast's book, is completely dispelled before the volume is half completed. And by the time it has been read through, one realizes that this is without any question a strong and closely reasoned argument in support of lighter-than-air craft, and—what is more important—there is engendered the conviction that the day of the airship, far from ending, is only beginning to dawn. It is not surprising that Congress has appropriated more money for another airship, nor can we dismiss as groundless Secretary Ickes' fear that helium in German hands would be of military importance. Indeed, the quixotic nature of the Helium Act of 1937, which proposed in the name of maudlin sentimentality to make America's unique helium supply available to foreign nations which, to speak gently, do not regard with excessive enthusiasm either America's institutions or her attitudes, is never more apparent than after a study of the facts and views presented by Commander Rosendahl.

To begin with, the author shows that, up to the time of the *Hindenburg* disaster, 354,265 passengers had been carried in commercial airship operation—this includes those carried in Goodyear blimps—with a loss of life of only thirteen passengers, all in the *Hindenburg*, and twenty-nine crew, majority also in that ship. He concludes that "the safety record of commercial lighter-than-air transportation is unequalled by that of any other means of transportation." The reader, recalling the sickening series of airplane accidents in this country, the sad procession of losses of life at sea, the ever-increasing toll of that grimmest of reapers, the automobile, to say nothing of a disquieting train mishap from time to time, is constrained to agree.

So far as cost of operation is concerned, the question boils down simply to this: that only the lighter-than-air ship can carry a payload of consequence. And the cost of construction of an airship is not disproportionately greater than the cost of a present-day super-sized flying-boat.

Therefore, with respect to commercial airship operation, all that is needed is helium—and the United States alone can fill that need. Now that there is no immediate prospect that helium will be exported, it follows that only the United States is in a position to take advantage of the commercial prospect offered by airships.

Commander Rosendahl also deals, and at some length, with the naval uses of airships, and discusses in detail the wartime experiences of both sides with lighter-than-air craft. So far as the former topic is concerned, he makes it abundantly clear that he does not view the airship as the answer to all naval problems, or as a panacea which will eke out every deficiency of other types. To the contrary, he argues that there are only certain tasks which the airship can perform, notably long-range scouting, but that these tasks can be better and more economically done by the airship than by any other naval types, including naval airplanes.

As to the World War experiences, the author is careful to preface a caveat to the effect that naval airships were hardly developed in 1914; none the less, he insists, they gave a creditable account of themselves, and he points to the insistence of the Allies after the war that all Zeppelins and Zeppelin plants be systematically dismantled and destroyed. The Jutland performance of the Zeppelins is discussed in detail, and while Commander Rosendahl admits that the German high command received numerous inaccurate and misleading reports from its airships during the course of the battle, he insists, and no doubt properly, that inaccurate reports constitute not a condemnation of the airship as such but rather of particular personnel under particular strains and stresses. In proof thereof, he points out, referring to the same book that criticized the airship, that reports equally inaccurate and misleading were received from surface craft.

The net result of the volume under review—and no attempt has been made here to give a complete view of its contents—is that every argument against the airship is pretty effectively met and demolished. There is left only the last imponderable, one which is really beyond the range of reasonableness, and that is the sales resistance in the public mind left as the residuum of the successive failure of the three American-built dirigibles: *Shenandoah, Akron, Macon*. It will take more than argument and logic to overcome that opposition. The problem is essentially one of psychology, and while some of the logic, such as the point that airplane crashes every year involve more loss of life and money than the more obviously spectacular loss of an airship, may gain adherents for the lighter-than-air vessels, it would appear that on the whole more progress can be made by fighting prejudice with pride: "If the Germans could do it, why can't we?"

Such talk appeals to the man in the street, and he, after all, is the lad who foots the bill. The recent naval appropriation bill seems proof of the effectiveness of this approach. In any event, it is not characteristic of Americans, particularly of American sailors, to quit after three reverses. The John Paul Jones tradition in that regard is much too strong.

