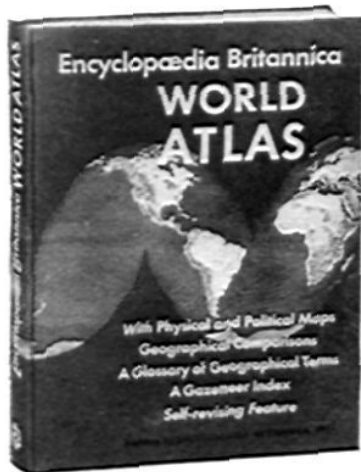


The
FIELD ARTILLERY
Journal



AUGUST, 1945



ENCYCLOPEDIA BRITANNICA

WORLD ATLAS, Trade Edition . . .

Two of the world's celebrated editorial boards have collaborated to produce a single vital and scholarly volume. A treasure chest of the world's finest political and physical maps—164—newly engraved, richly printed in full, "eye-ease" colors that establish cartographic standards. A large, illustrated encyclopedic-index of world geography: countries, mountains, cities, rivers, etc., all listed A-Z. No searching by countries. Edited by Britannica experts. "Built-in" binding for War Supplements and Revision Certificate. New air age maps. Illustrated statistical data. Striking washable covers—size 16½" × 12½". \$12.50



LIBERTY WORLD ATLAS, Popular Edition . .

With post-war Map Certificate. For home, office, school. A new, big (12¼" × 9½") global atlas. 84 pp. of highly detailed, multi-colored maps (there's wide use of inset maps for congested areas), war section, gazetteer-index and geographical comparisons. A timely set of natural resource maps show why we can't always get the food, raw materials, and other things we want.

To top all this, there are many pages of intriguing world geography (56 countries) profusely illustrated with expressive and striking photographs. The binding is attractive—chameleon leatherette in Old Spanish grain, fully embossed with a brightly printed jacket from which you can make your own World Globe. \$1.00

VICTORY WAR MAPS,

The Pacific and Orient . . .



All eyes are on the Pacific. Here is the final staging area for unconditional surrender. This complete picture of land, sea, and air fronts past, present, and for months to come, contains the following:—

- (1) Pacific Combat Area—Land, sea, and air map of the entire Theater of War from India to Hawaii and from the Aleutians to the northern tip of Australia.
- (2) 23 detailed maps showing Pacific Islands and areas conquered to date, under present attack, or in the path of our advancing forces.
- (3) China, Japan and contiguous territories. Detailed map showing railroads, trade routes, canals, passes, mountain peaks, Great Wall, etc.
- (4) Street map of Tokyo (before B-29s).
- (5) Burma-China Area. (6) East Indies and the Philippines.

All above printed in ten striking colors, both sides of sheet 27" × 21", conveniently folded to 7 × 10". 25c



U. S. FIELD ARTILLERY ASSOCIATION

1218 CONNECTICUT AVENUE

WASHINGTON 6, D. C.

LT. COL. JOHN E. COLEMAN, *Editor*
 MAJ. BERTRAM H. WHITE, *Assistant*
 LENNA PEDIGO, *Business Manager*

The Field Artillery Journal

AUGUST, 1945—Vol. 35, No. 8

MARINES ON OUR COVER are fortunately members of an Amphibious Corps! Rains on Okinawa supplied their position with plenty of running water. Note how handy metal mats, designed for paving runways, are for use as revetments.

FIELD ARTILLERY officers and families formerly stationed at Fort Stotsenburg, Philippine Islands, will be interested in the following information received from a general officer now in the islands. It concerns a Filipino merchant who had a wide acquaintance among Army personnel:

"Shortly after the outbreak of the war a rumor was circulated throughout the army that Mr. Tinio of Angeles, Pampanga, had been executed as a Jap spy. This was completely false. He has not been under suspicion, is alive, and is considered loyal to the United States. His wood carving factory, store, and home were demolished and all his business records lost. He is attempting to rebuild his business."

ALL COMMANDERS are requested to let us have lists of awards to their personnel which have not yet been published in this JOURNAL. We want to give due credit to decorated artillerymen — at least, to those earning major awards. It will be helpful if you include serial numbers as well as names, grades, nature of awards, dates, and places. Both an original and a carbon will be appreciated.

The United States Field Artillery Association

ORGANIZED JUNE 7, 1910

President

Major General Lewis B. Hershey

Vice-President

Major General Ralph McT. Pennell

Executive Council

Major General C. C. Haffner, Jr.

Major General Lewis B. Hershey

Brigadier General William H. Sands

Colonel Stuart A. Beckley

Colonel Ralph C. Bishop

Colonel Michael Buckley, Jr.

Colonel Alan L. Campbell

Colonel Malcolm R. Cox

Lieutenant Colonel F. Gorham Brigham, Jr.

Secretary-Treasurer

Lieutenant Colonel John E. Coleman

THE BATTLE OF MANILA.....	By Maj. Nelson H. Randall, FA	451
DIVISION ARTILLERY INTELLIGENCE	By Maj. James J. A. Kelker, FA	456
THE PESCADORES AND SAKISHIMA ISLANDS	By Col. Conrad H. Lanza	457
BINOCULARS HELP AT NIGHT TOO		460
ARTILLERY LIAISON WITH THE NAVY	By Lt. Col. John R. Crossen, FA	461
AN ARTILLERYMAN IN A JOINT ASSAULT SIGNAL COMPANY	By Capt. William M. Doolittle, FA	463
CASSINO OF THE PACIFIC	By Capt. Lauren K. Soth, FA	465
INDIRECT FIRE AT MOVING TARGETS—A SIMPLIFIED PROCEDURE	By Col. Louis H. Thompson, FA (CAC)	468
ARTILLERY TARGETS ACROSS THE RHINE.....	By Lt. Col. James E. O'Steen, FA	471
TRENDS IN FIELD ARTILLERY ORGANIZATION AND EQUIPMENT	By Maj. Shirley B. Metzger, FA	480
MISSION: DESTRUCTION.....	By Maj. Paul F. Wilson, FA	481
PERIMETERS IN PARAGRAPHS	By Col. Conrad H. Lanza	484
UTILIZING TANK DESTROYERS AS ARTILLERY.....	By Maj. Ernest C. Hatfield, Cav.	495
TANK DESTROYERS IN THE ROER RIVER CROSSING.....	By Col. Paul B. Bell, FA	497
TIPS FROM A BATTERY EXECUTIVE	By Lt. R. W. Grimm, FA	499
F.A.S. EVENTS.....		500
NOT IN THE BOOK.....		502
DIARY OF WAR EVENTS.....		503
BOOK REVIEWS		504

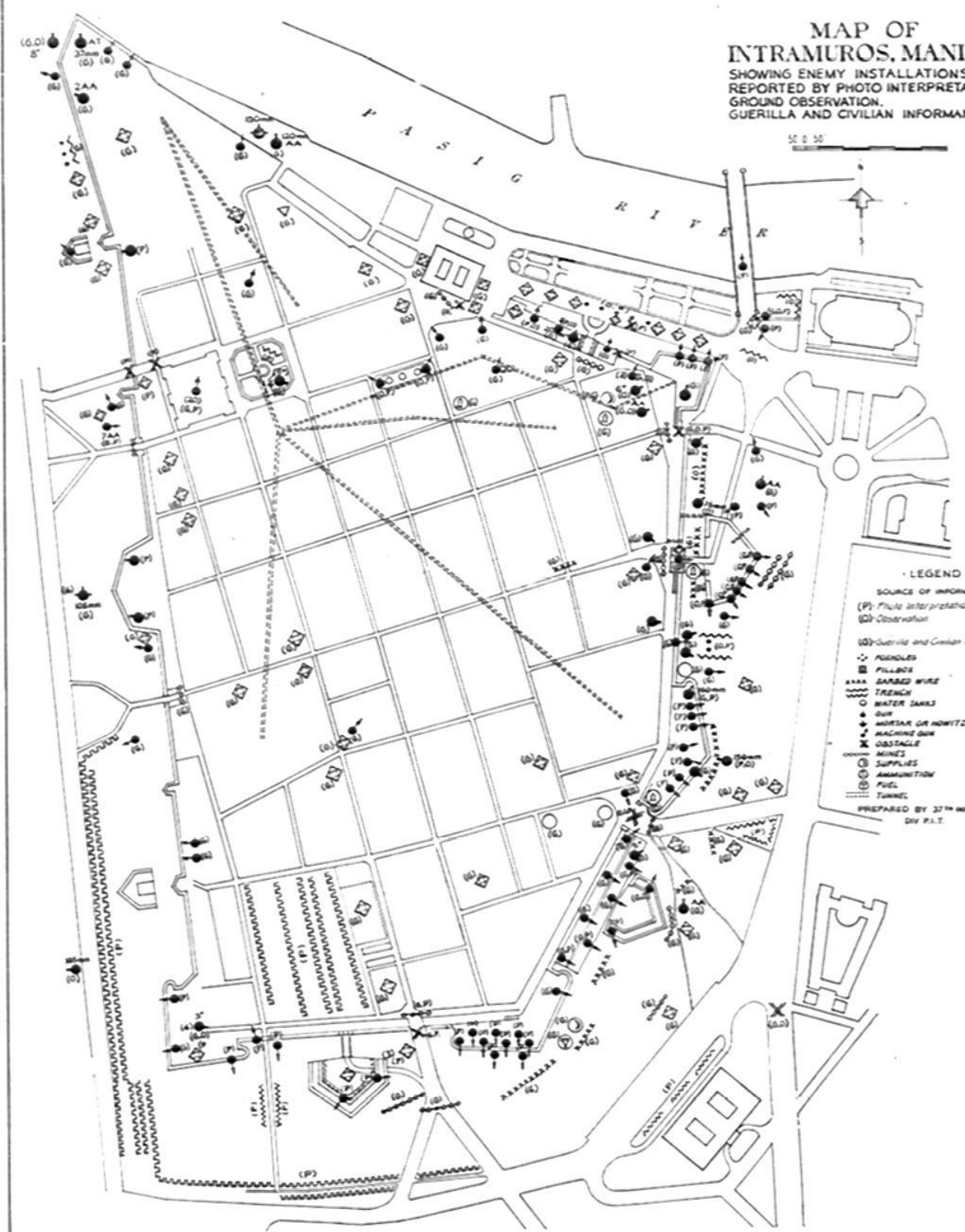
Published monthly by the United States Field Artillery Association. Publication office 3110 Elm Avenue, Baltimore 11, Md. Editorial and general offices United States Field Artillery Association, 1218 Connecticut Avenue, Washington 6, D. C. Address all communications for publication to the Washington office. Entered as second class matter August 20, 1929, at the post office at Baltimore, Md. Accepted for mailing at the special rate of postage provided in Sec. 1103, Act of October 3, 1917. Copyright, 1945, by The United States Field Artillery Association. Subscription price \$3.00; Canada \$4.00; foreign \$3.50; single recent copies to members, 25 cents; non-members, 35 cents. THE FIELD ARTILLERY JOURNAL does not accept paid advertising. It does pay for original articles accepted but unsolicited manuscripts must be accompanied by return postage if they are to be returned. *Addresses and ranks will be changed as frequently as desired, upon notification; not otherwise. Changes should reach the editor three weeks before date of next issue. Immediate notice should be given of any delay in the receipt of the magazine.*

Authors alone are responsible for statements made. No articles are official unless specifically so described.

MAP OF INTRAMUROS, MANILA

SHOWING ENEMY INSTALLATIONS AS REPORTED BY PHOTO INTERPRETATION, GROUND OBSERVATION, GUERRILLA AND CIVILIAN INFORMANTS.

50 0 50



LEGEND

- SOURCE OF INFORMATION
 (P) Photo Interpretation
 (O) Observation
 (G) Guerrilla and Civilian Informants
- POUNDS
 PILLBOX
 BARBED WIRE
 TRENCH
 WATER TANK
 GUN
 MORTAR OR HOWITZER
 MACHINE GUN
 OBSTACLE
 MINES
 SUPPLIES
 AMMUNITION
 FUEL
 TUNNEL

PREPARED BY 37th INFANTRY DIV P.I.T.

The BATTLE of MANILA



By Maj. Nelson H.
Randall, FA

Manila's City Hall shows the results of direct artillery fire. The Japs held this place in strength, refused to surrender. At one time they had a 15-cm gun mounted on the third floor, used tower for an OP.

Manila, "Pearl of the Orient," nestled in the bosom of the sick oyster that is the Imperial Japanese Army.

Three festering years had passed since Gen. Douglas MacArthur declared it an open city and left, vowing to return.

Now the pearl was ready to come forth into the light of a new day.

As the shucker's knife probes to unhinge the reluctant bivalve, the 37th Infantry Division made its stab. A quick twist of the wrist and we were in.

It had been a long haul to Manila, thirty-two months and eight days from San Francisco. The journey led us through New Zealand, Fiji, and all the Solomons to the Lingayen Gulf beachhead.

Spearheading an advance of 120 miles down the Central Luzon Plain, Maj. Gen. Robert S. Beightler's men were driven by a burning desire to reach Manila before the no-longer-dismounted 1st Cavalry Division. Far ahead of their trains jammed up behind blown bridges, infantry swam and artillery ferried in amtracks to keep their momentum, overrunning the Jap rear guard almost without a halt.

Brig. Gen. Leo M. Kreber's artillerymen met the difficulties of the 240-mile round trip from ammunition dumps stymied on White Beach 2 at San Fabian. Battalions were stripped of transport as never before to make up the 54-vehicle convoys.

We were in. Past the Bonafacio monument at Grace Park where Japanese infantry made less heroic figures, sprawled in death about the base, than those of the Filipino patriots deathless in stone above. Past the cemetery where two 120-mm dual purpose guns, their ammunition neatly stored in marble tombs, covered all northern approaches to the city, and straight down Rizal Avenue. Cheering Filipinos lined the streets, scarcely bothering to duck when a spate of sniper fire drove GI's to cover.

Hard pressed, the Nips made it plain that we would have to fight for Manila. There would be no open city policy on their part. As we pushed them toward the banks of the Pasig River which cuts the city in half, they put the torch to stocks of fuel and explosives stored in banks, theaters, hotels, and office buildings, blowing the newer business section sky high. Pulling south across the Pasig, they demolished Jones, Ayala, Quezon, and Santa Cruz bridges behind them.

Just one detail must be attended to before we could go over the river after them. In Old Bilibid Prison 800 military prisoners were cringing from the roaring flames of the burning city. Inured to privation under the Mikado's minions,



A corner of the Philippine Legislature Building. Within the basements of such buildings the Japs built pillboxes which could not be touched except by demolishing the structure with direct fire.



Ancient Intramuros in the heart of Manila

our comrades broke down only when they saw the pot-helmeted, HBT clad strangers of the 148th Infantry who came to rescue them.

As artillerymen labored against time to clear the Ang Tibay shoe factory of Jap machinery and filth so that these pitiful creatures could be sheltered, the first loads came off the trucks. Dazed men, wearing fixed grins, fondled the strange carbines, hefted the helmets, asked questions, said over and over, "God, it's good to see you!" It must have come as a shock to the young soldiers, viewing for the first time officers with insignia on the shoulders of their shirts and enlisted men in campaign hats, that these men were already prisoners before many of the rescuers were inducted.

Much the same scene was being enacted at Santo Tomas University, where elements of the 1st Cavalry were releasing civilian internees by the thousands.

Maj. Gen. O. W. Griswold, commanding the XIV Corps, had planned well. While his 37th Division slashed to the heart of Manila, the rest of his 1st Cavalry sweeping around the eastern outskirts secured the city water supply and his 11th Airborne Division approached from the south to secure Nichols Field and Fort McKinley.

Thus the stage was set to annihilate the remaining 12,000 Nipponese in Manila. Caught on the prongs of three converging columns, their backs to Manila Bay with no avenue of escape left open, they could only stare moodily at Bataan, hazy in the distance—and fight.

Fight they did. Allowing themselves to be distracted only to wantonly butcher the helpless civilians trapped with them, they made the utmost use of their skillfully contrived defenses.

It is virtually impossible to separate the artillery story from that of the infantry in this battle, so closely were the two arms associated. Every street corner was a strong point. Streets were mined and barricaded with steel rails. Forted up in modern

earthquake-proof apartments, hospitals, university buildings, and residences, the Japs had to be driven from building to building, ever inward, by extremely close supporting fires. Forward observers were calling for fires by giving the names of buildings and street intersections.

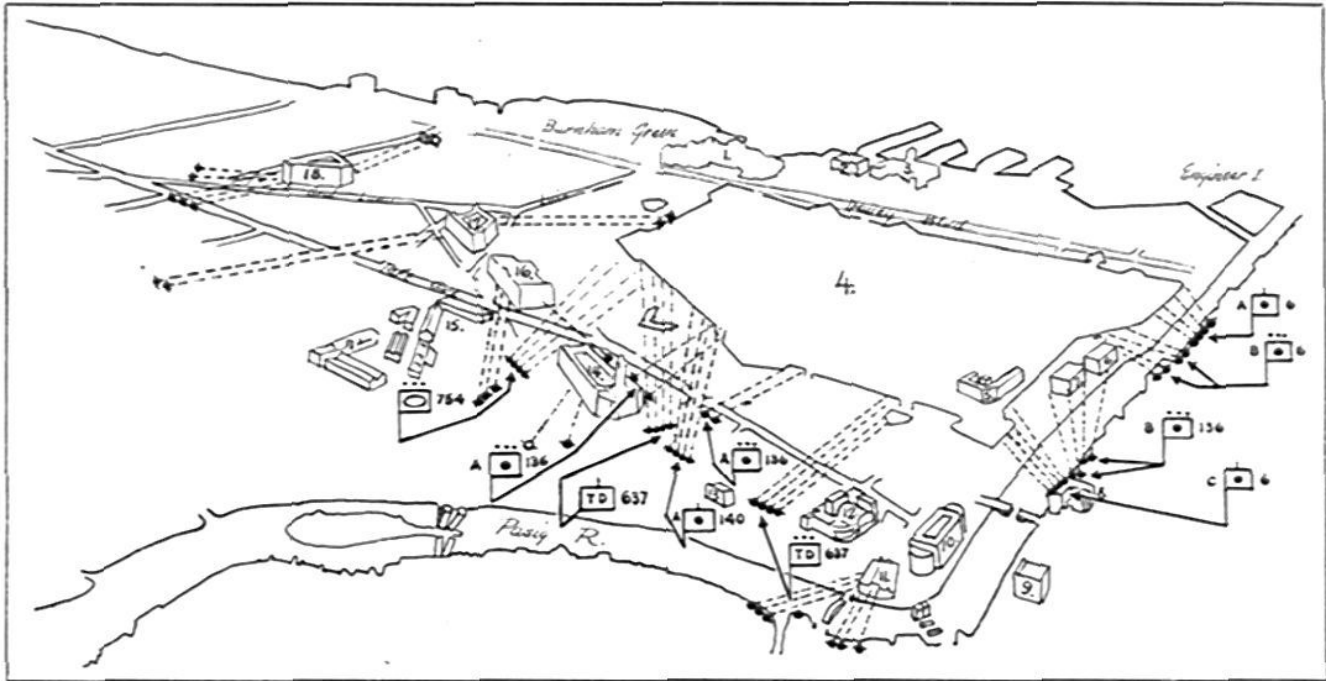
Affecting our every decision was the desire not to harm the civilian hostages and the property of our Filipino compatriots. The Japs would not have it thus, however. In the end, it was necessary to blast apart with all the fire power at our command every pocket of the suicidal defenders.

At the end of two bitter weeks, attacking troops had fought their way house-to-house through the fashionable Ermita district, through Paco and Pasay, up through the University of the Philippines, along the south bank of the Pasig, and were looking out upon the seat of the government and the ancient Intramuros, walled city of the Spaniards, the very heart of the Philippines. In forcing our way to the edge of the park-like area surrounding Intramuros, three hard cores of resistance had been by-passed and were being contained in the Legislative, Finance, and Agriculture buildings. For the moment, they could be ignored.

The story of the wicked fights for such places as Paco RR station, Provisor Island, the New Police Station, the Metropolitan Water District Building, the City Hall are for another time and place. Taken singly, they rank with any engagement in the Pacific, considering the number of troops involved. They were behind us now. We turned our whole attention to the harder fight to come.

The artist's drawing of Intramuros and the port area, with the government buildings on the east, Burnham Green on the south, the Pasig River on the north, and the Bay on the west, shows clearly how difficult any approach to the walled city can be made. There is no covered route.

Intramuros itself is the old Spanish fort around which



DIRECT FIRE POSITIONS AND KEY TO IMPORTANT BUILDINGS

- | | | |
|-----------------------------|--------------------------|---|
| 1. Manila Hotel | 7. Macondry & Co. | 13. Metropolitan Water District |
| 2. Marsman Building | 8. Ayala Building | 14. City Hall |
| 3. Customs House | 9. Great Eastern Hotel | 15. University of the Philippines Buildings |
| 4. Intramuros (Walled City) | 10. General Post Office | 16. Legislative Building |
| 5. Letran Building | 11. Cold Storage Plant | 17. Finance Building |
| 6. Mint | 12. Metropolitan Theater | 18. Agriculture Building |

the city grew. Built to withstand the assault of marauding tribesmen and Chinese pirates, it is still a formidable obstacle. Its walls are forty feet thick at the base. Their tops are wide enough to mount field guns. The gates are guarded by bastions barring the approaches. Some of the walls are tunnelled, providing covered routes for reinforcing troops. New and modern buildings tower over the walls, crowding the twisted narrow streets within. Surrounding the whole is the golf course and playground, built over the old moat.

On the north bank of the river, held by us, tall office buildings overlook the whole area and provide excellent OPs. Gutted in the fire set by the retreating Japs, the upper floors nevertheless yielded sufficient office furniture to establish very business-like offices for the observers, including several swivel chairs, desks for their feet, and lounging chairs for the guests—of whom there were many. General officers vied with cameramen for choice vantage points until the inevitable sniper reminded them to stand back from those windows.

To reach assault positions, four more buildings had to be occupied, in this order: the Metropolitan Water District Building; the cold storage plant, at the bend of the Pasig and covering the river in both directions; the Metropolitan Theater, flanking the Botanical Garden; and the General Post Office.

A tank-infantry team took the Water District Building, with tanks firing at less than 100 yards. Artillery observers in the Great Eastern Hotel watched our infantry get up to the foundation of the building time after time. Just at dusk, three

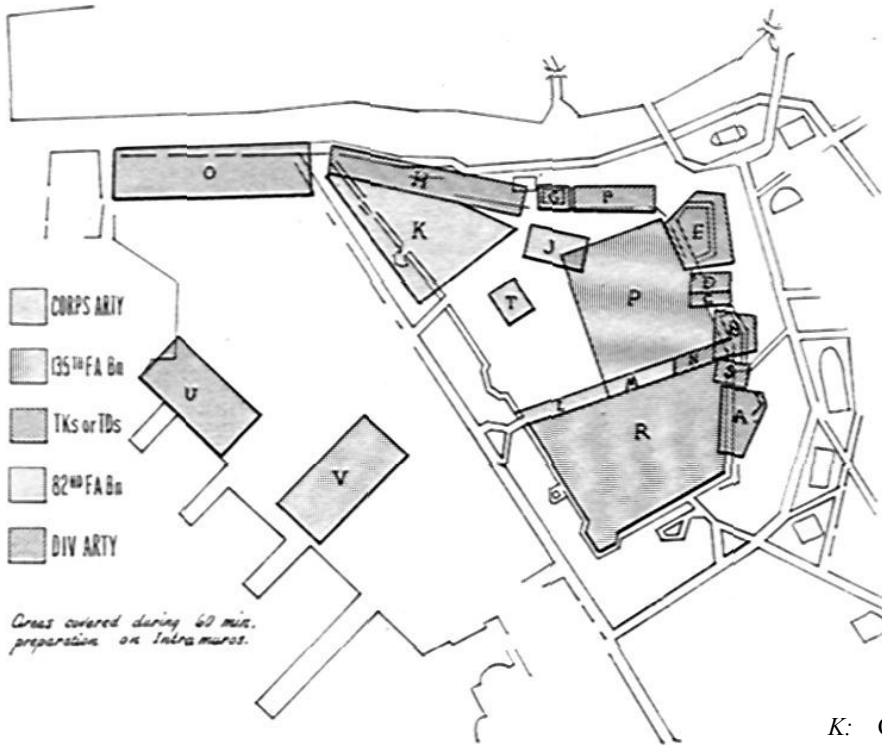
platoons of Japanese Infantry came out of the building and started north in a straggling column. Artillery killed at least fifty, and machine guns at the OP got the rest.

A battery of the 135th Field Artillery Battalion (105 how) was brought up to direct fire positions across the river to take the "ice house" under fire. Twice the lights tried to neutralize this thick-walled, windowless structure—and failed. A battalion of mediums was then used, one battery direct fire and another indirect. They set it afire, forcing the Japs out, leaving behind their huge stocks of fancy groceries and meats bearing U. S. trade names and Red Cross markings.

From the OPs in the Great Eastern Hotel and the Ayala Building, Nips in their own OPs in the Manila Hotel, the Customs House Tower, and the Marsman building could be observed bowing, scraping, and gesturing. We were using captured Jap 20-power observing instruments, which brought the enemy right up into our laps. His OPs were destroyed.

After we occupied the ice house, both the Theater and the Post Office were subjected to terrific artillery pressure. Concrete piercing ammunition was used with telling effect. These buildings were taken, not without casualties. Some 70 Japs were still alive and fighting in the basement of the Post Office when our people entered.

With the occupation of these buildings we were as close as we could possibly get to Intramuros. The next three days were spent in reconnaissance for direct fire positions and the preparation of positions.



ARTILLERY AMMUNITION EXPENDITURES FOR
PREPARATION FOR ATTACK ON INTRAMUROS
0730-0930 23 FEBRUARY 1945

Unit	Weapon	Total Ammo Exp	Wgt per Projectile (lbs)	Total wgt Projectile (lbs)
6th FA Bn	105-mm How	1,431 HE	33.00	47,223.00
		12 HC	32.87	394.44
135th FA Bn	105-mm How	1,630 HE	33.00	53,790.00
140th FA Bn	105-mm How	478 HE	33.00	15,774.00
		1 HC (red)	29.27	29.27
136th FA Bn	155-mm How	830 HE	95.00	78,850.00
		23 WP	98.40	2,263.20
82nd FA Bn	105-mm How	1,213 HE	33.00	40,029.00
		93 WP	34.31	3,190.83
754th Tank Bn	75-mm Gun	450 HE	14.70	6,615.00
		150 APC	14.96	2,244.00
637th TD Bn	76-mm Gun	450 HE	12.87	5,791.50
		150 APC	15.44	2,316.00
<i>Corps Arty</i>				
756th FA Bn	155-mm How	413 HE	95.00	39,235.00
757th FA Bn	155-mm How	461 HE	95.00	43,795.00
465th FA Bn	8" How	72 HE	200.00	14,400.00
544th FA Bn	240-mm How	39 HE	360.00	14,040.00
<i>All Units</i>	75-mm Gun	600 rds		
	76-mm Gun	600 rds		
	105-mm How	4,858 rds		
	155-mm How	1,727 rds		
	8" How	72 rds		
	240-mm How	39 rds		
	TOTAL	7,896 rds	TOTAL WGT	369,980.24 lbs.
				185 Tons

PREPARATION FOR ASSAULT ON
INTRAMUROS

- H Hour is 0830.
- The following areas will be fired from H — 60 to H Hour:

- AREA A: 754th Tank Bn, B Co. Maximum rate for prolonged fire.
- B: 637th TD Bn. Maximum rate for prolonged fire.
- C: 1 platoon 136th FA Bn direct fire at rate 100 rds per gun per hour. Total ammo ex: 200 155-mm.
- D: 1 Btry 140th FA Bn direct fire. Fire at rate 2 rds per gun per minute.
- E: Same as B.
- F: 1 Btry 6th FA Bn direct fire. Fire at rate 2 rds per gun per minute.
- G: 1 Btry 136th FA Bn direct fire. Rate of 100 rds per gun per hour. Total ammo ex: 400 155-mm.
- H: 2 Btrys 6th FA Bn direct fire. Fire at rate 2 rds per gun per minute.
- J: 1 Btry Corps Arty. Total ammo ex: 200 155-mm.

K: Corps Arty. Total ammo ex: 400 155-mm.

O: Corps Arty. Total ammo ex: 100 155-mm.

P: 135th FA Bn. 2 rds per gun per minute.

R: 82nd FA Bn. 2 rds per gun per minute.

S: 1 platoon 136th FA Bn direct fire. Total ammo ex: 200 155-mm.

T: Corps Arty. Total ammo ex: 50 155-mm.

U: Corps Arty. 240-mm Howitzers. Ammo ex at CAC's discretion.

V: Corps Arty. 8" Howitzers. Ammo ex as directed by Corps Arty Commander.

- The following areas will be fired from H+15 to H+45:

L: Corps Arty, H+15 to H+45, 50 rds.

M: Corps Arty. H+15 to H+45, 50 rds.

N: 135th FA Bn. H+15 to H+45.

The infantry plan was to attack Intramuros with two battalions, one jumping off from the Post Office and the Theater, and the other crossing the Pasig River in assault boats to hit the north side of the walled city.

The artillery plan conceived by Gen. Kreber and Col. Kenneth Cooper, his executive officer, called for emplacing 36 guns in direct fire positions. Reference to the plan of fires, which was superimposed on a sketch map by Col. Cooper, shows the approximate location of the guns and the areas covered. All told, eleven battalions of artillery, tank destroyers, and tank weapons were employed. Corps assistance was requested, and their 240-mm and 8-inch howitzers brought into the scheme.

A battery of the 6th Field Artillery Battalion (105 how) was given the task of reducing the stone embankment of the river to provide a gentle slope where the infantry could easily get out of their boats. This was accomplished the day before the assault. The 240s pounded the wall on the east, creating a breach which, as it turned out, was unnecessary.

Which brings this narrative up to the morning of February 23, 1945, the day of the attack. H-hour was 0830. At H minus 60 we shot the works, literally as well as figuratively.

Using all our organic battalions (the 6th, 135th, 136th (155 how), and the 140th and the attached 82nd), with the Corps 155 Hows of the 756th and 757th Bns, the 465th FA with their 8-inchers, and the 544th with their 240s, plus the 637th TD Bn and the 754th Tank Bn, the huge concentration landed TOT at 0730.

High above the river in their grandstand seats, observers rocked with the concussion of the bursts.



Battered by shell fire, wall-top pillboxes were neutralized before the infantry assault. Here appears south side of the Walled City.

emergency, blasted the already riddled building. No more Jap firing was heard.

At exactly 0830 a red smoke round blossomed, the barrage shuddered into silence, the infantry moved out of the Post Office and their holes along Taft Avenue and launched their assault boats from the estuary where they had been hiding. It was a perfectly executed maneuver right out of the book. They entered the walls without a



Jap 120-mm dual purpose gun, with camouflage knocked off and recoil cylinders holed by counterbattery. This was their principal weapon in defense of Manila.



Inside old Intramuros, last stronghold of any large Jap force in Manila. This shows proportions of the wall, and its construction.



Typical section of wall of Intramuros, showing firing slit, 40 feet thick at the base, tunnelled walls were excellent for defense.

Direct fire guns, employed in the same building eight floors below, jarred the floors. Heavy MGs in the windows added to the din.

Jap machine guns could be heard firing from the Letran Building, just inside the north wall, near where the 129th Infantry was to land. It was reckless, ill-advised defiance. A battery of the 136th FA Battalion, held out for just such



Spanish soldiers on the gate look askance at a Sherman tank entering their once impregnable Intramuros.

casualty and 24 hours later had complete control of Intramuros, despite determined resistance from deeply entrenched enemy in St. Augustine Church.

During that hour of hell the 11 battalions fired 7,896 rounds, totalling 185 tons of ammunition. As the assault moved off, fires were shifted to block off the southern half of the walled city, as shown by the fire plan.

Following the fall of Intramuros, there remained the three by-passed buildings to be cleared before the battle of Manila could be officially closed. The attack of these buildings may appear to have been an anti-climax after Intramuros. However, the caliber of their resistance can be seen in the fact that it took nine more days to finish them off.

Once again the solution was direct fire. Taking one building at a time, 155s were placed in a semi-circle around each building and hundreds of rounds of concrete-piercing and unfuzed shell were poured in. We are convinced that the unfuzed shell punches the best hole for demolishing a building.

Many times our infantry crept up close to the buildings,

only to be driven back by machine gun fire. The fanatics inside were selling out for the highest price possible. Not until piles of rubble had been built high enough to block the firing ports (see picture of Legislative Building) were our troops able to get into the first floors of the buildings, and with demolitions and flame throwers overcome the pillboxes-within-pillboxes dug into the basement floors. The last building fell on March 3, ending the battle for Manila.

There was once another assault on a walled city which went down in artillery history. Summerall, O'Reilly's executive officer, chalked his aiming point on the gates of Peking. We placed ours with colored pencil on a 1:3,000 map of Intramuros. Both acts spelled the doom of our enemies.

DIVISION ARTILLERY INTELLIGENCE

By Maj. James J. A. Kelker, FA

Only since the start of hostilities have we taken an active interest in the functions of the Artillery Intelligence Officer and his duties. Admittedly in time of peace it is difficult to devise problems and maneuvers in which the intelligence personnel can be gauged accurately. And there was very little for them in the Field Manuals other than a list of the things for which the artillery intelligence officer was responsible.

This article is based on a quotation from page 7 of FM 6-100, 24 May 44: "The S-2 section has the primary function of locating enemy elements which are appropriate targets for the division artillery in its support of the infantry. *It also secures information required by the division G-2.*"

Our own intelligence plan is based upon operations against the enemy in the Pacific Theater of War. It was devised and improved upon on that basis. It has been operated in the division artillery of two different divisions in two different types of operations against the enemy in combat, and found to be thoroughly satisfactory and flexible enough to allow for changes in personnel with a minimum loss in efficiency.

In order to facilitate the orderly gathering of information by battalion S-2s and their clerks, the following form has been adopted:

CONFIDENTIAL

..... F. A. Bn. S-2 JOURNAL
FROM 1945 TO 1945.
TIME

<div style="text-align: center;"> <hr style="width: 80%; margin: 0 auto;"/> <hr style="width: 80%; margin: 0 auto;"/> </div>	
--	--

CONFIDENTIAL PAGE

This form has been mimeographed by all battalions upon long mimeo sheets, which can be readily bound with an Acco

fastener. The same form is used by division artillery headquarters. It is purposely simple so that it can readily be typed if necessary or entered in a bound book if desired.

The collecting agencies of the division artillery intelligence system are excellently portrayed in FM 6-100, pages 8 and 9, and will not be repeated here. Frequent reference thereto is strongly recommended. All forward observers are instructed to continually relay information to the battalion S-2 when not engaged in a "fire mission." Liaison officers are similarly instructed. As the battalion S-2 receives each piece of information, he enters the time at which he receives it in the "time" column of his journal sheet. He next enters the source, time of occurrence, place, and the message itself in the second space of his journal sheet. Then, depending upon the urgency of the message, he either relays the information to DivArty S-2 or simply leaves it in his journal as an entry.

DivArty S-2, in turn, enters the time of receipt of the message at division artillery in the "time" column of his journal sheet. He enters the additional information as to his source of information (in this case the battalion S-2). He likewise passes the information to G-2 and other pertinent parties. Thus time elements are shown through each echelon; when action is to be taken by any echelon of command, the time value is known; furthermore, system delay faults, if any, can be corrected.

For example, the battalion sheet would show a message thus:
TIME

251000	<i>Ln O 2 reports that at 0950, the front lines of the 2d Bn of 999th Inf are from coord (25.4-32.7) to (25.9-32.7) and are in contact with the 1st Bn 999th Inf on their right (north). T. S. 0955. (Passed to DivArty.)</i>
--------	---

DivArty journal sheet would show:

TIME	
251015	<i>S-2, 888th FA: Ln O 2 reports that at 0950 the front lines of the 2d Bn 999th Inf are from coord (25.4-32.7) to (25.9-32.7) and are in contact with the 1st Bn 999th Inf on their right (north). T. S. 0955. (Passed to G-2 and all Arty Bns.)</i>

In this way a very complete chronological record is kept of all intelligence matters. Targets located are entered, as well as notes of CP moves, enemy shellings, etc. From this record it is possible at any time to make up a complete special file or any of the many types of records or reports that may be required by any of the appropriate commanders or command echelons. For example, a report of artillery allegedly "falling short" can often be disproved by comparison of the S-2 journal and S-3's record of fires.

At the end of each specified 24-hour period a copy of each battalion's S-2 journal for the day is forwarded to the DivArty S-2, who then compiles the information from all sources and makes up the DivArty S-2 Summary which in turn is forwarded to the division G-2 and to each of the artillery battalions.

This summary can either be condensed and written in the narrative form used by the division G-2, or evaluated and written in the journal form previously described. During the initial phase of combat there is much to be said in favor of the journal form, since it facilitates the work of the division G-2 in preparing the division intelligence report which, in the initial phases of combat, is largely dependent upon the artillery intelligence channels for information. Later, as things stabilize, the narrative form may be adopted.

The time of closing the journal day depends of course upon the closing time set by the next higher echelon. Each artillery battalion S-2 starts his journal as of the time his battalion comes ashore. DivArty S-2 opens his journal as of the time DivArty headquarters comes ashore. The first DivArty S-2 Summary is produced at the end of the first journal period that DivArty is ashore.

The simplicity of the above form and the method of operation of the division artillery intelligence system make it very easy to incorporate any attached battalions into the division artillery intelligence net. It has also been found that use of a copy of the DivArty S-2 Summary by field artillery group headquarters and corps artillery S-2, facilitates the work of these intelligence agencies and leads to a better dissemination of intelligence throughout artillery of the corps. The forwarding of a copy of each day's battalion S-2 journal allows the DivArty S-2, in addition to compiling the intelligence of the artillery, to have a continuous check on the flow of information from and to battalions. It facilitates corrections and constant



Japan manufactured her own version of the Krupp 7.5-cm field gun. This one was captured by Marine raiders along the Guadalcanal shore, where lush growth made observation almost impossible.

improvement to the division artillery intelligence system.

In initial operations against the Japanese it was found that a direct telephone line laid between DivArty S-2 and the division G-2 saved a great amount of time and took a lot of traffic off the already loaded switchboards. In fact, it made the G-2 and DivArty S-2 sections into one, for each was immediately available to the other by means of this direct phone. Use of this direct line, inaugurated by DivArty during our training phases, has become SOP. It has been discovered that in the heat of battle messages can be relayed from front line units through artillery channels directly to the division G-2, by-passing the always loaded division switchboard, in considerably less time than could possibly be done through direct infantry channels and switchboards.

Due to the fact that the Japanese seldom occupy anything approximating a "line," it has been found in the Pacific Theater that it is necessary to keep "friendly front lines" posted on the artillery intelligence map. The amount and type of intelligence posted upon this map will depend, of course, upon the wishes of the commanding general.

THE PESCADORES AND SAKISHIMA ISLANDS

By Col. Conrad H. Lanza

THE PESCADORES ISLANDS

A small but militarily important group, the Pescadores Islands lie 25 to 50 miles west of Formosa, in Formosa Strait. To the west, Amoy in China is 115 miles away. From north to south the islands are scattered over a distance of 40 miles. Twenty of them (of which 3 are of major importance) are inhabited. There are also 40-odd islets.

The three principal islands are so shaped and arranged that

they provide between them a natural harbor with good anchorage, about six miles long from north to south and from two to four miles wide. It has been improved by the Japanese and has become a strongly fortified naval base. There lies the reason why the Pescadores have a military value.

