The FIELD ARTILLERY Journal

JANUARY, 1943

FIELD ARTILLERY GUIDE

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THE

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MAJOR JOHN E. COLEMAN, ***Editor***
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MEMBERSHIP is zooming, on a sound, steady basis, thanks to the interest of our many friends, some unknown by name. Personal recommendation by present members, and examination of the JOURNAL by interested prospects, yield the finest results. These methods are combined at Fort Sill, where bulletin boards bear copies of the JOURNAL, the daily news summary recommends membership, and the Officer Candidate School both suggests membership and sees that every graduate has a handy combination application - envelope. (Yes, we'll be glad to furnish these envelopes to any interested group.) Units are sending in long lists of new memberships, along with a single check to cover them all; this system saves the Association both the time and expense of separate billings — doubly appreciated these days, when so many stencils must be changed daily due to moves.

The Red Guidon Association of advanced R.O.T.C. cadets at the University of Nebraska makes a practical effort to instill esprit-de-corps. At the suggestion of its sponsor, Maj. R. F. McNamara, it requires membership in the Field Artillery Association as a prerequisite for Red Guidon membership.

To all of these and to our anonymous workers, the sincere thanks of the Association.

We MISSED A BET on page 930 of the December, 1942, JOURNAL. The Marines' bridge on Guadalcanal was even more interesting than we thought. Photos subsequently released show this is actually an ingenious pontoon bridge supported by amphibious tanks whose outline is discernible on either side.

The Field Artillery Journal

"Today's Field Artillery Journal is tomorrow's training regulations."

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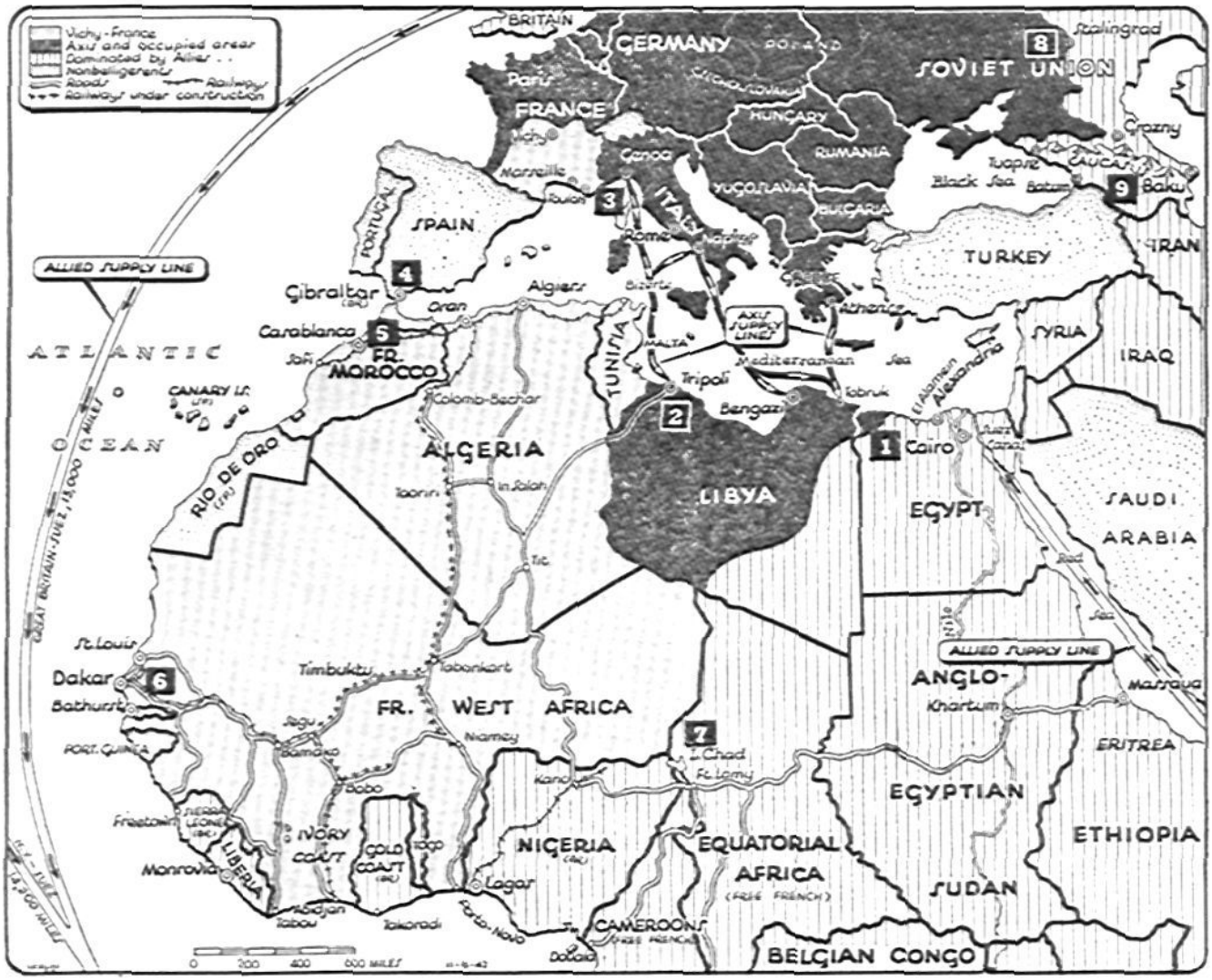

At El Alamein (1) on Oct. 23 the British opened an all-out offensive. Capture of Tripoli (2) is an objective. Land fighting has been supplemented by large-scale RAF raids on Genoa (3). chief shipping point for supplies for the Afrika Korps. American forces landed at Casablanca (5), and by-passed Gibraltar (4) to land also at Oran and Algiers. Darlan subsequently helped gain the capitulation of Dakar (6). Fighting French forces from the Lake Chad region (7) attacked northward through Libya. This activity aided the Russians with their drives around Stalingrad (8), in the Caucasus (9), and west of Moscow (off the map.)

THE BIG PROBLEM

By Lt. Riley Sunderland, FA

Lt. Sunderland's analysis was written almost exactly seven months before our invasion of North Africa. It obviously could not have been published in April, 1942, and so was regretfully rejected at that time, despite its sound reasoning. Now it could well be subtitled "Hindsight Confirms Foresight." As the author states, "An exposition of the reasoning behind the [present] campaign, and of its probable course, it is as good now as when written. As a matter of fact, it is even better, for History itself has written 'Q.E.D.' after my propositions." It is with pride and pleasure that the *Journal* now presents this analysis of reasons underlying our first major offensive campaign in this war.