F. B. W.

Prize Essay Competition 1938

First Prize $200.00

Honorable Mention Prizes . 100.00

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 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 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.

d. HOW SUBMITTED:

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.

e. FORM:

(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.

CHINA FIGHTS FOR HER LIFE. By H. R. Ekins and Theon Wright. New York: Whittlesey House. 325 pages; $2.75.

JAPAN IN CHINA. By T. A. Bisson. New York: The Macmillan Company. 405 pages; $3.00.

The first books written about the war in China are now in print. Here are two obviously independent efforts, which utilize various sources, and therefore supplement each other nicely. Although they reach the same general conclusions, they make interesting reading.

The books present different reasons for the outbreak. Ekins and Wright declare that Japan started the war as a last resort, because the rise of Chiang Kai-shek blocked her campaign of peaceful penetration in Asia. Realizing she would have to fight, Japan struck while there was yet time. On the other hand, Bisson attributes the war to a deliberate bid for home prestige by the Japanese military, who instigated a foreign war to renew their slipping hold upon Imperial affairs.

Ekins and Wright see the struggle as a fight for life both by China and Japan. A Japanese victory will relegate China to vassalage, while defeat will reduce Japan to a third-rate power. Neither book commits itself, but each believes Japan to be involved in a desperate gamble with the odds running increasingly against her. The chapter of Bisson's work on Manchukuo is interesting and contains a severe indictment of Japanese imperialism.

Japan in China is the more thorough in its research and presentation as the author has spent ten years in the Orient as a representative of the Foreign Policy Association. *China Fights For Her Life*, a collaboration of two veteran UP correspondents with extensive Far Eastern experience, does not pretend to be more than a running account of what has happened, as unbiased newspapermen see it. Of the two, it is the more entertaining reading.

Both are unhesitatingly recommended. J. W. R.

JAPAN IN TRANSITION. By Emil Lederer and Emy Lederer-Seidler. New Haven: Yale University Press. 260 pages; $3.00.

An evaluation of this book for general reading is difficult. Granted that it is scholarly, at times the scholarship overshadows interest and the book drags unnecessarily. At other times, its colorful paragraphs swing along at a lively and appealing clip.

The early chapters are more a comparison of Chinese and Japanese language, philosophy, and customs than a description of a changing Japan. About midway the reader is likely to wonder just what the authors are driving at and where this "transition" stuff comes in. Then in the final—and excellent—chapters, the loose ends are all skillfully gathered up in a splendid summation of the problems and potentialities of modern Japan.

The tremendous psychological gulf between East and West is shown in great detail. There is an interesting

tudy of Oriental languages, portraying the fathomless ifferences between Oriental thought processes and our wn. Perhaps the best analysis is the chapter on the Japaese state, which shows the unbalanced psychological ituation caused by the clash of eastern and western eleents in Japanese civilization. Here we find a basic inight to Japanese character—a factor too often forgotten in onsidering the Far Eastern scene.

Professor Lederer served for two years at the Imperial niversity of Tokyo, where he made the preliminary udies for this book. That he admires much of Japanese ife and is critically interested in all of it is obvious. His ffort has not been wasted. The book is a useful addition o the literature on the Far East. J. W. R.

* * *

GALLANT JOHN BARRY, 1745-1803: THE STORY OF A NAVAL HERO OF TWO WARS. By William Bell Clark. New York: The Macmillan Company, 1938. 530 Pages; Illustrated; $3.50.

Though written in a flowery, old-fashioned style, this ook is nevertheless a fine account of the "Father of the American Navy." John Barry was an admirable character s well as gallant sea dog, and here we can read in careully wrought detail his part in our inauspicious naval beginnings.

An excellent ship's master by the time he reached his najority shortly before the Revolution, and a resident of Philadelphia where the Continental Congress carried on, ohn Barry was a natural choice for early command in the a forces of the new and struggling country. Before his eath he was senior captain and honorary "Commodore" f all warships flying the American flag.