Total area of all islands and islets is only about 50 square miles, half of which is contained in Great Island (*Boko To* in Japanese).

The islands' name is derived from the Spanish *Pescador* (fisherman). Due to the fact that the islands are a meeting point for a warm current coming from the south and a cold one from the north, fishing conditions are excellent. They led the Spanish explorers to assign a name for what appeared to be the sole occupation of the natives.

Although the Pescadores are unrivalled as a fishing center they are not altogether desirable in other ways, and are far from being an ideal site for a military base. That they have become so is due to their wonderful harbor, which is the only satisfactory one in this part of the China Sea.

Strong winds are common, the southwest monsoon blowing in June, July, and August and the northeast monsoon during the remaining nine months of the year. The latter monsoon causes the frequent high winds. During the six months from October to March (both inclusive) strong gales blow two days out of three. During September, April, and May ordinary gales prevail about five days out of six. July and August have fewer windy days, but are subject to typhoons which last about four days each; their number varies yearly, but averages about one a season. A calm day is rare.

The constant strong winds affect flying conditions. On shore the winds have had an effect similar to that of our Dust Bowl, causing soil erosion and destruction of crops. On account of the difficulty of farming the natives have taken to fishing to secure food. Trees are stunted.

Fogs occur from January to May, but are not serious impediments to navigation or flying. They are much less severe than those on the opposite China coast.

The Pescadores lie just north of the Tropic of Cancer. Temperatures are never freezing. Winters are cool, with temperatures of between 50° and 80° F.; in summer the air varies between 70° and 90° F. Winters are usually dry and summers wet, but the total precipitation is moderate and below 40 inches per annum.

These islands are of the volcanic type, but no active volcanic symptoms remain. All are low and flat at a mean elevation of about 50 feet above sea level. The highest elevations are below 300 feet. Due to the steady severe winds, there are but few trees. No land is capable of cultivation, on account of soil being blown away, unless protected by walls. Such walls, made out of coral, which is locally abundant, afford protection to a limited number of small cultivated plots.

Earthquakes are common, but no destructive ones have occurred within recent times.

Exclusive of the garrison, the population in 1940 was almost exactly 50,000, of which 94% were Chinese from Formosa or of Formosan origin. Only 75 Chinese came from the mainland. There were no remnants of any original race, and there may never have been any. Japanese, other than those in the military service, numbered about 6,000.

The islands have plenty of good roads. Due to lack of vegetation and the generally flat surface, there are no important terrain obstacles. There are neither rivers, lakes, hills, nor mountains.

All invasions of Formosa to date have been preceded by an invasion of the Pescadores, which has invariably been the base for operations against the large adjoining island. The earliest known invasion was by the Chinese about the year 600. This

was more of an immigration. Not until 1367 did the islands become politically associated with China. Although the Spaniards visited the islands there is no record of an attempt on their part to occupy them. The Dutch seized the Pescadores in 1622 and then proceeded to Formosa. After establishing themselves there they abandoned their advanced base in the Pescadores, which reverted to Chinese jurisdiction.

In 1683 the Manchus conquered and held the Pescadores, and continued on into Formosa. Never thereafter were the islands under Chinese jurisdiction. In 1884 France conquered the Pescadores but ceded them back to the Manchu Emperor in the next year. In 1895 the Japanese conquered the Pescadores, en route to Formosa. Since then the islands have remained in Japanese control.

The fact that occupation of the Pescadores has in the past been the initial step to an invasion of Formosa should not be construed to indicate that this must be a necessary preliminary in the future. With modern methods of invasion, the Pescadores could be bypassed.

There are no special diseases in the Pescadores. The water supply comes from wells, including artesian ones, and by collecting rainfall. It is suspect as to quality and might be insufficient in quantity for a large invasion force.

Boko Bay* is the main anchorage of the Pescadores. Leading from it are minor bays, where are the naval yards and bases. The bay has two entrances; the north one's axis extends northwest, the south one's extends southwest. Each entrance is a mile and a half wide. The north channel is narrow.

On the west side, between the two entrances, is Gyoo (Fisher) Island. This has the shape of a sea horse, with head at the north facing east and tail at the south pointing west. The island is 6 miles from north to south, the body being about a mile wide. The tail of the island is nearly three miles long. This south front consists of two shallow bays where landings could be made when the wind is not from the southwest. The west coast has two bays, each about one and a half miles wide and affording shelter against both monsoons.

At the south center of the west side is the island's capital, Shochikaku (pop. 2,000). There are nine other villages, the combined population (excluding troops) being over 9,000. Fishing is the principal occupation. Sorghum, millet, and sub-tropical fruits are grown, but food (including rice) must be imported. Road net is good.

The southeast side of Boko Bay is bordered by Boko Island, which is the Great Island and where the navy yards and docks are located. Out of the 50,000 inhabitants in the Pescadores, 25,000 live on Boko in nearly 50 villages, or an average of 2 villages per square mile. The capital, port, and principal city is Mako (at the center of the west side), with a population of nearly 8,000.

Boko has an irregular coast line. By air the island is nearly 8 miles long with axis SW-NE and a width of about 3½ miles. Immediately adjoining Mako on the south side is Junk Bay. This, a mile and a half deep and a mile wide, is believed to be a submarine base. A narrow peninsula separates Junk Bay on the south side from Mako Harbor, which is horn shaped, over three miles deep, and more than a mile wide. Here is the main naval base. The outer or south side of Mako Harbor is another

*Ponghau Harbor on some maps.

peninsula, forming the exterior ride of the horn. The west end is three miles long and a quarter to a half mile wide, the sea side facing southwest. The inner end of the peninsula is about three miles long, the sea side facing southeast and with average width of a mile. There are a number of bays on the sea side, all of which are reported to be heavily defended.

On the northeast side of Boko are three bays which would be suitable for landings. The center one has a narrow entrance, the others open and partially exposed to the prevalent northeast gales.

There are at least two airfields on Boko, but no information as to enemy forces.

Agriculture and fishing are about the same as on Gyoo Island. The principal employment of the inhabitants is in connection with the army posts, naval yard, and airfields, which ordinarily furnish employment to most of the inhabitants.

The northeast side of Boko Bay is bordered by Hakusha and Chuton Islands, which are really one island, having the form of an inverted hook. The shaft of the hook adjoins Boko Island, with which it is connected by a causeway. The hook curves westward with the point directed to the south. Its hollow forms a bay which is part of Boko Bay. The length of the hook shaft, which extends NNW, is 4½ miles. The hook is 3 miles across with the outer part facing northwest. Capital of Hakusha is Taishakan, a village of 1,300 people on the northeast coast. Total population, including ten other villages, is about 7,500.

Two miles out to sea from the southwest corner of Boko is Kosei Island, two miles long and about a third of a mile wide. This is an army post reported as strongly fortified, guarding the south entrance into Boko Bay. The coast is not high but is steep and unsuitable for landing vehicles.

Four miles north of Hakusha is a sandy island—Kichibai—about two miles long and ¾ mile wide. Nothing is known as to fortifications on this island, but indications are that it probably is fortified. It would make a possible advance base for a subsequent invasion of Hakusha.

* * *

The center of activity of the Pescadores is Mako. Here are four piers or quays suitable for transports, and adjacent warehouses for a base. Mako is one of the most recently walled towns, the Manchus having erected the wall following the restoration by the French in 1885. The Japs have removed most of it. At the present time it would not be a serious means of defense.

Water for the town comes from wells and a plant for distilling sea water. Destruction of the water tower would at once destroy water distribution.

Around Mako are the Japanese bases, airfields and establishments, and about everything that is important.

THE SAKISHIMA ISLANDS

This small group lies east of the northeast coast of Formosa, the nearest being 60 miles off and the furthest 220 miles. There are seven main islands and about sixteen islets. They are an important enemy air base, and several small harbors afford possibilities for minor depots and bases. Unlike the Pescadores, the Sakishima have not previously been used as bases for an

invasion of Formosa. They could be so used, however, and would provide good air bases for such a mission.

These islands are non-volcanic, but are flat or hilly. They are the tops of a submerged mountain chain. Their climate is sub-tropical with a corresponding type of vegetation, bananas being especially plentiful. It never freezes, but during the winter months the temperature occasionally drops to below 50° F. at night. Maximum temperature in summer seldom exceeds 90° F. Rain occurs in all months but with heaviest falls from June to October, inclusive. The summer monsoon (June to September) blows from the south, the winter monsoon (September to March) from the north. From March to June winds are variable. The regular winds do not interfere with flying. Storms are generally limited to typhoons, which usually occur from May to October. These are very violent, and may completely destroy crops and native villages. There are no reliable statistics as to the average number of typhoons per season for localities.

Total population at the time of the 1940 census was over 98,000, all Japanese or descendants of native races who closely resemble the Japanese. The original native language survives and is quite similar to Japanese. The latter language is in general use. No foreigners have lived in these islands and few have visited them; they are consequently little known to Americans and Europeans.

The inhabitants live by farming and fishing. Standard of life is below that in Japan; poverty has been general. Besides poultry, pigs and goats are common. Food raised is not always sufficient for local needs; in some seasons it has to be imported.

Notwithstanding the rains, water is none too plentiful: rocks are partially of limestone so surface water runs off quickly. Rainfall is collected, and is occasionally transported by water boats from one island to another as required. Due to the shortage of water cleanliness is not so good as in Japan. For invasion troops, a supply of water would need to be provided.

Mosquitoes are common, and the islands are noted for an unusually poisonous snake—the *huba*—which varies between six and seven feet in length and whose bite is reputed to be fatal unless immediate treatment is received. Local Japanese authorities pay bounties for captured snakes from which anti-venom serums are prepared.

The island nearest Formosa is Yonakuni, which is six miles long from west to east and about three miles wide. At the east end is a 750-foot hill. A lower one is in the southwest corner, which has precipitous sides. In between the hills are a series of plateaus. All coasts are bordered by coral reefs. The population is about 4,500.

Thirty-five miles to the east is Iriomote, one of the three most important islands of the group, with a population of some 9,000. This island is fifteen miles from west to east and about ten miles wide. It is very hilly, being a succession of ridges separated by deep valleys. The west shore is deeply indented by narrow inlets. Both south and north shores are nearly straight. Behind some sand beaches nearly all the coast rises abruptly from the sea, thirty to sixty feet high on the east and north, back of which the land slopes gradually toward the interior. The west and south coasts average over 600 feet high. In general this would be a difficult island on which to

land against opposition. Highest elevation is 1,449 feet, on a hill nearly at the center of the island; around this hill are plateaus suitable for airfields. The island's port, Iriomote village, is on the west side.

Due south of Iriomote is Haderuma, a low island three miles long from west to east and two miles wide. Maximum elevation is only 220 feet. Terrain is generally level.

Ishigaki is a bell-shaped island, with a handle pointing northeast. It is fifteen miles east of Iriomote and connected with that island by a coral reef which impedes navigation between the islands. Total length of the island in a SW to NE direction is eleven miles; widest part of the bell (at SW corner) is six miles. There is a bay in the mouth of the bell, with one good beach and Ishigaki port. Around this bay most of the inhabitants live on a plateau about 250 feet above sea level. Off the south shore the coral reefs extend over six miles out to sea. The population of this island is nearly 20,000. The handle of the bell is a plateau about 650 feet high and with steep sides.

Eighteen miles further east is a round island having a diameter of 3 miles. This is Tarama (pop. 3,600). It is about thirty feet high, with one 100-foot hill. The north side is wooded. The entire island is surrounded by reefs. It does not appear to have a military value.

Miyako is the principal island of the group. It lies beyond Tarama, being 54 miles NE of Ishigaki. This island is

triangular in shape, with the south side (thirteen miles long) as a base. The irregular west side is twelve miles long, with good harbors in the south center and center at the town of Hirata. The third side of the island extends from NW to SE and is eighteen miles long. Population is 50,000. There is a coastal road on the west side. From Miyako an axis road extends to the southeast end of the island. The island has six ridges parallel to its long side, each about 300 feet high. Each ridge has a steep slope on the northeast side and a gentle slope on the southwest. There are numerous beaches. With its ports, yet undeveloped, it is the island of main military importance. Miyako town has water and power plants. Destruction of the water plant during winter months might easily lead to a water famine.

Three miles west of Miyako is Erabu, which is really two egg-shaped islands pointing northwest, the northern one being 5½ miles long and the southern 3½. These are flat, low islands suitable for air fields in connection with Miyako. These small islands have 8,500 people, being like Miyako the most densely populated and cultivated of the Sakishima group.

NOTE: In April and May, 1945, the Sakishima Islands have been an enemy air and light naval base for counter-operations against Allied forces in the vicinity of Okinawa, which is about 200 miles northeast.

Main enemy airdromes are on Ishigaki and Miyako.

BINOCULARS HELP AT NIGHT TOO

It is a common but fallacious belief that ordinary binoculars are useful only for daytime seeing and that a mysterious kind of "night glass" is required for night seeing. Consequently issue binoculars are seldom carried or used during night operations. Actually, the advantage of the present standard issue binoculars for night seeing is immediately apparent to anyone using them at night, and while even better seeing can be obtained with binoculars of higher power and larger exit pupil, the benefit to be derived from GI binoculars is striking. Lights and objects which cannot be seen with the unaided eye are seen and objects which can be seen but whose form cannot be distinguished with the unaided eye are easily recognized.

In order to appraise the improvement in vision quantitatively and determine the relative contributions of objective lens diameter and power to this improvement, experiments were recently carried out by the Armored Medical Research Laboratory, using the (M3) 6×30/GI binocular (6-power, 30-mm objective lens diameter), Navy 7×50 binocular, and the 10×45 BC 'scope. Use of the binoculars by troops on night operation problems confirmed the practical advantages indicated by the experiments.

Use of the present issue (M3) 6×30 binoculars makes it possible to recognize a target at night at approximately 3.5 times the distance at which the same target can be recognized with the unaided eye under the same starlight conditions. The 7×50 Navy binoculars make it possible to recognize a target at night at approximately 4.75 times the distance at which the

same target can be recognized with the unaided eye under the same starlight conditions.

The greater the magnification of the binoculars and the greater the light gathering, the farther objects can be seen and recognized at night. The fundamentals of efficient night seeing for the unaided eye (e.g., dark-adaptation, off-center vision, and scanning) also apply when using binoculars.

Night lookouts, reconnoiterers, sentries, night combat officers, and key men in all night operations should be supplied with binoculars for night use. They should be advised of the advantages to be gained from binoculars and instructed in their proper use.

The above conclusions also apply to monocular sighting equipment, hence the need for and recent trend toward sights incorporating greater power and larger objectives. Recognizing the importance of these factors for sighting at low illumination, such sights as the T-8, M-10, M-76, etc., were developed and are now in production for tanks. These instruments give to the tank gunner seeing ability at low light levels equivalent to that of the tank commander using binoculars with comparable characteristics. Such sight characteristics are required for all guns employed for direct laying at low illumination levels. In view of the above-mentioned results, little imagination is required to appraise the relative night hitting ability of tanks with sights of proper characteristics as opposed to tanks with formerly existing sighting equipment.

ARTILLERY LIAISON WITH THE NAVY

By Lt. Col. John R. Crossen, FA

Profitable artillery targets frequently flourish well within reach of destroyers or cruisers. Often a ship's guns can do a more thorough job than can the bombers. It is a naval function to deliver the fires, but often the officers of the available ships know nothing of such areas. The army locates the targets and wants them destroyed or neutralized. Liaison with the ships therefore becomes an army function when no naval or marine officers have been especially assigned for this task, and the army officers selected are usually field artillerymen.

In our part of the Southwest Pacific Theater daily air coverage is afforded and prints are excellent: for this work 1:5,000 prints are usually made available. Suspected areas are photographed on request if the daily coverage is not over them. Prints are usually ready twenty-four hours after request, unless greater speed is required. The photos go to Photo Intelligence Unit officers who study them stereoscopically. At present, we have a naval officer assigned to Division Artillery; Corps also has its own army section.

A mission handled against Japanese forces will be described rather than setting forth generalities. All equipment referred to has long been generally available in our theater.

From a study of earlier photographs, patrol information, and the logical available supply roads and areas, Corps G-2 suspected an area near a river mouth. A special coverage was requested of the area adjacent to this river, and 1:5,000 prints were delivered in twelve hours. The stereoscopic study definitely showed trails, a probable bivouac or supply area, a small barge landing, and suspected machine gun and small cannon emplacements. Trails led from this area directly to Jap strongpoints.

The Corps P.I. officer promptly wrote and delivered a letter to his G-3, setting forth a description of the targets and their location geographically and by coordinates, together with an overlay of the air photo outlining the limits of the requested fire. G-3 telephoned DivArty for an artillery officer, who reported to Corps and received a copy of the letter, an overlay, stereoscopic verticals, and obliques of the coast line. The Task Force Commander requested one destroyer (sometimes several are used). One of the protecting destroyers of a convoy arriving early next morning was assigned by the senior naval officer, who also informed the LnO through Corps to what beach to go; a Higgins boat was made available. These details are important because so many headquarters are involved that a slip or failure to settle details in advance has resulted in such confusion that the mission could not be accomplished. A radiogram informed the destroyer simply that it was to fire a mission that would be given it by army liaison personnel who would board the "can" at 0615L.

In his study of the missions the artillery officer decided that an air observer would be of great assistance in placing

the fire on this narrow target. He 'phoned DivArty, who assigned an SBD. The LnO then secured marked maps for the artillery air observer, and prearranged details of observation and communications. When the artillery air observer went to the field he acquainted the pilot with the mission and handed him a marked print of the targets. (In passing, this was of great help because the observer's radio went out for about five minutes during adjustment and the pilot, by reference to his photo, carried on the adjustment till the observer could again take over. Some of the pilot's sensings were not SOP, but when he said "Your bearing is good but it looks like you're shooting a couple of hundred yards too far" we could tell what he meant and commanded, "Down 200.")

The Officer of the Deck met the LnO and conducted him to the bridge immediately. The ship's Captain asked for an outline of the mission, glanced at the targets on the vertical photo, studied the oblique briefly, and then referred to the navigation map and determined where he would go. While he and his navigator worked out their course he turned the LnO over to his gunnery and communication officer. The CommO learned the frequency to be used, the time the plane would be in the air, the call sign of the plane, and the fact that marine or naval commands (rather than army sensings) would be used; for instance "Go Left 200, Go Down 100" rather than "200 R, 100 Over." When ship's communication personnel understand a fire command they frequently say "Affirmative" or "Roger"; a request was made for a repeat of the command so errors could be caught.

The gunnery officer was shown that one target east of the river ran about 600 yards along the coast, just back from the beach, and that it was 70 to 100 yards deep. The second target extended 400 yards along the coast west of the river, and had a depth of about 150 to 200 yards. He asked for recommendations on ammunition. Destroyers usually fire their five 5" guns in "salvo" (a "volley" to us), converged, but the front usually turns out to be about 100 to 150 yards. The LnO recommended 10 salvos (50 rounds) for each 100 yards of front, or 500 rounds. The Captain allotted 600 rounds in all. Then the gunnery officer learned the direction the ship would sail and its speed while firing, and decided to fire salvos (or rapid fire) at 6-second intervals. This density conformed with the army recommendation.

Returning to the bridge, the LnO found the ship nearing its predetermined firing area. The obliques taken from the sea were compared with the landscape. As the river's mouth was marked on these prints it was an easy matter to locate it. (Coast line features are often difficult to locate from a distance. One time, without obliques, a "can" got the wrong river and had commenced firing before the error was discovered.) A few native huts about 1,000 yards east of

the river could be seen as the ship came to within about 8,000 yards. These marked the right edge of the target; the gunnery officer was instructed to lay on them. Communication with the plane had been established about five minutes earlier and the observer was instructed to "Mark Target 1." By prearrangement, the plane was to fly the ship—right-edge-of-target line, and turn off when directly over the target; this check verified that the guns were on the target.

The first ranging shots were fired at the observer's command. They were correct for deflection and were sensed as 150 yards short for range. Air bursts were fired in the salvo because they are much easier to see from the air when shots might land under heavy foliage in the jungle. The ship fired again. The observer radioed, "Go down 50 yards, Fire for effect, Rapid fire." Six-second salvos then commenced. As the fire reached the center of the area longitudinally the shots commenced to go a little over, as the ship was not exactly parallel with the front of the target. The observer said, "Down 50 yards." This was applied without cessation of fire. The observer had a colored pencil and while watching the fire lightly colored the area effectively covered; when Corps received its report it had an accurate record of the exact area covered and the density of the fire—nothing was left to memory and the report was not a generalization.

After Target 1 was finished the ship turned, set a new course, and in a similar manner delivered fire on Target 2. The marked photo showed effective coverage in all of the outlined area of Target 2 plus about 100 yards' extra coverage to the west and 50 yards' greater depth. It showed complete coverage of Target 1 except for 50 yards of the left edge, but 50 yards beyond this sector about 20 rounds had landed. Every gun seemed to fire at a slightly different range, though all were in the suspected areas. Each gun, however, appeared to fire each of its rounds into almost exactly the same spot. Fires were started, large clouds of smoke and dust arose, and a later look showed the whole position badly mauled.

About twenty minutes were due to lapse between fires on Target 1 and 2, and this was reported to the plane. Suspecting some activity below him, the pilot dove down to strafe along the river during this period. He received some ground fire, probably machine gun, and the observer saw an area trampled down under the trees. There appeared to be a small boat landing and a trail to this clearing. A second dive indicated trails freshly used and an apparent bivouac or supply area about 150 yards square. The observer radioed, "Target of opportunity. From left edge of Target 2 go left 200 yards, go up 1,000 yards." The ship fired on Target 2 and then the Captain decided to fire 100 rounds at this new target. The observer was told, "Will fire on target of opportunity, Target No. 3. Report when ready to observe." His reply, "Will adjust on Target 3, Fire," came back promptly. The first salvo was sensed "Deflection correct, Go down 300 yards." As the second ranging rounds were correct, rapid fire was ordered. The observer reported 80 to 90 rounds right on his target.

When the personal report was made later to Corps, Photo Intelligence drew out another series of photos. Unknown to the LnO, G-2 had been watching this spot further inland for a week, had marked a trail in and out of it, had ringed in as a "probable" almost this exact area, and had requested aerial coverage on the following day. They were delighted to have their suspicions confirmed, and crossed off this area for the present. So it is important that full reports be given to higher headquarters. In no other way can they determine whether this method of attacking targets is productive, or keep accurately up to date. A sloppy or half-completed report doesn't help the men who work hard to find the Japs.

Prearrangement and details are important. The destroyer and the pilot, on whom so much depends, must know exactly what to do. Advantage can still be taken of unexpected occurrences, as witness the target of opportunity herein described.

For this mission the LnO needed to have:

- a. Marked verticals of the targets.
- b. Obliques of the shore line, with the river mouth marked, to assist the ship's officers in coming up to the firing position.
- c. A hasty terrain map, scale 1:250,000, compiled from old and somewhat inaccurate navigation charts and up-to-date air photos, with the target area spotted; this was suitable for navigation.

He needed to know:

- a. Location and accurate description of enemy positions in order to be able to recommend expenditure of ammunition and method of fire.
- b. Number of the destroyer.
- c. Time to go aboard.
- d. Whom to see where to get transportation from shore to ship.
- e. Type of plane and time it would take the air.
- f. Radio frequency the plane will use (ship can conform to this).
- g. Call signs of plane and ship.

The air observer needs the same information about the plane, radio frequency, and call signs. He should have marked photos for himself and the pilot, and know what time he is to be in the air and report in. Conference between pilot, observer, and LnO is of utmost importance; if time is limited, though, the observer can give the pilot the necessary instructions. Prearrangement as to when fire for effect will be called, giving sensings or commands during fire for effect, and flying the line of fire to a mutually known part of the target, give knowledge and confidence to both.

Such work is not difficult, but it requires common sense and thoughtful planning. The Navy is always glad to fire these missions and their hospitality is unsurpassed. And after the observer compliments the ship's officers by saying they have fired the best naval shoot he has seen, and he is sent home with "No further need of you. Happy Landings and Thanks," then comes the high spot to the artilleryman who has spent months in the jungle—a hot shower and ice cream for dinner!

An Artilleryman in a Joint Assault Signal Company

By Capt. William M. Doolittle, FA

AUTHOR'S NOTE

In the past two years a considerable number of Artillery officers have found themselves suddenly plunged into that bewildering tangle of military and naval objectives, a JASCO. Their new duties usually come as a complete surprise. May this description of a Joint Assault Signal Company, stressing particularly its Shore Fire Control component, help familiarize Artillerymen with the methods of conducting naval gunfire in an amphibious operation.

The name *Joint Assault Signal Company* is derived from the old *Signal Company, Special* designation. When Shore Fire Control Teams and Air Liaison Teams were added to these companies their titles acquired the "Joint Assault" prefix.

These varying components of a JASCO were put together in one organization because they are all concerned primarily with the assault phases of landing operations. Although the various teams comprising a JASCO have little to do with each other during an actual operation, the theory that they would all enter and leave the scene of action at about the same time made their amalgamation into one organization for administration a logical move.

ORGANIZATION

A JASCO consists of a headquarters group, nine Shore Fire Control Parties, thirteen Air Liaison Teams, and ten Shore Beach Teams. One JASCO works with each division in an amphibious operation.

Air Liaison Teams (each headed by an Air Corps officer) provide liaison between the commanders of the infantry units at battalion, regiment, and division levels, and the naval aircraft to be used in support of the landing forces.

Shore Beach Teams (commanded by Signal Corps officers) provide communications on the beaches for each assault battalion. The tenth team supplements their installations during the division phase. These communications teams work under the Engineer units which control each beach.

Various divisions have somewhat modified the composition and use of the Air Liaison and Shore Beach Teams to meet special attack situations, but these permutations need not enter into a discussion designed primarily for artillerymen.

Each Shore Fire Control Party consists of one Artillery officer, one Naval officer, one scout, two radio operators, and two driver-linemen. Each party is assigned to work with an infantry battalion, with which it is loaded prior to an amphibious attack. The Artillery officer acts in general just as would an artillery forward observer except that he directs the fire of destroyers or larger ships instead of land-based guns. The Naval officer acts much as would an Artillery liaison officer with an infantry battalion.

Since two officers and five enlisted men are all that are

available for both the FO party and the Liaison party, it becomes immediately apparent that the T/O for Shore Fire Control is inadequate. In actual operation the lacks are made up in most cases by borrowing men from the infantry, from the JASCO headquarters personnel, or from such of the JASCO Shore Beach Teams as the division does not plan to use on that particular landing. At any rate each part of the Shore Fire Control Team must have sufficient personnel to operate efficiently, and to operate on foot if necessary.

One team organization that has been found to be satisfactory in actual operation is: (1) Artillery officer's team: scout, 2 radio operators, driver, lineman; (2) Naval officer's team: 2 radio operators, driver, lineman. This is a minimum which may have to be increased in some cases. For instance, if vehicles and drivers are to be left on board ship during the early part of an assault three men are insufficient for the radio load, it being necessary for the spotter (Artillery officer) and scout to remain relatively unencumbered.

Most (if not all) units interested in training Shore Fire Control Parties call for a Naval Liaison Officer and party with each regiment and a Division Naval Gunfire Officer with party at the division CP. The JASCO table of organization makes no provision for these teams, so they too must be improvised from the sources previously mentioned.

Naval officers for the regimental jobs are usually assigned prior to an operation from an officers' pool used for this purpose. If they do not arrive the Naval Liaison Officers of the reserve battalions may undertake the regimental duties, or liaison at regimental levels may be abandoned.

The Division Naval Gunfire Officer is usually assigned to this work from among the Artillery officers of the division. There would be decided benefits if this officer were permanently assigned to the JASCO. In one instance, where the CO of the JASCO happens to be an artillery officer, he has acted very adequately as Division Naval Gunfire Officer. In most cases, however, this cannot be done, as the CO of the JASCO is generally a Signal Corps officer.

These T/O difficulties have been touched on at considerable length because they crop up frequently in the actual operation of Shore Fire Control Parties. If they are better understood by all branches the borrowings and improvisations necessary to overcome them will be borne more easily.

In some divisions the work of the Shore Fire Control Parties is put by the division commander directly under DivArty. Hence JASCO's methods of operation and difficulties are important to many Artillerymen not otherwise directly concerned therein.

EQUIPMENT

Each battalion Gunfire Spotter's Team is equipped with a ¼-ton vehicle and trailer, a 694 or 284 radio, 536s, light



wire, phones, etc. The equipment is complete and adequate. The battalion Naval Liaison Team is similarly equipped. The JASCO T/E provides none for the Regimental Naval Liaison Parties nor for the Division Naval Gunfire Officer's Party. Although, with the cooperation of the Division to which the JASCO is attached, there is little difficulty in lining up the necessities for these parties, it would be helpful if they were provided for in the T/E.

DUTIES OF SPOTTER AND TEAM

The primary duty of the Naval Gunfire Spotter is to direct the fire of supporting destroyers, cruisers, and battleships during the landing phases of an amphibious assault. When the artillery is well established ashore Naval gunfire begins to play a less vital part. It may well continue to be used as long as the front lines are within the ships' range, however.

All types of fire may be delivered by the ships: call fire on targets of opportunity, harassing fire, illumination by star shells, etc. While the flat trajectory of naval guns presents some problems, this is offset by the easy maneuverability of one's supporting guns. The firing ships may be so located as to outflank defilade and to permit a line of fire parallel to the front lines. This latter point is particularly important, as naval gunfire is very accurate for deflection but has considerably larger range dispersion than artillery.

The Naval Gunfire Spotter, then, acts as a battalion Forward Observer, transmitting his firing instructions by radio directly to the firing ship assigned to support his battalion. If additional fire is needed or if heavier guns are required he may ask for this through the Regimental Naval Liaison Officer or the Division Naval Gunfire Officer.

FIRE COMMANDS

The commands to be used are outlined for both the ships and the Gunfire Spotter in an official Fire Control Code. Only a brief summary of methods will be given here.

Initial commands must locate the target by map coordinates. Typical opening would be (1) "Target at ———", (2) Enemy gun position, (3) Close supporting fire, (4) Commence firing immediately." (1) All initial missions start with "Target at" or "New Target." The latter is used when a shift from the previous target is to be made. (2) A brief description of the type of target is given. (3) All fire is called "close supporting" or "deep

supporting." (There seems no real use for this distinction, but it's in "the book" and may help to keep the ship better informed.) (4) Fire may be requested "immediately" or at some specific future time. For an initial mission the ship may require three minutes or more to get off its first rounds.

Adjustment is usually by 2-gun salvos. This varies somewhat from ship to ship. At the instant of firing the ship sends "Salvo." Then, calculating the time of flight and deducting slightly for transmission, "Splash" is sent to correspond with the burst.

Orders are sent the ship by the Spotter, *not sensings*. Range comes first ("Up" or "Down" so many yards), then "Right" or "Left" so many yards. For time fire the command is (to throw in what amounts to extra site) "Raise burst" so many feet. To move the burst in or out along the trajectory the commands are "Fuze range in" or "Fuze range out" so many yards. The range command and the deflection command must appear for each spot. Thus "No change, right 100" would call for another salvo at the same range 100 yards to the right. "Up 100, no change" would increase range and leave deflection the same. The ship in its initial laying by map normally takes account of site, although the observer may help (especially if the map is not too good) by giving "Elevation [so many] feet" as part of his target description.

When on the target, fire for effect may be given as "No change, no change, maximum rate 2 minutes," "One volley per minute for 10 minutes," or any similar command which may be appropriate. In fire for effect a destroyer will fire volleys from its five or six 5" guns, as the case may be. "Maximum rate" is construed by the ship to mean 10 rounds per minute.

An open sheaf is not normally used, the ship's fire control apparatus being set for all of its guns to converge at the range fired. A wide front may be covered by giving "no change" for range followed by deflection shifts.

In practice a reasonable latitude in the form of commands is found. For instance, "Give me 25 rounds spread along the road from ——— to ———. Cannot adjust. Commence firing immediately" would get satisfactory results from one's ship. Also, if the target is visible to seaward, instructions may be given for the ship to take it under direct fire doing its own spotting.

At the end of a mission the command might be "Cease firing. Mission successful" (or "You knocked the hell out of that emplacement. Good work!"). At this the ship would cease fire and would cease tracking the target with its guns. If you wish a cessation of fire but wish to have the ship continue to keep its guns aimed at the target the command is "Check fire." The latter may be followed by a command to resume fire or by "New target, Up 600, Right 200, Commence firing immediately" if a new target in the vicinity appears. A ship cannot track a target indefinitely, so unless a resumption of fire in the vicinity is expected very soon, "cease firing" should be given. After this command firing can only be resumed by "Target at" and new coordinates.



No, this isn't Signal Mountain. It's Conical Hill, on Okinawa, and the 105-mm rounds landing there have been fired by the 921st Field Artillery in support of the advance on that peak by the 383d Infantry of the 96th Division.

CASSINO OF THE PACIFIC

96th Division Artillery Against Strongly-Fortified Okinawa

By Capt. Lauren K. Soth, FA

Artillerymen on Okinawa have a great deal in common with their fellow disciples of fire power who tackled the German positions around Cassino, Italy. Judging from articles on the Italian campaign in *THE FIELD ARTILLERY JOURNAL*, the Cassino pillboxes and fortified hills might very well have been copied by the Japs on Okinawa.

When we hit the landing beaches of this island, only 300 miles from the Jap homeland itself, we expected something entirely different from jungle warfare. But we didn't anticipate the very potent and cunning defenses which the Japs had built into these coral-rock hills and precipices. Jap camouflage was so good that our excellent air photos did not reveal locations of key pillboxes and strong points.

The first week or so was a walkaway. For some reason, the Japs elected not to defend the landing beaches but concentrated their power in a series of east-west lines across the southern part of the island above the main cities of Naha, Shuri, and Yonabaru.

When the infantry ran into the first one of these lines, the high command planned a coordinated attack, with a heavy preparation by artillery, naval gunfire, and airplanes using rockets and bombs. I spent the night before the attack with a front-line rifle company in order to watch the early morning preparation fires. For half an hour the ridge-line to the front of my OP took a terrific pasting. The artillery ceased firing for 10 minutes. Then, hoping to catch the Japs out of their holes, cannoneers sent another series of concentrations whamming into the opposite hills.

The doughfeet jumped off and made three or four hundred yards before the smoke and dust cleared. But when they

started up the slope of their objective Jap machine gun fire cut into them from both flanks and from the front. Naval gunfire and air bombardment in rear areas effectively silenced enemy artillery—which had been causing us no little trouble after the first few days of the invasion—but the infantry still couldn't move.

Apparently the artillery preparation had done little good.

The Nips had dug great tunnels into the hills, with openings on both sides. They had constructed concrete pillboxes and faced them with coral rock so that they appeared to be part of the hillside. During the artillery preparation they had gone down into their deep tunnels, suffering no more than a slight shaking up. When our artillery lifted, they came up to man their guns.

There was only one answer to such a position. Artillery observers all along the line registered individual guns on definitely-located machine gun positions and fired enough rounds to knock them out. But it was a long, slow process. Tanks, using direct fire, along with self-propelled 105s and infantry antitank guns, helped knock out pillboxes. Even then you couldn't get them all, and the doughboy had to reduce many of them himself with satchel charges, flame throwers, and grenades. On occasion he even went inside to bayonet the occupants.

And that's the way it's been ever since. A slow, tedious business of blasting out reinforced concrete and rock pillboxes.

The most impressive fort hit so far was a high cliff tunneled out and built into a series of interconnected pillboxes.

This cliff has a 45-foot escarpment stretching 400 yards across the top. Two or three shafts run straight down to the



Mud on Okinawa has made it tough going even for the sturdy M-5s. During some displacements, wheeled vehicles couldn't get through at all—but the M-5s made it, even pulling the 155-mm howitzers, M-1.

bowels of the hill, and there are at least three levels of horizontal tunnels. Since all the known entrances interior. Apparently the Japs had facilities for maintaining a large number of troops inside this Maginot Line-type of fort for a long time.

When we hit this cliff, the artillery and direct-fire weapons hammered it for a couple of days before the infantry went up. Antitank guns inside the cliff knocked out several of our tanks before artillery finally silenced them.

After this preparation the infantry walked up on either end of the escarpment itself without difficulty. But when they tried to go around it, they were met by heavy machine gun fire from the reverse side! The Japs had built the fort so that it could defend against an attack from the south as well as from the north where we hit it.

Since we couldn't get artillery around in front of our own front lines, the reduction of the southern part of this cliff became almost an exclusively doughfoot task. Tanks helped some, but the terrain made it difficult to get tanks around without getting them knocked off like ducks on a pond. It took two regiments nearly two weeks to get past this fort! And this was after the artillery had knocked out the northern side.

I've gone into some detail on these Jap defenses because many readers of the JOURNAL will undoubtedly be working on similar fortifications later on. The Okinawa defenses may well be typical of what we can expect on the home islands of Japan.

Before writing this I spent a couple of hours with Brig. Gen. Robert G. Gard, who commands the 96th Division Artillery. I asked him to comment on the use of artillery in the Okinawan campaign for the benefit of other artillerymen who will be coming over to this side of the world to fight Japs now that Germany is out of the way.

"Well, you can tell them that any half-hour (or halfway) preparation for an infantry attack just won't do the business against these strongly-built defenses," he said. "You've got to pound and pound and pound—at least 6 hours, and preferably 24—to make the enemy so groggy that he can't man his guns, to crack open his pillboxes and to smear his antitank gun positions."

"That means a preparation about like World War I," I remarked.

"Exactly," replied Gen. Gard, "and it means plenty of ammo. But anything less than that is just a waste of ammunition."

Forward observer casualties have been heavy here, as in every theater, so I asked Gen. Gard for his suggestions in training artillery observers coming into the Pacific.

"You can't get too many people trained to adjust fire," he answered. "Our infantry wants an FO party with every rifle company—even those in reserve. We just don't have enough men to do it. Every battery ought to have at least 15 officers and non-coms trained to handle a forward observer assignment. That means other enlisted men must be trained to do the wire and radio work. You never have enough.

"The second thing I'd like to emphasize on training FOs is to give them more scouting and patrolling—infantry tactics. We've lost a lot of good observers because they didn't know how to take care of themselves in an area where Jap snipers and machine guns are a menace. Observer parties must know how to take cover, use camouflage—in fact, do everything the front-line infantryman does. On Leyte we sent out forward observers with infantry patrols to train them in such matters. It has paid big dividends, but that's a little late to start training. It should begin back in the States."

The general is a strong advocate of air OPs. "They've



Looking over the 96th DivArty firing chart are Maj. James J. A. Kelker, S-2; Brig. Gen. Robert B. Gard, Commanding General, 96th Division Artillery; and Lt. Col. Ben Burdick, S-3.

done a marvelous job for us here on Okinawa," he said, "especially locating and adjusting on enemy artillery.

All 96th Division Artillery planes have been operated from a single division field on Okinawa. Gen. Gard praised the work of the engineers in building Cub strips for his planes. The first strip built near the beach served the needs of the division artillery for about the first two weeks. Then another field was quickly prepared farther south. Air strip metal has kept this field operational even after heavy rain.

The L-5 liaison planes have been equipped with special radios in addition to their own. They can thus communicate directly with liaison officers and forward observers.

Japanese anti-aircraft artillery has been troublesome and has accounted for several of our planes, but small arms and machine guns have not bothered our pilots even though they have flown at low altitudes far behind Jap lines.

Division artillery headquarters has had to perform many more functions in this campaign than were contemplated by these in setting up the table of organization. In addition to several additional battalions of artillery attached, the headquarters has controlled the fire of a large number of warships and has coordinated the bombing and rocket missions of aircraft.