The big problem in this war, the one that overshadows the rest, is that of establishing a bridgehead on the European continent through which a force can be sent to give the final blow to the German army. Given our present means and present situation, what can be done to attain that end?

What we are seeking are the proper opening moves of the campaign. Many seek to place the cart before the horse, to march on Berlin before they have landed on European soil. We should also have an eye for opening moves that will aid us in other theaters of war.

Nazi Europe has two coasts. One is along the line Spain-Norway, the other, Spain-Turkey (Turkey-in-Europe). We can have no doubt that the line Spain-Norway has been fortified by every device known to the Wehrmacht, and that it is well-garrisoned. We may doubt that the other line is as well-held, or that Hitler's resources are equal to holding it in real force. Relatively, it is lightly held.

The general direction of our first attack on the European continent proper should be through that line Spain-Turkey. Colonel Kernan, as is well-known, suggests the middle point, Italy. We suggest that he is guilty of putting the cart before the horse.

We suggest that the first blow should be struck in the area Casablanca-Rabat, on the coast of French Morocco.

First consider the logistics of such a move. That area is no farther from New York or England than is Norway. Germany and England are equally close to Morocco—but Germany is not only closer to Scandinavia, the Germans are actually on the spot, with all that implies. There are adequate port facilities at Casablanca and Rabat. The climate is not so bad as that of Norway, and less equipment would be required for the soldiers' comfort.

It is known that units of the German fleet are in Norwegian waters, and could intervene in any attempted landing operations or could raid supply lines. To raid the lines to North Africa they would have to go around England, cutting the time they could be at sea (increasing the chance of interception), or go through the Channel, even more risky.

Further, the British army has had wide experience in African war, on which experience we could draw. We should also note that the Free French, many of whom have fought in this area, could be of great service to landing forces.

An approach to Africa would be easier by the fact that our task force would easily be taken for a large convoy en route to Egypt or India.

The tactical problems of a landing on the Moroccan coast, and those of landing on the Channel or the Norwegian coast, are hardly to be compared. True, the terrain is bad in places. But the character and quality of the opposition are not in the same category. On the one hand, disorganized, ill-equipped French colonials; on the other, the hardened veterans of the Wehrmacht. Further, we could count on De Gaullist risings and disorders among the natives to complicate the task of the Vichy Fascists.

What force do we put ashore? Perhaps two armored divisions and three infantry divisions, with strong motor components, and every airplane that can be carried.[1]

The moment that force is ashore, the position of Rommel's Panzer Gruppe Afrika is serious, such is the power of correct strategy. And, for one of the few times in his career, Herr Hitler and his intuitions are given the task of choosing the lesser of a group of evils.

Is the Wehrmacht to move down through Spain, with a bad rail net and no local resources on which to draw? Should Spain be brought into the war? Will there be another uprising?

Or should France collaborate and at once? Should reinforcements leave Toulon covered by the French fleet? Will that fleet cover them? What of disorders in France? Or is the Allied move a feint, to draw attention from the channel coast? (One could collect invasion barges with great solemnity!)

Does the Wehrmacht have the troops to spare, or has everything that could be spared been sent to Rommel already?

Will the Allies move through Europe, or is Rommel to be attacked?

On that point we need not leave the Fuehrer in doubt. Relying on Gibraltar, on the flexibility of motorized and armored forces, and on speed, to safeguard our left, we have by-passed Spanish Morocco and are moving through North Africa toward Libya.

Supplies are being landed in the ports of French North Africa as the advance forces them into our hands; thus we have the advantage of a line of water-borne supplies. In true blitz fashion, the task force airplanes range far afield, keeping air superiority and blasting any attempt to stop the advance. At the appropriate moment, whatever it may be, the British 8th Army intervenes in Libya, striking a desperate Rommel.[2]

Are the distances to be traversed beyond the power of a mechanized force? German forces have struck from Tripoli to Sollum,[2] and British forces have gone from Mersa Matruh to El Agheila. We can do as well and better. Probably we need only match that performance to clear the North African littoral.

Bear in mind that the process of reinforcement will be continuous. Troops and supplies will come through Casablanca and Rabat, and later through Algiers and Tunis, as fast as they can be landed. It is about three times as easy to supply an army in North Africa via Casablanca or Algiers as to supply that army via Cape Town and Alexandria.

Now let us consider some of the strategic advantages

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[1]It should be remembered that this article was written last April, and that these figures do not relate at all to those of the actual operation.—Ed.

[2]Remember, this article antedates both the German drive to El Alamein and Gen. Montgomery's successful counter-blow.—Ed.

that would flow from control of North Africa. First of all, with ample support from land-based aircraft, Allied convoys en route to the Far East could use the short Suez route. The advantage to the Allied position in the Far East is obvious.

Second, the second front so badly needed by the Soviets would have been opened with a vengeance. Hitler will have no assurance that that front will not begin to move steadily closer. He will have to pull troops out of Russia to guard against that.

Turkey would be strengthened in any desire she might have to avoid the Axis, or such a desire might be reestablished.

A drive by the Axis through Turkey to the Suez to meet with Japan would become impossible.

Allied morale would soar.

From the North African springboard we can enter Nazi Europe via the Balkans. Thus we enter Europe behind Germany's channel forts, and as we advance we shorten our line of water communications. We strike Hitler at his heart.

The route through the Thracian passes, reversing the German advance down into Greece, then thrusting up the Vardar valley, has its points. One is that of flank pressure on Nazi communications to Southern Russia. Another is that we unite with a little war already in progress.

The disadvantages are that we are at the end of a long line of communications, and that we cannot strike home, north from the Balkans.

But those are problems to be settled as they arise. Most important to bear in mind is that we can strike in the very near future. We can strike with what we now have. We can make an opening gambit with real strategic possibilities. We can lessen Jap pressure in the Far East.

Oh, what about Vichy France's tender feelings? As you see, I regard Vichy France as already a Nazi pawn, and am not concerning myself about what they may or may not be told to do.

But there's one answer to the problem. It's not perfect, but the *perfect* plan never comes. I've not seen any better plan in print, nor have I seen one that could begin within the assembling and equipping of a task force, not in 1943 or 1944, but now!