To military readers, perhaps, the most interesting parts f Mr. Clark's biography are those that deal with the Revolutionary combined land and sea defense of the Delaare River and the adjacent seacoast. Most of this area ppears time after time in our present-day map problems rolving the larger units. Thus a reading of this book ill give double interest to such problems, just as the nowledge that the cities of Lancaster and York were sucessively Revolutionary capitals of the United States—ats of the Continental Congress—adds historical flavor paper wars fought along the valley of the Susquehanna.

But possibly the chief delight of this biography lies in e many quotations Mr. Clark gives us from Gallant John arry's own journals, and especially in Barry's magnificent-original spelling. Here the Father of Our Navy outone even the Father of Our Country, who took his own ithographical line with as firm determination as he took y other. Of capturing a British schooner Barry noted in journal that it could not be done by "Currage allone" that it took "a Grate dale of Art." When things went ong once in a Connecticut port he wrote, "I never was such a damb country in my life." Elsewhere he wrote hat he "spurned the eydee of being a treater [traitor]."

One other quotation, not from Barry, but from a friend,

COAST ARTILLERY RING

The Coast Artillery Association has approved this ring, but it may be worn by any Coast Artilleryman, whether or not he is a member of the Association. The design, as shown in the illustration, has been worked out with great care. The other side is equally attractive, depicting a fort and the shield of the United States superimposed on a crossed saber and rifle above the letters U.S.A.

GOLD OVERLAY

To keep the cost within reach of all, the manufacturer has worked out a plan whereby the outside of the ring is 10k. gold over a sterling silver inlay; in appearance this is exactly like the solid gold ring and will wear equally as well.

Men's Rings	*10k Solid Gold*	*Sterling Silver*	*Gold Overlay*
Plain, no stone	$23.00	$ 9.50	$16.00
Ruby	29.30	11.50	22.30
Sapphire	31.50	13.50	24.50
Topaz	31.50	13.50	24.50
Garnet	31.60	14.00	24.60
Amethyst	32.00	14.50	25.00
Tourmaline	34.75	17.00	27.75
Emerald	28.50	13.50	21.50
Black Onyx	26.50	9.50	19.00
Blood Stone	27.00	10.00	19.50

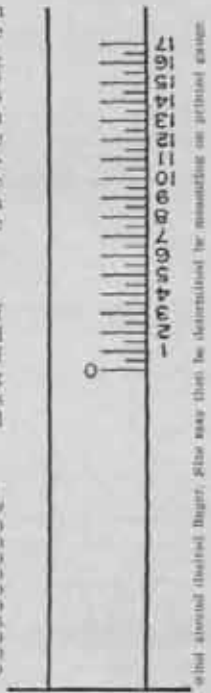
The same design furnished in miniature for ladies.

PRICES ON APPLICATION.

Order From

THE COAST ARTILLERY JOURNAL

1115 Seventeenth Street, N.W.
Washington, D. C.



Automotive Transportation for the Military Service

By Major John T. deCamp, C.A.C.

and

Captain Lew M. Morton, C.A.C.

Instructors in Motor Transportation, Coast Artillery School

Here is a concise, technical discussion made available to the service at a time when such a book is in considerable demand. This one volume covers all necessary information concerning the design, operation and maintenance of automotive transportation issued to the military service. The text has been *reviewed* and *approved* by Professor Erwin H. Hamilton, B.S., M.E., of New York University, acknowledged authority on automotive engineering.

HERE ARE THE TITLES OF 31 FACT-FILLED CHAPTERS:

Outline of Automotive Vehicle Construction.
Explosive Cycles and Firing Orders.
Cylinders, Pistons and Piston Rings.
Connecting Rods, Crankshafts and Fly-Wheels.
Valves and Valve Operating Mechanisms.
Valve Timing.
Crankcase Lubrication.
Engine Cooling Systems.
Fuel and Fuel-Feed Systems.
Elements of Carburetion.
Carburetors.
Elementary Electricity and Magnetism.
Storage Batteries.
Battery Ignition Systems.
Starting Motors, Generators, and Lighting Systems.
Theory of Internal Combustion Engines.
Engine Test and Performance.
Diesel Engines.
Clutches and Transmissions.
Universal Joints, Drive Shafts, and Differentials.
Rear Axles, Frames, Springs, and Shock Absorbers.
Brakes.
Front Axles and Steering.
Tires, Rims and Wheels.
Engine Overhaul.
Automotive Vehicle Troubles.
Painting.
Convoys.
Organization and Supply.
Methods of Inspection.
Automotive Maintenance.