Throughout the campaign each division has had ships' gunfire in direct support. Liaison officers and naval gunfire spotting teams have had to coordinate the fires of these naval guns with the field artillery. Naval gunfire has proved invaluable on some targets on reverse slopes which the artillery couldn't reach. With air spot, this fire has been extremely accurate.

The Japs' predilection for defending reverse slopes has made heavy fire support for the infantry a very difficult job—at times impossible (as in the case of the escarpment described above). On one occasion the infantry were pulled off a hill so that a skip-bombing air strike could be laid on the other side of the hill.

Coordination of the air strikes has been accomplished through an air liaison officer at division artillery headquarters.

The division artillery staff has at times also directed and coordinated the fires of tanks and amphibious tanks in addition to the naval guns and airplanes. Gen. Gard believes that artillery staffs should be increased when operations such as this require the headquarters to handle so many different supporting arms.

To go back to similarities to the Italian campaign, the Japs have used a lot of artillery on this island—and used it well. "The Japs aren't in our league on artillery," said Gen. Gard, "but they've done a better job here than anywhere else in the Pacific. They have emplaced their weapons well and have directed their fires accurately—often on our own artillery positions. We've learned the value of digging in. One of our battalions had 80 rounds fall in its area in a half hour."

Japanese artillery generally fires by single piece or platoon. The Japs hardly ever mass as many guns as a battery—never a battalion. Many individual 75s and even 150s have been emplaced in caves and pillboxes on hillsides. Several Jap officers with radios have been killed or captured behind our

lines, and it is believed that they were either adjusting artillery fires or reporting hostile locations to their artillery.

Because of enemy counterbattery our artillery has had to



A 105-mm howitzer crew of the 361st Field Artillery, 96th Division, starts to fire another mission on Okinawa.

spread out much more than on Leyte or in other jungle campaigns. This means that each battery has been forced to set its own perimeter defense against night infiltration attacks. In the Leyte campaign Jap counterbattery wasn't a problem, so batteries were placed close together. Then a battalion perimeter could be set up to guard against the Jap infiltrators.

In contrast to Jap artillery communications, which have apparently been pretty poor, our radio and wire nets have worked just as they were planned to work by the communications people at Fort Sill. The Jap wire lines have been shot out repeatedly, judging by the slowness with which enemy artillery brings fire on our troops, vehicles, and installations under their observation.

We have had elaborate wire nets ever since the battle stabilized on the Jap defenses above Shuri. Gen. Gard pointed out that his headquarters had six ways of reaching one of the light battalions—by wire. In one instance a battalion had five routes shot out or cut, but it was still possible to fire the battalion by the remaining line.

Radios have worked better here than any place else in the Pacific—at least better than in any of the jungle operations. One wrinkle in radio communications: The infantry has been given additional SCR-536s to communicate with forward observers. In this terrain, the forward observer frequently cannot stay with the doughfoot company commander because of the necessity to get high ground for observation. So instead of personal contact, he has the little "walkie talkie."

As I started to leave Div Arty headquarters Gen. Gard stopped me for one last word, "Be sure to tell them that the artillery can't get along without bulldozers. They've got to be handled by artillery personnel. So that means training of mechanics and operators before they get over here. We had to train ours in Leyte."

Indirect Fire At Moving Targets—*A Simplified Procedure*

By Col. Louis H. Thompson, FA (CAC)

AUTHOR'S NOTE

Since nearly all of our mobile seacoast artillery units have been converted to other arms and branches, the duty of protecting our Pacific bases against raiders must necessarily fall upon the Field Artillery. This problem deserves and requires much thought. The method here proposed does not suggest any radical departure from the presently accepted methods of fire against land targets, but does present an easy and quick way for the Field Artillery to accomplish what the Coast Artillery has done by other means.

The following method of indirect fire at moving targets will give about the same degree of accuracy as direct fire, with a great many advantages over direct fire. It permits the fire of the entire battery to be controlled from a distant instrument. With an aiming point on the flank the difficulty of the gunner trying to keep on a moving target with the usual amount of dust and smoke in front of the guns is eliminated. Under the usual conditions of firing it is very difficult for the gunner to see a small target at long ranges with a 4-power panoramic telescope; with this suggested method an instrument of much higher power may be used to control the fire.

When firing at land targets the field of direct fire is usually very limited and the position of the battery doing the firing is immediately disclosed to the enemy. When firing at naval targets suitable positions for direct fire are not always available, and since with direct fire the battery would be visible to the naval vessel being attacked its destruction by naval fire would be very probable. Due to the steep slope of fall at long ranges only a small percentage of hits may be expected when firing at small targets such as tanks, although with a sufficient expenditure of ammunition tanks may be destroyed at medium and long ranges. Since with this method the guns are always laid in direction, continuous fire may be delivered at the maximum rate possible with the weapons being employed. Corrections for deflection are applied automatically and instantly by the observer without the necessity of reading the lateral deviation and applying the correction to the gun sights by an independent operation.

No equipment other than that normally carried by a Field Artillery battery is required. Since Field Artillery sights are graduated so the guns move to the left as the azimuth of the target increases, it will be necessary to reverse the graduations either on the observing instrument or on the panoramic sights. If it is desired to change the observing instrument this may be done by placing a narrow strip of paper over the present numbers and renumbering so the reading will decrease as the instrument is turned to the right; the graduations remain the same. This will be necessary for both the main azimuth scale and the micrometer. Numbering should be from 0 to 3200 to correspond to the numbering on the sights. The same result can be accomplished by changing the numbering on the sights and leaving the observing instrument as it now is. In the latter case it will be necessary to change the four sights of the battery

instead of only one instrument, and with a type of sight where the main scale is inclosed this would be difficult to accomplish. Furthermore the paper scales would have to be removed when reverting to the normal method of fire.

As soon as the battery goes into position the executive lays the pieces parallel, directed at the base point or about the center of the field of fire if there is no base point. He then selects a convenient distant aiming point, directs the gunners of all pieces to turn their panoramic telescopes to the aiming point, and directs the gunner of the base piece to call off the reading on his sight. With all sights directed at the aiming point they are made to read the same as that of the base piece by moving the correction pointer in the proper direction. In case a distant aiming point is not available, all sights are made to read the same and aiming stakes are set for each piece on its line of sight.

As the M-12 sight allows a correction of only 20 mils right or left, if the pieces are widely separated it may be necessary to converge the pieces at mid-range or the most probable range to be used before setting the aiming stakes. In this case the pieces would be converged and with the correction pointer on each piece set at zero and with each sight set at the same reading as that of the base piece, the aiming stake for each piece would be set on its line of sight without changing the reading. The amount of the closing correction should be noted in order for the additional closing correction for a target at a different range or azimuth to be determined. For example, if the closing correction applied to No. 4 piece is 10 mils and the target appears at a shorter range requiring a closing correction of 16 mils, then the gunner would apply a 6-mil correction.

While the above operations are being carried out the observing detail proceeds to the nearest hill or high ground from which the target area can be observed, and sets up the BC telescope. The communication section will run two lines from the OP to the battery position with two telephones at each gun or howitzer and two at the OP (10 telephones). The reader on the BC instrument will be connected to each azimuth setter, all four azimuth setters being connected on the same line. The range adjuster or battery computer will be connected to the four elevation setters in a similar manner. All telephones should be equipped with head sets.

As soon as the battery is ready to fire the executive is directed to fire one round at the base point or any other point or area visible from the OP. The observer sets the same reading as that appearing on the sight of the base piece; with the lower motion loose he directs the telescope at the burst and tightens the lower motion. The instrument is now oriented with the guns. As long as the observer can see the burst it makes no difference how far the burst was from the point fired at. If the instrument is now turned to a target, with the angle T remaining approximately the same and the guns laid with this reading, the guns should be pointed at the target.

If the target is at a considerable distance from the point at

which the instrument was oriented an "s" shift should be applied. For example, let us assume that the value of "s" is one mil and the target is at a 500-yard greater range. If the OP is on the right the correction would be left 5. It will be more convenient to apply this correction on the instrument rather than on the guns. The vertical cross wire of the instrument is placed 5 mils to the left of the target (or any other point) and then brought to the target or point selected by the *lower motion* without changing the reading. The observer brings the burst to the OT line by moving the vertical wire from the target to the burst with the *lower motion* and then traversing back to the target with the *upper motion*.

As soon as a moving target appears the observer begins to track the target and the reader begins to call readings at 5-mil intervals. The azimuth setters begin to turn their sights in unison with the readings coming down to them. They creep between readings, and when a new reading comes down should have their sights set at approximately this reading at the time it is called off. The gunners keep on their aiming points by continuous traversing of their pieces. Range is estimated by the range adjuster; the computer sends down the elevation corresponding to this range, or if the guns are equipped with range drums the range is set directly in yards.

As soon as the first burst occurs the observer jumps from the target to the burst with the *lower motion* and then traverses quickly back to the target with the *upper motion*. This will throw in an automatic correction to bring the next burst on the OT line provided the range is not changed. In order to warn the azimuth setters that there has been a jump and the next reading is not in error, the reader should immediately call "correction applied" when the observer jumps to a burst. In order that the guns may not fire before the correction takes effect, the azimuth setter should repeat "correction" and as soon as he has set the new reading he should call off "correction applied."

Since the gunner is the only person who can know when he is on the aiming point he should give the command to fire the piece. If the range adjuster makes a large change in range he should call off the appropriate "s" shift to the observer, who will apply it as previously indicated. The range adjuster is not interested in the amount of the correction required to bring the burst to the OT line, since this correction is automatically applied by the observer in jumping to the splash. During adjustment the only purpose in applying an "s" shift is to keep the burst near enough to the OT line to get a range sensing; it is therefore obvious that shifts of one or two mils would not be justified.

For the first salvo of fire for effect the pieces should be fired at about 2-second intervals in order that the observer may have time to call off the necessary

corrections to converge all pieces on the target. These corrections should be applied directly to the gun sights by means of the correction pointers. It will be noted that the only corrections applied to the gun sights are the corrections for convergence. The observer notes the position of the burst or splash on his reticle scale with the vertical wire on the target and calls off the necessary corrections—for example, "No. 1 left 3, No. 2 right 4," etc. These corrections are repeated by the reader to the azimuth setters.

After all pieces are properly converged the observer jumps to the center of subsequent salvos or volleys in order to keep the fire of the battery centered on the target. It is obvious that as the target changes in range and azimuth the value of the T-angle will be changing, which of course will be throwing the instrument out of orientation with the guns. It will therefore be necessary for the observer to continue to jump splashes if the center of impact begins to creep away from the target, but a small correction should be avoided until need for it is verified by a subsequent volley. If the observer notes that splashes are continuously behind or ahead of the target he may anticipate the correction and take the necessary lead by placing the target on the reticle scale at the proper point. For example, if the range is decreasing and the OP is on the right, the splashes may be on the left of the target. Let us suppose that the observer notes that the splashes are consistently two mils to the left between salvos; then he would place the vertical wire two mils further to the right after each salvo.

Any time that he desires to bring the vertical wire back on the target he does so with the lower motion, thus keeping the total correction that he has applied up to that time. Likewise,



Here is a circular emplacement found on the French coast. Although big, cumbersome, and hard to camouflage, such an installation does facilitate fire control and may increase the accuracy of laying. The piece shown here is a French 155-mm gun. St. Chamond, model 1916 (called by the Germans the 15.5-cm K.420 (f)). It is 38 calibers long and has a maximum range of around 22,000 yards; its traveling weight is 13,090 kilograms—about 14½ tons. For stability in normal firing the carriage is braced by two jacks; these are emplaced by means of handwheels, one of which can be seen between the carriage wheels.

if he notes that the target is changing direction he estimates the angular travel during the time of flight and takes the proper lead in the new direction. It must be borne in mind that if the target is traveling from left to right at the rate of (say) 10 mils during the time of flight and suddenly starts back in the opposite direction, then the total change in lead would be 20 mils. The observer must keep in mind that he cannot jump a splash the round for which was already in the air at the time he made the last jump, as to do so would double the correction. In other words, he must be sure that the last correction has taken effect. If, after the jump, the next salvo strikes at approximately the same place with respect to the target, then he can be fairly sure that the last correction was not on at the time that salvo was fired.

While a suitable range finder would of course be a great advantage, effective results can be obtained with estimated ranges. Firing will be greatly speeded up when using estimated ranges if the range adjuster will call-out ranges instead of giving "[so much] up (or down)." For this purpose he should have a pad and pencil so he can note the last range called out, or have a recorder do it for him. Range changes of less than 50 yards will rarely be justified. If the range is decreasing and the entire salvo is over he should come down 100 yards. On the other hand, if the entire salvo is short and apparently very close no range change should be made as the decrease in range to the target during the firing interval will probably put the next salvo on without correction. If the salvo has mixed overs and shorts the range should be changed by the estimated decrease or increase in range during a firing interval. The range adjuster should also keep in mind that he should not base a correction on the sensing of a salvo unless the last correction sent down has had time to take effect.

Fire should be maintained at a fairly uniform rate as the range adjuster is estimating the rate of change during one firing interval. As speed is very important when firing at a moving target, the rate of fire should be not less than 4 RGM for guns up to and including the 155-mm.

In order to obtain a quick adjustment with estimated ranges the Australian method of ladder fire may be employed. In this method the guns are laid at ranges varying by several hundred yards between pieces and a salvo fired at about 2-second intervals. For example, No. 1 is laid at 5000, No. 2 at 5300, No. 3 at 5600, and No. 4 at 5900. Let us suppose that the range

adjuster senses the splashes as short, short, short, over; then the target is included between Nos. 3 and 4 and for the next salvo No. 1 would be laid at 5600, No. 2 at 5700, No. 3 at 5800 and No. 4 at 5900, plus or minus the estimated range change between salvos. If we now assume that the sensings were short, short, over, over, fire for effect would be commenced at 5750 plus or minus the estimated change in range during the salvos. In each case the observer jumps to the splash nearest to the target and on the first salvo of fire for effect makes no jump but calls off individual corrections to bring all pieces together in direction.

When using ladder fire in this manner it is obvious that all splashes will not be on the OT line unless "s" shifts were applied to the individual pieces. Since this would complicate the procedure this method is of doubtful value unless the range adjuster is at sufficient height above the target to make range sensings by placing the horizontal wire of his instrument on the target and sensing splashes below the wire as short and those above the wire as over. It has the advantage of speeding up the adjustment by permitting the adjuster to find the gun range to the target more quickly.

The writer has used this method of firing, with various modifications, at water-borne targets over a period of 13 years, and has found that the results were always better than with the standard Coast Artillery Case III (indirect fire) methods. Results will depend upon the degree of training of the key personnel, that is, the personnel actually engaged in determining the data and applying it to the pieces. For successful results the value of r/R should not vary materially from unity and the T angle should not exceed 100 mils. This means that for ranges of around 5,000 yards the OP should not be more than 500 yards from the battery, and of course for ranges shorter than this the OP should be even nearer to the battery. This method of fire was given a limited test, employing one 75-mm gun at a range of approximately 2,500 yards, by the Research Department of the Field Artillery School in November 1944. The average lateral deviation during fire for effect was about 2 mils and several direct hits on the small material target were obtained. The personnel conducting the test did not have any practice prior to the test, and since only one gun was employed the results insofar as a battery is concerned were inconclusive. Training for this type of firing will be greatly facilitated by the use of a Bishop Trainer.



AN "ARMY MOTORS" TIP

While on duty in China my duties kept me traveling on the Burma road in western Yunnan Province. In early 1943 we had very little transportation, and that was somewhat the worse for wear. In a ¼-ton Ford, about halfway between points on the top of a mountain, with the rain coming down in sheets, the fuel pump went out. The screw that runs down through the pot-metal case had stripped the threads and there was no way of tightening it to maintain the vacuum.

Distances between stations required carrying an extra gas tank which was mounted under the other front seat, and, in addition, I had an extra 5-gallon can of gas. I shut off the gas tanks and took off the gas line, tied the 5-gallon can to the windshield so the bottom of the can was above the carburetor and placed the end of the gas line inside the can right down to the bottom. The line was extended out around the windshield and under the hood to the carburetor. Suction was applied to start the siphoning effect and then the line was attached to the intake connection of the carburetor. Each time the can was emptied, this procedure had to be repeated as I had no way to refill it except to use the gas line to siphon it out of the tanks into the can. A little more time and gas than usual was required—but I reached my destination that night.

MAJ. BRUCE E. REY

Artillery Targets Across the Rhine

By Lt. Col. James E. O'Steen, FA

Referring to the Rhine River crossing, Brig. Gen. C. C. Brown, then Commanding General of the XVI Corps Artillery, says:

"I feel that whatever merit the XVI Corps Artillery attained in this operation is due, in a great measure, to the accurate location of definite artillery targets."

The following extracts are taken from an official summary published by the U. S. Ninth Army following the XVI Corps offensive across the Rhine which began 24 March 1945: ". . . PWs soon began to pour in. The first few hundred reached the Army Cage within six hours after capture, many still being in a stunned or dazed condition from the artillery pounding to which they had been subjected. 'Hellish!' 'Terrifying!' was all some of them could say at first. One officer PW apologized for seemingly incoherent answers, saying his head still felt thick and numb from his recent ordeal. Others who had recuperated from the first shock expressed professional admiration for the barrage, using such terms as 'Prima' (first rate) and 'Kolossal.' . . . Artillery officers in particular attributed their plight to the destruction of communication facilities by our artillery barrage. They sent runner after runner to make contact with the Infantry and with their Headquarters, but the runners did not return and no radios were available. . . Artillery preparation is described as very accurate. . . ."

* * *

Shooting coordinates of eight hundred sixty-seven targets were furnished for the preparation by the Corps Artillery Intelligence Section. This total included enemy artillery batteries, flak batteries, OPs, CPs, dumps, assembly areas, interdiction, and miscellaneous targets. All targets were evaluated by a system of ageing and the latest "time active" was disseminated to artillery units with the Corps up to H-hour, reaching some Fire Direction Centers as late as twenty minutes prior to the preparation. In many instances the enemy, by noise or the indiscreet use of lights, was the unwitting source of the information which moved an old target to the active target list and led to his destruction.

Such data cannot be obtained without a clearly defined plan and a definite system of operation. Here in detail are the plan and the methods used by the XVI Corps Artillery Intelligence Section to obtain the information and produce the intelligence for the Rhine River crossing. While the system was tailor-made for that special situation, the principles employed are those that apply to the intelligence function during any operation.

PERSONNEL

The Section was split equally between the FDC and the CP, with three officers and three enlisted men at each location. The

CBO was in charge of the operations at the FDC; the Intelligence Officer supervised the work of both sections from the CP. In addition to this organic personnel, for this operation two officers and three enlisted men were attached to the CP and one officer and two enlisted men to the FDC, because of the volume of information that was handled. This personnel was taken from one of the Groups. But the system which follows does not in any way depend upon additional personnel, and under normal operating conditions all duties can be performed by T/O personnel.

At the CP a duty officer was assigned for each twenty-four hour period. He was responsible for the smooth functioning of the section during his tour of duty, including the processing of all incoming messages and the preparation of daily reports. A duty clerk was also assigned for the same period. His work included the keeping of the Area Activity records, which are discussed below.

At the FDC two officers were on duty during daylight hours. At night after enemy activity quieted down one officer was on duty until eight o'clock the following morning.

Enlisted personnel at both installations were an Intelligence Sergeant, a clerk, and a draftsman, with the additional enlisted personnel assisting on these assignments. All enlisted personnel was trained to function on all jobs.

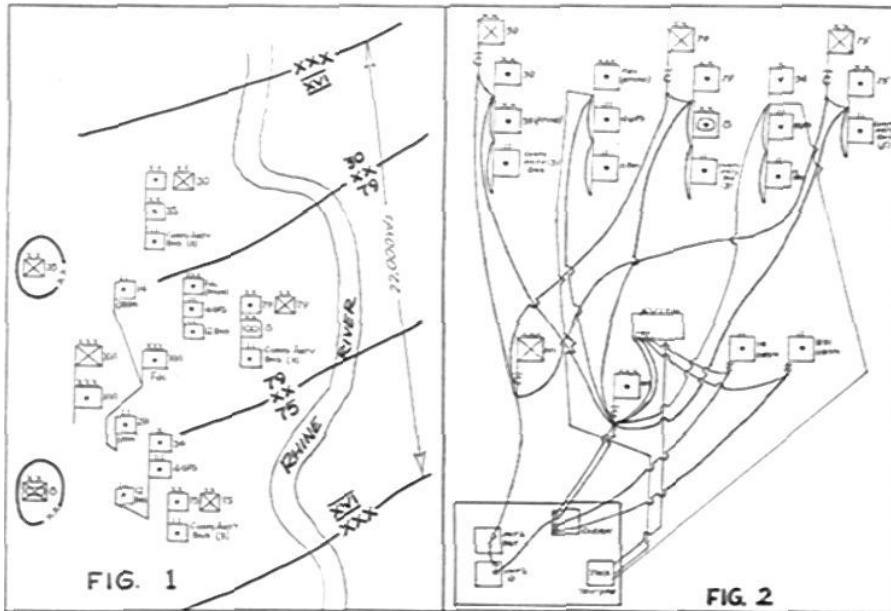
SITUATION (FIG. 1)

Four infantry divisions and one armored division were attached to the Corps. Corps Artillery consisted of thirty-five gun and howitzer battalions, eight Group Headquarters and Headquarters Batteries, a Brigade Headquarters and Headquarters Battery, a Fire Direction Center from another Corps, and two Observation Battalions.

Three infantry divisions were employed in a line across a 22,000-yard front. The organic artillery of the fourth infantry division was attached to the left division, that of the armored division to the center division. Five battalions of Corps Artillery were attached to the right division and three battalions to each of the other two divisions in the line. The remaining Corps Artillery battalions were attached to groups, which in turn were attached to the Brigade or the Fire Direction Center from the other Corps. The organic Fire Direction Center controlled all fires of the Corps Artillery, but no battalions were attached directly to it except the two observation battalions, which divided the sector equally with an overlap in the center. All counterbattery operations were performed by the organic CBO Section.

COMMUNICATIONS (FIG. 2)

At the CP there were two lines to the Battery switchboard and one to the Corps switchboard, with an extension



Radio communication was maintained with all artillery with the Corps by 193, 608, and 610 sets. The 399 radio operated in the Army Artillery Net.

COLLECTION OF INFORMATION

Plans. Prior to the operation an Intelligence Plan was published (Fig. 3). This plan listed the Essential Elements of Information and certain specific instruction for the operation. It was the means by which all subordinate intelligence officers obtained a common understanding of the intelligence mission.

Special Intelligence Plans (Fig. 4) were published at different times during the operation, as required by the situation. These plans were

to the Corps phone and to one of the battery phones. Each observation battalion ran a direct line to the section from the plotting central. Teletype communication was maintained between the CP and the organic FDC, the Brigade, and the attached FDC.

There were four phones in the Counterbattery Section at FDC: two to the Battery switchboard and a direct line from each of the Observation Battalions.

supplemental to the first plan and were more specific as to the information that was desired. This Special Plan served four purposes: it (1) directed the observers' attention to the specific area where information was desired, (2) kept unit intelligence officers informed, (3) assisted them in issuing instructions, (4) and increased the interest and enthusiasm of observers. Distribution of all plans included each ground and air OP.

HEADQUARTERS XVI CORPS ARTILLERY
 APO, U. S. ARMY
 SPECIAL INTELLIGENCE PLAN NO. 2

Auth: CG XVI Corps Arty
 Init:
 Date: 19 March 1945

Grid square	Indications	Collecting units*	Specific orders and instructions†
2036	Occupied entrenchments	1, 2, 6, 8	Surveillance of entrenchments from 207367 to 209373 for Hq and fixed installations.
2135	New (?) entrenchments	1, 2, 6, 8	Search for digging operations; determine if fox holes at 212351 are occupied.
2137	Occupied entrenchments	1, 2, 6, 8	Surveillance of entrenchments from 212375 to 209359 for Hq and fixed installations.
2138	Occupied entrenchments	1, 2, 6, 8	Surveillance of entrenchments at 219394, determine extent of trenches; location of Hq and fixed installations.
2139	Bridge usable to foot troops	8	Determine condition of bridge at 215392.
2140	Occupied building	1, 2, 6, 8	Determine if building at 21454090 is occupied and whether civilian or military personnel.
2230	Occupied fortifications CP	1, 2, 6, 8	Determine if fortifications at 222309 to 225309 and house at 223306 are occupied; obtain exact coordinates.
2233	OP and other installations	2	Continue surveillance 222309, 221332, 221338, 225338; improve locations. Describe activity.
2234	Occupied trench system	1, 2, 6, 8	Surveillance trench system from 22503456 to 22893448 for Hq and fixed installations.
2235	Hospital or CP	1, 2, 6, 8	Surveillance for ambulances and hospital activity; CP activity.
**	****	***	*****
3928	Headquarters	1, 3, 5, 7, 8	Describe activity at 39122837.
3931	Supply installations	1, 3, 5, 7, 8	Describe activity at 39153100; also 39353100.
4023	Large ammunition dump	3, 5, 7, 8	Describe activity at 40342303.

*1—XIX Corps Arty; 2—14th FA Obsn Bn; 3—34th FA Brigade; 4—291st FA Obsn Bn; 5—75th Div Arty; 6—30th Div Arty; 7—79th Div Arty; 8—Corps Arty Air Officer.

†Report all observations immediately through normal artillery channels.

Figure 4

HEADQUARTERS XVI CORPS ARTILLERY	
INTELLIGENCE PLAN—OPERATION "FLASH POINT"—11 MARCH 1945	
Auth: CG XVI Corps Arty Init: _____ Date: 19 March 1945 Collecting Agencies: All Artillery with the Corps	
Essential Elements of Information	Analysis of Essential Elements
1. Locate enemy arty batteries for counter-battery.	1. Battlefield surveillance by ground and air OPs; Photographic interpretation; activity as indicated by Sound and Flash disposition, zones of fire, caliber and type.
2. Identify enemy arty units; determine disposition, zones of fire, caliber and type.	Ranging; Shellreps; Interrogation PWs; Civilian Sources; Order of Battle teams; TAC/R.
3. Determine location of Special (other than enemy artillery) Targets.	1. OPs; CPs; Supply and Ammunition dumps; Assembly areas; Important roads, road junctions and intersections.
4. Determine location of enemy Antiaircraft (Flak) Batteries.	1. Light, Medium and Heavy batteries; Heavy batteries in Arty role. Activity reported by Arty Ln Plots; APID interpretations; TAC/R reports; reports from retreating pilots.
Specific Orders and Instructions	
1. Div Arty:	
a. Establish maximum number of ground OPs; assign definite zones of obsn to each OP; maintain continuous surveillance over entire Div zone during daylight hours; each OP to maintain tabular record of all vehicular traffic observed on roads within assigned zone to include (1) Time of obsn, (2) No. and type vehicles, (3) location, (4) direction of movement.	
b. Coordinate obsn with flank Divs and Corps Arty units operating in sector with particular attention to dead spaces in zones assigned to organic OPs.	
c. Maintain maximum Air OP effort consistent with security and XVI Corps Arty Air Policy. Assign definite areas for search and surveillance missions with particular attention to dead space areas of ground OPs.	
d. Stress importance of Shellreps to own and supported troops. Hold Shellrep Teams in readiness for call from other units in accordance with Operations Memo No. 7, Hq XVI Corps.	
2. Corps Arty:	
a. Brigade, Group and Sep Bn coordinate with Div in whose sector obsn is desired for location of OPs and zone of obsn. Establish maximum No. of ground OPs; assign definite zones of obsn to each OP; Maintain continuous surveillance over entire zone during daylight hours; each OP to maintain tabular record of all vehicular traffic observed on roads within assigned zone to include (1) time of obsn, (2) No. and type of vehicles, (3) location, (4) direction of movement.	
b. Air OPs: Coordinate with Corps Arty Air Officer for sector and assignment of search and patrol missions. Maintain maximum effort consistent with security and XVI Corps Arty Air Policy.	
c. Stress importance of Shellreps. Hold Shellrep Teams in readiness for call from other units in accordance with Operations Memo No. 7, Hq XVI Corps.	
d. Obsn Bns: 14th Obsn Bn atcd to 291 FA Obsn Bn for operations.	
(1) Establish Sound and Flash Bases to cover Corps Zone with maximum cover in center of zone. Coordinate with flank Corps for maximum cover on flanks of Corps Zone.	
(2) Establish SIC vic Corps Arty FDC.	
(3) Make continuous study of situation and have written detailed plans for displacement across Rhine.	
e. APID: Make continuous study of latest photo cover of Corps Sector for Enemy Arty, Flak Btrys and other arty type targets. Be prepared at all times to answer requests for special interpretations.	
f. Corps Arty Asst S-2 Ln Officer: Maintain continuous liaison with PW, MI, and OB teams, Asst G-2 Air and CPID for information of an arty nature.	
What—Where—When—How to Report	
1. Submit I/25000 overlay to CG XVI Corps Arty, Attention: S-2, showing (1) location of all Div OPs, (2) tabulated list showing OP No. and coordinates, (3) lateral, minimum and maximum range limits of Div (consolidated) observation, and (4) dead-space areas to ground OPs.	
2. Report all activity observed, other than shelling and routine vehicular traffic, to Corps Arty S-2 immediately, through channels.	
3. Forward all tabulated reports of vehicular traffic to CG XVI Corps Arty, Attention S-2, by messenger so as to arrive by 0800 on day following date of obsn.	
4. Report Shellreps and all information pertaining to enemy gun location direct to CBO at Corps Arty FDC.	
1. Submit I/25000 overlay to CG XVI Corps Arty, Attention S-2, showing (1) location of all OPs, (2) tabulated list showing OP No. and coordinates, (3) lateral, minimum and maximum range limits of Group or Sep Bn (consolidated) obsn, and (4) dead-space areas to ground OPs.	
2. Same as 2 above.	
3. Same as 3 above.	
4. Same as 4 above.	
5. APID: Report interpretations by 399 radio to Corps CP; confirm radio messages with written reports.	
6. Corps Arty Asst S-2 LnO: Report pertinent items of information as received. Submit written summary for each period ending 1200 daily.	

Figure 3

Collecting Agencies were classified for convenience into the following seven categories in the order of their importance and/or reliability: (1) Photo Interpretation, (2) Artillery Liaison Planes, (3) Flash Ranging, (4) Ground OPs, (5) Sound Ranging, (6) Shellreps, and (7) Miscellaneous.

Photo Interpretation. Data obtained over a period of time and checked on the ground indicates that the best and most accurate locations are those obtained from photo interpretation. This source can be tricked by dummy and camouflaged installations, however, and it cannot determine whether or not the installation is active. Photo interpretations were therefore used as a basis for suspecting that a target was at a certain location, but confirmation was obtained through reports of activity made by other sources before the location was used. The best combinations for enemy artillery was Photo Interpretation confirmed by Sound Ranging; for targets other than enemy artillery, ground and air OPs were used.

The artillery PI Team was stationed at the airfield with the planes that flew the photographic missions. The disadvantage of the team's being away from the section was more than offset by the time that was saved in getting the interpretations. Locations were broadcast over the 399 radio as they were obtained, and in most cases were received within six hours of the time that the mission was flown—which was eighteen to twenty-four hours sooner than would have been possible had the team remained with the section and waited for the pictures to be delivered before interpretations could be made. Special interpretations were requested by radio as needed and were always promptly complied with.

On D — 3 a special PI team was sent to the section from the Army Photo Interpretation Detachment. This team was used to confirm or reject suspected locations of artillery batteries and other targets, and to determine whether old locations that had been inactive for a number of days were still occupied. Pictures used by the team were flown in by courier plane as soon as they were developed. This method contributed much to the success of the counterbattery program and was of material assistance in the selection of other targets for the preparation. No battery was included in the fire plan that had not been definitely confirmed by latest photo cover, and many of the positions fired upon had been occupied less than twelve hours when the preparation was fired.

Artillery Liaison Planes were a most valuable and reliable source of information. Definite search missions were assigned in accordance with Special Intelligence Plans (Fig. 4) and the number of planes in the air was rigidly controlled by the Corps Artillery Air Officer, who coordinated all air activity for the Corps. Division Artillery controlled its own planes, except that the Corps restricted them as to the number of planes that could be in the air at any one time.

Flash Ranging. Approximately 40% of the information and 70% of the accurate locations pertaining to enemy activity were obtained from the flash bases of the two Observation Battalions. This was in addition to the enemy battery information sent direct to CBO. All observations were reported immediately over the direct line from the flash

centrals. Each flash central also reported the average visibility for ground OPs each hour on the hour, which information was kept on a chart at the CP and used in interpreting information received during the period. Another very profitable use made of the Observation Battalions was to call upon them for immediate verification of activity reported by another source.

Ground OPs. Each division artillery was responsible for observation within its zone of action. Corps Artillery S-2s coordinated with the division artillery S-2 in whose sector observation was desired. The maximum number of fixed ground OPs consistent with security were established, with emphasis on the assignment of definite zones of observation to each OP.

OPs were manned by a minimum of three men, each of whom acted in his turn as observer, recorder, and operator. Continuous surveillance was maintained and posts were changed on an average of every twenty minutes to keep the observers fresh and alert.

All information was reported immediately as it was obtained. The only exception to this rule was that routine vehicular traffic was recorded in tabular form and a report submitted at the end of each day. This method of handling routine traffic had two advantages: (1) it kept the telephone lines cleared for the transmission of more important data, and (2) the OPs sent the information in on a form which facilitated interpretation without any additional record-keeping on the part of the clerks at the CP.

Sound Ranging. As a rule sound locations were not good enough to fire upon without further verification, though some "P" plots were checked with PI and found to be quite accurate. Sound-on-sound adjustments were made when the need was urgent and there was no other way to silence an enemy battery. After the attack, four periods of silence of fifteen minutes' duration were observed and some new locations were obtained. Normally, as sound locations were obtained they were radioed to the PI team for verification.

Shellreps. Prior to this operation the information received from shelling reports was disappointing. An analysis of these reports over a period of time disclosed that 70% were incomplete and of little value. To overcome this deficiency, on D—20 was published an Operations Memorandum which called the attention of all commanders within the Corps to the importance of shelling reports and directed that front line troops report all enemy shelling to the nearest artillery unit. Artillery commanders with the Corps were directed to maintain a minimum of two "Shellrep Teams" per firing battery; that these teams be thoroughly trained in the technique of obtaining data for shelling reports; that they aggressively seek information; and that they proceed immediately to the scene of shelling reported from all sources for the purpose of procuring the necessary data for prompt transmission to the CBO.

Calipers and gauges cut to fit all known enemy artillery shells were furnished to each battalion headquarters, to be used in determining caliber of enemy weapons from shell fragments. Mimeographed instructions on the subject of

crater analysis were distributed to each firing battery with the Corps. Three posters, designed to catch the eye of the front line troops, were prepared. One of the posters was large enough to occupy a prominent place on bulletin boards (Fig. 5); the other two were of a size to appeal to pin-up fans (Fig. 6).

The bulletin board poster and one of the small ones were distributed with the Operations Memorandum. The third poster was distributed in time to be in the hands of troops on D — 4. An examination of the records revealed that 80% of the shellreps received from D — 3 to the end of the operation were obtained by crater analysis, enabling the CBO to neutralize the guilty battery with approximately one-fourth of the ammunition that had been required when the information was based on incomplete shellreps.

Other Sources. Corps Artillery S-2 and Corps G-2 occupied the same building. Close personal contact was maintained between the two sections at all times. Runners delivered messages back and forth, and important pieces of information were handled immediately in person. G-2 was given a copy of every message received by the artillery section and all information received by him pertaining to artillery or to an artillery type target was brought over immediately.

One officer of the section spent his entire time maintaining liaison with IPW, MII, OB, and Corps PI Teams and the Assistant G-2 Air. One receiver of the 399 radio was kept tuned to all broadcasts made by Tactical Reconnaissance Planes, whence valuable information pertaining to enemy traffic, active marshalling yards, and boat docks was obtained.

Maps and Photographs. An adequate supply of all scale maps was distributed to artillery units with the Corps. In addition to the maps a mosaic of the area and complete photo coverage were distributed in a quantity which permitted each



Figure 5

ground and air OP to have complete coverage. Photos included vertical pairs and two sets of obliques. One set of obliques was taken from a liaison plane flown just short of the Rhine River. These pictures included the Rhine in the lower foreground and the area to the east for approximately 5,000 yards. Another set of obliques was taken by high performance aircraft which picked up the area approximately 4,000 yards east of the Rhine and extended it to the east to the maximum range of all weapons with the Corps.

COLLATION OF INFORMATION

Collation is the military term for bookkeeping. Just as a business firm must have an efficient bookkeeping system in order to be successful, the S-2 must have good records before he can be successful in his mission of locating artillery targets. This entire operation was built around the system that was used to record information.

The CP section was charged with the location of all artillery targets, except enemy batteries, and with keeping the Artillery Commander informed of the enemy artillery situation and capabilities. This section also prepared estimates and handled the publication of target lists and periodic reports.

The CBO Section devoted its entire effort to locating enemy artillery batteries. Enemy Battery Lists were published at the CP from information furnished by the CBO.

CP Section

At the CP installation the following records were kept: work map, interdiction map, situation map, area activity record, special target cards, files.

Work Map. This was a 1/25,000 map covered with duraseal, which permitted the use of china marking pencils and could be cleaned with gasoline when the information was no longer needed. Four clear acetate overlays were used, two of which rolled down from the top of the map and one which rolled from either side. These overlays were referred to as the Enemy Battery Overlay, the Observation Capabilities Overlay, the Special Targets Overlay, and Enemy Defense Overlay.



Figure 6

Enemy Battery Overlay. All enemy battery locations were recorded on this overlay which rolled from the top of the map. "Fixed" locations were indicated by a circle and "Suspected" locations by a cross. The name of the battery, the date of last known occupancy or activity, and the number of pieces were shown. The number of pieces at a location was written in a color which indicated the caliber. All data for this overlay was obtained from the CBO and was used to study disposition, identification, and trends of enemy artillery and to prepare estimates and determine capabilities.

Observation Capabilities. This also rolled from the top so the map had to be studied through the Enemy Battery Overlay, but this presented no particular problem. Observation possibilities of all artillery units with the Corps were plotted. Separate major units were indicated by a color scheme. The exact location of each OP was plotted but only the consolidated observation and dead spaces of the unit were shown. This overlay was used in the assignment of observation missions when Special Intelligence Plans (Fig. 4) were made.

Special Targets Overlay. All targets other than artillery were plotted on this overlay. Plot was by symbol with target number. These targets were classified and a numbered prefix indicating category was used as follows: (1) OPs, (2) CPs, (3) Dumps, (4) Assembly Area, (5) Interdiction, (6) Miscellaneous. Thus target 116 was the 16th OP that was located.

Enemy Defense Overlay. All permanent-type enemy defenses (such as trench systems, pillboxes, and bunkers) were plotted on this overlay. Light and medium caliber anti-aircraft batteries were also included. (Heavy anti-aircraft batteries were considered as artillery because of their capability of being employed in the ground role, and were plotted on the Enemy Battery Overlay). All defenses were plotted by symbol. This data was used in the study of the enemy's ground organization and to evaluate Special Targets.

The Interdiction Map, on a 1/25,000 scale, was covered with duraseal but no overlays were required. All important crossroads, road intersections, and defiles in enemy-held territory were circled and numbered. This map was used to disseminate enemy traffic information quickly. The Special Target List, explained below, included all data necessary to fire upon these targets if the situation warranted.