FIELD ARTILLERY SCHOOL
Office of the Commandant

Fort Sill, Oklahoma
October 21, 1942

MEMORANDUM: Contribution of articles to *Field Artillery Journal*.
TO: Directors, All Departments
Commanding Officer, School Troops
Commanding Officer, FAS Detachments

1. Personnel of this command are encouraged to contribute articles on field artillery subjects to *The Field Artillery Journal*. It is the duty of artillerymen to assist in the improvement of the arm in which they serve. The *Journal* is a professional periodical; contributions from varied and individual sources tend to stimulate thought, create and disseminate new ideas, and generally benefit the profession of the artilleryman.

2. Publication of articles submitted will depend upon the editors of the *Journal*. Review by this headquarters will be limited to indicating glaring defects and unsound theory and practice. No attempt will be made to halter the ingenuity or sound logic of writers. It is not essential that articles be in strict accord with accepted school doctrines. However, it is necessary that personal opinions not be confused as being methods or principles taught here.

3. Articles should be submitted direct to The Commandant, FAS, Fort Sill, Oklahoma, Attention of Publications Division, S-3 Section. Manuscripts should be in legible form, preferably typewritten, double-spaced, on 8″ by 10½″ paper, written on one side only. Illustrations should be on a separate page for each illustration. The writer should not identify his connection with the school.

4. Directors of departments and activities, chiefs of section, and unit commanders will cause this memorandum to be brought to the attention of all personnel and render such assistance as may be possible.

By Command of Brigadier General BALMER:

/s/ D. G. McLennan, *Major, FA, Acting Secretary*

The foregoing memorandum is worthy of study by all field artillerymen in view of its clear, logical, and understanding statement of the purposes and benefits of such professional military publications as THE FIELD ARTILLERY JOURNAL. Although articles should be sound in theory and practice, one of the best ways for our tactics and technique to grow and develop is through a forum for the free, unhampered expression of the thoughts of officers of all grades; the JOURNAL provides this forum. With this strong support from the fountain-head of our doctrine, the Field Artillery School, officers should not hesitate to express themselves to us. Space limitations may delay or occasionally prevent publication of a given article, but there is always a place for sound, live articles however heretical their theme might appear to be to some individuals.

AN ADDITIONAL MEANS OF TRAINING ARTILLERY

By Brig. Gen. J. E. Lewis

Readers who have a file of back JOURNALS *may be interested in referring to "Notes on Sub-Caliber Practice" (page 129 of the* JOURNAL *for March-April, 1932), written by the then Major Lewis while he was serving with the 1st Field Artillery at Fort Sill.*

The current shortage of ammunition for the training of inexperienced officers and firing batteries, and the limited availability of and distance to artillery ranges, indicated the development of means of training officers and gun squads with other than service or 37-mm. subcaliber ammunition. Below is described one of the means developed by the undersigned to overcome this difficulty.

As miniature sub-caliber, we have used at various places the "Tommy gun," the .22 sub-caliber rifle, and the .30 caliber rifle. If a range with suitable backing is available, the .30 caliber appears to be the best of the lot, as it can readily be used with a range of from 300 to 600 yards where the soil in the impact area is such as to give a puff of dust or sand—and this condition has been found to prevail rather generally all the way from Pine Camp to Camp Blanding. An impact area sloping toward the firing point is desirable; unless it is large and bare, a few rounds of tracer should be at hand to find the trajectory in case several successive rounds are lost.

THE MOUNT

The mount shown herewith is designed for fastening the .30 caliber rifle (M1917, M1903, or M-1) to the tube of the 155-mm. howitzer. Figure 1 shows it mounted parallel to

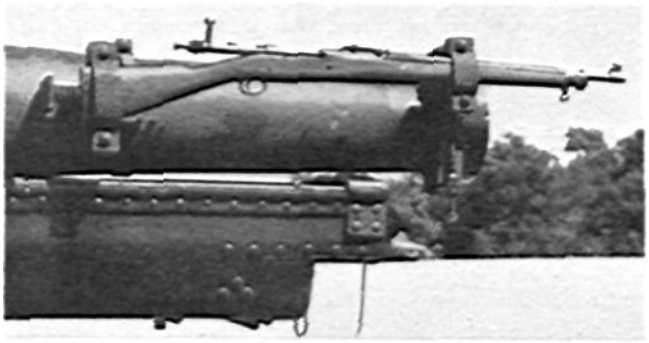


Figure 1

the axis of the bore and offset to the right about 7 inches. This particular setting is suitable for use in direct laying or training in antitank work.

Figure 2 shows the setting appropriate as a miniature sub-caliber device for gunnery use, where the bore of the rifle is set about 250 mils below the axis of the tube of the howitzer. The elevation screw "A" permits any setting desired.

Figure 3 shows the two parts of the mount, the left-hand one being for the breech and the right-hand one to support the muzzle of the rifle.

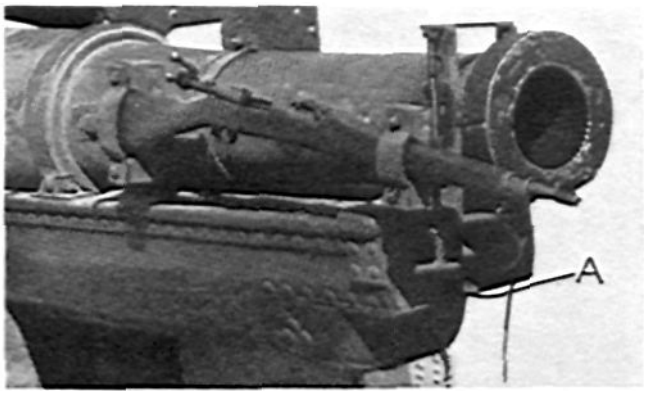


Figure 2

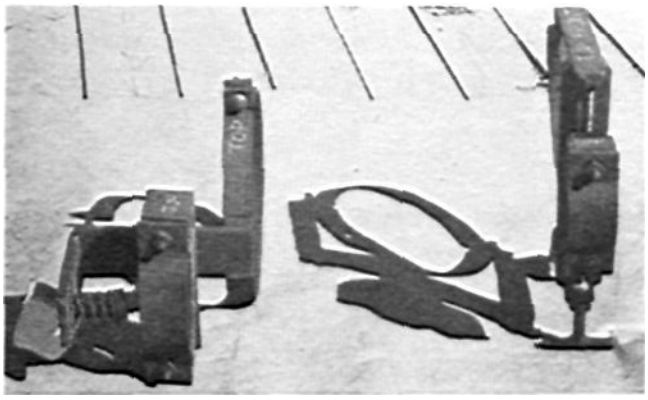


Figure 3

An examination of Figures 1, 4, and 5 shows further details of the rear mounting. Note the spring "B" in Figs. 4 and 5 which cushions the rifle in recoil. This is not necessary in case the .22 caliber is used.