Prices are retail, postpaid. On any order for 10 or more copies a discount of 10% is allowed F.O.B. Washington.

PRICE: Durable Paper Binding, $2.50.
Leatherette Binding, $3.00.

gives the fine Irish measure of the man and the commander, John Barry. On returning from a two-year voyage from China (as master of a private sailing ship between wars) his friend writes that Barry told him "there had never been one dispute or angry word on board his vessel" during the whole trip. Barry could administer harsh discipline, and did more than once when mutiny arose among a rapscallion crew. But never did he take such measures without full reason, though irons and the cat-o'-nine-tails might be a daily medicine on other ships in that early day.

Mr. Clark has also cleared up a number of untrue traditions that have grown up around John Barry's memory. Now, thanks to him, we can read an accurate narrative of this steadfast, honest, and energetic, fighting Irish-American.

J. I. G.

* * *

THE SECOND ADMIRAL: A LIFE OF DAVID DIXON PORTER. By Richard S. West, Jr. New York: Coward-McCann, 1937. 345 pages; appendix; bibliography; 16 illustrations; 8 maps; index; $5.00.

Overshadowed by Farragut, the first admiral, and villified by political generals, the "Second Admiral" has not heretofore been given his true place in American history. However, Professor West steers the middle course of biographers—carefully weighing the evidence, he makes Porter neither peerless hero nor worthless warrior. Professor West, now Assistant Professor of English and History at the United States Naval Academy, must be congratulated upon a well written volume. With unfailing maintenance of interest, the author traces the rise of a distinct personality from the early years of a midshipman, through the trying years of the Civil War, on to service as Superintendent of the Naval Academy where the Admiral inspired the new generation of officers who were to carry on to the end of the century.

The personality of Porter was such as to make him a doubtful example for the young officer of today. He seldom "kept his finger on his number"; and he wrote impulsive critical letters about his superiors that later were resurrected to crucify him. His flair for controversy and participation in foreign and personal imbroglios embittered prominent people against him. However "his audacity, his perseverance, his passion for the sea—his penchant for bright discipline and smart appearance, his readiness to apply inventions to naval uses, his fondness for vast new undertakings, however, complicated they might be by politics and economics, his buoyant, daredevil fighting spirit—these live on in the United States Navy today."

If any officers still have any doubts as to the vital necessity for exact plans and definite responsibility whenever the Army and Navy engage in joint operations he will find both successful and horrible examples in the campaigns of New Orleans, Vicksburg and Wilmington, in

each of which Admiral Porter played a large part. Particularly at Vicksburg "under General Grant and Admiral Porter the new Federal strategy of well-coördinated Army-Navy coöperation, with greatly augmented forces, was executed in a professional, business-like manner." . . . "The absence of friction between the two branches of the service was truly remarkable. Since on battlefield and in cabinet councils alike the traditional rivalry of Army and Navy normally creates sparks of friction, . . . the country was fortunate to have Grant and Porter fighting together in the most trying and difficult of all the combined military and naval operations of the war. It is impossible to account for the peculiar success of Grant and Porter except on the basis of the character of the men themselves. Both were doggedly persistent in pursuing their main objective. Both scorned red tape. Both were fertile in resource, energetic in preparation, and believed with Lord Nelson that something must be left to chance." . . . "His ability to adjust his personality so as to lead effectively this large, heterogeneous squadron, with its multitude and diversity of objectives, won for Porter the right to rank with the greatest American commanders."