Situation Map. This was a 1/50,000 map covered with duraseal. Three overlays were used. Boundaries, friendly CPs, road data, and bridge data were all plotted on the duraseal covering. The three overlays used with the map were referred to as the Situation Overlay, Activity Overlay, and Activity File Overlay, the first two being clear acetate and the latter ordinary overlay paper.

The *Situation Overlay* was used to record current changes in the enemy situation. It rolled down from the top of the map. Entries were normally left on the overlay until they were thirty-six hours old, then were cleaned off with gasoline as more recent changes in the situation were plotted.

The *Activity Overlay* also rolled down from the top, so it was necessary to read through the Situation Overlay to the

map when it was used. When a report of activity was received, the grid square which bounded that location was outlined in a color selected to represent activity for that period. If activity was reported in the same grid square for a second time a check mark was made inside the outlined square; the third time activity was reported a second check mark was made, etc. This overlay was used to study the overall activity for the period.

The *Activity File Overlay* was used to show the areas active over a period of five days, each day being represented by a color. As the Activity Overlay was completed for a twenty-four hour period and the study had been made, the data was taken off and put on the Activity File Overlay, except that no attempt was made to show on the file copy the number of times that an area was active. This overlay was used to study trends. It was maintained for a period of nineteen days before D-day, presenting a graphical picture of changes in activity which were used to interpret dispositions and ground organization.

An *Area Activity Record* card (Fig. 7) was kept for each grid square in enemy-held territory. Cards were filed by grid square

AVI CORPS ARTILLERY 5-2 SECTION		GRID SQ	
LOCATION	DESCRIPTION OR REMARKS	REFERENCE DATE	SIP TARGET NO

Figure 7

in a box labeled "Activity File" until a report was received of a location that was active, at which time the card was pulled out of the Activity File and a proper entry made; then the card was put in a file labeled "Today's Activity."

Only those locations which were reported to the nearest one hundred yards or closer were entered on these cards. Reports that gave the location by grid square only were kept in tabular form until the end of the period, at which time they were studied and if more information was required instructions were issued in the Special Intelligence Plan (Fig. 4).

Time and date of the reported activity were included under the column headed "Description or Remarks." Sufficient data was included under "Reference" to enable anyone to go to the source of original entry for additional information, if necessary. If the activity reported was not sufficient to determine whether or not a target was at that particular location, additional information was obtained through the Special Intelligence Plan and the number of that plan was entered in the column headed "SIP." Normally two or more reports of activity at the same location were necessary before a target was obtained, but when it had been determined that a target was at that location it was given the proper number according to category and the number was placed in the column headed "Target No." This number was put opposite each entry for that location on the card, and it was used by the clerk in posting Special Target cards (Fig. 8).

A *Special Target Card* (Fig. 8) was made up for each target located, except Interdiction and Miscellaneous Targets.

XVI CORPS ARTILLERY 3-2 SECTION									
NO _____		SPECIAL TARGETS		ELEV _____ GRID SQ _____					
(COORD)		(COORD)		ACTIVITY		ACTION			
(COORD)		(COORD)		DATE		UNIT		RESULTS	
DATE	HOW	NO	SOURCE	DESCRIPTION	DATE	UNIT	AGRS	RESULTS	

Figure 8

Often the coordinates were improved as the result of additional information, so room was left for three different sets of coordinates. The last coordinate shown was always taken as the best location. All entries under "Activity" were copied from Area Activity Record, the only reason for putting them on this card being to facilitate the evaluation of the target when fire plans were made. If the target was included in fire plans the entry was made under "Action," which was also used in evaluation. If no further activity was reported over a period of time following the date that the target was fired upon it was taken as indicating that the target no longer existed.

Files. Incoming messages were received in one of three ways: telephone, teletype, or messenger. One clerk was used to receive all telephone messages. He operated the four 'phones in the section with a head-and-chest set. When a message was phoned in, this clerk plugged into the 'phone and typed the message in triplicate as it was dictated. Messages received by 'phone were numbered beginning with 1. Time signed was used as the number for teletype messages. Messages received by messenger were numbered from 501.

Much of the information received came from periodic reports from Corps G-2, Army G-2, and other regular publications. A separate file was maintained for all of these regularly published reports.

All data pertaining to enemy artillery activity was received in summary form from CBO by 1400 hours daily. This information plus all messages was filed in an envelope plainly marked on the outside to indicate the period covered. Any message could be found when needed.

Counterbattery

The Counterbattery Section operated at the FDC under the Counterbattery Officer. This section was charged with the location of enemy artillery. In collating enemy battery information the following records were kept: counterbattery chart, situation map, historical file, shellreps, sound and flash reports, cobble reports, log.

Counterbattery Chart. This was a 1/25,000 map mounted in the center of a table with a ten- to fifteen-degree slope. A space approximately two feet wide was left on each side of the map to accommodate overlays.

The chart was covered with duraseal on which were plotted all friendly OPs and the front lines. Three overlays were used, one of clear acetate and two that were sheets of ordinary overlay paper. Overlays were referred to as "Enemy Battery," "Shellrep," and "Sound and Flash," respectively.

The *Enemy Battery* overlay rolled from the top. On it were plotted all enemy batteries, including heavy anti-aircraft batteries, which were considered as artillery because of their

capability of firing in the ground role. Enemy batteries were classified into three categories: (1) "Fixed," which were located at shooting coordinates, (2) "Suspects," which were located within two hundred yards, and (3) "Prospects," which were locations obtained from such outside sources as PWs, civilians, and captured maps. Fixed locations were indicated by a circle, suspected locations by a cross; prospective areas were outlined by grid square. Each plot included the battery name, number of pieces, date last active, and the source of information. A color scheme was used to indicate caliber.

The *Shellrep Overlay* rolled onto the map from the left. It was tacked well back on the board so that additional overlays could be placed in front and toward the map in such a way that several days' plots were available for study and analysis. A minimum of five were kept in this manner at all times. The ray was drawn in a color representing the caliber of the weapon reported as firing. The Shellrep number, time of shelling, number of rounds, and method by which direction was obtained were all included along this ray.

The *Sound and Flash Overlay* rolled onto the map from the right. Locations received from these two sources were plotted as received, using a circle to indicate sound and a cross to indicate a flash location. A color scheme was used to represent the date that the location was reported. Number of pieces, caliber, and accuracy of the location were also shown. By a system of colors, locations for five days were kept on the same overlay.

Situation Map. This map, at a scale of 1/50,000, was covered with duraseal on which were plotted boundaries, CPs, roads, and bridge data. One overlay was used to record current changes in the situation.

Historical File. Regular 5×8 Hostile Battery cards (Fig. 9) were used to record all pertinent data pertaining to enemy

LISTED ON HB LIST NO _____		SQUARE _____	
HOSTILE BATTERY POSITION		OUR COUNTERBATTERY FIRE	
COORDINATE	TARGET DESCRIPTION	DATE	HOW FIRED BY
TIME	ELEV	NO	BY
RES	DOUBT	ISS	BN

Figure 9

batteries. The Historical File was a box which contained these cards. The cards were filed under the proper classification by grid square, and by coordinate within the grid square.

Shellreps. Shellrep Forms (Fig. 10) were distributed to all units with the Corps. Information was 'phoned in, using the phonetic alphabet for each line of information reported. All reports had to be complete, and where the information called for was not known the reporting unit was required to state "unknown" for that particular line. Following the shellrep campaign (see above), this was one of the most valuable sources of information during the entire operation.

Sound and Flash Reports. A regular report form (Fig. 11) was used to record all locations received from the Observation Battalions. These were immediately checked with

Journal No: _____
 (Use applicable columns for bombing)
 From: _____ Date & Time Recd: _____

A Reptd By _____
 B Obsr (Loc) _____
 C AZ (S, P, Fur) _____
 D Dist or Loc _____
 E Area Shelled _____
 F Time From _____
 G Time To _____
 H No/Type of Guns _____
 I Shell/No/Type _____
 J Nature _____
 K Damage _____
 L Flashbang _____
 O Initials _____

B & K will never be sent by radio in clear.

Time Signed: _____

Figure 10

SOUND AND FLASH						
FILE NO	TIME	CALIBER	COORDINATES	TREND	ACCY	DESCRIPTION

Figure 11

XVI CORPS ARTY ENEMY GUN LOCATION FOR VERIFICATION						
SHEET _____						No _____
DATE _____						
NO	COORDINATES	DOUBLE	HEAVY	STOPS	SHOTS	REMARKS

Figure 12

COBBLE REPORT											
FROM _____						TO _____					
1	2	3	4	5	6	7	8	9	10	11	12
UNIT	TYP	DIR	NO OF	CORRECTED	COORDINATES	TIME	NO	EFFECT			DATE

Figure 13

the cards in the Historical File and then plotted. If a new location was indicated the coordinates were sent to the Photo Interpretation Team on a regular form (Fig. 12) for verification. If the need was urgent the request was sent by radio.

Cobble Reports (Fig. 13). This was the report that artillery units made on new battery locations obtained by observed fire. All such locations were immediately phoned to the CBO, reporting the information shown on the form. The Historical File was checked to see if the location reported was a new battery or one that was already in the files. If it was an old battery the correct name was given to the unit that phoned the information. If it was a new one the next name was given, a new card was made up, and the position plotted on the Counterbattery Chart. All Fixed and Suspected positions were named with three letters of the alphabet, the former being prefixed by the letter "X" and the latter by "Y." Thus a Fixed battery was referred to by its name as "Xray Charlie Mike" and a Suspected battery as "Yoke Love William," etc.

The Log (Fig. 14) was a consolidated report of the activity

HEADQUARTERS XVI CORPS ARTILLERY APR 197, U.S. ARMY COUNTERBATTERY OFFICER											
SUMMARY FOR PERIOD FROM _____ TO _____											
SHELL	TYPE	AREA	COORDINATES	NO	COOR	TIME	NO	TYPE	NO	REMARKS	

* SHOW TIME OF BATTERY ACTIVE; IF NEW SUSPECT OR NEW FIRE SHOW "N" OR "Y". INCLUDE DAMAGE, IF ANY

Figure 14

for the period. From this report comparisons were made with previous reports and conclusions reached as to which areas were still important, which were newly active, and trends in activity. Certain statistical data furnished by this report were helpful in analyzing enemy artillery, such as number of rounds fired, caliber, time of day that heaviest concentrations were fired, type of targets fired upon, etc. This form was the basis for the artillery portion of the intelligence paragraph in the FA and TD Summary.

EVALUATION AND INTERPRETATION

If the work described in the preceding paragraphs has been complete and accurate, evaluation and interpretation of information is a most fascinating occupation.

The period closed at 1200 hours each day. From that time until the analysis was completed, the data obtained during the previous twenty-four hour period was carefully evaluated and interpreted. This involved first of all a study of the Activity Overlay to determine the over-all activity for the period. This was compared with the Activity File Overlay to detect any changes in areas that might indicate changes in disposition or give a clue to the attitude of the enemy.

After the big picture was determined, a careful study was made of the details of enemy activity from the Area

Activity Record cards. Each bit of information was evaluated by studying the reported activity in relation to other activity reported for that same area; by a study of the Observation Capability Overlay to determine whether or not the activity could actually be observed from the reporting OP; and by checking this with the visibility for that time of day as reported by the Observation Battalions and recorded on the Visibility Chart.

Normally two reports of activity, preferably from different sources, were considered necessary before the location was interpreted as a target. Additional information was obtained by directing all units that could observe in the area of reported activity, to check that coordinate for activity. Units selected were those that the Observation Capability Overlay showed could see into that area. Instructions were issued on the Special Intelligence Plan.

When two or more reports of activity had been obtained for the same location, a study was made of that location in relation to previously-located Special Targets shown on the Special Targets Overlay, plus a study of the enemy defenses in that area as shown by the Enemy Defense overlay.

When a new Special Target was selected it was immediately plotted on the Special Targets Overlay, and a note was given to the Duty Officer showing the target number, the coordinates, the altitude, a description, and the source of the information so that it could be included in the FA and TD Summary for that period. The target number was also entered on the Area Activity Record card so that the clerk could make the proper entry on the Special Target Card when more activity was reported at that location.

Evaluation and interpretation is a continuing process in the Counterbattery Section. The CBO has the one job that is never completed; there is never a time when he can consider himself caught up with his work. During quiet periods he should study maps and photographs for likely enemy battery positions. When he can find time to do so he should fly over the area to study defilade and search wooded areas and other places that might conceal enemy artillery. He must have a complete mental picture of the road net in enemy territory and must keep abreast of the disposition, identification, and capabilities as reported by the Intelligence Officer at the CP.

As shellreps were received during the operation they were first checked with the Enemy Battery Overlay. If no shelling connection could be made a check was made with the Sound and Flash Overlay. Failing there, a check was made of previous shelling shown by Shellrep Overlays. The "Prospective" areas were checked, and when all else failed a call was placed to the CP and request made to contact the Photo Interpreters for an interpretation of the suspected area.

DISSEMINATION

Important information was disseminated as received to all interested units. The Duty Officer phoned each Division Artillery S-2, the Brigade S-2, the attached FDC S-2, and

Army Artillery S-2 twice daily for a routine exchange of information. All messages received were copied in triplicate and a copy was distributed to G-2 and the S-3 with the third copy kept for file.

Targets obtained by the Section were disseminated to all artillery units with the Corps by the publication of target lists which included Enemy Battery Lists, Enemy Flak Lists, Special Target List, and Supplemental Special Target Lists. On each list the grid square in which the target was located was shown, followed by the target name or number, the coordinates, the altitude, a description (to include the number of pieces, type, and caliber of enemy artillery), the source of the information, and the date last active or occupied.

A Field Artillery and Tank Destroyer Summary was published daily. The intelligence paragraph of this report included changes in disposition during the period, activity during the period, statistics to include the total number of rounds fired by the enemy artillery as reported by shellreps with a breakdown as to caliber, the heaviest concentration fired and the area receiving heaviest shelling, shelling connections (connecting the area shelled with the battery that did the firing), etc. Changes in target lists were also included on this report, to include additions and deletions plus the name of the previously located batteries that had been active during the period. As the bookkeeping on target lists became burdensome, new lists were published which rescinded all previous lists, except in the case of Special Targets where supplemental lists were published. As D-day drew near new lists were published almost daily and on D — 1 all locations were disseminated as obtained by teletype and telephone.

CONCLUSION

Nothing in the foregoing paragraphs is intended to imply that subordinate artillery S-2s should stand idly by and wait for the Corps Artillery S-2 to furnish intelligence. The very word suggests—and in a military sense is synonymous with—teamwork. The basic ingredient of intelligence is information. The basic source of information is the subordinate S-2. The objective of artillery intelligence is to obtain the shooting coordinates of artillery targets, without which artillery is little more than expensive hardware. No intelligence officer worthy of the name will stop short of this objective or purposely neglect a single source of information that will lead him to a target.

The Corps Artillery S-2, however, is the logical target finder for the Corps. He receives information from all units with the Corps and has available other sources which enable him to evaluate and interpret information as it relates to the situation on the entire Corps front. Based on his intimate knowledge of the Corps mission, the Corps Artillery S-2 should have a definite intelligence plan for each operation. He should carefully and skillfully direct the efforts of subordinate S-2s and fully exploit all sources of information available to him.

Having the best equipment and the best mechanics in the world is not enough to assure an unbreakable supply line. They must be backed up by regular servicing on the part of using personnel.

TRENDS in Field Artillery Organization and Equipment

Although this column announces only approved changes, it does not constitute authority to requisition personnel or equipment listed herein.

By Maj. Shirley B. Metzger, FA

Field Artillery units have long felt the need for a command post vehicle. The present transportation plan in the army does not contemplate the use of special purpose trucks. Various models have been tested, and improvisations made by individual units in the field. The command car was eliminated as a standard vehicle because of its distinctive shape. To fulfill the need for a command post vehicle a weapons carrier type with side curtains, front and rear windows, rear door, map table, and two bucket seats has been standardized.

The Truck, $\frac{3}{4}$ -ton, 4x4, command, weapons carrier, with winch, will have a 12-volt battery and ignition system. The command weapons carrier will replace the standard cargo type weapons carrier in Field Artillery units on a one-for-one basis when the truck is used in the operations and fire direction section, instrument and survey section, or radio section of headquarters batteries (except observation); one (1) per gun or howitzer battery; one (1) per service battery; in observation battalion, one (1) per battery headquarters, operations section, and topographical platoon (section).

Three model classifications which result from modifications in construction of the Tractor, high speed, 13-ton, M5, are presently in use. A cab accommodating eleven (11) men with provision made for installation of a ring mount and similar to the M4 cab except for a roll back top, is designated the M5A1. The M5 modified to reduce ground pressure by use of a center guide 21-inch track is termed the M5A2. When the M5 is equipped with both the new cab and the new track and suspension, it assumes the M5A3 model designation.

Service batteries of heavy Field Artillery, T/O & E 6-59 and 6-359, are authorized one (1) Radio Set SCR-608 in lieu of the SCR-619 to provide longer radio range for these units. A substitution of two (2) SCR-608 for two (2) SCR-619 in T/O & E 6-397, Field Artillery Battery, 240-mm howitzer or 8-inch gun, is also approved. Revisions to these tables will include the new authorizations.

Corps Artillery and Brigade headquarters batteries are provided with mechanics and necessary tools to perform their own second echelon maintenance, which includes 6,000-mile maintenance. The authorized tool sets do not include a low voltage meter and certain other tools which are required for complete performance of the 6,000-mile maintenance. A Tool Set, Special Armored Force, Separate Company, is approved for these units in addition to the present second echelon tool sets. The Separate Company Set is small and will not require an increase in transportation.

Section II of T/O & E 6-57, Field Artillery Battery, Motorized, 155-mm Gun, Truck-Drawn, and 6-61, Field

Artillery Battery, 8-Inch Howitzer, Motorized, Truck-Drawn, dated 20 October 1944, authorizes two (2) trailers, $\frac{1}{4}$ -ton, 2-wheel, cargo. Section I of these tables indicates that three (3) such trailers should be authorized to these batteries. Changes No. 1 (dated 15 June 1945) to both T/O & Es are now in the hands of The Adjutant General for publication and distribution authorizing three (3) trailers in Section II, equipment. This trailer is to assist in hauling the added weight of the Wire W-110-B now authorized to Field Artillery gun or howitzer batteries.

A new command post tent, larger than the present tent, and more suitable for use as a battalion aid station, will be issued as soon as available. First production models will go to Medical Detachments. The entrance is of sufficient length to accommodate a stretcher and both bearers when both doorways are closed, thus maintaining blackout conditions. The new tent has increased roof pitch, better seams, improved windows, increased ground floor space, and linear insect screening. This new model is intended to iron out all the deficiencies of the present command post tent.

Outfit, officers' mess, is being replaced in all Field Artillery batteries on the basis of one (1) per six (6) officers or major fraction thereof.

In order to help reduce the noise attendant to constant firing of artillery weapons, ear wardens under the nomenclature of Plugs, ear, with pouch, will be issued by the Quartermaster General. Basis of issue for this item is one (1) set per four (4) months per individual in gun or howitzer crews. Allowances will be carried in ASF Catalog QM-4.

The Telescope, observation, M1917, has been declared obsolete. It will be retained in non-standard storage without maintenance or spare parts.

Packboard, plywood, and attachment are authorized to Airborne Artillery on the basis of one (1) per ammunition handler, Bazooka, Radio Set SCR-619, Switchboard BD-71, $\frac{1}{2}$ -mile Wire W-110-B on Reel DR-4, and 2 miles Wire W-130-A; and two (2) per Radio Set SCR-694 and Switchboard BD-72. These items will be reflected in the next published changes to Airborne Artillery T/O & Es.

Shutter Assembly AN/GVA-1(), an electrically controlled shutter for Ordnance telescopes in flash ranging instruments, will be included in T/O & E 6-77 Field Artillery Observation Battery, on the basis of one (1) per battery.

Headquarters batteries of non-divisional Armored Field Artillery Battalions have been authorized one (1) Radio Set SCR-608 to provide communication with standard Field Artillery or Tank Destroyer units with which the separate Armored Field Artillery Battalion may be operating. This will appear in the next published changes to T/O & E 6-167.

MISSION : DESTRUCTION

By Maj. Paul F. Wilson, FA



During a year in the lines this 194th Field Artillery Battalion fired 85,789 rounds, of which 16,681 were expended on 599 destruction missions. Higher authority—namely, the Corps Arty—has established the policy determining what targets are profitable. But determining firing conditions under which the missions are practical is left to the battalion.

Basic artillery instruction teaches the practices which secure efficient use of ammo, but consideration of the critical factors relating to each mission may save a few rounds or accomplish a mission otherwise abandoned. Planning the mission requires observation adequate to place the center of impact on the target, and requires a probability of obtaining hits during fire for effect which will make completion of the mission practical. Analysis of records of destruction missions disclosed 258 missions completed on similar targets on which sufficient data is available to make a comparison of *types of observation and of probabilities of obtaining hits* during fire for effect. With few exceptions the initial data was map data with latest corrections.

AUTHOR'S NOTE

"Level that village," from an infantry battalion commander. "AT gun firing on our tanks from pill box 18.7-32.6, can adjust," from DivArty forward observer. "Enemy Btry 'PL' active again, adjust with Air OP, marked photo waiting for you at Corps Artillery airfield," from Corps CBO.

When the war of movement slows and organized defenses are encountered, general support artillery is called upon for many destruction missions. "Destruction" is the type of mission in which the heavy howitzer excels. Ammo, material, and time are seldom adequate, however, to accomplish all the missions which seem profitable. Our 8" howitzer battalion found this true at Cassino and Anzio, along the Arno, and on the "Western Front."

Rounds required for adjustment were very closely related to type of observation and only slightly dependent on the range of fire. Rounds in adjustment were taken as the number required to obtain both "deflection correct" and an elevation which resulted in target hits.

	<i>No. Missions</i>	<i>Mcan Rounds in Adjustment</i>
Axial Precision	8	4.5
Small-T Precision	13	7.0
Air OP	138	6.0
Bilateral Observation (including Observation Battalion flash bases)	28	7.2
FO	56	9.8
Large-T Precision	15	11.7

Axial precision adjustment was most efficient, as would be expected, but was obtained in only 8 of the 258 missions.

Small-T observation (angle T 100 to 300 mils) was obtained only a few times. A wide battalion front covering directions of fire from 1600 mils to beyond 3200 mils has made ground observation difficult.

The Air OP has been outstanding in its advantages in locating designated targets and adjusting fire upon them. During spring, summer, and early fall it was seldom grounded. Weather in late fall and winter kept the plane out of the air about a third of the days.

Bilateral observation was established when possible, to obtain adequate observation when the plane could not observe and to relieve the plane of a burden of targets. On the hills around Cassino bilateral adjustments on CB and destruction missions were very satisfactory, but on the flat beachhead at Anzio BL observation was very difficult to obtain. Seldom could more than 3 targets be observed from the same base. Several OPs were established for single prearranged targets. A mission on the tallest tower in

Littoria (Tower = 1) with BL observation required 32 hits for completion; the mission cost 109 rounds at 13,170 yards' range. Tower = 2 was fired upon to discourage its use as an OP, but it was not destroyed because of the probable cost.

Forward Observer adjustments have been adequate when the observer could see the terrain in the vicinity of the target so as to establish a scale on the ground. The most expensive adjustments were those with large angle T adjusted by FO methods where the observer could not see the ground about the target even though the O-T range was less than 1,000 yards. An observer on the Anzio beachhead with a disabled tank at a distance of 800 yards insisted FO methods were adequate because he had made bracket adjustments in the area. The mission had a high priority and was fired immediately by FO methods. Adjustment required 18 rounds. In such cases the AOP has been called in to save several missions when the FO was not making satisfactory progress.

Regardless of observation, the dispersion to be expected must be considered in order to make best use of ammunition. Range, which is usually the most important factor, is controlled by tactical necessity. However, accepting missions as practical can depend upon the range. The probable error as given in the range tables is the best guide. In analyzing the destruction mission fired, the targets selected for comparison were single buildings, pill boxes, and bridges whose dimensions were in the neighborhood of 8×16 yards. The rounds per target hit during fire for effect are listed in relation to the ranges at 2/3 maximum range of each charge.

	Range	Rds. per Hit
2/3 maximum Charge 3	6,000	2.9
2/3 maximum Charge 4	7,200	3.3
2/3 maximum Charge 5	8,700	3.4
2/3 maximum Charge 6	10,300	4.7
2/3 maximum Charge 7	12,400	4.8
	13,800	5.6
8/9 maximum Charge	16,500	8.8
	18,000	

Rounds per target hit did not depend so much upon the type of observation as did rounds in adjustment. The cost of target hits by air observation was slightly less than average but was much less variable from mission to mission.

Selection of charge has a definite bearing on the probability of obtaining hits. The policy of using the lowest possible charge is false economy *when that charge has less probability of obtaining hits*. Except for the extremely short and the long ranges, three charges are available for selection. Considering probable error without regard to angle of fall, the charge should be selected to avoid using one at ranges beyond 2/3 its maximum range. The difference in probable error between charges 6 and 7 is especially noticeable for ranges beyond 2/3 maximum range for charge 6. At 2/3 maximum range of charge 6, the probable error for charge 6 is 50% greater than that for charge 7 at the same range.

The slope of fall at 2/3 maximum range of each charge is near 2. At 8/9 it approaches 1. For decreasing ranges *below* 2/3 maximum, the trajectory flattens out to a slope near 3 at 2/3 the maximum range of the next lower charge. Thus by selection of the flatter trajectory, for targets with appreciable height the probability of a hit may be more than doubled. In practice, the use of the flatter trajectory requiring minimum elevations down to 260 mils is not always possible: defilade is too attractive.

Analyzed missions included 54 AOP missions at ranges between 2/3 maximum for charge 6 and 2/3 maximum for charge 7. The charge 6 missions cost an average of 4.4 rounds per target hit, the charge 7 missions 3.8

rounds per target hit. This difference does not reflect all the difference between trajectories because the greater ranges within the bracket were fired with charge 7.

Ceaseless effort in proper care of powder and segregation of powder lots is necessary in order to keep the probable error down to the figure in the tables. This battalion has found as many as 18 different powder lots at the same ammo dump. Mixing powder lots on a destruction mission is certainly costly and may cause the mission to fail. A change in adjusted elevation as large as 2 c's at 8,000 yds. has been observed with a change in powder lot. If an equal mixture of two such powder lots were used, no rounds could be expected on the center of impact since the range of each lot would be separated from the mid-point by more than 4 probable errors. In firing at a small section of stone wall in the rubble of a house on the Anzio beachhead, 16 rounds were fired at a range of 5,670 yds. without obtaining a hit. Range was favorable but powder was available in only a few rounds per lot. The mission was shifted to another piece with a range of 7,800 yds. but where powder of the same lot was available. With 27 rounds 6 hits were obtained which leveled the wall and stirred the rubble where an enemy strongpoint had been established. The wall had been used for an OP which had been the highest point of



Tower 2 is standing. Tower 1 is a pile of rubble.

enemy observation in the vicinity.

Keeping the center of impact on the target during fire for effect is complicated by weather changes as well as by changes in powder lot. An increase in the metro correction of 20 yds. per thousand during the two hours before darkness is not uncommon. When a gradual change is evident, the correction should be applied as soon as the preponderance of overs or shorts is noticed. Following the rule of correcting to 1/10th after groups of 6 rounds keeps the CI on the target when ammunition and weather are constant, but much of the time correcting by rule will not keep up with the weather changes. If observation permits the amount of deviation of each round to be sensed (AOP, FO, or bilateral), the CI of any three consecutive rounds can be used to shift back onto the target. If sensings are obtained only as "short" or "over" a new adjustment is often required when the CI shifts off the target. Creeping during fire for effect can be as expensive as creeping during the adjustment.

Keeping the rate of fire from lagging helps to avoid weather changes. The practice of firing for effect with groups of 3 rounds and making necessary range corrections between groups has proven satisfactory. Firing the group of 3 rounds at one round per minute with a longer interval between groups has avoided over-heating for missions of 30 to 40 rounds. When the tube gets too hot, simply stopping to let it cool has been more satisfactory than firing at a very slow rate because of the difficulty of maintaining adjustment of the slow rate of fire.

Tube wear is another factor which adds to the dispersion, but for the 8" howitzer it is one of the less important factors. Several tubes continued to fire satisfactory destruction missions at twice their expected lives. One was fired largely on destruction missions near the end. Until 300 rounds before the tube was condemned, dispersion seldom sent a round as far as 4 probable errors from the center of impact. During the last 300 rounds dispersion increased rapidly to the extent that 16% of the rounds were falling as far as 4 probable errors from the center of impact. The missions were AOP-observed

on targets in a level area where ground scale was easily established.

Occasionally an apparently simple mission will not yield results. A variable wind or one of high velocity may be the cause. One windy afternoon on the Anzio beachhead a target 2 probable errors in depth was abandoned after 47 rounds with only 2 hits (range 13,400 yds.). According to the latest metro the range wind was 33 mph; direction varied 1600 mils between line 1 and line 6. Later in the evening, when the wind had died down, the same piece fired the mission with 41 rounds and obtained 9 target hits. The AOP observed both times.

During another AOP mission in the Vosges Mountains low rain clouds swept across the line of fire at intervals. One target hit was obtained with 28 rounds (medium range). After the clouds had raised, forming a complete overcast, the mission was resumed. It was completed with 12 rounds, obtaining 5 target hits.

All luck for the year wasn't bad luck. One first round directed at a live Tiger tank was reported by the observer, "Target, mission complete, tank destroyed."

SUMMARY

1. Estimation of ammo cost of destruction missions can be divided into cost of adjustment and probability of target hits during fire for effect.
2. Cost of adjustment depends to a large extent upon the type of observation.
3. The AOP is only slightly more expensive in adjustment than axial observation and is more practical to obtain.
4. Obtaining a maximum of hits at a given range requires
 - a. Proper selection of charge,
 - b. Same powder lot through mission.
5. When expected results are not obtained, controllable factors should be investigated for possibility of returning to mission under more favorable conditions.

OIL RIGHT!

One of the critical problems in theaters of operation is that troops are using special oils (such as recoil oils and instrument oils) instead of preservative oils to take care of artillery pieces and small arms. This has two bad effects. First, the special oils have practically no preservative ability and will not protect weapons except possibly under the most ideal conditions. Secondly, the special oils are critically scarce and hard to get. In one theater, for example, many units ran out of recoil oil completely.

Using units should follow instructions in War Department Lubrication Orders and Technical Manuals not only so far as preservative oils are concerned, but also for all lubrication of weapons. Weapons will ultimately suffer if they don't, and they will interfere with supply by over-consuming critical oils.

Generally speaking, Oil, engine (SAE 30 above 32° and SAE 10 between 32° and 0°F) is the proper preservative to use for artillery. Oil, lubricating, preservative, *special* is the corrective preservative for small arms. In extremely humid climates, Oil, lubricating, preservative, *medium* should be used for both artillery and small arms when the temperature is above 32°F. The engine oils and preservatives may leave a slightly stained appearance on metal surfaces, but this is normal and does no harm. The important thing is that the weapons are fully protected, and critical oils are not being misused and wasted.



PERIMETERS in PARAGRAPHS



(BASED UPON LATEST INFORMATION AVAILABLE AT DATE OF WRITING, AND SUBJECT TO CORRECTION AS MORE COMPLETE REPORTS ARE RECEIVED.)

By Col. Conrad H. Lanza

THE OKINAWA CAMPAIGN (19 May to 18 June 45)

EARLIER OPERATIONS

An American naval force appeared in the Ryukyu Islands on 23 Mar 45, after attacking airdromes on Kyushu with a view to neutralizing enemy air action. It then proceeded to attack with planes and naval guns various objectives in the Ryukyu Islands, including Okinawa. The Japanese correctly interpreted this activity as preliminary to a landing.

On 1 April the Tenth Army, under Lt. Gen. S. B. Buckner, was landed near the west center of Okinawa. There were two corps present, each with three divisions. The III Marine Amphibious Corps turned north, the XXIV Corps to the south. Neither corps met more than minor opposition. It was believed that there were no large forces present. Measures were initiated to clear the island, each corps taking

half of it.

By 15 April the Marine Corps had about completed its mission. The XXIV Corps had not, for a strong hostile force had been encountered in a prepared position across the island covering the approaches to Naha, which was the main port and had been an enemy air and sea base.

Our first serious attack started on 19 April and continued through the 27th. Only relatively small gains were made, notwithstanding the assistance of naval gun fire and the air force. In the period prior to this attack total American casualties on land were 3,195, distributed among 6 divisions. For each of the 18 days this averages 177, or 30 per division per day. For the 9 days of the first attack our losses were 8,218, or 913 per day, apparently mostly limited to 3 divisions. The daily loss of 300 per division in line per day made approximately a 20% loss in the 9 days.

The III Marine Amphibious Corps was now inserted in line, taking over the west sector. At first 4 and later 5 divisions were normally engaged. The sixth division was one withdrawn from line from time to time for rest and reorganization, and for garrison duties over the occupied area.

The battle was never broken. Attacks were made daily. Our second serious attack was made from 4 to 7 May, both days inclusive, and the next from 8 to 13 May. Average losses for the intermission between the 1st and 2nd attacks and during the 2nd and 3d attacks were respectively 485, 525, and 737 men per day.

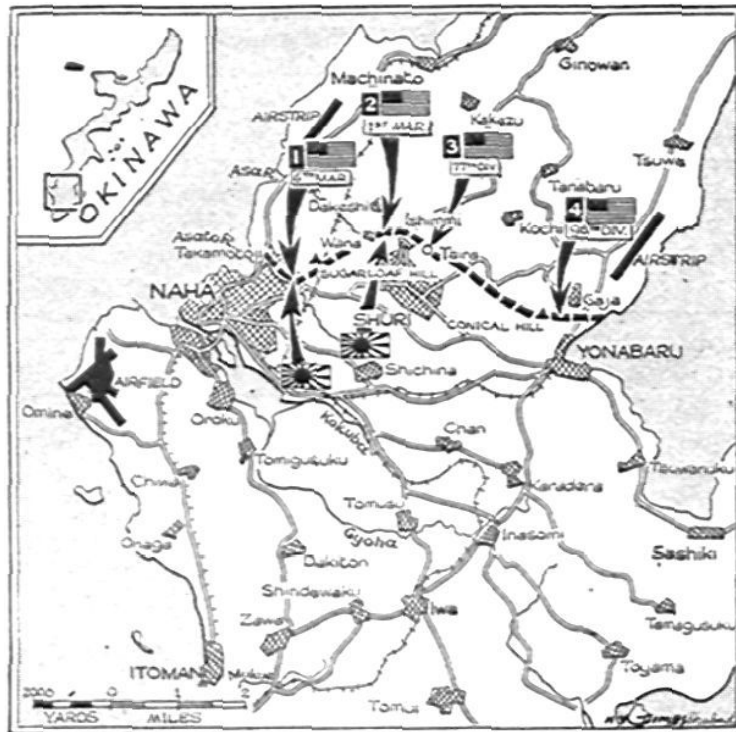
Fighting thereafter decreased in intensity, attacks being made more cautiously and with increased naval gun and air support. At the close of 18 May the front had been steadily advanced southward and had reached the line

Naha (Jap) — Dakeshi (US) — Shuri (Jap) — Gaja (US)—Yonabaru (Jap, with Jap salient along the coast for about 2 miles to include the airfield).

The entire line was about 4½ miles long and was held by 4 divisions, in order from right to left (west to east) the 6th Marine, 1st Marine, 77th Infantry, and 96th Infantry Divisions. Both the III Marine Amphibious and XXIV Corps had corps artillery. The airfield south of Machinato was available, but main reliance for air support was on the Pacific Fleet's aircraft. Admiral Raymond A. Spruance commanded shore, sea, and air forces, and was present afloat.

OPERATIONS BETWEEN 19 AND 24 MAY

On 19 May the enemy attacked north from Naha. He made no gains, but neither did the 6th Mar Div. The 1st Mar and 77th Inf Divs in the center attacked toward Shuri, while the 96th Inf Div concentrated on an effort to capture Conical Hill, which covered the immediate approach to Yonabaru. No division made more than minor gains.



Japanese troops, some of them wearing American uniforms, made a strong counterattack on 21 May just above Naha, but the Marines threw it back (1). A lighter counterblow was parried by other marine units in the area of W and (2). North of Shuri Army troops took the small town of Taira (3) and advanced south of it, while near the east coast infantrymen gained in the area of Yonabaru (4).

In view of this lack of appreciable success, a strong artillery preparation was fired next day by artillery on shore and guns on warships, with the mission of blasting a gap 600 yards wide and 400 yards deep between Wana and Shuri. 10,000 tons of ammunition were expended on the target, or an average of a ton to each 24 square yards. Tanks then led the 1st Mar Div. They were unable to negotiate the terrain, and infantry moved forward about 800 yards without them. On the left the 77th Inf Div made a 400-yard advance. The 96th Inf Div made the greatest advance—almost a mile east of Ishimmi. In the evening about 35 enemy planes attacked the supporting naval ships. Met by our own fighters and anti-aircraft fire, 26 enemy planes were reported downed, at a cost to us of 5 light warships hit and damaged.

On 21 May the battle continued, with the enemy attacking the 6th Mar and 77th Inf Divs. The 6th Mar Div's battle centered about Sugar Loaf Hill. This had been an objective for several days, and was captured this day for the eleventh time. Later in the day the 77th Inf Div attacked without an artillery preparation and captured Taira. The left of this division had made a predawn attack which gained 600 yards east of Shuri. Fighting centered about flame-throwing tanks, which with accompanying infantry attacked enemy cave positions. The enemy had caves on reverse slopes, which were hard to reach. When summits were occupied enemy grenade throwers issued and counterattacked.

Heavy rains which now set in lasted for a number of days. The ground turned to mud which seriously interfered with tanks and other vehicles. During the night 21/22 May the 7th Inf Div entered line on the extreme left. The enemy abandoned Yonabaru, and the new division in a pre-dawn attack extended the front eastward to the vicinity of Rioi and Itarashiku. Elsewhere there was no material change in the situation.

On the 23d the 6th Marines crossed the Asato River into Naha. This river, 150 feet wide, is fordable at low tide. Troops crossed in squads and singly under cover of smoke and against machine gun fire. A few small bridgeheads were established. Only slight advances were made elsewhere.

Next day the 6th Mar Div established two bridges to their bridgeheads. On the rest of the front there was heavy fighting as usual, with minor advances. Rain and mud prevented use of armor.

This day ended another period in the campaign. During the preceding six days the maximum advance was along the east coast, where the non-defense of Yonabaru resulted in an advance of over a mile and the elimination of the former Japanese salient north from Yonabaru. Next greatest advance, with probably the hardest fighting, was around Shuri in the center, where the advance was about 1,000 yards on the northwest side and somewhat less on the north and northeast. On the right the advance had gained less than a quarter of a mile, but a start had been made in the crossing of the Asato River into Naha.

Casualties on shore for an 11-day period ending the 24th were 5,817, or an average of 527 a day. Casualties afloat were 1,588 additional, or at the rate of 144 a day. The latter loss was primarily due to constant enemy air attacks against ships. The number of our ships lost and damaged had not been released at date of writing.

Military Government had been established by this time on Okinawa, except for the south tip. Japanese numbered 114,000 women and children and 25,000 men, old and unfit for military duty. Other males had been drafted into the Japanese army and were believed to be included with the troops defending the south tip. The foregoing figures indicate that they may have totalled around 30,000.