Figure 6 shows details of the front mount. Note particularly

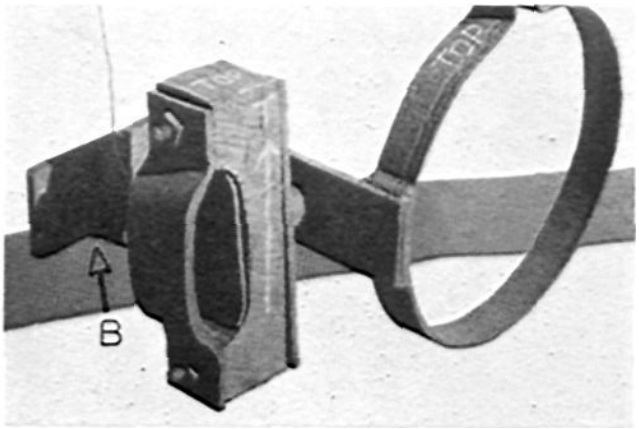


Figure 4

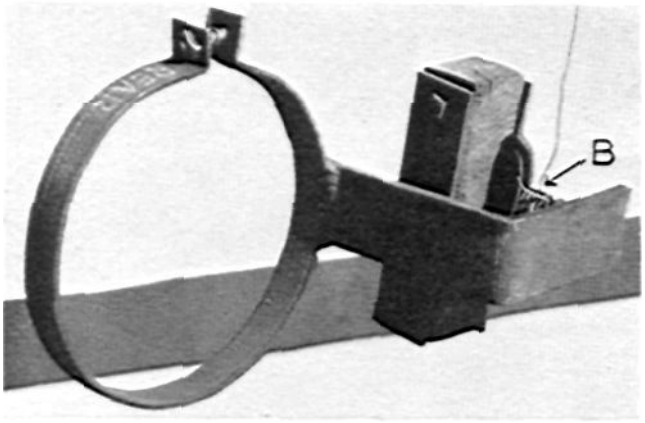


Figure 5

the elevating screw marked "A," and the elevating screw lock nuts marked "C."

Any good Ordnance shop can improvise this mount from scrap metal and a few parts common provided it has the necessary cooperative attitude and the interested commanders have the interest to urge its production.

USE

As a miniature gunnery device, it is desirable to depress the muzzle of the rifle to between 200 and 250 mils below the axis of the tube of the piece, thus permitting elevations comparable to service ammunition. For precision adjustments single pieces can be used without further ado. "c" will be found to vary between 2 mils at about 300 yards to 4 mils at about 600 yards. If it is desired to increase the probable error, it can be done by snipping off the points of the bullets with wire cutters. This device at least doubles the probable error and gives a more curved trajectory.

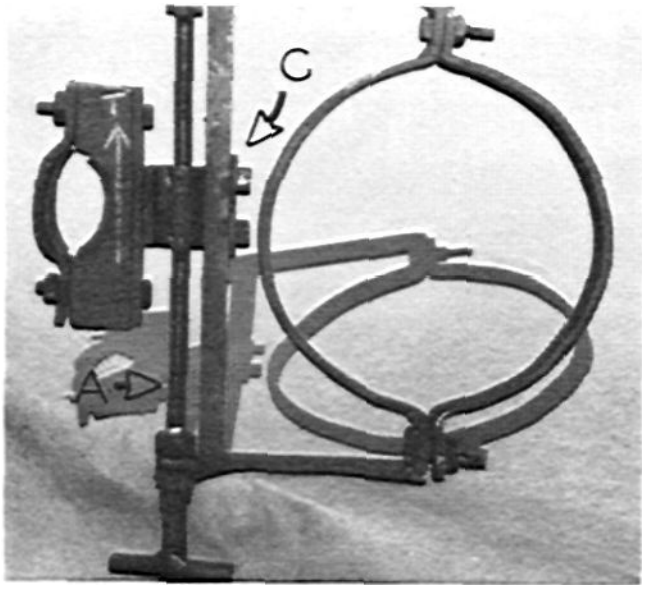


Figure 6

One extra member in each gun squad is required, i.e., a soldier who stands in front of the shield and loads and fires the rifle. He should load at the command for quadrant or elevation and fire only on command of his chief of section.

BRACKET ADJUSTMENTS

If a four-gun battery with the sub-caliber device is to be used for bracket adjustment, the battery should be calibrated. The following methods were found to be suitable: Select a line target (one whose elements are known to be at the same range) or a battery target (also of pieces at the same range), and by precision methods adjust each piece on its proper part of the target. Compare the adjusted elevations with that of the selected base piece and either apply the calibration correction to each elevation announced or, preferably, elevate or depress the muzzle of the sub-caliber tubes of other than the base piece by the required number of mils or fractions thereof by means of the elevation screw (see Fig. 6) on the mount. The calibration correction also may be applied to the angle of site set off on appropriate pieces, thus permitting but one individual site setting during a mission and using common elevations throughout. In case the 1917 Enfield is used it will be found that the gunner's quadrant can be placed directly on the top surface of the receiver, since this surface is parallel to the bore.

After this initial calibration it is now possible to proceed with bracket adjustments, much as one would in firing service ammunition. The pieces should be placed about two yards from muzzle to muzzle, and if a range of from 300 to 600 yards is available everything can be used on 1/10 scale, permitting the computation of firing data with facility. All types from axial to large T can be fired and it will be found that factors work out quite well.

DIRECT LAYING

As a means of developing the gun squads in direct laying, small sleds bearing a suitable superstructure (representing armored vehicles) can be towed over a variety of tracks in the foreground, preferably 75 to 150 yards from the guns; certainly twenty problems per hour can be fired. It will be very realistic if the squad is required to load the piece with dummy ammunition between rounds.

GENERAL

The assumption is not made, nor any claim made, that fire of this type is the equal of service ammunition, but it is a useful and, under the current circumstances, almost a necessary means of familiarizing inexperienced officers with the mechanism of gunnery. Its use makes a distinct contribution in developing assurance, accuracy, and speed in gunnery. Since it is a very fast and economical method of doing it easily, it permits giving gunnery instruction to noncommissioned officers.

Air-Rifle Subcaliber

By Lt. Ben Altman, FA

When one reads reports that "The enemy first engages our antitank guns and artillery with his Mark IV tanks and supporting guns; meanwhile, Mark III tanks form up for the assault and frequently challenge the defended area at different points in strong compact formations," too much emphasis cannot be placed on skillfully training all cannoneers within the gun sections. The solution lies in sub-caliber material within economic limits, variable and interchangeable mounts which are available or can be constructed, and practicable targets. A miniature firing range is considered a minor problem for field or garrison troops.