Although we cannot entirely agree with Grant when he wrote in his *Memoirs:* "I believe Porter to be as great an admiral as Lord Nelson," after reading Professor West's biography we must conclude that here was a great officer and a human gentleman, entirely too heroic in stature to be known merely as the "Second Admiral." E. W.T.

* * *

AMERICA GOES TO WAR, by Charles Callan Tansill. Boston: Little, Brown & Company, 1938. 730 pages; $5.00.

Here is a volume that overshadows all previous studies on the background of America's entrance into the Great War. It is a ponderous affair of 700-odd pages heavily balanced with footnotes and studded with quotations from documentary sources. Dr. Tansill, former lecturer at Johns Hopkins University, former adviser to the Senate Committee on Foreign Relations, and former professor of history at American University, spent ten years in research for this study. He has examined a mass of American papers and German documents heretofore not available to researchers.

The whole effect of this massive volume is to alter the commonly held views of Bryan, Lansing, and Colonel House. Dr. Tansill's exploration of the records leaves him with a fine appreciation of Mr. Bryan's wisdom and humanity. He finds Colonel House flitting from the field of high finance to that of international law with equal ease and with a marked tendency to see the Allied point of view on all questions. Mr. Lansing's knowledge of the fine points of international law and his legalistic mind led him to make an effective lawyer's case against Germany, while, rather than Mr. Bryan, led the president.

The wartime diplomatic corps in Washington pass in

New

FEDERBUSH SINGLE ROD MAGAZINE BINDERS

The single magazine binder is used extensively in waiting rooms and reading rooms of libraries, offices, steamships and other public places. Besides lending a dignified appearance, when on the reading table or in the magazine rack, it keeps the copy clean and inviting. Inadvertently, people often carry off magazines which are lying around loose, whereas it is less likely to happen if book is contained in a binder. The key lock mechanism locks the rod which holds magazine fastened to binder. Binding is made of stiff boards, covered with canvas, genuine or imitation leather. Also made in Flexible Covers. Supplied in colors, if desired, for any size magazine.

Three lines of lettering in gilt allowed without charge, i.e. name of magazine, organization and location. Instead of location you may substitute "Do Not Remove From Day Room."

Key Lock Mechanism

Prices

Style MK — Imitation Leather
1 to 22 — $2.00 each, any size
23 up — $1.90 each, any size

F.O.B. NEW YORK

ADDITIONAL QUOTATIONS AND INFORMATION FURNISHED ON REQUEST

Order from

THE COAST ARTILLERY JOURNAL
1115 17th Street, N.W.
Washington, D. C.

NEW TYPE TESTS
for
GUNNERS' EXAMINATIONS

(HARBOR DEFENSE REGIMENTS)

THREE years of successful use have proved the New Type Gunners' Examinations the logical answer to the problem of examining a unit quickly and accurately. Battery commanders will welcome the news that an extensive revision of the examinations has been completed and that the printed forms now await their order.

Form "B" has been added, thus giving an alternate selection to the users of Form "A." Moreover, Form "A" has been entirely revised and is to all intents and purposes a new examination.

The organization using these forms is examining its men in accordance with the latest thought. Here are a few of the advantages of the New Type Tests for Gunners' Examinations:

1. They test more thoroughly than hit-or-miss oral examinations. More questions are asked and answered. At the end of the test, the state of the candidate's training in *known;* it has not been guessed at.

2. The candidate has more time for careful thinking. He is not required to snap out an instant answer. He is without the strain that makes many soldiers forget all they ever knew in the presence of an examiner or inspector.

3. The candidate works at a speed of his own choosing. He is not harassed by a "hurry-up" atmosphere.

4. All candidates take the same examination. All who fail know less about gunnery than those who passed—something you are not sure about in an oral examination.

5. The final rating is objective. The use of keys for objective scoring eliminates guesswork. Only the candidate's knowledge of gunnery has been tested.

6. These examinations improve gunnery instruction. An analysis of the tests will reveal a general weakness in certain subjects among candidates from certain organizations. Corrective measures may then be applied.