OPERATIONS 25 MAY—1 JUNE (PERIOD OF HEAVY RAINS)

During the night 24-25 May the enemy bombed the American-held airfields on Okinawa for about an hour. This attack was followed by a raid, with Japanese planes and gliders landing on or near the airfield. Airborne troops debarked and attacked planes on the ground, fuel tanks, shops, and isolated mechanics and men working. A 2-hour fight

ended with the destruction of the enemy. We lost 7 planes and suffered unstated other damage. At the same time the enemy's planes attacked ships off Okinawa and hit 11 of our light naval units. Our own air force fought off the enemy and, assisted by anti-aircraft fire, reported a total enemy loss for the night of 111 planes. During the ensuing day 55 more enemy planes were reported as downed. Hard fighting occurred on land, but there was little change in the line. This gives a loss of 15 enemy planes for each of our ships bombed.

Very heavy rains fell during the 26th. The condition of roads on Okinawa made the supply of forward troops quite a problem. It was necessary to use planes to drop part of what was needed. There was no material change during the next two days, other than a slow advance by the 6th Mar Div into the west part of Naha.

A small enemy air raid, apparently more for reconnaissance purposes, occurred on the evening of the 28th; it damaged one of our light naval units. That raid was followed by a heavy one during the night 28-29 May, directed principally against our ships. For a loss of 115 Japanese planes, 1 light naval unit was sunk and 12 others were more or less damaged. During the following day, notwithstanding adverse weather, a continued enemy air attack damaged two more ships for a loss of 8 Jap planes. Average Jap loss was 8 planes per ship hit.

On land the Japanese abandoned the west part of Naha. During the 29th this area was occupied by the 6th Mar Div without opposition except for patrol contacts (sniping). Naha had had a population of 65,000, and had been a Japanese air and sea base. The captured sector had been flattened by incessant air and naval bombardments. Few dead bodies were found.

No special change took place on the 30th. At the end of this day the line was

Naha north of the harbor (US)—Shuri (Jap)—Conical Hill (US)—Yonabaru (US)—Chan (Jap)—Tsuwanuku (Jap).

No change took place on the 31st, but on 1 June the 6th Mar Div advanced through Kobakura at the southeast edge of Naha. The 1st Marine and 77th Inf Divs reached the edge of Shuri, while the 96th Inf Div passed slightly beyond Shuri on the east side. The 7th Division closed on Chan. Fighting was severe, and was markedly so east of Shuri.

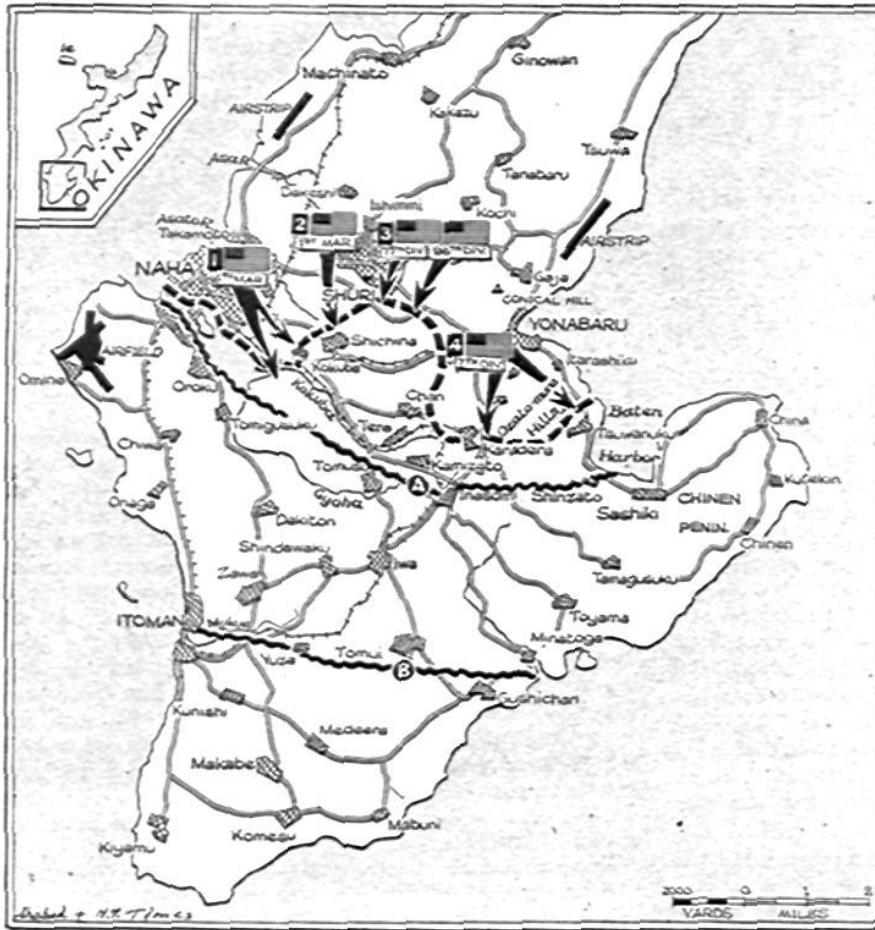
This day ended a rainy period of 10 days during which over 13 inches of rain had fallen. The mud was so bad that supplies were largely hand-transported within 2,000 yards of the front. Trucks, tractors, jeeps, and even weasels were grounded and unable to circulate. Evacuation had been quite a problem.

At this date the local estimate of the situation was that Japanese resistance was on the verge of collapse, due to personnel losses (especially among officers) and to loss of transportation. Most of the Japanese regular troops were thought to have been destroyed. Our own fierce artillery and naval fire were believed to have so depleted the enemy's artillery and ammunition that he lacked the fire power to support his defense line. His present positions were considered to be untenable, with little possibility that he would be able to establish a new line. The end was expected to occur within a week or ten days at the most, less possible enemy isolated pockets. Casualties for the period have not yet been reported.

OPERATIONS FROM 1 TO 10 JUNE

A reorganization of the American High Command was made by the Pacific Fleet Area Commander, Admiral Nimitz. The Tenth Army was relieved from duty under Admiral Spruance, overall tactical commander, and placed under direct orders of Pacific Fleet GHQ at Guam. Admiral Spruance, transferred to new duties, was replaced by Vice-Admiral Harry W. Hill as local commander of forces afloat. This resulted in having two local commanders, one each ashore and afloat, who were to cooperate with each other but each of whom was independent and under direct orders of the Pacific Fleet C-in-C.

The month opened with a bright sun which dried out the



In early June the Marines occupied 1,000 yards along the north bank of the Kokuba River and then pushed across it (1). Other marine units gained 2,000 yards to seize the Shichina hill mass (2). In the center of the line Shuri (3) was captured as Army troops mopped up remnants and reorganized. On the left flank infantrymen pushed 1,000 yards deeper into the Ozatomura hills (4). Two possible lines of resistance (A and B) were foreseen for the withdrawing Japanese.

ground and by afternoon made it possible for armor to participate in the fighting. An advance was ordered. It was discovered that the enemy had withdrawn to an as yet undetermined new front. The 6th Mar Div advanced to Kokuba, the 1st Mar Div to Shichina (exc), the 77th Inf Div through Shuri to a line prolonging the front of the 96th Inf Div to its left. The latter division and the 7th Inf Div made minor advances, but patrols entered the Chinen peninsula on the east and reported only small hostile forces in that area.

Three abandoned enemy tanks were captured, stuck in the mud. With that exception little abandoned enemy equipment and ammunition was discovered, indicating that the enemy's retreat had been planned. His defenses were found to have been based largely on caves interconnected by tunnels. One large cave appeared to have been an important command post. Another had evidently been a motor repair shop.

On 2 June the 1st Mar and 96th Inf Divs, meeting moderate resistance, advanced about 1,000 yards, thereby reducing the enemy salient south of Shuri. The 7th Inf Div advanced to the line Kamizato (inc)—Shinzato (exc).

With considerable fighting on the 3d the front reached the line Kokuba River to Kokuba (US)—Shichina (Jap)—Tera (?)—Kamizato (US)—Inasomi (Jap)—Ogusuki (US)—Tamagusuku (Jap)—Shichiya (Jap).

Enemy air activity increased; 45 enemy planes were reported downed by the fleet, for a loss of one light naval unit damaged. Enemy planes

were believed to come mostly from Kyushu in the north and Formosa and the Sakishima Islands to the south. The Pacific fleet was regularly bombing airfields on Kyushu and in the Sakishima Islands, while the Southwest Pacific Command (Gen. MacArthur) was almost nightly raiding Formosa fields.

Heavy rain fell most of 3 June. With it came mud, and the impracticability of moving vehicles. The 6th Mar Div attacked Oroku peninsula, at the south entrance to Naha harbor. One regiment was sent by water and landed at daylight after an artillery preparation of 30 minutes fired by about 40 batteries and an unspecified number of warships. Although the ground was favorable for defense there was little resistance, and the landing from amphibious tractors and landing craft proceeded according to schedule. During the afternoon engineers laid two bridges from Naha to the newly gained beachhead and linked it up with the remainder of the division.

A slight advance was made by the 1st Mar Div. Mud was so bad that Marine planes were supplying forward areas. The average tonnage of ammunition, food, medical supplies, etc., dropped daily for a 5-day period, including this day, was 13½ tons for just one division. The 96th Div advanced 3 miles to Iwa, and the 7th Inf Div to the line Meka (inc)—Toyama (exc); there was little resistance.

More rain impeded the advance on the 5th. The 6th Mar Div ran into enemy cave positions on Oroku peninsula and undertook to destroy these one by one. On account of the mud, ammunition and supplies moved forward by hand. Other divisions made minor advances. In the evening an enemy air raid damaged two ships (class not reported) for a loss of 5 Jap planes downed.

The rains and mud continued on the 6th. The 6th Mar Div reduced more strong points, and maintained its forward supplies by hand, air, and amphibious vehicles. Other divisions made small advances. Again in the evening an enemy air raid attacked ships off Okinawa. Two ships were damaged, but 47 Japanese planes were destroyed—or 23½ planes downed per ship hit, the most satisfactory ratio yet. A reconnaissance made by observers on launches following around the shore reported that on a line through the Yaeju-Dake hill or escarpment there appeared to be a well established line of caves suitable for the Japanese style of defense. Air reconnaissance reported numerous parties of what appeared to be labor details working to improve the above line. This information caused a revision of the previous estimate of the situation as to the crumbling of enemy resistance, less pockets, by 10 June. It was now believed that the enemy could hold out beyond that date.

On 7 June the weather improved, mud declined, and tanks could operate. With this assistance, and very heavy artillery support, the troops reached the line

Gushi (US)—Oroku (?)—Hill 108 (US)—Dakiton (US)—Shindawaku (Jap)—Yonagusuku (US)—Tomui (Jap)—Gusichan (US)—Minatoga (Jap).

Japanese planes again attacked our ships, but lost 20 of their planes while none of our ships were reported as having been hit.

Next day the battle continued. The 6th Mar Div continued with its task of reducing enemy strong points on Oroku peninsula. The 1st Mar Div, meeting no opposition, advanced about 1,000 yards to Itoman (exc)—Zawa (inc). Slight advances were made by the 7th Inf Div along the east coast. The enemy's main position along the Yaeju-Dake escarpment was heavily attacked by artillery, naval gun fire, and an air strike. Twelve enemy planes attacking our ships were downed without any ship losses. No substantial change occurred on the 9th and 10th, the artillery and air preparation against Yaeju-Dake being continued and the divisions slowly closing in toward that line of hills.

ATTACK AGAINST YAEJU-DAKE ESCARPMENT (11 TO 18 JUNE)

Now the Tenth Army was in close contact with what seemed to be the enemy's last available line of defense on Okinawa. This was a 5-mile line from Itoman along Yaeju-Dake heights to Hill 95, just south of Hanagusuku. The entire enemy position had been under constant air and artillery attack for several days, and it was hoped that it could be reduced within a short time. On Oroku peninsula the enemy still held on the south shore of Naha harbor a pocket which was under attack by the 6th Mar Div. The enemy's main line was being attacked by the 1st Mar and the 96th and 7th Inf Divs in that order from west to east.

The commanding general of the Tenth Army dropped a message to the enemy demanding surrender, on the ground that further resistance was useless. An answer was requested by 1800 hours, 12 June. However, there was no answer. On the 11th the 96th Inf Div in the center succeeded in gaining a foothold on Yaeju-Dake, notwithstanding numerous enemy counterattacks which issued out of caves. The two flank divisions made advances of 600 yards on the west and 400 on the east, the latter reaching summit of Hill 95. Bitter resistance was met. A new enemy air attack damaged a light naval ship for the loss of 10 enemy planes.

On the 12th the 96th Inf Div consolidated its foothold on Yaeju-Dake just south of Yuza. The 7th Inf Div gained another footing at the east end of the escarpment northwest of Hanagusuku. In a pre-dawn attack the 1st Marine Div advanced to the foot of the Yaeju-Dake, meeting only minor resistance—but after daylight the enemy's fire became intense and there was difficulty in holding on to the new gains. In an all-day battle, the Marines reinforced and held their forward position.

The severe battle thus engaged continued throughout the next day without cessation. The 1st Mar Div consolidated their gains of the previous day while the two infantry divisions made gains along the escarpment. The 6th Mar Div reported that most of the enemy on the Oroku peninsula had been killed, and all that remained were numerous caves holding out as isolated strong points from which the enemy made occasional sorties.

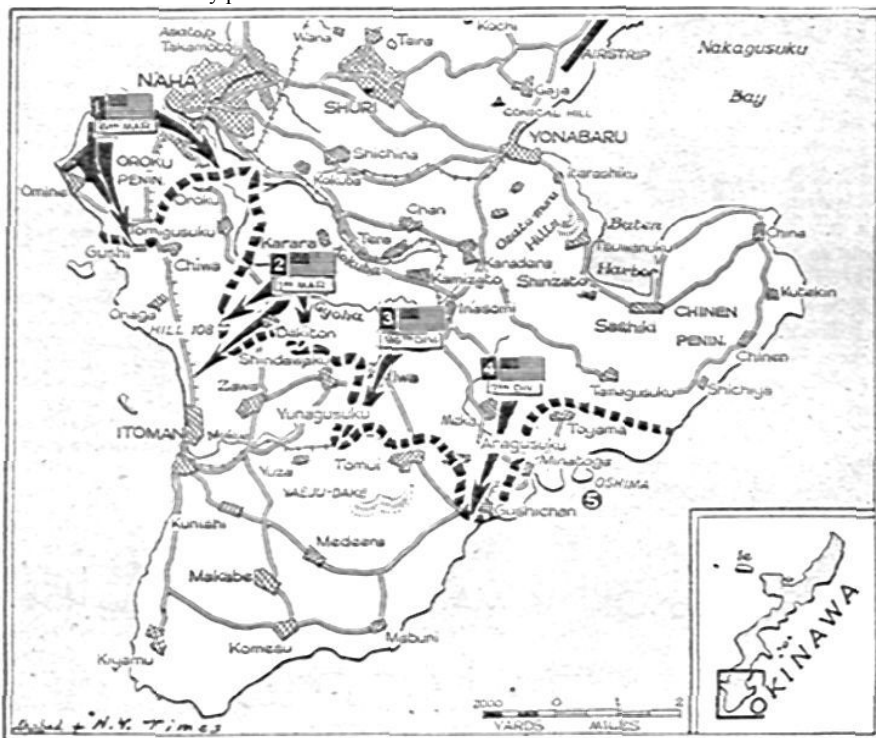
The enemy's defense was by no means inactive. Each of the three divisions in line had counterattacks to repulse, some being by day and others by night. The enemy fought hard, and advances were made only at the expense of considerable losses. As the entire front could be covered by most of the batteries, opportunities were afforded for concentrations of fire against single targets. About 30 batteries were used, of which half were of 105-mm guns and the rest were 155-mm guns and howitzers and 240-mm pieces.

In rear of the front, enemy in caves continued to hold out. Special mopping details of flame-throwing tanks and infantry were assigned to this task. Using extension hoses where necessary to reach cave entrances up or down steep slopes, entrances were burned out and then sealed by demolition charges. On this date over 100 caves were so disposed of by the three divisions.

In an effort to destroy Japanese headquarters, believed to be in a rather narrow ravine, about 60 planes (Marine Corps) dropped within two hours several thousand gallons of gasoline which was ignited. There was no doubt but that the ravine was burned out, but there was no way at the time of determining how many casualties had resulted to the enemy.

On 14 June progress was made. The 96th Inf Div enlarged its hold on Yaeju-Dake, while the 1st Mar and 7th Inf Divs advanced several hundreds yards, extending their lines on the same escarpment. The 6th Mar Div about completed its mission of clearing the Oroku peninsula. An unusual feature was that about 100 Japanese surrendered. Other Japanese committed suicide or killed each other. Next day 145 more Japs surrendered on Oroku peninsula. Elsewhere the only material advance was by the 7th Div for a maximum of 700 yards. The other divisions were engaged in consolidation and mopping of numerous by-passed enemy caves.

Although the Japanese were in a precarious position they did not diminish their resistance. Every night infiltration attempts were made and the battle was continuous almost 24 hours a day. On the 16th the 77th Inf Div had been withdrawn from line, and the attack was continued by three divisions. The 1st Mar Div on the right (west) met very heavy machine gun and mortar fire and failed to advance. Against heavy opposition the 96th Inf Div in the center advanced to Hill 167 and went over its tip. The greatest gain in yards was again by the 7th Inf Div, which advanced 800 yards to Hill 153 (NW



By the 7th Oroku Peninsula was cleared by Marines who reached Gushi and smashed forward 200 yards on their left flank (1). Other marine units took Hill 108 (west of Dakiton), sent advance elements close to the coast above Itoman, and drove toward Zawa (2). Infantrymen, in an apparent effort to swing around the Yaeju-Dake escarpment, gained 1,000 yards northeast of Yuza (3). To the east Gushichan was captured (4) and American units landed on O Island (5).



Near the period's end elements of a fresh marine division pushed down the west coast to the vicinity of the Nagusuku—Makabe highway (1), while the left wing of the marine force reached heights southeast of Mezado (2). Ahead of them a battalion of Japanese fled southward in the open northeast of Kiyama (3) and our guns opened up on them. Army troops advanced to the neighborhood of Medeera (4) and, on the left flank, to a point 1,000 yards north of Mabuni (5), a coast town of Nakaza) and 500 yards to Hill 115 (SW of Nakaza). The enemy air force raided our shipping in 5 small waves and had 3 planes downed; they succeeded in sinking a light naval unit.

On 17 June the 6th Mar Div entered line on the right (west). Attacking, it reached Mezado. On its left the 1st Mar Div reached the line Mezado—Ozato (inc). Both these divisions, forming the III Amphibious Corps, were supported by a very strong artillery preparation and barrage. The XXIV Corps on the left (east) made only slight gains. The day was taken up in mopping bypassed caves. The 96th Inf Div made a slight advance, the 7th Inf Div hardly any. Enemy resistance was determined, but his artillery had about disappeared so the attackers were confronted almost entirely by infantry fire. This was particularly heavy in the zones of action of the two center divisions. In the afternoon an experiment was tried out by the 7th Inf Div. After warning the enemy by dropped mimeographs as to what was going to happen, all fire was suspended for one hour during the afternoon while loud speakers invited the Japanese to come over and surrender. Ten Japs took advantage of this opportunity and surrendered.

On the 18th the 2nd Mar Div made a pre-dawn attack. During the preceding night it had relieved the 6th Mar Div on the right. With the 1st Mar Div on its left, the line Nagusuku—Makabe—Medeera (all exc) was reached, many of the enemy withdrawing southward. Observation being good, the retreating Japs were taken under fire by guns of the fleet who surrounded the south part of Okinawa and heavily shelled enemy positions. The 96th Inf Div closed on Medeera on its north and east. The 7th Inf Div advanced $\frac{1}{4}$ to $\frac{1}{2}$ mile to reach a line 1,000 yards north of Mabuni. On this day the commanding general of the Tenth Army, Lt. Gen. Simon B. Buckner, while observing the battle, was killed by the burst of an enemy shell. Maj. Gen. Roy S. Geiger, Marine Corps, thereupon assumed command of the Army.

As this account closes the campaign of Okinawa was obviously nearing its end. The enemy held only the south tip of the island on a front of 5 miles and with an average depth of 2 miles.

COMMENTS

The Okinawa campaign commenced with naval operations in March. The first troops landed on 1 April. Practically three months have been required to capture the island. During this period large naval and air forces have been tied to covering the troops engaged in action.

Some criticisms have appeared on the ground that the campaign was unnecessarily long, and that it would have been materially shortened by landing an amphibious expedition in rear of the original enemy front north of Shuri rather than continue on to the end with an uninterrupted succession of frontal attacks.

Credit must be given to the generals and admirals at the theater of operations. They considered the possibility of flanking the enemy out of his defenses. A turning movement by land was impracticable. The island was only about 6 to 7 miles wide, and the enemy had ample troops to defend this short distance.

The enemy could have been turned by an amphibious expedition. The size of this would have been limited by reefs and cliffs which reduced possible landing places to narrow limits. It is reported that a G-4 study based upon reefs and beaches showed that if a landing were made in rear of the enemy's Shuri line, supplies for not over one division could thereafter be landed per day. The G-3 study indicated that a force as small as one division did not have a reasonable chance of succeeding in an isolated contest in rear of the enemy's main line of defense. For these reasons, an amphibious turning expedition was rejected as not promising under existing geographical conditions.

PACIFIC FLEET COMMAND, LESS OKINAWA (19 May to 18 June 45)

OPERATIONS AGAINST JAPAN

An air and sea blockade has been maintained along the south coast of Japan. This is enforced principally by air forces and submarines. A similar blockade is in partial effect as to sea traffic between Korea and Japan, enforced mostly by planes based on Okinawa or aircraft attached to the Fleets operating in these waters. Of surface ships, the enemy is using hardly any but small cargo boats. As these are continuing to be sunk it is presumed that the enemy manages nevertheless to get some use out of them. It is noted that Japanese shipyards have numerous small boats in hand.

There is little information as to Japanese submarine cargo craft. Enemy posts in the Marshall Islands, which are 4,500 miles from Japan, appear to be well supplied with artillery and ammunition. It is to be assumed that some supplies are shipped to that distant place, and in the same way Japan probably receives a limited supply of raw materials in her home territories.

There has been an increase in the bombing of Japan. It is mainly dependent on the 21st Bomber Command of super-bombers, based on Saipan, Tinian, and Guam. Upon completion of the capture of Okinawa additional bomber commands are to be

brought there. It will then be possible to increase the bombing program greatly.

During the period Tokyo, Yokohama, Nagoya, Kobe, and Osaka have been heavily bombed, Tokyo and Yokohama on two occasions and Osaka thrice. Our loss of planes has been small: due to enemy action they have with one exception not exceeded three planes per raid. The exception was a night raid on Tokyo, when we lost 19 super-bombers.

Incendiary bombs have been largely used. The nature of Japanese construction is such that fires are likely to spread, and greater destruction can often be caused by conflagrations than by destructive bombings. Mines have also been laid in Japanese waters.

JAPANESE PLANS

According to a speech by the Japanese premier on 9 June, Japan will resist to the end, notwithstanding bombing of her home land. From Japanese radio broadcasts, the defense of Japan apparently will rest on an elaborate system of underground plants, dumps, quarters, and defense positions. It is claimed that munitions can be produced in subterranean chambers and that the entire scheme of defense is impervious to bombing. The civilian population is being sheltered in underground tunnels close to wherever they live. Japanese claims (which are not very reliable) are that in Tokyo the destruction of houses was considerable, but that loss of life was not great due to shelters already built in that city.

Japanese claims are that considerable help is arriving from China and from Manchukuo, but the nature of this help is not known. Troops from Formosa have been identified by prisoners taken in the Philippines. Chinese troops serving under Japan have been identified in China. Their reliability appears to be questionable.

According to our own reports, received by the FEA (Foreign Economic Administration), the Japanese war industry is yet intact. Necessary raw materials are or can be obtained from north China, Manchukuo, Korea, and Japanese home islands, which source of supply has not yet been seriously interfered with. 1944 production of synthetic oil is estimated as having been 21,000,000 barrels, which is believed to be sufficient for the air forces, restricted sea use, and military vehicles. This supply of oil is apt to increase.

War plants were dispersed beginning at least three years ago. There is very little information as to their being underground, but they were distributed over wide areas throughout Manchukuo, Korea, and north China. This of course requires extensive transportation to distribute the raw materials to plants and the manufactured products to where they are needed. It is one of the aims of our Air Force to destroy transportation so as to prevent distribution of supplies.

MINOR OPERATIONS

In the north Pacific the Kurile Islands have been regularly reconnoitered and bombed. Special attention was given to Shimushu Island, on which the enemy has a naval and sea base at Katuoka. Next most important objective was Paramushiru, which has several bases. This island was shelled once by naval ships.

In the central Pacific the Palau and Marshall Islands have been bombed almost daily. Chichi was bombed 8 times, Yap 11 times, Marcus 5 times. Truk was bombed by American planes 6 times, after which a British force attacked with ships and planes on 14 and 15 June, including the intervening night. According to Japanese sources the attacking force had 2 cruisers, 4 destroyers, and an aircraft carrier. The extent of damage inflicted is unknown.

THE PHILIPPINES (19 May to 18 June 45)

On 19 May there were three major campaigns under way:

By the Sixth Army:

I Corps in North Luzon

XI Corps just east and northeast of Manila

By the Eighth Army:

X Corps in central Mindanao

OPERATIONS OF THE I CORPS

The 33d Inf Div held Baguio and vicinity; the 32nd Inf Div was astride the Villa Verde Trail, abreast of the 25th Inf Div plus one regiment from the 37th Inf Div, which held Balete Pass on Route 5. The 37th Inf Div, less one regiment, was in corps reserve. The corps mission was to advance along Route 5 into the Cagayan valley, where was the enemy's largest remaining force in the Philippines.

The Cagayan valley is very fertile. Besides good tobacco, it raises large food crops, sufficient for the native population plus the enemy's forces. The latter were estimated at between 20,000 and 30,000. The local Japanese C-in-C, Gen. Tomoyuki Yamashita, was last reported as present in the Cagayan valley in April, 1945. Whether he was still there thereafter is unknown. The enemy had occasional air communication with Formosa, and his base at Aparri on the north coast was reached by submarine cargo boats. It is probable that there were some other ports or landing places.

On 25 May the 25th Inf started a strong attack against the enemy holding positions across Route 5 at Santa Fe. The 32nd Inf Div attacked at the same time astride the Villa Verde Trail, which joins Route 5 near Santa Fe. The 25th Div by-passed its objective and, attacking from the north, entered Santa Fe on the 28th. Next day the 32nd Div linked with the 25th to establish a new front 3 miles north of Santa Fe. No details of this fighting, and no report as to casualties incurred in it, have yet been received.

The two infantry divisions were now withdrawn from line and replaced by the 6th and 37th Inf Divs. The latter's mission was to

continue on into the Cagayan valley, while the 6th went north following Route 4 toward the Baguio area.

On 2 June the 37th Div started its advance and gained ½ mile against light resistance. Next day the advance was 3½ miles. By the 4th contact with the enemy had been lost. On 9 June the leading elements were 4 miles beyond Bagabag, where contact was again established with enemy rear guards.

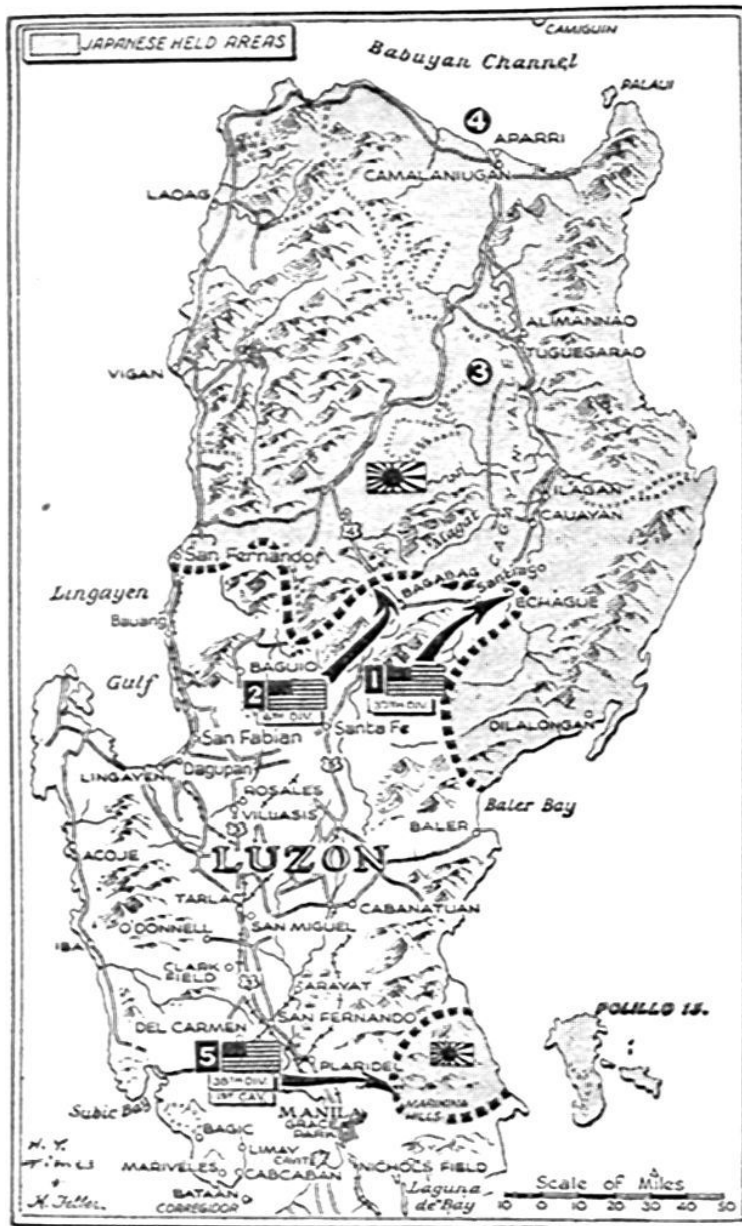
Up to this point Route 5 had followed the Magat River, whose valley is about 3 miles wide and highly cultivated. At Bagabag the route, hard surfaced but reduced to one lane wide, turns eastward over a 500-foot ridge which separates the Magat and Cagayan valleys. This stretch is the Orioung Pass. The enemy defended this in a battle which lasted from the 9th through the 13th. On the following day contact with the enemy was once more lost, and a 22-mile advance was made to Echague on the Cagayan River. By the 17th 18 more miles had been gained and the advance was at Cauayan, without contact with the enemy other than small patrols. On the 18th the 37th Inf Div was approaching Naguilian.

The 6th Inf Div followed the 37th as far as Bagabag, junction with Route 4. It then turned off along that road. On 14 June the enemy was met 4 miles out. In a 3-day fight a further advance of 4 more miles was made. By the 18th this division was 7 miles south of Kiangang, which was reported to be held by the enemy in strength.

The 33d Inf Div's advance elements on 18 June were at Bohod (or Bojod) in Benguet.

OPERATIONS OF THE XI CORPS

The enemy held the Manila water supply sources along the line Ipo—Wawa—Bosoboso, all inclusive. Manila had been deprived of water since its recapture in February. In an air line the enemy held positions within 15 miles of the center of Manila. As there were about 500,000 people in the devastated city, the absence of water constituted a serious nuisance and a health menace.



In a 22-mile break out of the mountains into the Cagayan Valley, last stronghold of the Japanese in the Philippines, late in the period our troops captured the towns of Santiago and Echague (1). Other forces pushed 5 miles northwest of Bagabag (2). Filipino guerrillas slashed at enemy garrisons at the northern end of the valley (3) and light naval units shelled positions east of Aparri (4). The clean-up of the Marikina Hills area east of Manila (5) continued, with cavalymen joining in.

It was highly desirable to force the enemy out, and reestablish water connections. This was the corps mission.

The 43d and 38th Inf Divs were engaged in advancing toward the Ipo and Wawa dams, respectively. The enemy defended these areas by an elaborate system of caves and tunnels, well laid out from his point of view. Caves and tunnels were in interconnected series and had from 1 to 4 levels. Entrances to caves were by zig-zag passages, which prevented fire of attacking forces from reaching other than the front line (or entrance) details. The enemy was supplied with machine guns, mortars, and light artillery. The 1st Cav Div plus a guerrilla force of unstated size was enveloping the enemy's left (south) flank by attacking his sea base on the east coast near Port Lampon and Infante.

It was believed that through these bases the enemy received ammunition, food, possibly replacements.

In heavy fighting extending from 19 to 24 May the 43d Div captured the Ipo Dam, which was found to be not seriously damaged. This did not open the water supply to Manila as the enemy still held the pipe line below the dam. The captured enemy cave and tunnel position for this area included caves large enough to provide shelter for 500 men, an assembly room fitted to hold 1,500 men, and elaborately furnished command posts. No further operations of the 43d Div have been reported.

The 38th Div started its final attack on Wawa Dam on 25 May and reached its objective on the 28th in a tank-led attack following the river bed. The dam lies in a narrow gorge, with the enemy holding the high ground on both sides. Thereafter the division advanced on the south side of the Mariquina River and cleared Mount Purro (1,634 feet) on 7 June.

The 1st Cav Div, which is dismounted, was south of Port Lampon. It was reinforced by the 112th Combat Team, plus guerrillas. The attack on Port Lampon had been under way for several days. On 20 May the guerrillas by an amphibious movement landed at Cape Dinahican (or Inaguican). There was no resistance, and on 25 May the town of Infanta (about 12 miles to the north) was taken.

OPERATIONS OF THE X CORPS

The mission of this corps was to clear that part of Mindanao east of the line Iligan Bay—Illana Bay. The initial landing had been on 19 April. One month later the 24th Inf Div had advanced from Cotabato to Davao, and held that place and vicinity. The 31st Inf Div, landing in rear of the 24th, turned north at Kabacan and was 11 miles south of Malaybalay. The 40th Inf and Americal Divs had landed in Iligan Bay and were 15 miles north of Malaybalay.

Meeting minor resistance, the 31st Div entered Malaybalay on 22 May and two days later linked with the 40th and Americal Divs, 10 miles further north. The enemy seemed to disappear eastward into the jungle.

The 24th Div at first advanced north from Davao. It reached Bunawan on the 22nd, and patrols subsequently established that there was no enemy of importance along the shore. He appeared to have disappeared westward into the jungle mountains.

Best information was that the enemy had about 3 divisions plus 1,500 Japanese civilians. His exact position hadn't been established, but appeared to be in the interior of Mindanao between the 24th Div on the east and the other three divisions on the west. The divisions were ordered to attack toward each other.

The attacks started on 29 May. The 24th Div attacked between the Davao and Talomo Rivers, astride a trail which leads across high mountains to Kibawe. The latter town is on the north and south highway (Francis Sayre Route) connecting Kabacan and Macajalar Bay. The 31st Div attacked eastward from Kibawe and also from Malaybalay.

The 24th Div met very heavy resistance, and up until the end of the period had advanced only a few miles inland from the coast. The north column of the 31st Div by 18 June had reached the Pulangi River near Silae, a 10-mile gain in 20 days. Its south column reached the Pulangi River and established a bridgehead on the east bank, for an 8-mile gain.

COMMENTS

Since December, 1944, the Japanese forces in the Philippines have adopted a passive defense. The campaign of Leyte, in which

they were badly defeated in the air, on land, and on the sea, convinced the Japanese High Command that American air and naval superiority forced them to keep away from possibility of attack by those two arms of the service. Consequently there were no more operations in the vicinity of the coast where naval gun fire could be effective. Troops were withdrawn inland, into jungles



When one American division moving north from Malaybalay (1) joined two others advancing south (2) the large Philippine island was bisected in the latter part of May. The greater part of the Japanese forces have been pressed into the northeastern corner. On the shore of Davao Gulf our men gained 8 miles and joined guerrilla units (3).

and mountains where they had cover and protection against air attacks.

This policy has led to each Japanese force constructing and occupying a position whose defense is based upon caves. No attempt was made to unite separated forces, nor to withdraw to main bodies several small detachments in outlying positions.

The three largest forces of Japanese are those above reported and under attack by the I, XI, and X Corps. Other Japanese cave positions so far identified are

a. Opposite Fort Stotsenburg and Clark Field in the Zambales Mountains. This is a nuisance position as it is within artillery range of the two posts. Japs are reported raising their own food. Position is close to the sea, but it has not been established that the Japs are receiving supplies by water.

b. On Cebu, in mountains northeast of the city of Cebu. Believed not to have access to the sea.

c. On Negros, in the southern part. Has access to the sea.

d. In Mindanao, north of Zamboanga, in the mountains and with access to the sea but without land connection with the large force in eastern Mindanao.

e. On Leyte, in northwest sector. Access to the sea not known about.

Japanese having access to the sea may occasionally receive a submarine barge with supplies. Japanese air communication is believed to be limited to north Luzon.

The three main areas have engaged against them 10 American divisions and an 11th is entering in the north sector as the period of this article closes. How many troops are engaged against the minor positions has not been disclosed.

The overall Japanese mission is to keep the Philippine campaign going as long as possible, thereby to tie up American divisions which might otherwise be free for an invasion of Japan or other Japanese-held territory. During the time thus gained, areas believed by Japan to be threatened are being prepared for defense by construction of as elaborate a system of cave and tunnel defense as time will permit.

Since the initial invasion in October total American casualties in the Philippines have been about 50,000 men. The enemy's killed and prisoners are reported as over 400,000.

SOUTHWEST PACIFIC COMMAND Less Philippines (19 May to 18 June 45)

Commencing in 1942, American forces captured Guadalcanal in the Solomon Islands. Thereafter they proceeded from island to island and by September, 1943, held positions on Bougainville, the north coast of New Guinea, and Morotai. The Japanese were not driven out of any of these places. They had been driven away from the American-held territory.

An air and sea blockade was established, and it was believed that further operations against the enemy in this area would be unnecessary. Without hope of relief or supply, it was expected that the enemy would die of starvation or be forced to surrender.

This hope has not been realized. It seems probable that in the tropical islands held by the enemy he can find food sufficient to maintain a fair ration. Japanese submarine barges bring in a certain amount of supplies. Just what, is unknown. Neither is it known whether replacements have been brought in. In any case, the enemy hasn't starved to death nor has he surrendered.

In the autumn of 1944 American troops were largely replaced by Australian divisions. These have initiated active campaigns to reduce the Japanese who have held out now for over three years. At the same time new operations have been started in Borneo. Ground operations are in charge of Australians; naval and air operations are mainly American. British and Australian naval forces are aiding the American Fleet and Australian and New Zealand Air Forces are assisting the Americans. The High Command remains American, under Gen. Douglas MacArthur.

SOLOMON ISLANDS

The Australian II Corps (Lt.-Gen. S. G. Savage) with the Australian 3d and 11th Divs and New Zealand Air Force, early in November, 1944, relieved American troops holding Empress Augusta Bay on the west coast of Bougainville. The enemy held the remainder of the island, with important air and naval bases at Buka in the north and Buin in the south. The enemy also held Choiseul Island; the

Australians held the remaining Solomon Islands to the southeast of Bougainville.

Operations by two expeditionary forces commenced at once to recapture the remainder of Bougainville. The 11th Div went north up the west coast, the 3d Div south. By 19 May the north force had advanced about 70 miles and the south force 60 against considerable opposition. On 4 June the south force started to force a crossing of the Hari River. This was accomplished by the 9th. The objective of this advance is Buin.

The north force, advancing over difficult country, reached the vicinity of the north tip of Bougainville on 20 May. The enemy was found in strength. Not much progress being made, an amphibious attack was launched on 10 June when troops landed in rear of the enemy's lines near Chabai, which is 6 miles south of the north tip of the island.

As this account closes the Australians have secured control of the major part of the west coast of Bougainville. Enemy casualties were estimated, since last October, as about 5,000 men out of a supposed total of 20,000.