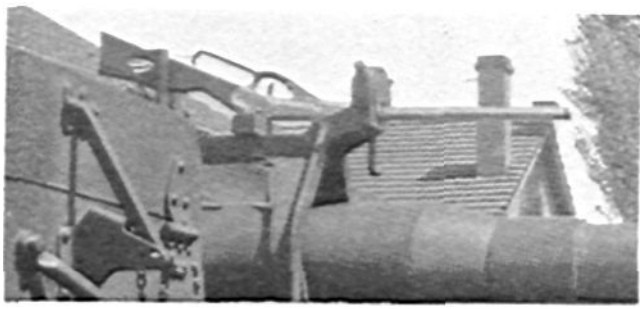
An air rifle firing lead or steel balls has proven successful for this purpose. Cost per gun is between $1 and $5. Ammunition expenditures are negligible, 200 shots costing 5c. This weapon is sufficiently accurate at short ranges, 50 to 100 feet, to permit sensings.

Two types of mounts were tested. Both are satisfactory, each having advantages and some disadvantages.

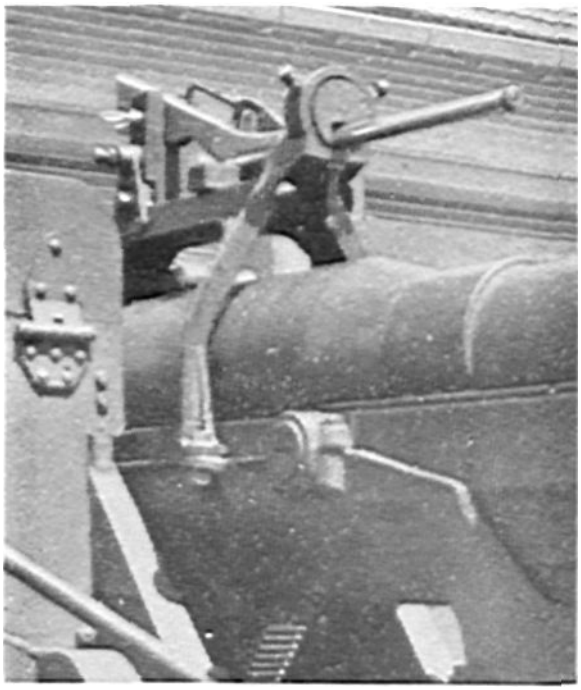
TYPE I MOUNT

The first type consisted of a 37-mm. subcaliber mount M7 with improvised wooden seats for housing the weapon. A cylindrical wooden disc was fitted within the collar and a small hole bored to receive the rifle barrel. A tin strip tacked around the outer circumference of this disc keeps the adjusting screws from penetrating the wood.

A rectangular block was fitted between the trunnion bearing brackets; fillister head cap screws and jam nuts hold this section firmly intact. A slit at the upper end seats the rifle stock. To stabilize the gun further, a small hole was bored continuously through the wooden seat and rifle stock and a screw inserted. By mounting the air rifle upside down, it can be cocked easily and quickly. At first this cocking action created undue pressure beneath the lever arm, but the trouble was overcome by inserting a small rectangular support block between mount and rifle.



Photograph 1
Air rifle is mounted upside down in Mount M7 to permit cocking and facilitate firing.



Photograph 2
Note special mounting to relieve pressure on rifle barrel at collar, and also supporting block between mount and back of rifle.

Since the air rifle loads by gravity, it is necessary for No. 2 of the gun squad to load each shot singly and seat it by means of a wire rammer; this is advantageous, as uniform seating for every shot is attained. Cocking must always precede loading to insure proper discharge.

Photographs 1 and 2 illustrate this type mount. Its major drawback is that accurate bore-sighting is impossible.

TYPE II—ENCLOSED MOUNT

A second type mount was constructed from an empty 75-mm. cartridge case. The primer container is initially removed and a hole bored through the base of the empty case. This must be accurately machined out so that the hole will be centered, and this opening must equal the diameter of the air rifle barrel. A steel disc, 3″ in diameter and with a hole through its center also equal to the diameter of the rifle barrel, is inserted in the open end of the cartridge case. The rifle barrel thus fits snugly and is accurately centered. Solder between the brass case and metal disc and also at both ends of the cartridge case firmly attaches the rifle to case. Since this particular air rifle holds 500 shots and occasionally a round jams the magazine, it was found practicable to remove approximately 4 inches of the cartridge case so that the magazine could be removed when sticking occurred.

In fact, the average air-rifle barrel is too short to permit attaching the entire cartridge case and still leave the filler hole exposed. This shortening does not hinder a perfect seat between bore and case.

Other methods of mounting cartridge case to air rifle are feasible. A solid wooden cylindrical block can be inserted into the case to seat the rifle barrel, or two separate discs can be leaded in at either end of the case.

Photograph 3 illustrates cocking the rifle by No. 2 of the

Photograph 3
Rifle is quickly cocked and magazine automatically fed by gravity.

gun squad. Photograph 4 describes method of holding prior to loading, while Photograph 5 shows the final seating and firing of the sub-caliber. Time required for this operation is about that for actual loading and firing.

Advantages for this type mount are: (1) its use resembles actual firing technique, (2) it is easy and economical to construct, (3) bore sighting requires no extra equipment, (4) rifle can be fully loaded and (5) the rifle can be quickly transferred from one gun to another. The principal disadvantage is that empty cartridge cases are sometimes difficult to obtain. Although cases are expanded to some degree after firing, both HE and shrapnel cases (used) have been found which will fit the bore. An unfired case is naturally desirable, if one can be obtained from Ordnance. Dispersion is variable in air rifles, some firing consistently low with others either to the right or left. Each rifle should be tested throughout a number of ranges to determine its peculiarities.

Photograph 4
Cartridge case is shortened by 4" to permit removal of magazine and natural loading of 500 pellets.

TARGETS

Steps in training gun squads include thorough instruction in either one- or two-man system of laying (depending upon materiel), tracking suitable targets, firing on a miniature range, and firing of service ammunition.

Photograph 5
Rifle seats in reverse position, as the cocking lever encounters the eccentric-screw type breechblock in natural position. On sliding wedge breechblock the rifle may be fired from a sideward angle.

Photograph 6

Above set-up represents an ideal tracking target for gunner training.