7. There is an objective record for headquarters. Moreover, the papers can be returned to the battery commander for remedial instruction of those examinees requiring it.

8. They save time and money, especially in National Guard organizations where boards generally call for extra-drill pay and travel allowances. Moreover, the majority of officers will welcome relief from this duty.

PRICES { 1st Class Gunners' Examination ..... 7c postpaid
2d Class Gunners' Examination .....10c postpaid

COAST ARTILLERY JOURNAL

1115 17th STREET, N.W. WASHINGTON, D. C.

review, and their portraits by Dr. Tansill have the hard unflattering character of a passport photo. The British ambassador, Sir Cecil Spring-Rice, often studiously insulting to Americans, is shown to have an ungovernable temper. M. Jules Jusserand, the French ambassador, was equally undiplomatic and unrestrained in his tirades against American attitudes. Strange to say, Count Bernstorff, the German ambassador, appears in the most favorable light as a discreet, courteous, and broadminded diplomat whose sound advice *Wilhelmstrasse* saw fit to ignore. The ramifications of the Boy-Ed, von Papen, Dumba activities are clearly set forth in a perspective which diminishes their importance.

Several chapters are devoted to American trade with Allied countries, and statistics concerning this trade and American loans to foreign countries during the war are set down in appendices. Some of Dr. Tansill's sharpest indictments are drawn against the British practice regarding American rights. He shows that in his protests to the British, "Secretary Lansing's language was studiously deceptive," deluding his countrymen into thinking that Lansing was insisting upon full protection of American rights while giving the British admiralty lawyers plenty of legal-loopholes for escape.

The written style of Dr. Tansill cannot be described as brilliant, but the orderly march of his paragraphs and chapters is like the pitiless advance of an overwhelming and victorious army. H. A. D.

* * *

HISTORY OF THE BOMBAY ARMY. By Sir Patrick Cadell, C.S.I., C.I.E., V.D. New York: Longmans, Green & Company. 362 Pages. $7.50.

To write an appreciation of this book, into which a tremendous amount of labor and research have gone, the reviewer needs a thorough background of Indian history, which the present reviewer does not have. At the same time, no man can read its pages without realizing, however dull the catalog of organization and command may become at times, that Sir Patrick Cadell has made a solid contribution to the military history of India.

Most American military readers are aware that the Indian Army has had a long and honorable history with the one main exception of the Great Mutiny near the middle of the last century. This new volume recounts the development through the course of three centuries of one of the three main subdivisions of the Indian forces, the Bombay Army, as distinguished from the Bengal Army and the Coast or Madras Army, which have been treated fully by other historians. The Bombay Army, incidentally, was almost untouched by the mutiny of 1852.

Judging from the later chapters dealing with the Indian Army in the World War, of which this reviewer has some basis from other sources for criticism, it must be said that Sir Patrick has written an unusually frank history. He does not gloss over, as is so often done in works of this kind, the errors of high command or the weaknesses of

MAGAZINES

•

The JOURNAL'S periodical department is the most efficient agent for handling your magazine business—both organizational and individual. It is speedy and accurate: speedy because orders are sent to the various publishers on the date of receipt; accurate because the JOURNAL understands the idiosyncrasies of military addresses.

No matter how many magazines you order, you have but ONE letter to write. If a change of address becomes necessary, ONE letter does the trick. ONE letter suffices to renew a group of magazines no matter what the expiration dates.

We guarantee to meet the best price quoted by any responsible agent for any magazine or group of magazines. We will supply any periodical, published anywhere, in any language, at publishers' rates or less.

•

The next time you order periodicals for the club, day room, or yourself, get a quotation from

COAST ARTILLERY JOURNAL

1115 17th Street N. W. Washington

Field Manual Binders

This binder was designed especially for the War Department Field Manuals. It keeps your manuals intact and in systematic order.

No hole-punching is necessary—the manuals slip easily into the binder and are securely locked into place.