NEW IRELAND AND NEW BRITAIN

The enemy maintains a large air and sea base at Rabaul, a minor base at Kavieng. Australian troops hold all of New Britain west of the line Open Bay—Wide Bay. The enemy holds a strong position at the northeast end, covering an area about 50 miles deep and 70 miles wide.

On New Ireland there are no Allied troops.

The Admiralty Islands and the Saint Matthias Group to the north are in Allied possession. They were originally taken from small enemy observation and radio parties. It was expected that a blockade of Rabaul and Kavieng would thereby be established, which would insure the fall of these strong points. It hasn't happened.

NORTH NEW GUINEA

One campaign has been under way. The Australian 6th Div has been engaged in a reduction of enemy forces in the general vicinity of Wewak. This has been the headquarters of the Japanese Eighteenth Army, which had 3 divisions with 30,000 troops in all, including service units. It was believed that not more than half of this number of men remained. The enemy held Wewak itself, through which he received supplies by submarine barges. He also held the Sepik valley to the south, across a mountain range about 4,000 feet high.

The Australian 6th Div had relieved Americans at Aitape, about 100 miles west of Wewak, and since November had been engaged in slowly advancing this distance. By 19 May Cape Borom just west of Wewak had been reached. At the same time a detachment had been landed east of Wewak by an amphibious move. The two Australian forces attacked toward each other.

Daily advances resulted in the capture of the Wewak area on 25 May. The enemy retreated south. It was believed that he was not cut off from all possibility of receiving supplies. Wewak is a port, and is immediately available.

The Australians now turned south and by 18 June were about 5 miles inland in the foothills of the Prince Alexander Mountains. This latter advance had been facilitated by artillery support furnished by Australian naval ships. Enemy resistance was strong.

In the Sepik valley an Australian right flank guard has operated in the vicinity of Maprik. In the month covered by this account an advance eastward has been made to a line 7 miles east of Maprik.

MOROTAI

The Allies hold an air station on the southeast side. The enemy holds the interior of the island. The only report of operations is from Japanese sources, which say that a successful amphibious raid was made on 24 May. Its mission was presumably to secure intelligence.

The enemy holds Halmahera, some 30 miles away. It would be

possible for amphibious raids to be made in either direction across this short passage by night, which under favorable weather conditions might be undetected while in transit.

TARAKAN

This is an oil base having numerous wells but no refining plant, as the oil can be used for fuel purposes "as is." Australian troops, with a small detachment of Dutch troops attached, landed on 1 May without initial opposition of a serious nature. The enemy retired to interior positions.

At the beginning of the period about half of the island of Tarakan had been captured. The island is egg-shaped, point toward the south and with a long axis of 20 miles. All parts of the island are within range of the naval ships which have been constantly aiding. The island is rugged, and there are a number of defiladed areas. By 19 May, with aid from naval and air forces, the enemy had been pushed into strong points based upon caves in the northern part of the island, with other positions in the south.

On 29 May the Australians attacked in the south. In hard fighting an advance of 1,000 yards was gained in the hills. This attack does not appear to have been followed up. The decision was to conserve lives by a slower but methodical reduction of enemy centers of resistance.

BRUNEI BAY

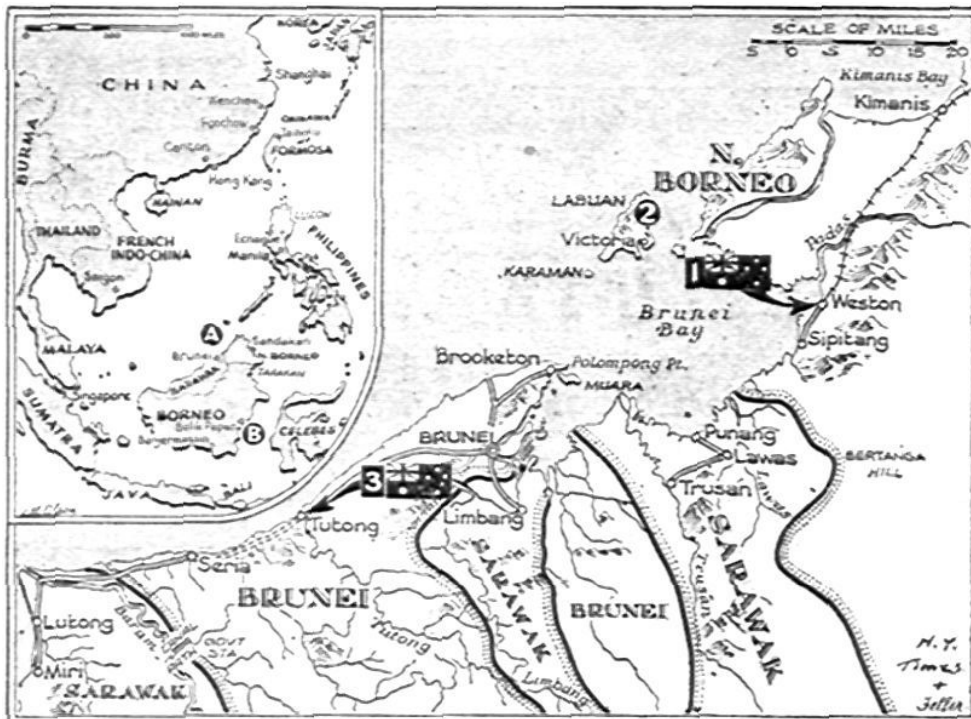
In and around this bay have been several enemy airfields. More important, there are oil wells. As at Tarakan, this oil is so good that refining is not necessary. The Allies will need large quantities of oil and occupation of Borneo oil fields will materially reduce sea transportation. The Borneo fields are about 700 miles from Manila as compared with 7,000 miles from Manila to California, the next nearest available source.

On 10 June the Australian 9th Div (Lt.-Gen. Sir Leslie J. Morshead) attacked following a 3-day series of air strikes and an initial naval preparation. Both American and Australian air and sea forces participated in this expedition.

At 0915 hours the first wave landed near Hamilton Point on the southeast of Labuan Island. Other troops landed at the same hour on Muara Island on the south side of the bay. A third landing was made in the afternoon near Brooketon, just across a narrow channel from Muara. Except for patrols, the Japanese followed their standard plan and made no resistance to landings.

On 12 June a new landing was made 7 miles east of Brunei, the local capital, without opposition. The troops which had landed at Brooketon closed in also without meeting resistance. On Labuan the airfield was secured.

On the 14th Brunei was occupied. This point is the headquarters of a local Sultan who is acknowledged as a spiritual leader by American Moros from the Sulu Islands. Next day the occupation of Labuan was completed. By 18 June troops had advanced as far as Tutong, 35 miles southwest of Brunei along the coast. Most of Brunei Bay had been occupied.



As the period closed a new landing was made at Weston (1) by troops that moved swiftly inland. The captured airfield at Labuan Island (2) has been put into operation. West of Brunei the Australians reached Tutong (3) On the inset this region is at (A). Balikpapan (B) was bombed.

The Japanese resistance has been limited to patrol actions only. If there was any considerable force, it has withdrawn into the interior. As the Japanese destroyed the oil wells they will have to be

reconditioned. Extensive rubber plantations were not destroyed. Whether or not they can be operated as long as they are subject to enemy raids has not been determined.

SOUTHEAST ASIA COMMAND (19 May to 18 June 45)

At the beginning of the period the Japanese held that part of Burma east of the Sittang valley and south of the Mandalay—Lashio road. A detached enemy force held the Pegu Mountains from Paukaung (inc) to within 10 miles of Pegu. Another detached force held positions in the Arakan Mountains from Mindon (inc) to opposite Kyangin. The enemy held Kama on the Irrawaddy River, where he operated a ferry service which connected the two detached forces with each other. This time of year is the rainy season, so flying weather is bad; this facilitated enemy communications. It was assumed but not known, that the two detached enemy forces were seeking to withdraw to the main body east of the Sittang. British G-2 estimated the enemy's main body as approximately 44,000 men, well equipped, and with open lines of supply eastward into Thailand. The detached enemy forces were estimated as 6,000 men west of the Irrawaddy and 12,000 east of that river.

The British mission was to destroy the two hostile detached forces and to drive the enemy's main body eastward. The British Fourteenth Army had the XXXIII Corps in the Irrawaddy valley; the Indian XV Corps operated in the Pegu area. Other troops attacked the enemy's main force along the main roads extending south from Aungban and east from Toungoo.

IRRAWADDOY VALLEY OPERATIONS

At the beginning of the period the enemy's front extended from a point 9 miles northwest of Prome to one 34 miles southwest of that city. The Indian 7th Div, charged with capturing the ferry at Kama, on 24 May arrived within 2 miles of that place. The initial attack was from the west. Not making much progress, the attack was shifted to the southwest sector on the 27th. Very savage fighting ended with the capture of Kama on 1 June. The enemy was reported as having lost 1,221 killed.

No other important events occurred in this sector. British troops based on Prome have pushed the enemy's lines to the northwest back to 13 miles from Prome. The other detached enemy force held a line across the Paukaung Road, 20 miles out from Prome. From that point a strong enemy force holds the Pegu Mountains as far southward as a line from Taikkyi to Pegu. On the west the Japanese are close to the Irrawaddy valley road and railroad, and on the east to the Sittang valley road and railroad. The latter lines of communication are interrupted.

PEGU OPERATIONS

At the beginning of the period the same hostile force which was east of the Irrawaddy had a strong detachment 10 miles northwest of Pegu. The Indian 5th Div attacked on 23 May. After advancing 4 miles it appears to have withdrawn to its original line. A similar advance of 4 miles was made on 28 May and again on 5 June. These seem to have

been reconnaissance attacks. Another attack on 10 June reached to 20 miles west of Pegu.

At the end of the period enemy forces appeared about 25 miles to the northeast of Pegu. The enemy seemed to have a connection across the Sittang valley.

OPERATIONS EAST OF THE SITTANG RIVER

The main British operation has been an advance by the Indian 19th Div east from Toungoo, along the Mawchi Road. The line was approximately 11 miles east of Prome. On 21 May enemy attacks were repulsed. On the 28th the Indian troops started their advance. It has been very slow, as the enemy contested every attempt to move. Details of the fighting are unknown. By 18 June the British had advanced to a line 23½ miles east of Toungoo. The enemy retained hills bordering the road for a mile and a half in rear of the advance British elements.

To aid the foregoing advance a left flank column was started from the vicinity of Aungban with the mission of reaching the Salween valley in rear of the enemy facing Toungoo. On 1 June this force attacked a defended hill position and captured a zigzag road approach covering a 3,000-foot lift. Next battle developed on 5 June near Lake Inle. This lasted to include the 8th, when the enemy was driven out of Kalaw. On the 11th contact with the enemy was lost.

Minor fighting has occurred near Kyaukkyi and Shwegin.

COMMENTS

Lines of communication throughout Burma are almost non-existent. The railroads have been bombed by Allied air forces for three years. They have done such a good job that nearly all bridges are down and practically all locomotives and cars burned out or demolished. Burma is mountainous, and many bridges were long and or high. Their replacement requires special materiel and considerable labor. Rolling stock needs to be completely replaced.

River transportation used to be a main supply method. Boats were of light draft. They have been sunk, and a complete new line of boats is now needed.

Roads have lost many bridges, destroyed by Allied planes or demolished by the enemy.

In view of these circumstances supply of troops is dependent upon air transportation, and sea lines for troops along the coast.

American combat air forces have been withdrawn, but the Air Transport Command remains and is operating to supply British forces throughout Burma.

A new British Army—the Twelfth—was made active on 1 June, with headquarters at Rangoon. According to Japanese intelligence reports the mission of this new army will be to seize and hold Singapore, while the Fourteenth Army remains in Burma. The rainy season will continue until through November. It is not impossible to operate during the rainy season. While constructing the Ledo Road American forces under Gen. Stilwell operated without regard to seasons. So far, however, the British have engaged in no major efforts except during the dry season.

CHINA (19 May to 18 June 45)

POLITICAL DIVISION AND FORCES

The only political government in China recognized by the Allies is that of the Kuomintang Party, whose seat is at Chungking and whose leader is Generalissimo Chiang Kai-shek. It controls that part of central and south China approximately west of the line

Loyang (Jap)—Laohokow (Jap)—Ichang (Jap)—Changteh (Jap)—Shaoyang (or Paoking) (Jap)—Ishan (Ch)—Indo-China (Jap).

This line is just about 1,000 miles long. Main Japanese bases are Hankow in the north and Canton in the south. Main Chinese bases are Chungking in the north and Kuming in the south.

Chinese forces are supplied by the United States and Great Britain, mostly by the former. The old Ledo Road has been renamed the Stilwell Road after the general who worked so hard to open it. It connects with the old Burma Road via Bhamo in Burma, and affords a continuous route for vehicles from the railhead at Ledo in Assam, India, to Kunming and Chungking. Although open, the road is reported as carrying but limited traffic.

Main reliance for supplying China is the American Air Transport Command, which operates out of India. It reaches all parts of Kuomintang China and brings in monthly tonnages several times greater than the Burma Road ever carried in its best days.

There is also a pipe line from India to Kunming which delivers gasoline and oil to that center.

With all these facilities, some new and others expanded, China is receiving a very large amount of materiel.

According to Japanese reports this has been sufficient to equip 20 Chinese divisions with motor equipment, tanks, flame throwers, artillery, and other American equipment complete. The only confirmation from our own sources is that 3 divisions—the 14th, 22nd, and 50th—have been so equipped and are present in China as part of the Chinese Sixth Army. These divisions formerly served in Burma with the Chinese First Army, which appears to have returned to China. The American elements of the Mars Task Force—475th Inf and 124th Cav—have also been identified in China.

An American Industrial Board under Donald M. Nelson has reported that Chinese industrial production has been reorganized and maternally increased and bettered. No figures are available as to amount and kind of production. Chief bottleneck is the lack of proper transportation to distribute supplies and troops. Roads are few and poor; truck transportation is consequently available to but a limited number of locations. Railroads are practically non-existent. There is water transportation on the rivers; this is rather slow but fairly reliable.

Throughout the entire zone of Kuomintang China the U. S. 14th Air Force has complete air control. Using a number of bases, they daily raid into Japanese-held territory.

The next important Chinese political division is the Communist area, whose headquarters are at Yanan (or Fushih) in Shensi. Its leader is Mao Tze-tung. It controls territory approximately west of the line **Kweisui (Communist)—Fenyang (?)—Loyang (Jap).**

The Kuomintang and Communist parties are on unfriendly terms with one another. Both are at war with Japan. The Communists do not receive aid from the Allies, and have made this an excuse for not conducting active operations against the common enemy.

According to reports of recently returned missionaries less than 2% of the population in Communist-controlled areas are of that party, which rules through its Communist army. However, there is no active opposition to the Communists, who on their part claim that in Kuomintang China less than 1% of the population belong to the Kuomintang party.

There is a pro-Japanese government with headquarters at Nanking. It controls that part of China held by the Japanese, which is east of the lines already given, less extensive areas which include most of the provinces of Fukien, Chekiang, and Shantung along the coast, and extensive interior areas in Kiangsi, Anwhei, and eastern Honan. In all of these areas are armed Chinese forces who have communication with Chungking China by radio and an occasional plane. Those forces are commonly referred to as guerrillas. Due to lack of proper organization and poor discipline they are sometimes a burden on their own people rather than a threat to the enemy.

RECENT JAPANESE MILITARY MOVEMENTS

On the west boundary minor changes have occurred. In theory, the Japanese have had an overland route through China connecting Korea with Indo-China. How much, if any, through traffic goes over this

route is unknown. Railroad communications are bombed so frequently by the 14th Air Force that it seems that much rail traffic is improbable. Road transportation is open, but the route is excessively long for motor vehicles. Water transportation by river is available over most of the route, and this is also being attacked from the air.

The changes have been south of Lake Tungting. With one exception they have involved withdrawals of a few miles from unimportant towns. The exception is in Kwangsi, from the triangular space between the Pak and Siang Rivers. This has involved abandoning the road and railroad line from Liuchow to Nanning, including the latter town. That road and railroad line were captured by Japan in 1944. At that time the railroad had not been completed. The grade was in or nearly so. It was believed that Japan would complete the line. There is no information that this was done, however. The Japanese have an alternate road, south of the Siang River, which connects Indo-China to Wuchow on the Si River and with Canton.

It is believed that Japanese supplies are obtained locally as to food, clothing, and some other articles. Ammunition, weapons, and replacements are sent by submarine barges to Jap-held ports south of Hong Kong.

The Japanese abandoned Foochow (or Minhow) on 18 May, the garrison marching north along the coast road. As it passed through Siapu and Wenchow (or Yungkia) those places were evacuated respectively on 4 and 18 June. At date of closing this report the combined garrisons were en route to Hangchow. Average rate of withdrawal has been about 5 miles a day.

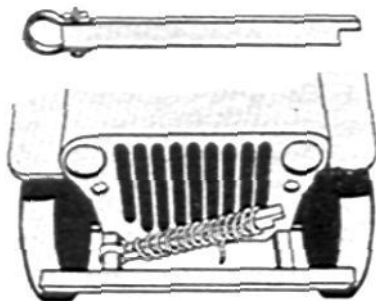
The three ports given up were established by Japan as air bases to cover sea traffic through Formosa Strait. Sea traffic has about disappeared as the result of the American air and sea blockade—there is no more traffic to protect. The troops withdrawn are temporarily being added to the Shanghai defenses.

Now the central and north parts of Fukien and the south and central section of Chekiang are open to Allied invasion. It is not a particularly attractive area. The ports are shallow and unsuitable for ocean-going ships, although they can be used by coastal vessels and landing ships. Roads into the interior are limited to one from each port; two are narrow and with steep grades over 4,000-foot mountains back of Foochow and Siapu. The nearest Kuomintang supporting troops are about 1,000 miles to the west.

On 5 June a Japanese withdrawal was reported south and southwest of Canton. This appears to be a readjustment of lines and does not involve important areas.

COMMENTS

Japan is readjusting its position in China. It is yielding minor areas and strengthening others. According to Japanese broadcasts China is giving material support to Japan. How, was not explained. Best information is that south of the Yangtze River Japan is receiving next to no support. On the other hand, the south contains the vast areas where the war is nominal and where there is no active opposition to the Japanese. North of the Yangtze River, and more particularly north of the Yellow River, there seems to be some Japanese support. Chinese troops of unknown reliability are serving under Japan, and raw materials and manufactured products from that area are being furnished the Japanese army.



AN "ARMY MOTORS" TIP

Here's a neat way to carry a tow rope on a jeep. The way it's usually carried around the front bumper, it's bound to take a lot of punishment when you're pushing other vehicles and whatnot. Besides, it's awkward to wind and unwind around the bumper.

Just take a piece of scrap 2×4, a piece of tin 2" wide, and a bolt about 5" long with a wingnut. Cut out a bottom corner of the 2×4 enough to have the top corner lie on the frame between the radiator and the bumper, put your piece of tin around the opposite frame member, and attach it to the 2×4 with the bolt and wingnut.

It's Col. H. J. Crigger's idea, by the way.

PFC. FRANK DEMAR

Utilizing Tank Destroyers as Artillery

By Maj. Ernest C. Hatfield, Cav.

It was with full realization of the advantages and disadvantages of the tank, the most potent single weapon of World War II, that such units as Tank Destroyers were created and trained.

Original field manuals of the tank destroyers did not include as a secondary mission that of reinforcing artillery. The tank destroyer was created to destroy tanks and was conceived to be a direct fire weapon only, due to its high velocity and flat trajectory. Field Manual 18-5, dated 16 June 1942, paragraph 11, stated: "When tank destroyer units can be spared from this primary mission, they may be employed on secondary missions, such as beach defense, action against parachute and airborne troops, and the reduction of bunkers, pillboxes, and other weapon emplacements." Although the secondary mission of indirect fire was not included in the manual, this role was anticipated by many of the officers who possessed an artillery background. These officers realized that although tank destroyers were primarily designed for the exacting job of destroying tanks, they would at some time be called upon to use the fire power and characteristics inherent in their design for other purposes.

Modern axioms of warfare indicate that the commander who achieves the greatest superiority over the enemy at the decisive point will win the victory. In keeping with this concept, all weapons available to him should be capable of adding their weight to the power of his army when called upon. Therefore, all weapons able to fire should not be so specialized as to make them incapable of action except in certain narrow channels or under certain conditions. During the African campaign there arose a critical need for more weapons to increase the volume of fire on the enemy at long ranges. Commanders carefully scrutinized equipment available to them and realized the volume of fire that the newly equipped tank destroyer battalion could deliver. This unit, having nine firing platoons, was comparable in weapons to a regiment of field artillery and was available for use as field artillery when not engaged in its primary mission of destroying enemy tanks. Therefore, the tank destroyers were used in the role of reinforcing artillery.

Although initially crude, due to lack of precision instruments, the fire was effective and the tank destroyers accomplished many successful missions for the artillery. They were used to interdict roads, fire on enemy batteries, and knock out OPs at long ranges where organic artillery could not reach. Their fire became more and more effective with experience, and the mission of supplementing or supporting the fire of the artillery was accepted as a secondary role for tank destroyers.

As soon as this secondary role was confirmed as an effective mission, through combat experience, doctrine was



Mounting a 76-mm gun and a .50-cal. machine gun, the M18 tank destroyer has a road speed of 55 mph. Its turret has 360° traverse, both hand- and power-operated.

developed and training literature revised. All tank destroyer units not in combat were given additional training in preparation for this mission.

The revised tank destroyer Field Manual 18-5, dated 18 July 1944, paragraph 6, states: "Suitable secondary missions are: *a.* Direct or indirect fire to reinforce or supplement that of artillery units. *b.* Destruction of pillboxes and permanent defensive works. *c.* Support of landing operations. *d.* Defense of beaches against waterborne attack. *e.* Roving gun and roving battery mission."

In analyzing the excerpts from the two field manuals it is obvious that the original conception of the use of tank destroyers was somewhat different than is the present. This has come about through combat experience, as are all changes in doctrine during the war.

In combat the artillery continued to give instruction and used the tank destroyers as supplementary or supporting weapons. After the German defeat in Africa, units were re-equipped and trained for future battles to come. It was during this period that these units perfected the tank destroyer-artillery team whereby tank destroyers could supplement the organic and attached artillery of the divisions with their long range fire.

In the assignment of fire missions it was desirable to use the tank destroyers for long range targets because (1) due to the flat trajectory of the tank destroyer guns, there was always the danger of hitting trees and other objects short of the target and endangering our own troops; (2) the difference in range for a slight change in quadrant elevation is much greater with the tank destroyer gun than with lower velocity weapons; (3) its dispersion is much less than that of the 105-mm at long ranges; (4) the 3" HE shell makes a small crater that can easily be traversed by vehicles; (5) the high velocity of the shell allows surprise on a target, as it will burst on the target before it can be heard.

The following missions for tank destroyer units employed as reinforcing artillery were developed:

- a.* Reinforcing the fires of field artillery battalions.
- b.* Deepening and extending the zones of fire of the field artillery.
- c.* Targets of opportunity.
- d.* Counterbattery—to a limited extent.

- e. Harassing missions.
- f. Interdiction missions.

All tank destroyer units in the States were undergoing accelerated training in the field artillery role and were required to take a test to determine their qualification in this role prior to movement overseas.

Tank destroyer battalions are attached to the division, which attaches to the field artillery either the battalion or companies, depending upon the tank threat in that particular area. It has been normal in the infantry division to attach a company of tank destroyers to a light field artillery battalion. Missions may be called for and directed by the forward observers of the artillery battalion or by observation posts manned by tank destroyer personnel.

The field artillery provides the target area survey. The tank destroyer unit executes the position area survey, to include establishment of place marks near its fire unit and an orienting line by short aiming circle traverse from convenient control established by field artillery. Position areas are coordinated by the reinforced artillery unit. The tank destroyer unit establishes a fire direction center, and the artillery executes fire direction by designating targets and prescribing time of firing and number rounds to be fired. The artillery may be called upon, however, to perform such position area survey as the battalion either is not qualified to make or does not have time to perform.

Normally the communication system between the TD and FA consists usually of a wire line laid by the FA to the TD company and a party line laid by the TD company to each of its platoons. Radio communication is not considered as a normal means of intercommunication between TD-FA.

When the tank destroyer battalion is inexperienced and its ability to deliver accurate fire is questionable, each tank destroyer company is usually paired up with a field artillery battalion. The tank destroyer company maintains a FDC near its platoon positions and has wire communications to the field artillery battalion to receive missions and to enable the field artillery to make use of any tank destroyer observer who might be connected by either radio or wire to the company. As the division artillery commander recognizes an increase in efficiency of the battalion, through experience, he deals directly with the S-3 of the tank destroyer battalion headquarters, who in turn deals direct with the FDCs of the companies. Personnel operating the FDCs consists of the reconnaissance sergeants, corporals, and trained personnel from the security sections who act as instrument operators to lay the guns. The companies are tied in directly by telephone to the battalion to which they are attached and work directly under it for fire missions.

Tank destroyer units have had considerable difficulty in registering for indirect fire missions due to the small burst of the HE shell. This situation has been relieved through registration by platoon (1 round) and the use of smoke shells. The 630th TD Bn had very little difficulty in securing good registrations which were made by platoon (1 round).

Air observers have been used to adjust the fire of tank destroyers very effectively. The 776th TD Bn had an officer

who did full-time duty as an observer at the divisional air strip and, by placing the battalion channel crystal on one of the channels of the SCR-610 radio set of divisional artillery planes, the same observation facilities of the field artillery battalion were secured for the tank destroyer battalion. The battalion Air OP Officer took care of the duties of a divisional artillery observer, and flew his share of the daily air patrol, but he was also a tank destroyer officer flying over the assigned sector of his battalion. He had constant daily contact with the pilots and observers of the division and was in the best position to insure that the aerial observation and reconnaissance requirements of the tank destroyer battalion were immediately brought to the attention of the planes about to take off and already in the air. From his place in the operations room he could sift out and evaluate information from the patrol reports and radio traffic and phone it in immediately to his battalion. Before he flew he contacted his battalion and talked to the S-2 and S-3 to find out if they had any special instructions for him.

Tank destroyer companies have been organized in both six-gun and normal four-gun batteries. The companies of the 776th TD Bn were organized into two 6-gun batteries, and on one occasion it was necessary to revert to primary mission on very short notice. This was accomplished in a minimum of time.

Under special conditions tank destroyer units can be utilized in forward positions as roving batteries, thereby gaining range and obviating the probability of being neutralized by enemy firing.

In defensive positions the 803d TD Bn has employed a roving gun against the enemy. The gun was moved into position at night, with a small amount of artillery fire in the sector to hide the noise. It is necessary to stray from normal tactics in this type of employment, therefore the rewards must be great. After finding a target and destroying it, the gun was immediately pulled out and sent to another part of the sector the next night.

An example of the accuracy of the 3" gun was evidenced on the night of 14 January 1945 when "C" Company, 808th TD Bn, in the role of reinforcing artillery was called upon to deliver emergency fires on a troop concentration. The target was over 800 mils outside of transfer limits, requiring a shift of 1612 mils, and over 12,000 yards in range. A *K* of +78 yards per 1,000 was used. A check round fired at the target in the morning showed that the deflection was correct, range 100 short.

Tank destroyer guns of the 6th TD Group in indirect fire positions supported the assault crossing of the Roer River and establishment of the bridgehead. Targets selected were those suitable for harassing and interdiction fires, such as towns, roads, and road junctions. All fires were scheduled and coordinated by the reinforced field artillery. In this operation the tank destroyers also fired illuminating shells according to a scheduled fire plan for the purpose of illuminating and directing the movement of the assaulting infantry.

During a 24-hour period 21-22 March 1945, Company "A" of the 630th TD Bn fired 17 harassing missions, 1

registration mission, and 1 continuous harassing mission on a Rhine River bridge, a total of 4,180 rounds of HE being expended. A total of 2,830 rounds were placed on the Maximil Sau bridge over the Rhine River during the period in one continuous harassing mission. Air reconnaissance later reported the bridge was out, and the 13th FA Brig credited the company with destruction of the bridge. During this same 24-hour period Company "B" fired 1,569 rounds and Company "C" 450 rounds, for a battalion total of 6,199 rounds of HE. During an eight-day period the following missions were fired: 14 registration, 37 counterbattery, 160 harassing, 5 interdiction, 18 preparation, 6 enemy strong

points. Total expenditures were 9,220 rounds of HE. Supply of ammunition presented a considerable problem, so the ammunition trucks were running continuously. The supported artillery battalion aided in transporting the ammunition by using some of its trucks.

The comparative cheapness of 3" ammunition in tonnage and transport, and the fact that tank destroyers are highly effective in performing harassing and interdiction missions, were the reasons which caused a marked increase in their use as reinforcing artillery in Europe. As their experience and training have increased, so has their effectiveness in their performance in the role of reinforcing artillery.

Tank Destroyers in the Roer River Crossing

By Col. Paul B. Bell, FA

The Roer River Crossing Operation in Western Germany, by the XIX Corps, beginning on 23 February 1945, was a major military operation. It provided an excellent example of the complete utilization of all available fire support in the corps, in which the tank destroyers played a prominent part.

Assault crossings were made on a two-division front, with the 29th and 30th Infantry Divisions each attacking with two regiments abreast. To support the bridging operation, comprehensive and coordinated fire plans were made by both divisions and by Corps Artillery in which the fires of tank destroyer units in the corps were fully exploited. In addition to their primary mission of destroying enemy armor, tank destroyers were used on other direct and on indirect fire missions.

Indirect fires of tank destroyer battalions attached to the divisions were incorporated in the Division Artillery Fire Plans, with the indirect phase ending as the tactical situation developed and the battalions were required to assume their primary missions. Two tank destroyer battalions in Corps (the 702nd Tank Destroyer Battalion (90-mm SP) and the 801st Tank Destroyer Battalion (3" towed)) were attached to the 2nd Tank Destroyer Group for the crossing operation. The assigned mission was three-fold: to provide direct fire support to assault infantry; to neutralize suspected enemy positions by indirect fire; and to harass and interdict main routes of approach to the scene of the assault by long range indirect fire. The primary principle followed in siting of all tank destroyer guns was to be able to deny the use of flank approaches to the bridgehead by hostile armor, expressly ordered by the corps commander. His knowledge of a similar operation on the Volturno River in Italy, in which two battalions of Rangers were wiped out by enemy armored attacks from the flanks of the bridgehead, led to ordering these preventive measures to insure that a like occurrence would not arise in this operation.

Initially, six platoons (24 guns) of the 90-mm SPs were emplaced in direct fire positions on the west bank of the Roer River, so sited as to permit the delivery of fire upon targets and areas which were deemed most likely to require neutralization. Tank destroyer FOs with the leading infantry elements were in

radio communication with the guns, and afforded a rapid means of placing fire upon desired targets. These FOs remained with the assault infantry commanders in order to make recommendations and advise the commanders on the direct fire possibilities of the tank destroyers. When the infantry advanced to such an extent that direct fire was no longer feasible, the tank destroyers were moved to indirect fire positions. These positions had been previously prepared and surveyed, so no delay was encountered in the change of mission.

Fires of the tank destroyer battalions were utilized to the utmost to thicken and deepen the fires of Corps Artillery. Initially, the remaining three platoons of the 90-mm SPs were sited to deliver long range enfiladed interdiction fire upon each of three highways, firing at the rate of 100 rounds per platoon per hour, from H—45 to H+210, for the purpose of cutting and prohibiting the repair of wire communication and preventing enemy traffic from reaching the scene of the assault crossing.

The 3-inch towed guns maintained neutralization fire upon the Staatsforst, a woods east of the Roer River opposite the 30th Division sector, with one company (12 guns) firing 300 rounds per hour from H—45 to H+210. Two companies maintained neutralization fires upon a system of trenches opposite the 29th Infantry Division, on high ground east of the river. The rate of fire was 300 rounds per hour for each company for one hour, beginning at H—45. At H+15 the fire was lifted to three towns three to four thousand yards farther east, maintaining the same rate of fire.

At the end of the scheduled fires, both the 90-mm and the 3-inch guns were prepared to fire missions upon call from Corps Artillery Fire Direction Center. Control was accomplished by establishing a Tank Destroyer Fire Direction Center at the Corps Artillery FDC with direct wire communication to each Battalion Fire Direction Center through the Corps Artillery switchboard. During the ensuing four days call missions were handled in this manner, without undue difficulty or delay. Missions were interdictionary, harassing, and neutralizing. Because of the abundance of artillery tank destroyers were not called upon for TOTs,

although fully prepared to do the job. The Fire Direction Center was concerned only with fire control and those points directly connected with fire control. All decisions pertaining to reconnaissance, number of guns, siting, amounts of ammunition to be used, and movements were made and coordinated by the Group Commander.

It is felt that the use of tank destroyer guns for indirect fire on this operation was highly successful. Results were gratifying to all concerned. The establishment of a Tank Destroyer Fire Direction Center at Corps Artillery Fire Direction Center greatly facilitated the accomplishment of the tank destroyer missions and made it possible for the Artillery FDC to be completely and constantly informed on the tank destroyer fire capabilities, ammunition status, and other relevant matters. This eliminated any delay or confusion, and left nothing to be desired in the way of coordination. The Tank Destroyer Fire Direction Center was operated in the same manner as an Artillery Group Fire Direction Center; artillery procedure for fire control was followed throughout the period of operation. Comment by the Corps Artillery Deputy Commander indicated complete satisfaction with the set-up, and at no time was there anything but full cooperation between artillery and tank destroyers.

Personnel of the TD FDC consisted of one officer and three enlisted men, which was sufficient for this operation. It is felt, however, that for a period of more than five days an additional officer and enlisted man would be desirable, so that personnel could obtain necessary rest. A competent officer must be on the job at all times, to prevent any delay on matters demanding immediate attention.

All requests for tank destroyer fire missions must go through the Tank Destroyer Fire Direction Center in order that control is exercised at all times. This procedure should be made clear to any unit likely to request fires, and must be strictly followed. Proper coordination is speedily effected at Artillery Fire Direction Center and unnecessary or duplicated firing is avoided.

The communications in this operation proved to be adequate. Fire missions were called through two switchboards, however, which should be avoided, if at all possible, to provide for quicker transmission. The Tank Destroyer Fire Direction Officer should be able to call the Battalion Fire Direction Officer directly. This is a "must" if TOTs or other urgent missions are to be fired.

Employment of the tank destroyer guns in this manner on similar operations is highly recommended. The high rate of fire maintained on enemy-occupied positions by the 3-inch guns was, beyond doubt, a great deterrent to enemy fire from these positions, and their value on harassing and interdicting missions is too well known to require comment. The 90-mm guns were used mainly for long range missions. Because they can be sited well forward, their fire can be placed on targets beyond the range of most of the Corps Artillery. It should not

be assumed, however, that their value is limited to long range missions only. As an illustration, three 90-mm platoons were called upon to place interdiction fire upon roads leading to a junction at Stein-strass, approximately 11,000 yards distant. The mission was to deny its use to enemy traffic which was observed moving in that direction from the woods to the south. Interdiction for a distance of 2,000 yards north, south, and west of the junction was maintained at the rate of 300 rounds per hour. PWs from a horse-drawn 150-mm artillery battery, captured intact by the 30th Infantry Division, stated that they were unable to evacuate their materiel because of the terrific interdiction fire.

The versatility of the tank destroyer gun, especially the SPs, on both indirect and direct missions, has been amply proved in the past. A maximum degree of effect is obtained with tank destroyer ammunition, and the great saving in shipping weight and space (over heavier calibers) is evident. With the matter of communications and coordination having been adequately handled in a comparatively simple manner, it is felt that use of tank destroyer battalions in this way was a valuable addition to the corps' fire-power. With the benefits of past experience, tank destroyers under centralized control should anticipate no undue difficulties in future employment in this type role.

The planning phase for the crossing was long enough to allow for thorough attention to all aspects. Several days were devoted to reconnaissance of routes and positions, map and terrain studies, coordination with adjacent units, and pertinent administrative matters. The corps sector was entirely familiar to all concerned, as all units had occupied the area for sometime—a fact which greatly simplified the planning problems. Thorough orientation of personnel aided in reducing the problem of coordination to a minimum. This was especially true of the tank destroyer FOs and the assault infantry COs. It is necessary that sufficient contacts and meetings occur between these officers so that each thoroughly understands the other's capabilities and needs. Constant liaison between supported and supporting units maintained a high degree of cooperation; this is attested to by the smoothness which characterized the crossing operation from the start.

The variety of employment presented no new problems to the veteran tank destroyer battalions in XIX Corps. Their roles since the beachhead days have included almost every type of combat use. For this reason, they are entirely capable of carrying out assigned missions. However, placing two battalions under 2nd Tank Destroyer Group Control with the dual mission of bringing all available fire to bear on the enemy and of constituting a mobile Corps Reserve for such an operation, is believed to be a new use of Tank Destroyer Group. The facts that the tactical capabilities of the Group were used to present a powerful striking force against the enemy, and that all missions were successfully accomplished, are evidence of the usefulness of Tank Destroyer Groups.

Sighting and Fire Control equipment may be defective without personnel of the operating unit being aware of it. Therefore, the sighting and fire control equipment for each artillery weapon should be checked regularly and thoroughly.



Tips FROM A BATTERY EXECUTIVE

By Lt. R. W. Grimm, FA

Overseas the sector you cover is usually always larger than anything you had in the States. Most of the normal zone and contingent zones require you to fire in a sector of at least 1600 mils. To accomplish this we have a little system that seems to work very well.

On every deliberate occupation I take a small crew forward, leaving enough men to man the pieces. We also take a small wooden platform for each section (made of 2 × 4s and roughly 6' × 8'—can be made in two sections 4' × 6'). After the gun pit is dug the platform is laid in it where the wheels will be when the piece is in the appropriate direction of fire. (When it is muddy, as it is so often so many places, after all the mud is out of the pit the area where the platform is going to be should be filled with crushed rock, if possible.)

When the pieces arrive they are manhandled onto the platforms, or winched on if necessary (90% of the time we have had to winch them on in the last two months). Next (assuming we have a 1600^{mils} sector to cover) the guns are laid in the center of the 800^{mils} sector to the left. Here the trail logs are dug in. They are short (to extend not more than 6" on either side of the spade), about 8" or 10" in diameter, reinforced by crushed rock if the ground is soft and muddy, and securely anchored by stakes. Then the guns are given a shift of right 800. The trails are shifted and again trail logs are dug in in the same manner.

Thus with only four small holes with trail logs in them you can cover your whole sector. For anything in the right half of the sector the cannoneers immediately move the trails to the prepared holes. The platform lets the piece be shifted easily without digging the wheels down into the mud. We have had steady rain for a week at a time so that a 6×6 2½-ton prime mover would sink down to the hubs, but five men have been able to man the piece and shift 600^{mils} or more either way (one on the telephone, one on each trail, gunner on the brake, and other man on the tube). Of course the water in the trail holes must be bailed out daily, and a drain made for the pit.

One reason for the four small trail logs instead of the old semi-circular affair is that the logs are seated against the spades evenly and squarely. Thus the pressure on the spade is the same all over when the piece is fired. When your spades do not seat evenly on the trail logs, pressure is exerted on one side and the small reinforcing iron that extends from the trails to the spades bend in, first on one side and then on the other, and finally your spade begins to bend back.

This can be avoided several ways. First, by seeing that the spades seat squarely on the logs. Second, by cutting a large block of wood the size of the opening between the two reinforcements under the trail, you can force it in the opening and thus help to strengthen the reinforcements and keep them from bending in. Third, if you have time and ordnance is handy have them reinforce your trail by welding some angle iron on the outside of the trail. (Be sure to put it on the outside because you can't close the trails if you put it on the inside. We have fired nothing but Charge 7 for two months so we finally had ordnance reinforce all our trails.)