Photo 6 illustrates a target set-up for gunner instruction in tracking. Target consists of a miniature metallic tin tank, mounted on a sheet of white cardboard. Shots hitting the tank resound a distinct ringing noise, while those missing leave a black mark on the white background and can be easily noted by the gunner through the panoramic telescope (and usually by the No. 1 cannoneer by glancing over the shield).

This target is mounted between two poles 120 feet apart in order to give a wide traverse. W-110 wire is utilized for the carrying medium, being suspended on two pulleys, one at either end. A metal roller for upper line and clamp device to the lower line permits the target to be traversed smoothly in either direction; one man at a pulley can manipulate the target for the desired speed and direction. Wire clamps hold the cardboard to the lower line. White paint or chalk can be used to cover previous problems. This type target gives insufficient training for No. 1, however, since the maximum elevation change throughout our target run is only 25 mils.

For training both gunner and No. 1, Photo 7 illustrates a more suitable target. Tank is realistic in appearance and can be moved in 'most any direction by means of four leading lines. A sloping dusty ridge is ideal terrain for picking up shot sensings. At least four or five targets should be on the terrain in order that once a direct hit is scored, the gunner can immediately transfer his fire to another tank.

Photograph 7

A miniature target pulled on a sloping surface gives excellent training for the gun squad. Vulnerable parts of the tank are quickly brought to the gunner's mind.

Training Films and Film Strips

The following training films, prepared at Fort Sill, are being completed in Hollywood:

Signal Communication in the 105-mm. Howitzer Battalion

105-mm. Howitzer Battalion in Organization of Position

155-mm. Gun, M1

The following film strips are under preparation at the Field Artillery School:

1st Echelon Maintenance

Field Fortification for Field Artillery

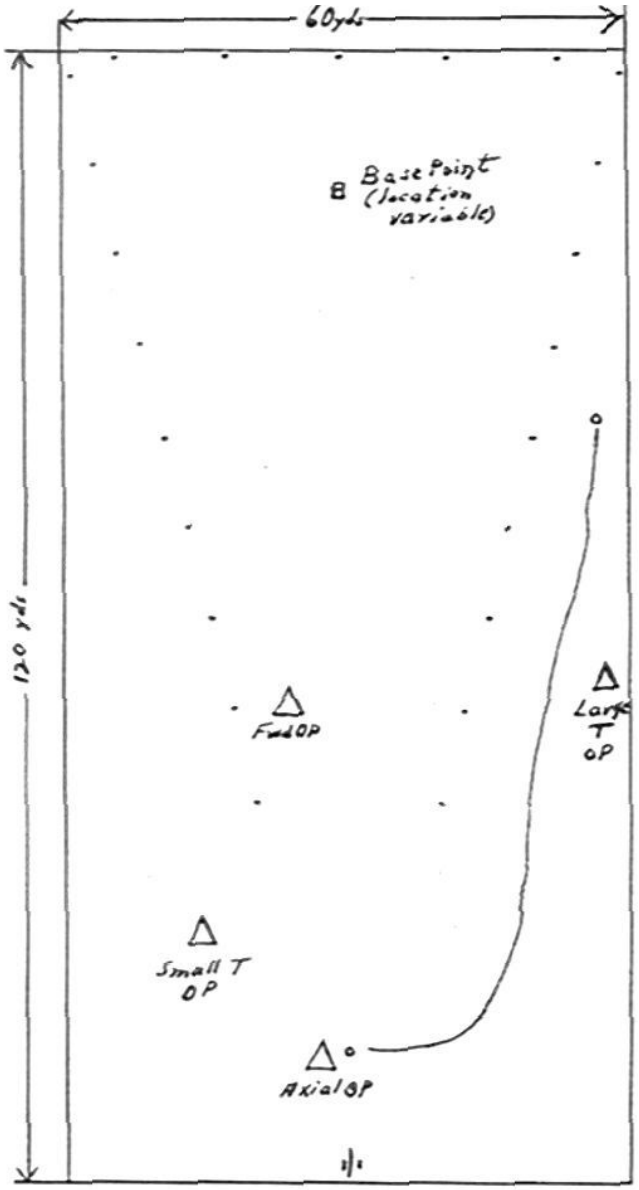
—F.A.S. Information Bulletin

TAKING OUT THE "DRY"

By Maj. H. S. Howard and Lt. John E. Duker, Jr., FA

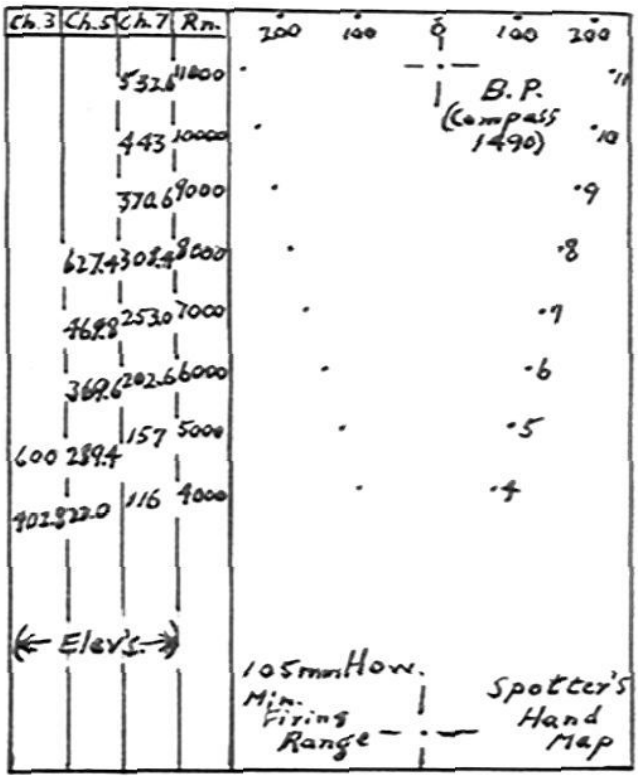
A method that has been found effective for conducting Officers' School in observed fire, particularly in circumventing the artificialities and "dryness" of classroom blackboard problems, involves the use of a miniature range large enough to reflect terrain features and so laid out that a "spotter" can accurately place every shot called for.