Price $1.50

(20% discount in lots of 10 or more, f.o.b. Washington)

Wear the U.S.C.A.A. Insignia

Official emblem to be worn on civilian clothes, by officers of all components of the Army.

Bar is of bronze, gold-plated, center enameled red (for Coast Artillery), with panel of black and gold at ends designating an officer. Bar equipped with gold-plated shank back button. Illustration is actual size. Bar, is only part that shows, when worn. Neat and distinctive in appearance.

Lapel Bar and Lapel Ribbon Now Official U.S.C.A.A. Insignia

The new 3/8" wide lapel ribbon comes in the same color combination as the lapel bar.

PRICES

One lapel bar 50c
12" length lapel ribbon 50c

COMBINATION OFFERS

Two lapel bars 75c
Two 12" lengths of ribbon 75c
One lapel bar and 12" length of ribbon..... 75c

Any combination of 50c items, totalling $5.00 or more, subject to 10% discount, when shipped to one address.

Send all orders to

The Coast Artillery Journal

1115 17th St., N.W. Washington, D. C.

specific units in battle or campaign. When they did well, he says so; but when they gummed the works he also says so. Certainly in this respect Sir Patrick is an admirable model for military historians to follow. J. I. G.

THE FOUR HUNDRED MILLION. By Mary A. Nourse. New York: The Bobbs-Merrill Company. 398 pages; 31 illustrations; index; end-paper map of China, bibliography.

This is the second edition of the book of the same name published in 1935. Brought up to date, it gives a succinct history of the vastness that is China from the earliest times to the opening of the current war.

Miss Nourse has spent fourteen years in the Orient, traveling far into the interior where there are few foreigners. She has taught Chinese children in their own language and in English. She is familiar with the homes of the humble as well as the rich. The closing chapters of the book were written after her trip to China last year. The author's background gives ample assurance that *The Four Hundred Million* is accurate. Moreover, it is entertaining reading and will furnish a reliable source for those in quest of basic data on China.

Parts of the manuscript were read and checked by members of the Department of Orientalia of the Library of Congress and the Department of Chinese, Columbia University. The bibliography is especially helpful.

New Books

AIR ANNUAL OF THE BRITISH EMPIRE, 1938. 8th Edition. $7.00.

JULIUS CAESAR, Colonel John Buchan (Lord Tweedsmuir). New and cheap edition. $1.00.

SEBASTIEN LE PRESTRE DE VAUBAN, Sir Reginald Blomfield. A new biography of the great military engineer. $5.00.

SEAS OF ADVENTURE, Admiral E. K. Chatterton. The British navy in the Mediterranean, Adriatic and Aegean in the World War. Cheap edition. $1.50.

THE DEVELOPMENT OF THE BRITISH ARMY, 1899-1914, Colonel J. K. Dunlop. From the eve of the South-African War to the eve of the World War, with special reference to the Territorial Force. $3.75.

SOMME HARVEST, G. E. M. Eyre. Memories of a PBI (Poor Bloody Infantryman). $3.50.

T. E. LAWRENCE, Charles Edmonds. Supplements Lawrence's own *Seven Pillars of Wisdom*. Cheap edition. $1.00.

PLUMER OF MESSINES, General C. Harington. The Life of Field Marshal Viscount Plumer, who commanded the British Second Army. The book contains new light on the fighting around Passchendaele. Cheap edition. $2.50.

FLYING ADVENTURES, Captain W. Mittelholzer. Experiences of a German aviator in the World War. Cheap edition. $2.50.

SCIENCE AND MECHANIZATION IN LAND WARFARE, Colonel D. Portway, British Army. $2.50.

SOME STILL LIVE, F. G. Tinker. An American pilot's story of modern combat flying in the Spanish civil war. $2.65.

WITH LAWRENCE IN ARABIA, Lowell Thomas. Cheap edition. $1.00.