We have lines (W-110) to our aiming stake lights. All we have to do is complete the circuit right in the gun pit and the lights go on. This saves a lot of trouble when firing at night. We use either old radio batteries or flashlight batteries for power. It is a simple setup that any good wire man can fix in a day's time. No doubt something similar is being used by many other outfits.

When we go into position we report our battery front and depth and the distance between pieces not only for our normal zone but also for our contingent zones. For instance, a normal front of 130 yds. might only be 95 yds. in the contingent zone to the right, and Nos. 3 and 4 might be farther away in depth. Whenever we fire in either contingent zone the Exec already knows the depth and adds 1, ½, or ¼ *c* on to the site of that particular piece in his sequence of commands. This lets us shoot much closer to our own infantry and relieves the computer at FDC of this responsibility.

Some military experts claim that the army with the most artillery wins. In order to have the most artillery, the army must preach and put into practice preventive maintenance of its equipment.



F. A. S. EVENTS

DEPARTMENT OF COMBINED ARMS NOTES

Since VE-day, instruction in the Department of Combined Arms on German doctrines and tactical employment has been deleted. Additional instruction on Japanese doctrines, racial characteristics, and tactical employment has been incorporated in the Officers' Refresher Course, Special Officers' Basic Course, and the Officer Candidate Course.

With all emphasis now on the Pacific Theater, the eight-hour period *Planning an Amphibious Operation* becomes the highlight of the Officers' Refresher Course. This is divided into five phases which are presented as follows: two hours for the planning by division staff phase, one hour for the combat team phase, two hours where each student works out an LST loading plan using templates, and a final two-hour phase on a special terrain board where students are shown a battalion combat team in action. Boat and ship models made to scale present a graphic picture of this last phase.

Method of presentation for the most part is the demonstration wherein Lt. Col. Alfred Kramer, amphibious specialist for the Department of Combined Arms, acts as Chief of Staff and is assisted by the following instructors: Maj. O. J. Hall, Inf., Maj. W. B. Lee, Maj. R. S. Reaves, Maj. C. A. Reinhard, Maj. S. M. Brown, Maj. H. T. Ford, Capt. C. W. Cleverdon, and Capt. G. A. Smith.

Officers who have fought and defeated the Jap in combat are presently assigned to the OCS—OSBC—Combined Arms Staff. Conferences written by these veterans of oriental combat, included in the Course of Instruction for Officer Candidate and Officers' Special Basic students, are a one-hour conference on *The Psychology and Background of the Jap Soldier*, a one-hour lecture on *Weapons of the Nip*, a one-hour conference and sand table period on *Jap Small Unit Tactics*, and a four-hour period on *Security of the Battery Position*, emphasizing the importance and necessary precautions to be taken by our small units presented by a conference and sand table discussion, and concluding with a two-hour demonstration.

DEPARTMENT OF GUNNERY NOTES

The Department of Gunnery has adopted a new policy in the training of officer candidates and is now operating under a completely revamped schedule. Instead of attempting to graduate officers proficient in all phases of gunnery, the department is now placing emphasis on the training of battery executives, forward observers, and reconnaissance officers. Much of the fire direction and survey training has been

deleted. Instruction in firing battery and duties of the executive has been increased considerably. More time is devoted to service practice, with the guns manned by students. It is felt that as a result of the new schedule, the graduate will be better able to perform the duties to which he will probably be assigned.

The Naval Air Spotter Course has been made a regular two-week course and placed under the Department of Gunnery. It was formerly a special course, conducted by the Office of the Assistant Commandant. Students are Navy aviators, receiving instruction in adjustment of naval gunfire on terrestrial targets, map and aerial photo reading, and organization, equipment, and operation of ground forces. Departments of Gunnery, Combined Arms, and Air Training conduct the instruction for the course.

DEPARTMENT OF AIR TRAINING NOTES

Ten teams, each consisting of one officer and two enlisted men, are now in training on the Brodie airplane landing and launching device. Training started 11 June.

Lt. James H. Lefler, flight instructor, was placed on temporary duty for 30 days with the Army Air Forces at Muskogee, Okla., to give instruction to AAF pilots on the L-5 pontoon-equipped airplane.

DEPARTMENT OF MATERIEL NOTES

A new M40 155-mm gun M1, the latest thing in self-propelled artillery, has recently been delivered to the Department of Materiel at the Field Artillery School. One of the many interesting features of this weapon is the interchangeability of the 155-mm M1 gun tube with that of the 8-inch howitzer, M1.

Another new weapon recently received by the Department of Materiel is a 155-mm mortar.

Acquisition of these weapons will enable students to observe and familiarize themselves with each weapon during the course of instruction.

Instruction notes are being prepared for Officers' Basic Course #126. This course is given each year for United States Military Academy graduates.

* * *

The 519th Field Artillery Battalion, a unit of School Troops, FAS, has been converted to the 519th Rocket Field Artillery Battalion. The conversion became effective June 20th. Commanding officer of the 519th is Lt. Col. L. P. Lang.

The annex of the Field Artillery School museum will be moved to Building 154, one of the stone buildings of the Old Post. Most of the exhibits in the museum annex will be materiel of World War II. Most of the items to be placed on exhibit were received here from the War Department for intelligence purposes, but several items were presented by members and former members of the Staff and Faculty of the School who have served overseas.

One of the new additions to the museum exhibits is a German pillbox periscope. The periscope will be installed in the main museum building so visitors may observe the West Range. Lt. Col. Ralph R. Bush is museum officer.

* * *

Maj. Gen. Harry F. Hazlett, Commanding General of the Replacement and School Command, visited the Field Artillery School and Replacement Training Center June 13th and 14th, to inspect training.

* * *

Troops of the 467th Parachute Field Artillery Battalion, commanded by Maj. William P. Francisco, gave a demonstration of the tactics of Paratroop Artillery June 6. Members of "A" Battery of the 467th took part in the first jump landing in the Grierson Hill area, where troops and students of the Field Artillery School and Replacement Training Center were assembled to witness the event.

Twelve C-47 airplanes were used for the battery jump. The planes were based at Tinker Field at Oklahoma City, where they were loaded. The battery jump, which included the setting up and firing of the howitzers, was followed by jumps by maintenance personnel from Field Artillery liaison planes.

Commentary on the demonstration was given by Lt. Col. Robert E. Huneycutt, Field Artillery officer at the Airborne Center, Camp Mackall, N. C., where the 467th is stationed. Commanding officer of "A" Battery of the 467th is Capt. Frank B. Rockwood.

* * *

PERSONNEL CHANGES, MAY 18-JUNE 15

Arrivals

<i>Name</i>	<i>New Duty</i>
Lt. Col. Clinton L. Adams	Department of Combined Arms
Lt. Col. Edw. C. Greene, Jr.	Department of Combined Arms
Lt. Col. Walter A. Schultz	Department of Combined Arms
Maj. Archie L. Cochran	Department of Combined Arms
Maj. Lee J. Duvall	Department of Combined Arms
Maj. Erwin C. Frederickson	Department of Gunnery
Maj. William D. Mullins, Jr.	Department of Observation
Maj. Larue D. Myers	Department of Materiel
Maj. Robert G. Ragsdale	Department of Materiel
Capt. Bob F. Adams	Department of Gunnery
Capt. Raymond H. Bidwell	Department of Communication
Capt. Charles B. Foster, Jr.	Department of Combined Arms
Capt. Frank H. Hurst	Department of Combined Arms
Capt. Wm. H. Maxwell, Sr.	Department of Materiel
Capt. Joseph F. Murphy	Department of Observation
Capt. Robert J. Parent	Department of Observation
1st Lt. Austin J. Brummitt	Department of Motors
1st Lt. Peter J. Komen, Jr.	Department of Observation
1st Lt. Harry J. Muir, Jr.	S-1 Section
2nd Lt. Donald E. Brinkerhoff	Department of Observation
2nd Lt. Richard H. Davis	Department of Observation

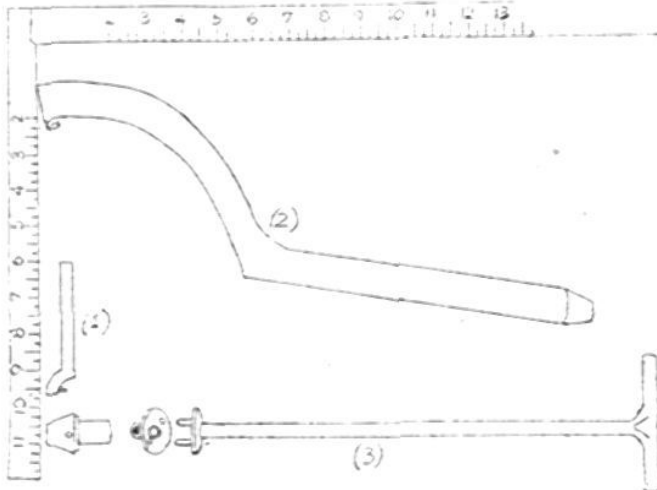
Departures

<i>Name</i>	<i>New Duty</i>
Maj. Orville J. Hall	IRTC, ORP, Camp Howze, Tex.
Capt. David R. Hagen	TC, ORP, New Orleans, La.
Capt. Neil C. Jackson	TC, ORP, New Orleans, La.
Capt. Arthur O. Johnson	TC, ORP, New Orleans, La.
Capt. Ira V. LeMaster	TC, ORP, Newport News, Va.
Capt. William D. McLean	TC, ORP, New Orleans, La.
Capt. Robert E. Peters	IRTC, Camp Croft, S. C.
Capt. Charles L. Pittman	TC, ORP, New Orleans, La.
Capt. William O. Rockwood	Alexandria, Va.
1st Lt. Karl E. Akin	AGF Repl. Depot #2, Ft. Ord
1st Lt. Melvin L. Allen	TC, ORP, Brooklyn, N. Y.
1st Lt. William H. Anderson	Hq 3d SvC, Baltimore, Md.
1st Lt. Haven Andrist	School of Military Government
1st Lt. Ralph O. Bush	AGF Repl. Depot #2, Ft. Ord
1st Lt. Carol O. Davis	TC, ORP, Brooklyn, N. Y.
1st Lt. Frederick H. Davis	TC, ORP, Brooklyn, N. Y.
1st Lt. John M. Davis	AGF Repl. Depot #2, Ft. Ord
1st Lt. John A. Eastwood	AGF Repl. Depot #2, Ft. Ord
1st Lt. Patt E. Eddings, Jr.	AGF Repl. Depot #2, Ft. Ord
1st Lt. Herman S. Greitzer	AGF Repl. Depot #2, Ft. Ord
1st Lt. Dale E. Hassinger	AGF Repl. Depot #2, Ft. Ord
1st Lt. Paul Haupt	AGF Repl. Depot #2, Ft. Ord
1st Lt. Donald L. Henry	AGF Repl. Depot #2, Ft. Ord
1st Lt. F. M. Lippincott	AGF Repl. Depot #2, Ft. Ord
1st Lt. Keith E. Lorentzen	AGF Repl. Depot #2, Ft. Ord
1st Lt. Thomas B. Maier	AGF Repl. Depot #2, Ft. Ord
1st Lt. Melvin N. Mattson	AGF Repl. Depot #2, Ft. Ord
1st Lt. Jack R. Mayer	AGF Repl. Depot #2, Ft. Ord
1st Lt. Alan C. McKittrick	AGF Repl. Depot #2, Ft. Ord
1st Lt. James W. Miller	AGF Repl. Depot #2, Ft. Ord
1st Lt. William E. Miner	AGF Repl. Depot #2, Ft. Ord
1st Lt. Robert L. Lowell	FAORP, Ft. Sill
1st Lt. Henry A. Olson	TC, ORP, Brooklyn, N. Y.
1st Lt. Guy J. Overman	AGF Repl. Depot #2, Ft. Ord
1st Lt. Guy W. Parker	AGF Repl. Depot #2, Ft. Ord
1st Lt. Billy D. Peyton	AGF Repl. Depot #2, Ft. Ord
1st Lt. Woodrow J. Sandler	AG, Washington, D. C.
1st Lt. Francis M. Sasse	AG, Washington, D. C.
1st Lt. Philip W. Schultz	AGF Repl. Depot #2, Ft. Ord
1st Lt. Arris H. Shulstad	AGF Repl. Depot #2, Ft. Ord
1st Lt. Samuel L. Smith	AGF Repl. Depot #2, Ft. Ord
1st Lt. Carl E. Watkins	AGF Repl. Depot #2, Ft. Ord
1st Lt. Jos. E. Weisheit, Jr.	467th Parachute FA Bn.
1st Lt. Albert O. Whittle	TC, ORP, Brooklyn, N. Y.
1st Lt. Kenneth F. Wilson	AGF Repl. Depot #2, Ft. Ord
1st Lt. Merritt M. Yancey	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Rayford F. Brown	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Donald P. M. Casey	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Paul H. Delaney, Sr.	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Louis A. Evans	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Antone Frade	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Page H. Gilman	AGF Repl. Depot #2, Ft. Ord
2nd Lt. W. C. Goodman, Jr.	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Edson W. Kitchen	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Grover G. Lee	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Joseph M. Loftis	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Arthur D. Lynn, Jr.	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Benjamin G. Miller	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Harold C. Morrison	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Benjamin F. Morrison	FA Pilot Training
2nd Lt. Harry D. Palmer	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Edward C. Payne	784th FA Bn.
2nd Lt. Mark W. Russell	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Hartwell T. Smith	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Gene E. Tipton	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Ludwig W. Weber	AGF Repl. Depot #2, Ft. Ord
2nd Lt. Thomas F. Weiss	AGF Repl. Depot #2, Ft. Ord

Not in the BOOK

FOR 8" GUN OUTFITS

No tools are issued for (1) removing and replacing the inert delay head or assembling the super-quick head in the nose of the windshield of 8" gun projectiles, (2) removing and replacing the windshield of these projectiles, and (3) assembling the inert delay-head to the retaining screw in the nose of the windshield. These operations have been performed by personnel of gun crews in any makeshift manner—



by using pliers, bronze drifts, hammers, screwdrivers, and even chisels. Such procedure is extremely dangerous.

The Heavy Artillery Augmentation Group has designed and improvised three tools to do these jobs. They have functioned so satisfactorily that the H.A.A.G. recommends that one set should be part of the equipment of each 8" gun. Numbers on accompanying sketch tie in with those in the preceding paragraph, indicating the use of each tool.

COL. WHITE C. JOHNSON, FA

ELEVATIONS BY M-2 COMPASS

In a recent operation in the Philippines we were faced with a difficult problem in vertical control. The only map available for this was a 1/50,000 map with 50-foot contour lines. The elevations of the target area, some three to four thousand yards from the battery positions, were shown as varying from 1,000 feet to 2,500 feet; these proved to be in error by as much as 600 feet.

Also available, fortunately, was a strip of vertical photographs which proved very accurate for horizontal distances. An observer equipped with the vertical photos and an M-2 compass would take off in the L-4 observation plane and, after identifying the target, would measure the range from it to another point identifiable on the ground. The pilot would then fly over that point to allow the observer to take an angle of site reading to the target using the M-2 compass. By using the mil relation formula and the altitude of the plane at the time the reading was taken, the observer was able to furnish the FDC with the elevation of the target.

This method gave excellent results in firing. Subsequent survey of some of the targets proved that the elevations determined from the air were within fifty feet of the correct ones.

CAPT. RAYMOND A. PLATTS, FA

SPADE-WORK WITH 155 HOWS

Reference "tips" on artillery trails in mud. I am a B. C. of a battery of the mediums of this division. Unluckily we were in on all the mud of France last fall, from Normandy to Alsace. We always had trouble

EDITOR'S NOTE: *This feature is devoted to ideas sent in by our readers describing methods or devices which, though not specified by official literature, have proved useful in service.*

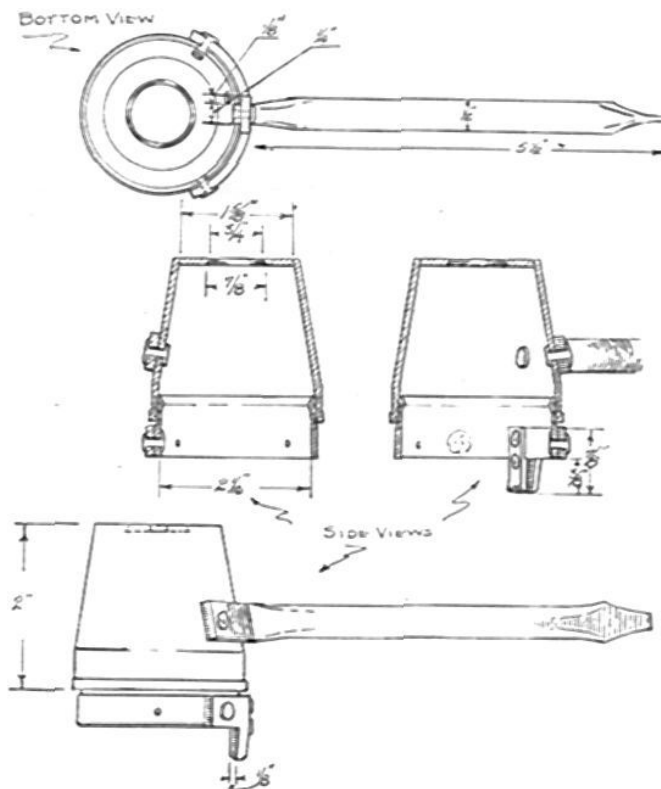
with the right spade driving under any trail logs we might devise. The left trail, however, seemed to hold very well since the lunette protrudes enough to hook over the trail log and prevent it from slipping under the trail log. We therefore tried welding two pieces of pig iron on the top flat surface of that right spade, and letting them protrude about 6" beyond the rear of the spade. This worked very well and we had no further trouble. The pieces of iron were 2" square and about 14" long. Electric welded, they have held to date.

Last winter we also had trouble when the ground was so hard it would not absorb any of the shock of the gun. This time it was with broken spades! We found that we had to cushion the spades with sand bags and matting of any kind. Sand bags were not the best solution, however, because they soon froze and became as hard as the ground around them. We finally had ordnance reinforce the spades with two half-inch steel plates welded one on each side of the present center plate and halfway between it and the outside of the trail. We have found also that in certain types of ground it helps to put the spades on backward.

CAPT. LEE E. CAGE, FA

SUBSTITUTE FUZE SETTER

One of my men, Pfc. Harold L. Martin of Btry B, 906th FA Bn, made this fuze setter for the M48 and M54 fuzes from pieces of scrap iron and parts of a 60-mm mortar star shell case. Our cannoners like this wrench because it does not slip off the fuze very easily and the fuze can be set with the use of only one hand. The body of the fuze setter contacts the fuze in two places, which helps to prevent the setter from slipping off the



fuze. The end of the handle is also ground so that it can be used to set the M48, which makes this a double purpose wrench.

CAPT. C. L. KIRKMAN, FA

Diary of War Events

(As taken from the American Press—Edited by B. H. W.)

JUNE, 1945

- | | |
|--|--|
| <p>1st Heavy rains and mud slow Marine advances on Okinawa. General de Gaulle complies with the British demand and orders his troops to cease firing in Syria and Lebanon.</p> <p>2nd U.S. troops on Okinawa gain up to 1,000 yards. U.S. troops in the Philippines land at Luayon on southern Mindanao.</p> <p>3d U.S. troops continue to push forward on Okinawa. Carrier planes of the U.S. 3d Fleet bomb Kyushu. Chinese troops liberate the junction city of Tsinkong, 53 miles SW of Liuchow.</p> <p>4th U.S. amphibious troops on the west coast of Okinawa seize half of Naha airfield. 7th Inf. Div. advances 5,000 yards to capture Meka. B-29s bomb Kobe.</p> <p>5th American, British, Russian, and French Commanders assume full control of Germany. Japs retreat from 4 industrial towns in Hong Kong area. United Nations Conference admits Denmark.</p> <p>6th U.S. troops drive Japs to the last high ground at the southern end of Okinawa. U.S. forces complete the capture of Naha airfield and the Chinen Peninsula. U.S. 10th Corps troops land on Cape San Agustin and Balut Island at both sides of the south of Davao Gulf.</p> <p>7th Tanks and planes help the U.S. 10th Army overcome bitter Jap resistance on Okinawa and push to the west coast above Itoman.</p> <p>8th 150 B-29s bomb production centers in Nagoya, Osaka, and Kobe. U.S. gunners shoot down 67 Jap suicide planes attacking U.S. ships off Okinawa. U.S. troops capture Bayombong on Luzon.</p> <p>9th Fierce Jap resistance slows our advances on Okinawa. Carrier planes from the U.S. 3d Fleet bomb Kanoya air base on southern Kyushu. Destroy 28 planes on the ground.</p> <p>10th American troops on Okinawa make slight advances. Australia's 9th Div. land on 4 points in the Brunei Bay area of Borneo, capture Victoria and the airfield.</p> <p>11th Japs sink U. S. destroyer, <i>Longshaw</i>, stranded on a reef off Naha.</p> <p>12th U.S. 1st Marine Div. on Okinawa occupies position on Kunishi Ridge.</p> <p>13th Stiff fighting continues on Okinawa. Australian troops advance on Borneo virtually unopposed. Chinese troops recapture Juian.</p> <p>14th 96th Div. captures Yaeju-Dake Hill, the highest point on Southern Okinawa. 520 B-29s bomb Osaka. Australian troops capture Brunei in Northwest Borneo. U.S. 3d, 7th, and 15th Armies to remain in Germany occupation zone. 9th to return home.</p> <p>15th British troops capture Hitler's Foreign Minister, Joachim von Ribbentrop.</p> | <p>U.S. troops on Luzon seize the valley towns of Santiago and Echangué and advance 22 miles. Australian troops off northwest Borneo capture Timbalai airfield on Labuan Island.</p> <p>16th Tank-led U.S. troops seize the last 3 Jap-held hills on Okinawa. U.S. troops push 5 miles through the Cagayan Valley of northeastern Luzon.</p> <p>17th U.S. troops advance 13 miles down the Cagayan valley on Luzon.</p> <p>18th Japs' artillery kills Lt. Gen. Simon Bolivar Buckner, Jr., Commanding General of the U.S. 10th Army on Okinawa. More than a million people welcome Gen. Eisenhower's arrival in Washington.</p> <p>19th U.S. troops in the Philippines cross the Cagayan River and meet strong resistance. 450 B-29s hit cities on Honshu and Kyushu.</p> <p>20th Brig. Gen. Claudius M. Easley, assistant commander of the 96th Inf. Div., killed on Okinawa.</p> <p>21st Fighting ends on Okinawa after 82 days. 90,401 Japs killed and 4,000 taken prisoner. We lose 6,990 killed and missing; 29,598 wounded. Gen. MacArthur appoints Gen. Stilwell to succeed the late Lt. Gen. Buckner in command of the 10th Army. Australians make unopposed landing 80 miles down the coast at Lutong. B-29s again bomb Honshu.</p> <p>22nd Jap planes sink 2 light naval units off Okinawa. U.S. troops and Filipino guerrillas capture Aparri, the gateway to the Cagayan valley on Luzon.</p> <p>23d U.S. fighter planes and shore guns shoot down 59 Jap planes attacking off Okinawa. Australian troops capture the Seria oil fields on Borneo. U.S. airpower continues to pound Jap industrial targets.</p> <p>24th U.S. and British planes bomb the entire Jap-occupied area from Burma to the Kuriles.</p> <p>25th B-29s bomb military targets in the Nagoya, Osaka, Akashi, and Gifu areas of Japan.</p> <p>26th United States Conference at San Francisco ends at 8:39 P.M. B-29s bomb the main Jap home island of Honshu.</p> <p>27th The conquest of Luzon ends after 5 months and 19 days. Navy announces that 2 Jap suicide planes crash on U.S. Carrier <i>Bunker Hill</i>, off Okinawa. 373 killed and 264 wounded. Edward R. Stettinius resigns as Secretary of State.</p> <p>28th B-29s bomb Jap naval base at Sasebo. Gen. Mark W. Clark is assigned Commander-in-Chief of U.S. occupation forces in Austria.</p> <p>29th U.S. patrols occupy Kume Island, 55 miles west of Okinawa and 345 miles from China. B-29s bomb Jap oil refinery at Kudamatsu. Australians in Borneo capture Beaufort, 62 miles northeast of Brunei.</p> <p>30th Chinese troops recapture Linchau airfield in southern China.</p> |
|--|--|

BOOK REVIEWS



SURRENDER ON DEMAND. By Varian Fry. 239 pp.; index. Random House. \$3.00.

In 1940 a group of Americans financed the establishment of an "underground railway" to smuggle from France anti-Nazis caught there when the country was over-run. Varian Fry was the active head of the working group. For 13 months he remained in France, opposing the Gestapo and Vichy police under their very noses. Not only black-listed individuals were saved, but British soldiers as well. Altogether, over a thousand refugees were shipped to safety across the seas.

This authentic epic of ingenuity and organization is as fast-moving as a good novel. It is well written, and adds another facet to help complete the story of this war.

BETIO BEACHHEAD. U. S. Marines' Own Story of the Battle of Tarawa. 160 pp.; photographs; endpaper map. G. P. Putnam's Sons. \$2.50.

Like Iwo Jima, Betio presented the problem of landing on a tiny island in the face of heavy fire and without room for maneuver when once ashore. Unlike Iwo, it was the first such operation. Men fought gallantly, died bravely.

Their own story is here told by four Marine combat correspondents who went through the battle. This invasion was important to the country, and to the Marine Corps itself. As one of his last acts as Commandant, General Holcomb arranged for participating personnel to prepare this account. It confirms the unsurpassed heroism shown there.

TANKS AND ARMORED VEHICLES. By Lt. Col. Robert J. Icks; edited by Phillip Andrews. 256 pp.; index; bibliography; illustrated. Duell, Sloan & Pearce. \$4.75.

In oversize format similar to that of *Navy Yearbook*, and full of rotogravure illustrations, *Tanks and Armored Vehicles* takes a look at the world's self-propelled weapons. Its subject is so constantly changing that of course it can not be right up to the minute. It does a good job, though, in covering the armored vehicles of the U. S., Great Britain, U.S.S.R., France, Italy, Germany, and Japan. Matters are discussed in general enough terms to be understandable to the layman, or the non-tanker in the military service. Experts will undoubtedly quibble about some of the phrasing—but they don't need a book of this type anyway, as they turn to technical manuals. In general a very good job has been done, though it is unfortunate that the index is not more exhaustive.

THE NETHERLANDS. Ed. by Bartholomew Landheer, 434 pp.; bibliography; index. University of California Press. \$5.00.

POLAND. Ed. by Bernadotte E. Schmitt. 463 pp.; bibliography; index. University of California Press. \$5.00.

To further an understanding among the United Nations, the University of California is sponsoring a series of books which exhaustively describe the land, the people, historical background, political growth and development, economic and social development, cultural aspects, colonies, foreign relations, etc. The several chapters are written by experts in the particular fields, usually by natives of the country being examined. This method assures the greatest of accuracy. A notable series is thus being developed, one which deserves general attention.

DOWN THE STRETCH: The Story of Col. Matt J. Winn. As told to Frank G. Menke. 299 pp.; illustrated. Smith & Durrell, Inc. \$3.50.

THE GASHOUSE GANG and a couple of other guys. By J. Roy Stockton. 283 pp.; illustrated. A. S. Barnes & Co. \$2.75.

ESQUIRE'S FIRST SPORTS READER. Edited and with an introduction by Herb Graffis. 292 pp. A. S. Barnes & Co. \$2.75.

At 82, Col. Matt Winn is still actively concerned with his first track, Churchill Downs. His life is a saga of American racing, from aristocrats to track hangers-on. His biography is a story of early America, of growing America, from Kentucky of the '70s through the New York and Far West of 50 years ago to the present time. Always, however, the emphasis is on the sport of kings.

There's only one "gashouse gang"—the St. Louis "Cards." This is their story, and that of their unique players—Martin, Medwick, the Deans, *et al.* Nuf sed.

38 headliner articles and stories make up the *Sports Reader*. Among them they cover about every sport in captivity, including that of "duffing" (*don't* miss Henry McLemore's advice on *How to Be a Successful Duffer*). Westbrook Pegler, Vincent Richards, Ford Frick, Clark Shaughnessy, Otto Lang—so the list of authors goes. There's lots of interesting and useful reading packed in this book.

ROCKETS AND JETS. By Herbert S. Zim. 316 pp.; index; illustrated. Harcourt, Brace & Co. \$3.00.

Bazookas, jet-assisted take-offs, robots and "robombs," AA and aerial rockets—developments are coming so fast that the list grows daily. But what are rockets? How do they and jets differ? How

DISCOUNT OFFER AND MAILING DATA

For cash with order your Association can obtain for its members 'most any books (texts, biographies, histories, fiction, etc.) at the following discounts:

On orders amounting to at least \$2.50 10%

On orders amounting to \$15.00 or more..... 15%

Remittance must be in U. S. funds; checks or money orders are the safest. Please do not send foreign currency, as it "shrinks" amazingly.

No discount is possible on Government publications, however, nor on *Journal* subscriptions or Association memberships.

We pay book-rate postage.

Nothing can be sent C.O.D. anywhere, or by insured or air mail to A.P.O.s overseas. Such items as globes are too bulky for shipment to individuals overseas, as we are of course subject to Post Office Department Order No. 19687; for its detailed provisions, consult your local postmaster.

did they originate and change? What propellants are used? What future uses will there be?

Dr. Zim discusses matters of this sort clearly and carefully. Many details are still shrouded in secrecy, of course, but even so *Rockets and Jets* contains a tremendous amount of fascinating information.

AMERICA'S FAR EASTERN POLICY. By T. A. Bisson. 230 pp.; index. The Macmillan Co. \$3.00.

This country is now clearly involved in the future of Asia. Our part in the war against Japan will have a far reaching effect on our relations with the countries of the Pacific. Our past policies, which ended with the war with Japan, are obviously unsuited to the future. A knowledge of what we have done, and an understanding of our mistakes, are vital to the settlement of the great issues confronting us in Asia.

This present book by Mr. Bisson includes a brief summary of the historical background of American Far Eastern policy and a more detailed treatment of the crucial events of the thirties. Its concluding sections cover the diplomatic milestones of the Pacific War and analyze several of the key questions which must be answered in the peace settlement. R. G. M.

AXIS RULE IN OCCUPIED EUROPE. By Raphael Lemkin. 651 pp.; index. Carnegie Endowment. \$7.50.

This is a scholarly description of the control of Europe by Germany, her partners and their puppet governments. Most of the book is a collection of statutes, decrees, and other documents which were the basis of their control. This is introduced by an analysis of how these laws furthered the rule of the totalitarian rulers. First the author examines their general technique with regard to administration, police, law, courts, property, finance, labor, Jews, and the Nazi policy of the cultural, biological, and actual extermination of nations ("genocide"). He then analyzes these practices with reference to each occupied country.

The author is a Polish attorney whose legal style is dry but ample to introduce the laws which tell all too eloquently of the inhuman net of Axis legislation that has entrapped millions of human beings. No reader can leave the book without a sickening realization of the thoroughness of the blight that has afflicted every corner of occupied Europe and of the huge task of restoration.

Despite the book's size and details, it is a source which must be consulted by anyone desiring an accurate picture of Axis rule in Europe. It is indispensable to anyone concerned in the slightest with the relief and rehabilitation of that continent. J. R. C.

ROBINSON CRUSOE, USN. As told to Blake Clark. 266 pp.; illustrated. Whittlesey House. \$2.75.

When the Japs overran Guam a few navy men took to the hills. Gradually they were captured and killed, but one survived—George Tweed, whose narrative of 2½ years as a fugitive makes as gripping a tale as any ever written. He played a constant game of hide-and-seek, for high stakes. Natives helped him and he aided them, but many a Chamorro was killed for being his friend before rescue came 11 days before the Guam landing. The whole story is one of danger, adventure, courage.

THE PACIFIC ISLANDS HANDBOOK, 1944. By R. W. Robson, F.R.G.S. 361 pp.; index; maps. The Macmillan Co. \$4.00.

Since 1932 this annual has become recognized as the standard reference work in its field. As wartime demand has stemmed largely from this country, the Australian compilation has been revised and somewhat rewritten for publication here.

Islands across the breadth of the Pacific are covered. Aspects described include administrations and administrators; anthropology and history of individual territories; populations, communications, missionaries; economics; industry, especially minerals; health, including statistics; native labor and labor conditions. Two chronologies are of distinct interest; one is a summary of discoveries and acquisitions in the Pacific, the other covers the Pacific war. Maps are excellent, although not always too well reproduced.

Each of these books is a unique contribution in its field

THE SOUTH SEAS IN THE MODERN WORLD

By FELIX M. KEESING

Dr. Keesing describes fully the political status of the South Sea Islands; their resources and economic development; the changing life and problems of the million and three quarter "native" islanders; and the position of Chinese, Japanese, and other migrants who have come in recent decades. Foreword by J. B. Condliffe. Second edition, revised. Index. Illustrated. Bibliography. \$4.00

ISLANDS OF THE PACIFIC

By HAWTHORNE DANIEL

"No respectable war-book shelf, nor any respectable sitting-room strategist will be able to maintain face without it."—*Philadelphia Record*. "Impeccably accurate."—John W. Vandercook, *N. Y. Times Book Review*. "Fills a genuine need."—Jacques Barzun, *N. Y. Herald Tribune Book Review*. Maps.

\$2.50

JAPAN'S ISLANDS OF MYSTERY

By WILLARD PRICE

"A first-class book."—C. Hartley Grattan, *N. Y. Times Book Review*. "Here is all the data you will need about our next island conquests. There is an index, maps and photos."—*Philadelphia Record*. "Important, filled with material we have not had before, and vastly entertaining."—*Los Angeles Times*. Photographs. Maps.

\$3.00

ISLANDS OF THE EAST INDIES

By HAWTHORNE DANIEL

"The right book to place beside your radio and your war map. . . . The air bases and the sinkings of the future you can locate here."—*Chicago News*. "An excellent description of the geography, resources, people, and interesting islands which will be increasingly in the news as General MacArthur moves northward."—*San Francisco Chronicle*, Maps.

\$2.50

THE AGELESS INDIES

By RAYMOND KENNEDY

Mr. Kennedy discusses the East Indies, the greatest "native" region in the world today: and one of the least understood. Under the Japs the life of these people, their agriculture, social customs, and tribal politics still continue and it is these permanent facts which are here lucidly considered. Indices. Maps.

\$2.00

EAST MALAY WORDS AND PHRASES

By MARIUS A. MENDELESEN

The simple vocabulary and grammar of a language common to all the peoples of the East Indies and British Malaya, taking into consideration differences of dialect.

\$1.00

U. S. FIELD ARTILLERY ASSOCIATION
1218 Connecticut Ave., Washington 6, D. C.

BUY YOUR BOOKS FROM YOUR ASSOCIATION

for prompt, accurate service and money-saving.

For any books not listed, write us.

See Page 504 before using order blank.