For the miniature range select a plot of open ground about 120 × 60 yards with ravines, hills (ditches, gulleys), and other topographical features. Designate a point on the center of one end as the gun position, and radiating therefrom drive small stakes every 10 yards on each flank (see Sketch I—10 yards on the ground represents 1,000 yards in range or 1 yard equals 100 yards). On the opposite end (and also on an intermediate line) place stakes every 100 mils as measured from the gun position; if possible have these stakes so they are not visible from the OP areas, especially the intermediate stakes, which may be particularly necessary if the range has a wide sector. The stakes, obviously, are used by the "spotter" to "spot" shots in accordance with the given fire commands. Plant a few targets (toy cannons, truck columns, soldiers, etc.) at appropriate points in the target area, and the miniature range is ready to use. OPs are occupied in accordance with the type of problem to be fired (see Sketch I again).



Sketch I.—Min. Rn. Layout
10 yds. on ground = 1000 yds. in range
(or 1 yd. = 100 yds).
▪ = "spotter's" stakes.

What about the shells? Simple! Arm an officer with a ten-foot stick with a paper burst on the end of it, equip him with a miniature map showing the compass to base and check points as well as elevations for various charges (see Sketch II), and orient him with regard to guns and stake locations (stakes are so marked as to be visible to spotter only). He is now ready to spot shots called for, whether single bursts or volley fire. Caution



Sketch II
Spotter's Min. Range Handmap.

him to use entire stick length and to stand in opposite sense of burst so observer can tell nothing regarding shot locations by spotter's position, particularly where shots are lost in ravines (which will happen, adding to realism).

Follow approved OP organization methods: run a line from OP to an invisible point in target area from which 'phone operator can repeat commands to spotter and to which the latter can signal when to report "on the way." Have regular recorders at both ends of the line to simulate an actual "set-up" (providing, incidentally, excellent training for recorders and operators). If desired, another recorder can follow each problem on a blackboard at the OP for reference (if necessary) by officer firing and for use in the critique. You are then ready to "fire" your officers under service practice OP conditions, with shots appearing as called for by the fire commands.

In actual use, this miniature range method, besides giving the officer just what he asks for, causes him to study the terrain and become accustomed to firing conditions, the latter overcoming or to a considerable extent suppressing "buck fever" on his actual service practice firing. Of course the r/R changes rapidly as does the $\angle$ T, which, however, is more of a training asset than a liability. This system approximates firing conditions in many respects, and where no FA Trainer is available is a good substitute for the Bishop Battery. It can also be adapted to training in fire direction.

MILITARY LOVE LETTER

First I write the heading and then put down the date
(Oh, how I wish I'd one with you, but leave is rare and late).
Of course I type in SUBJECT: Love. Directly after TO:
Goes—My Best Girl—and don't you dare to doubt that that means you.

Then—"Reference your letter, same subject as above,
The undersigned reports himself head over heels in love."
On to the second paragraph I snap typewriter carriage
And recommend that we proceed without delay to marriage.
Next comes name, rank, and outfit, and though it may encumber,
I add, so you will know it's I, my Army serial number.

By first indorsement you reply that "For your information,
The basic letter meets with favorable consideration."
Although non-regulation a practice such as this is,
I recommend that you append, "Inclosures: Lots of kisses."
Then since I may be leaving soon to bid the foe defiance,
I urge that my proposal shall receive your prompt compliance.
As to the third indorsement, you shouldn't have to guess.
Make it "Approved" or "Granted," or better, "Darling, yes!"
So far it seems as plain to read as well-spaced airplane panels,
The course of true love *can* run smooth through military channels.
But in the U. S. Army one is apt to meet with trouble;
Sometimes it comes in triplicate and sometimes merely double.
On up through proper channels goes that letter we've been writing,
Attention to the previous indorsements all inviting.

At last (it takes an age, my dear) it comes before the Colonel.
His is a stern exterior; his temper seems infernal.
But he was young himself once and remembers what is due men.
I never would have thought it but I know now that he's human.
He understands just how I feel, drawn by your sweet attraction,
For his indorsement grandly reads: "For necessary action."

—MAJ. FAIRFAX DOWNEY, FA

PERIMETERS in PARAGRAPHS

(Based on the latest information available at time of writing, but subject, of course, to future historical change.)

By Colonel Conrad H. Lanza

EGYPT AND LIBYA

On 23 October 1942, the Axis and British armies in Egypt confronted each other along a line about 35 miles long in the vicinity of El Alamein, extending from the Mediterranean Sea on the north to the Qattara depression on the south. The latter is a wide expanse of loose sand and swamp. While not impassable, it is difficult to traverse and neither side attempted to maneuver through it. It would have been possible to go around it by making a wide detour, but neither the British nor the Axis had forces available to make such a turning movement while at the same time holding the El Alamein front. Under these circumstances the only practicable offensive was a frontal attack or penetration at one or more selected points.

The Axis forces were commanded by Marshal Rommel, an experienced general. He had been defeated before, but had always managed to stage a comeback and was now deeper in Egypt than he had ever been. He had under him

German troops: 15th Panzer, 21st Panzer, 90th Motorized, and 164th Motorized Divisions, constituting the Afrika Corps.

Italian troops: XX Corps—Ariete Armored, Littoria Armored, Trieste Motorized Divisions; X Corps—Pavia, Brescia, and Folgore Infantry Divisions; XXI Corps—Trento and Bologna Infantry Divisions.

In all this was 4 armored divisions, 3 motorized divisions, and 5 infantry divisions—a total of 12 divisions. They were reported as below strength, and with only about 600 armored vehicles.

The British force was their Eighth Army under Lieut. General Bernard L. Montgomery, which included:

44th, 50th, and 51st British Divisions,

Two British Armored Divisions,

Divisions from Australia, New Zealand, South Africa and India,

and contingents from the Fighting French, Poles and Greeks.

This is the equivalent of about 10 divisions, with about 1,000 armored vehicles. The British had a superior force of corps and no army artillery, and a much superior air force (which included the 9th U. S. Air Force).

The opposing armies were not greatly different in strength, but in materiel the British were decidedly superior.

The Axis line consisted of strong points, well laid out and protected by double belts of wire and mine fields. The latter made it impracticable to use tanks for an assault. It was therefore necessary to open a way through the mine fields before the superior force of armored troops could be used. General Montgomery decided to divide his attack into two phases, separated by an interval of several days. The first phase would be devoted to capturing the enemy's front defense area by a joint infantry and artillery attack, which would place the mine fields within the British lines. During the interval engineers would remove the mines to allow the armored troops to come forward. In the second phase the armored units would pierce the enemy's front and bring his inferior armored divisions to battle, where they could be destroyed. This in turn should lead to the complete destruction of the hostile army.

Prior to the initial attack the air forces of both sides conducted daily frequent raids against the motor vehicles and gasoline dumps of the other side. Each side has claimed causing wide destruction, but no reliable figures have yet appeared.