It's as good as cash just before pay day, too

The Soldier's Handbook

Special Coast Artillery Edition

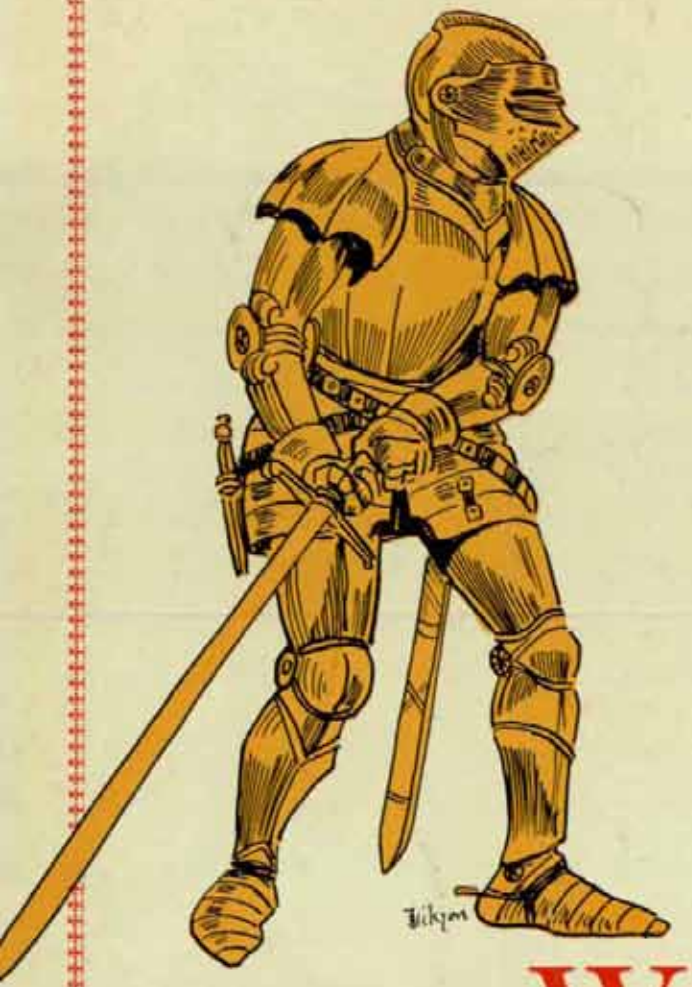
An illustrated book that tells the soldier in a simple, conversational, and interesting way what he needs to know. *Written in language he can understand.*

The new *Soldier's Handbook* is complete, well-indexed, and its 166 pages and 50 illustrations give the individual soldier a convenient and compact source of basic military information, thus aiding him to perform his duties more efficiently and prepare himself for promotion. The text is based on instructional matter contained in various War Department documents that are not, in general, available for distribution to the individual.

CONVENIENT; POCKET-SIZE; ILLUSTRATED; SIZE 6" x 4" x ½"

Produced with the idea of giving to the soldier a book he needs at a price he can pay

Single Copies, 50c, Postpaid. Substantial Discounts on Quantity Orders



There is a parallel between the armored man and the present tank. Will history repeat?

WARFARE

Tells you why armor *really* went to the scrap heap

A Study of Military Methods from the Earliest Times

By

COLONEL OLIVER L. SPAULDING, *Field Artillery;*
HOFFMAN NICKERSON, *Formerly Captain, U. S. Army;*
COLONEL JOHN W. WRIGHT, *Infantry*

THIS STUDY begins with warfare under the early Oriental monarchies and traces its development through the epic battles of the Great Frederick. The book closes with Frederick because he closed an era; after him began the epoch of our modern tactical systems.

THE STUDENT may justly ask, "What, then, is the value of a study that begins in antiquity and ends just when warfare is about to evolve into the existing system?" The answer is epitomized in the first chapter of *Warfare:* "Strip any military operation of external identifying details and one will find it hard to put a place and date on the story."

ALL OFFICERS will find *Warfare* a splendid means of rounding out their cultural background along military lines. Moreover, they will acquire with a minimum of effort the historical background which is so essential to an intelligent grasp of modern military problems.

601 Pages **$3.00 Postpaid** 36 Maps