Military Thought

Masters of Mobile Warfare (Colby).....	\$2.00
Makers of Modern Strategy (Earle).....	3.75
The Framework of Battle (Burr).....	3.00
Maneuvers in War (Willoughby).....	3.00
Roots of Strategy (Phillips).....	3.00
Frederick's Instructions to His Generals.....	1.00
Saxe's Reveries on the Art of War.....	1.00
Art of War (Sun-Tzu).....	1.00
Still Time to Die (Belden).....	3.00
The German Army (Rosinski).....	3.00
Science at War (Gray).....	3.00
Defense (von Leeb).....	1.00
How the Army Fights (Limpus).....	3.00
Lifelines of Victory (Harris).....	2.00
MacArthur on War.....	3.00
Napoleon on Modern War (Lanza).....	1.00
The Nature of Modern Warfare (Falls).....	1.25
Principles of Modern War (Clausewitz outline).....	1.00
Surprise in War (Erfurth).....	1.00

Notebooks

Army Officer's Notebook.....	1.00
Platoon Record Book.....	.50
Squad Record Book.....	.25

Mathematics

An Arithmetic Refresher (Hooper).....	1.50
A Mathematics Refresher (Hooper).....	2.50
Wartime Refresher in Fundamental Mathematics (C. Eddy).....	1.40
Military Applications of Math (Hanson).....	3.00
Mathematics for the Million (Hogben).....	3.75

Navigation

Navigation for Mariners and Aviators (Polowe).....	5.00
Navigation (Kingsland and Seager).....	1.00
Primer of Celestial Navigation (Favill).....	2.00
The Raft Book (Garry).....	3.25

Radio

Elements of Radio (Mareus & Horton).....	4.00
Roger Wilco: Radio for Flyers.....	2.00

Sciences

Secret and Urgent: Story of Codes and Ciphers (Pratt).....	1.00
Handbook of Elementary Physics (Lindsay).....	2.25
The Pacific World.....	3.00
Science at War (Gray).....	3.00
Cryptography: Science of Secret Writing.....	2.50
A Treasury of Science (Shapley).....	3.95

What the War Is About

Secret History of the War (Root) 2 Vol., each 5.00	
The Time For Decision (Sumner Welles).....	3.00

Geography of the Peace (Spykman).....	2.75
One World (Willkie)..... cloth 2.00 paper 1.00	

Use of Air Power

Bombardment Aviation (Ayling).....	2.00
Combat Aviation.....	2.00
Winged Mars: The Luftwaffe, 1870- 1914.....	2.50
Air Power and Total War (Caldwell).....	2.50
Winged Warfare (Arnold and Eaker).....	3.00

Airborne Troops

We Jumped to Fight (Roff).....	2.50
Paratroops: Airborne Tactics (Miksche).....	2.50

Mechanized Warfare

Armored Warfare: Lectures on FSR III.....	1.00
The Army of the Future (DeGaulle).....	2.00
Armies on Wheels: Mechanized War.....	2.50
Blitzkrieg: Its History (Marshall).....	2.00

Naval Warfare

Guide to Naval Strategy (Brodie).....	2.75
Sea Power in the Machine Age (Brodie).....	3.75
Toward A New Order Sea Power (Sprout).....	3.75
East of Malta: West of Suez (Bartimeus).....	2.50
Boomerang (Chambliss).....	1.50
They Were Expendable: The P. T. Boats.....	2.00

Military Training

Cadence System of Teaching Drill.....	.75
Essentials of Infantry Training cloth, 2.00; paper.....	1.50
Map and Aerial Photo Reading Complete.....	1.00
Riot Control (Wood).....	1.50
State Defense Force Manual (State Guards).....	1.00
Infantry in Battle: Examples from War.....	3.00
Infantry Attacks (Rommel).....	3.00
Map Reading for the Soldier.....	1.00
Combat Problems for Small Units.....	1.00
Psychology for the Fighting Man.....	1.50

Psychology and Leadership

Psychology and the Soldier (Copeland).....	1.00
Psychology and Leadership.....	2.00
Infantry Attacks (Rommel).....	3.00
The Battle Is the Pay-off (Ingersoll).....	2.00
Psychiatry in War (Mira).....	2.75

Headquarters and Administration

Handbook to Army Regulations and Administration (Sezudlo).....	2.50
How to Write a Military Letter (Klein).....	1.25
Army Food and Messing (mess management).....	2.50
Company Administration and Personnel Records)..... paper, 1.50; cloth 2.00	

Weapons and Weapon Training

Smith and Wesson Handguns (McHenry & Roper).....	7.50
Rifles and Machine Guns of the World Armies (Johnson).....	5.00
Rockets (Ley).....	3.50
A Manual of Military Small Arms (Smith).....	2.00
Ammunition (Johnson & Haven) with 100 tables.....	5.00
Automatic Arms (Johnson & Haven).....	5.00
Tools of War (Newman).....	5.00

Artillery

Field Artillery Guide.....	2.00
Rockets (Ley).....	3.50

Gas Warfare

Gas Warfare (Waite).....	2.75
--------------------------	------

Medical

Medical Soldier's Handbook.....	1.00
Military Medical Manual (complete text book).....	4.50
Military Preventive Medicine (Dunham).....	3.25
Nurses in Action (Flikke).....	2.50
Burma Surgeon (Seagrave).....	3.00
A Handbook for Nurse's Aides (Orbison).....	2.00

Military Intelligence

S-2 in Action (Thomas).....	1.50
Combat Intelligence (Schwien).....	2.00

Motors and Drivers

Driver Training: Handbook for Instructors.....	.25
Keep 'em Rolling: Handbook for Drivers.....	.50
Preventive Maintenance.....	1.00

Physical Training—Sports

Killed or Get Killed (Applegate).....	2.00
Military Ski Manual (Harper).....	2.00
Modern Judo (Yerkow).....	3.00
Sports as Taught and Played at West Point (Bauner).....	2.00
Baseball: How to Play It (Jessee).....	1.25
Basketball: How to Play It (Murphy).....	1.25
Boxing: Skills and Techniques (Haislet).....	1.25
Soft Ball: How to Play It (Norsen).....	1.25
Wrestling: Skills and Techniques (Gallagher).....	1.25
Volleyball: How to Play It (Laveaga).....	1.25
You Must Be Fit (WAC Physical Training)..... cloth, 1.00; paper .50	

Military Law

Manual of Martial Law (Wiener).....	2.00
The Soldier and the Law (McComsey & Edwards).....	2.00
Lawful Action of State Military Forces..... cloth, 3.00; paper 1.50	
Military Justice for the Field Soldier (Wiener).....	1.00

Articles of War Annotated (Tillotson)....	2.50
Court Martial Practical Guide (McCarthy).....	1.00
Manual of Courts Martial, 1928 (Govt. Publication)	1.00
War History and Geopolitics	
Use of Presidential Power, 1789-1943 ...	3.00
Great Soldiers of World War II (DeWeerd).....	3.75
Europe: An Atlas of Human Geography (Rajchman).....	2.00
Our Army at War (W. D. photos).....	3.00
Invasion (Wertenbaker).....	2.50
Geopolitics (Hupe).....	2.75
Grave Diggers of France (Pertinax).....	6.00
Invasion Diary: Sicily and Italy (Tregaskis).....	2.75
Atlas of Global Geography (Raisz)	3.50
The Six Weeks War (Draper).....	3.00
Geography of the Peace (Spykman).....	2.75
D-Day, What Preceded and Followed ...	3.00
China, Burma, India	
China Handbook, 1937-1943	5.00
Report from Red China (Forman)	3.00
Still Time to Die (Belden).....	3.00
Report on India (Raman).....	2.50
The Making of Modern China (Lattimore)	2.50
Burma Surgeon (Seagrave)	3.00
Introduction to India (Moreas and Stimson)	2.00
Retreat With Stilwell (Belden)	3.00
They Shall Not Sleep (Stowe).....	3.60
Thirty Seconds Over Tokyo (Lawson) ...	2.00
The War in Europe	
Brave Men (Pyle).....	3.00
Engineers in Battle (Thompson).....	1.50
The Six Weeks War 1940 (Draper).....	3.00
Grave Diggers of France (Pertinax).....	6.00
Invasion (Wertenbaker).....	2.50
One Damn Thing After Another (Treanor).....	2.50
Still Time to Die (Belden).....	3.00
North African War	
Here is Your War (Pyle).....	3.00
Conquest of North Africa, 1939-42.....	3.00
Artist At War (Biddle).....	3.50
One Damn Thing After Another (Treanor).....	2.50
We Jumped to Fight (Roff)	2.50
Pipeline to Battle (Rainier).....	2.50
Assignment to Nowhere: Battle for Tunisia (Bennett)	2.75
The Battle Is the Pay-off (Ingersoll).....	2.00
Tunis Expedition: Americans in Battle... 2.00	
The Pacific War	
Islands of the Pacific (Daniel).....	2.50
Japan's Islands of Mystery (Price).....	3.00
C/O Postmaster (St. George).....	1.00
Bataan: The Judgment Seat (Ind)	3.50
Green Armor (White).....	3.00
Capture of Attu: By Men Who Fought There	2.00
Still Time to Die (Belden).....	3.00
Tarawa (Sherrrod)	2.00
Guadalcanal Diary (Tregaskis).....	2.50

I Saw the Fall of the Philippines (Romulo).....	3.00
Men on Bataan (Hershey)	2.50
They Were Expendable: The P. T. Boats	2.00
The Enemy: Germany	
The Axis Grand Strategy	3.50
The Guilt of the German Army (Fried) ...	3.50
The Time for Decision (Welles)	3.00
The German Army (Rosinski).....	3.00
Berlin Diary (Shirer).....	3.00
Hitler's Second Army (Vagts).....	1.00
Last Train From Berlin (Smith)	2.75
The Enemy: Japan	
Still Time to Die (Belden).....	3.00
Ten Years in Japan (Grew)	3.75
Japan's Military Masters (Lory)	2.50
Thirty Seconds Over Tokyo (Lawson)....	2.00
Air Warfare Against Germany	
The Use of Warfare (Blunt)	1.00
Target Germany: The VIII Air Force	cloth, 2.00; paper 1.00
War Eagles: The U. S. Squadron of the RAF.....	3.75
Air Warfare Against Japan	
God Is My Co-Pilot (Scott).....	1.00
Thirty Seconds Over Tokyo (Lawson)....	2.00
Our Army	
Building An Army: How It Is Mobilized	1.00
The Officer's Guide.....	2.50
Our Soldiers Speak, 1775-1918	3.50
Our Army at War (War Dept. photos)....	3.00
History of the U. S. Army (Gano).....	5.00
Indian Fighting Army (Downey)	3.50
Our Navy	
Boomerang (Chambliss)	1.50
The Navy's War (Pratt)	2.75
Command at Sea (Cope).....	2.75
The Fleet Today (Banning).....	2.50
Naval Officer's Guide (Ageton)	3.00
Naval Reserve Guide	2.50
The Navy Has Wings (Pratt).....	2.75
Queen of the Flat-Tops: The Lexington... 3.00	
Our Air Forces	
Flying Health (Kafka).....	2.00
America's Fighting Planes in Action.....	2.50
How Our Army Grew Wings (Chandler & Lahm).....	2.00
Official Guide to the AAF	2.50
The Army Flyer (Arnold and Eaker).....	2.50
The Man Behind the Flight (Jordanoff) ..	3.50
Winged Victory (A Play by Moss Hart)..	2.00
Bombs Away: The Bomber Team.....	2.50
Take'er Up Alone, Mister (Hibbits)	2.50
Commandos and Amphibious War	
Combined Operations: Commando Raids	2.00
Great Britain and Dominions	
Report on India (Raman)	2.50
Pacific Partner: Australia (Johnston)....	2.50
The English People	3.00
Introducing Australia (Grattan).....	3.00

Introduction to India (Moreas & Stimson).....	2.00
New Zealand (Nash).....	3.50
The Making of Modern Britain (Brebner & Nevins)	2.50
The Netherlands and Dominions	
The Ageless Indies (Kennedy).....	2.00
Middle East	
The Middle East (Ben-Horin).....	3.00
Far East	
Mongols of Manchuria (Lattimore)	2.50
Gateway to Asia: Sinkiang	2.75
The Pacific World.....	3.00
U. S. S. R.	
Invasion in the Snow: War in Finland (Davies)	2.50
The Growth of the Red Army (White)....	3.75
The Red Army (Berchin and Ben- Horin)	3.00
Twelve Months that Changed the World.....	3.00
The Russian Army (Kerr).....	2.75
United States	
Short History of American Democracy (Hicks).....	5.50
Report on Demobilization.....	3.00
Carbine and Lance: Story of Old Fort Sill (Nye)	3.00
The Ten Grandmothers (Marriott)	3.00
U. S. Foreign Policy (Lippman).....	1.50
The U. S. A. at War (collection of war photographs)	4.50
America's Strategy in World Politics.....	3.75
Guide Books and Atlases	
Europe: An Atlas of Human Geography (Rajchman).....	2.00
The Pacific World.....	3.00
Global War (Mowrer and Rajchman)	1.00
Goode's School Atlas.....	4.40
How to Live in the Tropics (Hunt)	2.00
Look at the World (Harrison)	3.50
A War Atlas for Americans cloth, 2.50; paper 1.00	
Going Overseas	
How to Abandon Ship (Richards and Banigan).....	1.00
Biography and Experiences	
McNair: Educator of an Army (Kahn)....	2.00
Great Soldiers of World War II (DeWeerd)	3.75
I Never Left Home (Hope)	1.00
Woodrow Wilson (Johnson).....	2.00
Captain Retreat (Hough)	2.50
Allenby: A Study in Greatness (Wavell).....	3.00
The Army Life (Kahn).....	1.75
A Roving Commission (Churchill).....	1.75
Signposts of Experience 1917-19 (Snow)	2.75
Early American Wars	
When the French Were Here (Bonsal)....	3.00
American Campaigns: 1690-1899 2 vol. 8.00	
The War of 1812 (Adams).....	3.00

The Civil War

Stonewall Jackson (Henderson) 1.98
 Ranger Mosby (Jones)..... 3.50
 "First With the Most" Forrest (Henry).... 4.00
 American Campaigns: 1690-1899.... 2 vol. 8.00
 Conflict: The Civil War (Milton) 3.50
 Lee's Lieutenants (Freeman).... 3 vol., each 5.00
 Reveille in Washington (Leech)..... 3.50

The First World War

Fighting Generals (Bullard)..... 5.00
 Woodrow Wilson (Johnson)..... 2.00

Government Publications

Official History, 1st Division 1.50
 Official History, 2d Division..... 1.50
 Official History, 3d Division..... 1.50
 Official History, 4th Division..... 1.50
 Official History, 5th Division..... 1.25
 Official History, 7th Division..... .75
 Official History, 26th Division..... 1.25
 Official History, 27th Division..... 1.00
 Official History, 28th Division..... 1.50
 Official History, 29th Division..... .75
 Official History, 30th Division..... 1.00
 Official History, 32d Division..... 1.25
 Official History, 33d Division..... 1.25
 Official History, 35th Division..... .75
 Official History, 36th Division..... .75
 Official History, 37th Division..... .75
 Official History, 42d Division..... 1.50
 Official History, 77th Division..... 1.50
 Official History, 78th Division..... .75
 Official History, 79th Division..... .75
 Official History, 80th Division..... 1.25
 Official History, 81st Division..... .75
 Official History, 82d Division..... 1.00
 Official History, 89th Division..... 1.00
 Official History, 90th Division..... 1.00
 Official History, 91st Division..... 1.00
 Official History, 92d Division..... .75
 Official History, 93d Division..... 1.00

Captain Retread (Hough) 2.50
 Infantry Attacks (Rommel)..... 3.00
 Allenby: A Study in Greatness
 (Wavell) 3.00
 Combat Intelligence (Schwien)..... 2.00
 Signposts of Experience (Snow) 2.75

Military Histories

175 Battles, 490 B.C. to 1937 (Shaw)..... 2.00
 World's Military History (to 1918) 3.00
 War Through the Ages (Montross) 5.00
 The War of 1812 (Adams) 3.00
 Decisive Battles of the World (Creasy)... 3.00
 Warfare (Early Times to Frederick)..... 3.00

Insignia and Identification

Military and Naval Recognition Book
 (Bunkley) 2.50

Language Books

Army Talk (Elbridge Colby)..... 2.00
 Modern Military Dictionary 2.50
 Elementary Japanese (Sullivan) 2.50
 The Loom of Language (Bodmer) 3.75
 Blitz French (Nicot)..... .75
 Blitz German (Brandl)75
 Civil and Military German (Pfeffer) 2.50
 Easy Malay Words and Phrases
 (Mendlesen) 1.00
 English for the Armed Forces 1.50
 French Dictionary for the Soldier
 (Henius)50
 German Dictionary for the Soldier
 (Henius)50
 How to Say It in Spanish75
 Italian Dictionary for the Soldier
 (Henius)50
 Italian Sentence Book for the Soldier25
 Speech for the Military 1.20

Personal Affairs

Veteran's Rights and Benefits (Erana &
 Symons)..... 1.00
 Searne on Dice (Searne & Rawson)..... 2.50
 The Army Guide for Women (Dilts) 2.50
 The Importance of Living (Yutang)..... 3.50
 The Army Wife (Shea) 2.50
 Army Woman's Handbook (Collins) 1.75
 The Navy Wife (Pye and Shea) 2.50

Reference Books

Eneyclopedia of Knots and Fancy Rope
 Work 5.00
 Handbook of Army Regulations
 (Sezudlo)..... 2.50
 U. S. Government Manual, Summer
 1944 1.00

Anthologies and Readers

Freedom Speaks (Reynolds &
 Connors) 2.00
 Nods and Beeks (Adams) 2.00
 Try and Stop Me (Cerf) 3.00
 Thurber Carnival (Thurber) 2.75
 The Marine Corps Reader 3.00
 The Second Navy Reader 3.75
 A Treasury of American Folklore..... 3.00
 As You Were: Woolcott's Reader 2.50
 To members of armed forces 1.00
 At Ease: Brain Teasers (Leopold)..... 1.75
 A Book of War Letters 2.00
 Men At War (Hemingway's Reader)..... 3.00
 Patriotic Anthology (of American
 Writings)..... 3.00
 The Stag's Hornbook (Soldier Poetry) 2.00
 Steinbeck's Anthology 2.00
 A Treasury of Science (Harlow
 Shapley)..... 3.95

ORDER FORM

_____ (Date)

U. S. Field Artillery Assn.,
 1218 Connecticut Ave.,
 Washington 6, D. C.

Enclosed is \$..... for the following books:

PRINT OR TYPEWRITE

.....
 (Signature)

.....
 (Grade, Name, and Serial Number)

A.P.O.

(Complete Address)

.....
 (City, including zone number, and State)

WESTERN WORDS: A Dictionary of the Range, Cow Camp, and Trail. By Ramon F. Adams. 182 pp. University of Oklahoma Press. \$3.00.

Mr. Adams, a Texan, must have thoroughly enjoyed living the life which made him so familiar with the lore and history of the cattle country. This dictionary is a delight to dip into as well as to use as a working tool, for it is packed with anecdotes and homely descriptions that bring lots of chuckles.

MAIN STREET'S NEW NEIGHBORS. By Melvin K. White-leather. 252 pp. J. P. Lippincott Co. \$3.00.

From 1926 to 1940 Mr. Whiteleather spent most of his time in Europe. In four of his last five years he was based in Berlin. As a journalist he "covered" the important international events of the period, from conferences to the German invasion of Poland.

This background is drawn upon to describe not just our new world neighbors, but how we appear to them as well—what reactions our country and its actions have caused. Sections are devoted to the British Empire, France, Russia, and Germany. What these countries want and/or need, and perhaps intend to have, is gone into. The writing is straightforward, the statements at times are blunt. There can not be too many books of this kind, books which honestly add to our stock of understanding. To keep the peace we will all need much of it.

HIGHWAY TO ALASKA. By Herbert C. Lanks. 190 pp.; index; photographs; endpaper map. D. Appleton-Century Co. \$5.00.

Mr. Lanks made a 12,000-mile jeep trip over the Alcan Highway. During it he absorbed local lore and color, as well as details of this tremendous construction project. His is one of the best of the descriptions that have come from that part of the world.

DIPLOMAT IN CARPET SLIPPERS: Abraham Lincoln Deals with Foreign Affairs. By Jay Monaghan. 464 pp.; bibliography; index; illustrated. The Bobbs-Merrill Co. \$4.00.

In many ways this is a companion piece to *Lee's Lieutenants*. It is written by an expert in his field. It is direct, lucid, detailed. And it illumines a subject largely neglected heretofore.

Most studies of the Civil War years have been devoted to military operations. Actually, foreign relations were equally important. England, France, and Mexico posed great and delicate questions. At stake were the dominance of the American, the Monroe Doctrine, freedom from European encroachment.

Lincoln's cabinet, the men supposedly to carry out his policies, was a group torn within itself. Lincoln's genius appears at its highest in his welding a team out of such an assortment of strong individualists. Slow and cautious in working out his problems, he had an ultimate triumphant success. The story is a fascinating one.

JAPAN AND THE JAPANESE. By the Editors of *Fortune*. 166 pp.; illustrated.

SURVIVAL: Land, Sea, Jungle, Arctic. 376 pp.; illustrated.
AMERICA'S NAVY IN WORLD WAR II. By Gilbert Cant. 378 pp.; maps. Available to members of *Armed Services only*. *Infantry Journal*. 25c each.

A number of articles giving a quite rounded picture of Japan, have appeared in *Fortune* magazine. They are reprinted in handy pocket size, revised to Nov. 1, 1944.

Survival's theme is how-to-keep-alive-under-difficulties. It describes the regions; their friendly and unfriendly plants and wild life; suitable clothing; how to travel—in short, how to stay alive and make your way to civilization. Although quite uneven in content, it has a great quantity of useful information.

Mr. Cant's book, originally published in full size in 1943, is an excellent account of our navy's actions from the outbreak of war through the Battle of Guadalcanal, nearly a year later.

TATTERED COAT. By Nash Buckingham. 210 pp.; illustrated. G. P. Putnam's Sons. \$2.50.

Nash Buckingham's tales of shooting and fishing are without peer.

For any remembrance, give a
POLAR VIEW GLOBE



THE AIR CHIEF, No. 1225

A full-colored 12" globe ball rests in a solid American walnut base. The ball can be turned in any direction, or removed from the base for closer examination. A printed dial, mounted on the top of the base, makes it easy to trace and measure the great-circle distance between any two points on the earth's surface and also to read differences in time. Price each: \$10.00.

(See discount offer on page 504)

U. S. FIELD ARTILLERY ASSN., 1218 Connecticut Ave., Washington 6, D. C.

Send a year of the **FIELD ARTILLERY JOURNAL*** to

(Grade, Name, Serial Number)

A.P.O.

(Complete Address)

(City and State)

Remittance for \$3 inclosed

Overseas edition, via first-class mail, \$1 extra†

Send bill

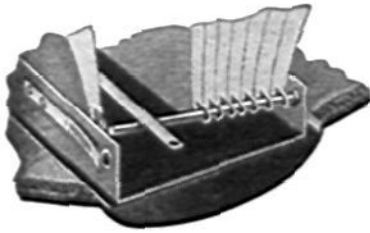
Indicate preference
by checking not
more than two

(Signature)

*Includes membership in U. S. Field Artillery Association if individual is eligible.
†This will top weeks or even months off delivery time.

PLEASE PRINT

**Keep Your Standard Size Field Artillery Journals
for Constant Reference Both Now and Later**



Here is a sturdy binder that will hold all 12 issues of your JOURNAL. Copies are held in place by a thin flat wire strip, spaced according to thickness, which allows each copy to be read clear back to the binding margin.

This binder is made of strong washable imitation leather, in traditional artillery color. *The Field Artillery Journal* is lettered in gold across the upper part of the front cover and on the back edge. The Field Artillery crossed-cannons are in gold on the lower front cover.

\$5, subject to discount, as noted on page 504

U. S. FIELD ARTILLERY ASSOCIATION
1218 Connecticut Avenue. N. W. Washington 6, D. C.

The only trouble is that they appear so infrequently.

Tattered Coat, the first collection in six years, recaptures the very air of days that are now gone—days of leisure and grace. Its colorful stories are set against a background of woods and fields and streams. Here are the quail, the geese, and the ducks; the bent rod and the work of bird dogs; the fireplace and the companionship. The book itself is a companion, one to whom a reader returns again and again.

THE JAMES. By Blair Niles. 310 pp.; bibliography; index; illustrated. Farrar & Rinchart. \$2.50.

In the *Rivers of America* series there has already been a volume on the James by this same author. It covered only the Tidewater area, however, which is so different from the rest of the stream geologically, geographically, and historically.

The "Tidewater James" saw our country's first English colonization. It was the land of John Smith and Nathaniel Bacon and William Byrd and so many more. It was a country of great plantations and traffic with England.

Upstream, above the falls at Richmond, life was more rugged. Through the Piedmont and then the mountains, there was no smooth waterway to speed communication. But it was a highway to the new West, and in it throve a vigor not always found in the rich lands by the sea. Its traditions and legends are as rich, though. So too are its history (Appomattox lies here) and its beauty (here are Natural Bridge, and the Blue Ridge country).

Blair Niles gives a comprehensive review of this important region, the watershed of the James.

NAMES ON THE LAND. By George R. Stewart. 389 pp.; index; endpaper maps. Random House. \$3.00.

Have you too wondered how some of the names got on our maps? Their variety is another testimony to the varied influences in our history. Some are Indian; others are French, Spanish, Dutch; some are named for persons, some for events, others are fanciful. Many have evolved into something quite different from their original forms.

In tracing the origins and evolutions of our principal place-names, Mr. Stewart comes up with a wealth of history and anecdotes. He covers more than four centuries in a flowing narrative that recaptures much of the past. It is a unique approach to history, and one that fascinated both this reviewer and the friends with whom he has already shared this book.

THE WINE OF SAN LORENZO. By Herbert Gorman. 472 pp. Farrar & Rinchart. \$3.00.

Novels are rarely mentioned in these reviews, but occasionally one appears which is so life-like historically that an exception is made. Such a book is this, which breathes life into the period of the Mexican War and a few years afterward. From the Alamo on, in Texas and in Mexico, the tale flows swiftly. In recreating the military as well as the civil life of the time, Mr. Gorman has done an outstanding piece of work.

OTHER MEN'S FLOWERS: An Anthology of Verse. Selected and annotated by Field Marshal Viscount Wavell. 395 pp.; indexes. G. P. Putnam's Sons. \$3.50.

Through his long service A. P. Wavell has taken keen delight, and obtained relaxation, in memorizing and repeating poetry. His unusually retentive memory readily retained the verse he liked. For his own amusement he set these down and arranged them, without thought of publication.

Fortunately, he changed his mind. His collection is varied, and each part has a point. Although Kipling, Masfield, and Chesterton are well represented, so catholic is the Field Marshal's taste that he includes many enjoyable things by practically unknown poets.

A good many selections bear Wavell's own comments, most of which are delightfully pithy.

THROUGH JAPANESE EYES. By Otto D. Tolischus. 182 pp. Reynal & Hitchcock. \$2.00.

In the last several years there have been many books about the Japanese. Mr. Tolischus wrote two of them, *They Wanted War* and *Tokyo Record*. All had one common fault: they tried to interpret

PLEASE PRINT

A.P.O. No. _____

(Battery or Comparable Unit)

c/o Postmaster

(Name of Post Office)

CHANGE MY ADDRESS TO:

(Grade, Name, Serial Number)

(Battalion or Comparable Unit)

(Signature)

the Japs, which no Westerner can really do; that is, they all looked at the Japs through Western eyes.

To give us a good look at the Japs in the terms of their own writing and speech, Mr. Tolischus has compiled something akin to *Mein Kampf*. To be sure, here there are many spokesmen instead of one; but at the same time they speak authoritatively for Japan, and show most clearly what are her aims, ambitions, and attitudes. These become piercingly clear as the pages unfold. Here is an outstanding self-expose of our enemy, Japan.

NATIVE PEOPLES OF THE PACIFIC WORLD. By Felix M. Keesing. 134 pp.; appendices; illustrated. *Infantry Journal*. 25c.

Professor Keesing's book, originally published by Macmillan, is one of a series designed to portray the entire natural history of the Pacific area. Restricted to the tropical island groups, it definitely leaves the reader feeling much better acquainted with the natives. Appendices give some data about the major groups of islands, and a brief chronology.

CONNIE MACK: Grand Old Man of Baseball. By Frederick G. Lieb. 276 pp.; illustrated. G. P. Putnam's Sons. \$2.75.

Now 82, Cornelius McGillicuddy ("Connie Mack" to you and me) has been "in" professional baseball since the early '80s. He is more than baseball's Grand Old Man—he is practically its patron saint.

His biographer wrote *The St. Louis Cardinals* last year. His heart is in the right place, though. As a Philadelphia boy he grew up in Connie Mack's aura, and has never lost his admiration and affection for him. He brings here a wealth of anecdote and baseball lore that fans everywhere will enjoy.

PATRICK HENRY AND THE FRIGATE'S KEEL. By Howard Fast. 253 pp. Duell, Sloan & Pearce. \$2.50.

While working on his outstanding books (*Citizen Tom Paine, The Unvanquished, Freedom Road, etc.*) Howard Fast became thoroughly indoctrinated with the spirit of our country's past. Many short magazine pieces resulted. Now a dozen of these grand historical stories have been brought together. They recreate the days when our country was young. They entertain young and old alike.

LAKE ONTARIO. By Arthur Pound. 363 pp.; index; illustrated. The Bobbs-Merrill Co. \$3.50.

Dr. Pound, former State Historian of New York, forcefully underlines the importance of Lake Ontario in the penetration and development of North America. The lake was of course discovered by the French who came up the St. Lawrence. They realized its importance as key to the West, as well as center of the fur trade. England knew this too; bloody frontier warfare developed.

In our Revolutionary War St. Leger used the neighborhood as a base for his campaign into the Mohawk Valley. Later the Loyalists passed through on their way from the seceded colonies to Upper Canada.

Lake Ontario has never been a true part of the inland waterways. At first it was blocked from the upper lakes by Niagara Falls. Although the Welland Canal by-passes the falls, it was not completed until six years after DeWitt Clinton's "big ditch" connected the Mohawk-Hudson with Lake Erie. As most goods passed from teeming New York to the lusty West, the Erie had much more traffic on which to draw. And the winter closing of the St. Lawrence was tighter and more serious.

On the northern shore Canada was struggling for unity and self-government. This phase of North American history, largely passed over in our history courses, is well covered here. It helps explain many of the similarities and differences of the nations.

THE BEST SHORT STORIES OF O. HENRY. Selected and with an introduction by Bennett A. Cerf and Van H. Cartmell. 338 pp. The Modern Library. 95c.

In Modern Library's conveniently portable format 38 complete stories have been gathered. Together they cover the full range of O. Henry's talent. They are good tales, as enjoyable today as when

VACCARI KANJI CARDS

(New American Edition)

BY

MR. AND MRS. ORESTE VACCARI

THIS set of cards, depicting the most common Chinese-Japanese characters as written with a brush, is noted for the legibility of the characters, a factor which allows the student to easily identify the various strokes in even the most complicated characters. Because of this, the set has become a popular choice of the increasing number of students who are discovering that the use of character-cards is a valuable aid in the study of written Japanese.

The set contains 1,224 cards (3 × 4 inches). On each card are the most common compounds (more than 7,000 in all) printed in handwriting style, and on the verso of each card the translation in romaji and in English. These cards are arranged by order of stroke in a sturdy boxboard box, with fourteen index partitions.

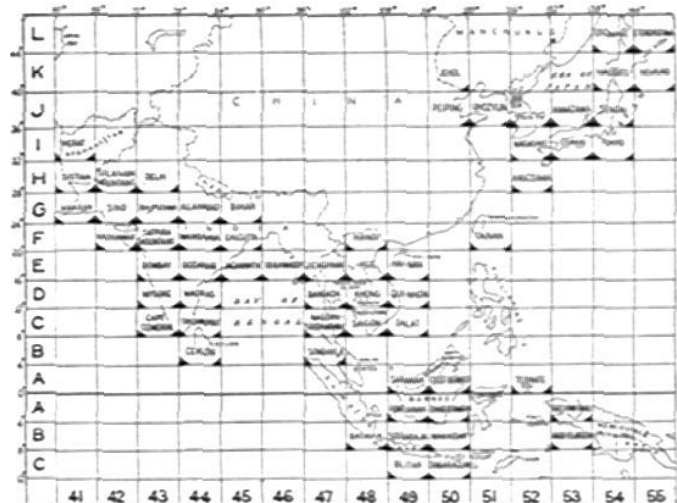
PRICE PER SET \$7.50

See notice on page 504

U. S. FIELD ARTILLERY ASSOCIATION
1218 Connecticut Ave. Washington 6, D. C.

"INTERNATIONAL" MAP SHEETS

were prepared by the various governments on a uniform scale of 1:1,000,000 (about 16 miles to the inch). Each covers an area 6° × 4°. Drawn on a modified polyconic projection, sheets naturally vary somewhat in size; the average is about 30" × 24".



All are black and white photostats, \$3.00 each

In ordering, designate sheets *both* by coordinates and by name of sheet.

(See discount offer on page 504)

U. S. FIELD ARTILLERY ASSOCIATION
1218 Connecticut Avenue Washington 6, D. C.

ORDER FORM

for books reviewed in the
AUGUST, 1945, FIELD ARTILLERY JOURNAL

.....
(Date)

U. S. Field Artillery Assn.,
1218 Connecticut Ave.,
Washington 6, D. C.

Enclosed is \$ for the following
checked books reviewed in this issue of THE
FIELD ARTILLERY JOURNAL:

Surrender on Demand, by Varian Fry.....	\$3.00
Betio Beachhead. U. S. Marines' Own Story of the Battle of Tarawa.....	2.50
Tanks and Armored Vehicles, by Lt. Col Robert J. Icks.....	4.75
The Netherlands, ed. by Bartholomew Landheer.....	5.00
Poland, ed. by Bernadotte E. Schmitt.....	5.00
Down the Stretch: The Story of Col. Matt J. Winn, as told to Frank G. Menke.....	3.50
The Gashouse Gang and a couple of other guys, by J. Roy Stockton.....	2.75
Esquire's First Sports Reader, edited and with an introduction by Herb Graffis.....	2.75
Rockets and Jets, by Herbert S. Zim.....	3.00
American's Far Eastern Policy, by T. A. Bisson.....	3.00
Axis Rule in Occupied Europe, by Raphael Lemkin.....	7.50
Robinson Crusoe, USN, as told to Blake Clark.....	2.75
The Pacific Islands Handbook, 1944, by R. W. Robson, F.R.G.S.....	4.00
Western Words: A Dictionary of the Range, Cow Camp, and Trail, by Ramon F. Adams.....	3.00
Main Street's New Neighbors, by Melvin K. Whiteleather.....	3.00
Highway to Alaska, by Herbert C. Lanks.....	5.00
Diplomat in Carpet Slippers: Abraham Lincoln Deals with Foreign Affairs, by Jay Monaghan.....	4.00
Japan and the Japanese, by the Editors of <i>Fortune</i>25
Survival: Land, Sea, Jungle, Arctic.....	.25
America's Navy in World War II, by Gilbert Cant.....	.25
Tattered Coat, by Nash Buckingham.....	2.50
The James, by Blair Niles.....	2.50
Names on the Land, by George R. Stewart.....	3.00
The Wine of San Lorenzo, by Herbert Gorman.....	3.00
Other Men's Flowers: An Anthology of Verse, selected and annotated by Field Marshal Viscount Wavell.....	3.50
Through Japanese Eyes, by Otto D. Tolischus.....	2.00
Native Peoples of the Pacific World, by Felix M. Keesing.....	.25
Connie Mack: Grand Old Man of Baseball, by Frederick G. Lieb.....	2.75
Patrick Henry and the Frigate's Keel, by Howard Fast.....	2.50
Lake Ontario, by Arthur Pound.....	3.50
The Best Short Stories of O. Henry, selected and with an introduction by Bennett A. Cerf and Van H. Cartmell.....	.95
Science Year Book of 1945, edited and with an introduction by John D. Ratcliff.....	2.50
The Portable Carl Van Doren, selected by himself.....	2.00
Up Front, text and pictures by Bill Mauldin.....	3.00
Great Tales of the American West, edited and with an introduction by Harry E. Maule.....	.95

PRINT OR TYPEWRITE

.....
(Signature)
.....
(Grade, Name, and Serial Number)
.....
A.P.O.....
(Complete Address)
.....
(City, including zone number, and State)

they were first written. O. Henry is a master story-teller—mellow, humorous, ironic. His best is here.

SCIENCE YEAR BOOK OF 1945. Edited and with an introduction by John D. Ratcliff. 224 pp. Doubleday, Doran & Co. \$2.50.

In this fourth annual volume, the editor finds nearly an equal division between destructive (rocket bombs) and preserving (penicillin) discoveries. After an introduction which comprehensively reviews scientific progress of the year, he has arranged non-technical articles which give excellent descriptions for the layman.

In the field of medicine, such things as the rigid trials of the new metal tantalum, establishment of "eye banks," childhood disease progress, fatigue, etc., are covered. Physics and chemistry have made perhaps greatest strides of all in both war and industrial research; in harnessing electrons for both industry and medicine; in exchanging ions; in using high-vacuum distillation on a large scale. Aviation is marked by progress with jet propulsion and gas turbines, buzz bombs, and in the conquering of problems created by sonic speeds. Petroleum problems of the future are the principal things discussed in the part dealing with "other sciences." This round-up is definitely stimulating and informative.

THE PORTABLE CARL VAN DOREN. Selected by himself. 628 pp. The Viking Press. \$2.00.

For this pocket-fitting compilation, Mr. Van Doren has made a varied selection from his writings. Two books are reprinted complete: *What Is American Literature?* and *Swift, Benjamin Franklin* is represented by three choice sections. There are substantial selections from *Three Worlds, Secret History of the American Revolution. Other Provinces*, the Introductions to *Indian Treaties Published by Benjamin Franklin*, and *The Travels of Baron Munchausen*. Also here is the previously unpublished story of American spies in Paris at the time of our Revolution, originally intended for a chapter in *Secret History*.

Van Doren writes well and interestingly. This anthology is especially well designed (physically) for travelers, and (in content) for those who want variety of subject.

UP FRONT. Text and pictures by Bill Mauldin. 228 pp.; illustrated. Henry Holt & Co. \$3.00.

Willie and Joe are authentic characters. So is Bill Mauldin, their creator in the 45th Division, even though he doesn't much resemble them physically. He knows them thoroughly, though, which is more important. These dirty, unshaven, tired infantrymen are this war's greatest cartoon creations.

Bill Mauldin has now gathered together a large number of his drawings, and connected them with a commentary that is as straightforward as his art work. It is a simple, honest narrative that even without the pictures would deserve much attention. Ernie Pyle was the GI's finest civilian friend; Mauldin, a GI himself, does an equal job here, besides proving himself the Bruce Bairnsfather of this war.

GREAT TALES OF THE AMERICAN WEST. Edited and with an introduction by Harry E. Maule. 361 pp. Modern Library. 95c.

Like stories by Bret Harte? Owen Wister? Zane Grey? Ernest Haycox? Max Brand? Like to read about the cowboy, two-gun man, prospector, gambler, rustler? If you do, here's a little book that will help you spend time happily. It gathers together 18 top-notch tales, good literature as well as good entertainment. They are printed compactly but legibly. It's a good deal, any way you take it.

ILLUSTRATION CREDITS

(If not listed, unsigned illustrations are from authors, by the *Journal* staff, or from special sources. References are to pages.)

- U. S. Marine Corps: Cover, 457.
- 37th Division: 451, 455.
- E. J. Dollrichs: 452, 453.
- U. S. Navy: 464.
- 1st I & H S, P O A: 466, 467.
- Signal Corps: 469, 481, 495, 499.
- New York Times: 484, 486, 487, 488, 490, 491, 492.

TWO-BIT SPECIALS

Small, compact, light, inexpensive, and varied in content, these pocket-size books are ideal for men on the move

Abraham Lincoln and the Fifth Column (Milton).....	25
America in Arms: History of U. S. Military Policy (Gen. Palmer).....	25
An April Afternoon (Philip Wylie).....	25
Anthology of Animal Poetry.....	25
Anthology of Canadian Poetry.....	25
The Army Life (Kahn).....	25
The Battle is the Pay-Off (Ingersoll).....	25
Blitzkrieg: Army on Wheels (Col. Marshall).....	25
The Blind Barber (Carr).....	25
Capture of Attu: By Men Who Fought There.....	25
Cartoons by George Price.....	25
Cause for Alarm (Ambler).....	25
Combat First Aid.....	25
Embarrassment of Riches (Fischer).....	25
Empire in the Changing World (Hancock).....	25
Fear in Battle (Dollard).....	25
Fundamentals of Electricity (Mott-Smith).....	25
Fundamentals of Mechanics (Mott-Smith & Van de Water).....	25
Great Soldiers of the First World War.....	25
The Good Soldier Schweik (Hasek).....	25
How to Shoot the U. S. Army Rifle.....	25
Island Victory: Critique on Kwajalein.....	25
Japan and the Japanese.....	25
The Jap Soldier.....	25
Leadership for American Army Leaders (Munson).....	25
The Lost Battalion (Johnson & Pratt).....	25
Love Nest and Other Stories (Ring Lardner).....	25
Ol' Man Adam and His Chillun (Bradford).....	25
Out of This World (fantastic stories).....	25
The Ox-Bow Incident (Clark).....	25
Psychology for the Fighting Man.....	25
Psychology for the Returning Serviceman.....	25
Purple Sickle Murders (Crofts).....	25
Report on the Army (Gen. Marshall).....	25
Sergeant Terry Bull.....	25
Shipyards Diary of a Woman Welder.....	25
Short History of the Army and Navy (Pratt).....	25
So You're Going Overseas (Barker).....	25
Soldiers in the Philippines, 1898-1902.....	25
Studies on War.....	25
Tales of Piracy, Crime and Ghosts (Defoe).....	25
They Were Expendable (White).....	25
What to Do Aboard the Transport.....	25
White Magic (Faith Baldwin).....	25
The World War: 1939-1944.....	25

ARMED SERVICES SERIES

(Available for purchase by (or for) members of the Armed Services only)

America's Navy in World War II (Cant).....	25
Animals in the Pacific World.....	25
Burma Surgeon (Seagrave).....	25
The Fight at Pearl Harbor (Clark).....	25
Freedom Speaks (Poetry and Prose).....	25
Gas Warfare (Waitt).....	25
The Gun (Forester).....	25
How to Abandon Ship (Richards & Banigan).....	25
Japan's Military Masters (Lory).....	25
Machine Warfare (Gen. Fuller).....	25
Making of Modern China (Lattimore).....	25
Native Peoples of the Pacific World (Keesing).....	25
Our Enemy Japan (Fleisher).....	25
Report on India (Raman).....	25
Rifleman Dodd (Forester).....	25
Rifles and Machine Guns of the World's Armies (Johnson).....	25
The Russian Army (Kerr).....	25
Thesaurus of Humor.....	25
We Cannot Escape History (Whitaker).....	25

25c each

Subject to a discount as noted on page 504

U. S. FIELD ARTILLERY ASSOCIATION

1218 Connecticut Avenue

Washington 6, D. C.



REDEPLOYMENT
TO THE
PACIFIC WAR
WILL REQUIRE MUCH
REORIENTATION
and
RETRAINING.

CAMPAIGNS TO DATE
PROVED THE

FIELD ARTILLERY GUIDE

TO BE INVALUABLE FOR

CONSTANT FIELD
REFERENCE

Have you your copy?

Have your men enough copies?

Cased in durable Sturdite. It is priced at \$2.00 subject to these discounts for remittance with order:

2 to 7 copies: 10%

8 to 12 copies: 15%

Over 12 copies: 20%

Bound in leather, with your name embossed in gold, it is \$5 per copy.



U. S. FIELD ARTILLERY ASSOCIATION

1218 Connecticut Avenue

Washington 6, D. C.