The first phase started on the night of 23/24 October, by an artillery preparation starting at H hour (about 2230) and which covered the entire 35-mile front. It was the most intense preparation yet fired in the Egyptian Desert. The infantry jumped off at H + 20, under the light of a full, brilliant moon, which gave enough illumination to maintain the direction of attack but not enough for the enemy's OPs to adjust fire. This attack followed a carefully prepared schedule, the infantry proceeding from one line to another. The artillery plan conformed to the infantry movements, and targets were allotted to batteries for definite periods of time. The attack ended at H plus 6 hours, when the final objective of the night was to be reached. Thereafter the artillery continued its fire for three additional hours to prevent the enemy from observing that the attack was over and to give the infantry an opportunity to consolidate its new positions.

The attack was completely successful; the British pushed into the enemy forward lines. Both belts of wire and mine fields were crossed and a tank head secured beyond. About 1,450 prisoners were taken. No data as to other casualties has been released.

Under protection of the new advanced infantry positions, the sappers proceeded to open a passage through the mine fields in rear of the newly secured tank heads. Much of this work had to be done at night, and was

necessarily a slow job. Two passages were opened: one in the north sector and the other in the center. During this period the artillery was displaced forward and ammunition moved up for a new artillery preparation. It was found that the tank heads secured had not been quite deep enough, so a new attack was made on the night of 31 October/1 November. It followed the plan of the earlier attack. H hour was 2200, at which time a violent artillery preparation started, covering as before a 6-hour attack period plus a 3-hour supplementary period. Some batteries had as many as 28 targets assigned them for the night. At one sector having a front of about 5,000 yards, in order to push the infantry through the enemy's main line of resistance (which had a depth of about 400 yards) the artillery fired 1,500 shells a minute. This gives a density of fire per minute of 1 shell for each 3 yards of front, or 1 per minute for each square 35 yards on a side. To maintain this rate of fire for the number of batteries reported, a rate of fire of about 7 rounds per minute was required. The smallest shells used were the British 25-pounders.

Both attacks in this first phase were exclusively infantry and artillery, with the guns as the main attack instrument and the infantry for consolidation and exploitation. The second attack accomplished its mission, and at the end of the engagement there were two bulges or tank heads within the enemy's original line. One of these was in the north, close to the coast and parallel to the railroad; the other was about 8 miles to the south. In rear of these the armored troops now assembled.

The last gain had involved some losses. The Axis claimed to have captured 2,000 of the infantry, while the British did not report the capture of any great number of Axis prisoners. Among these were included deserters, found to be Poles who had been drafted into the German Army.

Everything was now ready for the second phase, which started at 0200, 2 November, the night following the completion of the first phase. Behind a terrific artillery barrage the tanks rumbled forward in the greatest armored attack ever delivered by a British army. The tanks broke through the hostile front. They quickly became engaged with the two Panzer Divisions which, having noted the tank heads, had been posted about them. Amidst whirlwinds of dust and sand the tanks swirled back and forth in the vast desert all day long and into the following night. The British tanks which went through the south tank head turned north in rear of the enemy's lines and in a fierce running battle wound up in the north sector, joining in the tank battle there.

Back of the tanks, through the gaps that had been made, infantry divisions followed and mushroomed out to right and left, enlarging the gaps and bringing confusion into the Axis ranks.

On 3 November the tank battle was renewed at dawn. It did not last long. The few remaining Axis tanks were driven off the field. Marshal Rommel, realizing that he was beaten, issued the order to abandon positions and withdrew from Egypt. The British had won the battle.

This great tank battle was won not by superiority in number of tanks, which was considerable, but also by the superiority in the quality of the tanks. Many of these although in British units, were American tanks of the latest model. In comparison to the German tanks they had better armor, were faster, and had a heavier weapon —a 75-mm. gun. With these odds, the German Panzer divisions were almost wiped out.

German Field Service Regulations prescribe that if a retreat is necessary, it shall be made under cover of rear guards to a considerable distance, sufficiently far to assure ample time for reorganization and preparation for a new campaign before the enemy can attack again. In accordance with this principle, Rommel detailed a suitable rear guard. It contained engineers to lay mines on the few available roads and artillery to prevent the enemy closing in. The main body then withdrew at least 500 miles—farther than the British probably had expected so soon. It led the Axis out of Egypt and through most of Libya. It involved the abandonment of Tobruk and Bengazi, and at present seems to be ending in the vicinity of El Agheila, which was where Rommel retreated to about a year ago.

The El Agheila position is similar to that which the Axis held at El Alamein. A short line of 40 miles has the Mediterranean Sea on the north and an extensive, almost impassable depression on the south. The position can not easily be turned. As Rommel has had at least two weeks to rehabilitate this line, it may be necessary to make a new frontal attack, in the same manner as at El Alamein. This will involve moving forward artillery and accumulating ammunition, which will take time. In the meantime, Rommel may be reinforced.

Rommel did not quite abandon his Italian divisions in Egypt as has been charged in the press. He provided efficient rear guards. The average rate of the British pursuit has been about 30 miles a day. This is not beyond the march possibility of good infantry, and not beyond what German infantry appears to have accomplished in Russia in 1941. German transport planes brought out the Italian sick and wounded. Nevertheless, the equivalent of at least three Italian infantry divisions appears to have been lost. The British report a total of some 30,000 prisoners taken, and they estimate Axis losses in killed and wounded as another 45,000.

The British Eighth Army has won a great victory. Its strategical value has been enormously enhanced by the seizure of Morocco and Algeria by American troops, and by the prospective British-American attack on Tunisia. For the first time the Axis is now confronted with two fronts in Africa. Of these the east front has just been badly defeated, while the west front has to be hastily organized from nothing. From the point of view of the United Nations, the situation in North Africa has never been so favorable as it is at this moment.

THE SOUTHWEST PACIFIC

Last month's account of events closed on 16 October, at which time the Japanese had landed an undetermined number of troops on Guadalcanal. They had also commenced an air campaign against the positions on that island held by our Marines and Army troops; these attacks continued daily for several days, notwithstanding severe Japanese losses of planes.

On 20 October a large number of hostile ships were discovered assembling in and north of the North Solomon Islands. This was interpreted as indicating that an attack on Guadalcanal was imminent. The enemy's main base in this area was Rabaul, which was within the territory assigned to General MacArthur. He had his air force bomb Rabaul nightly. Enemy scouts ranged the seas for great distances.

On the north side of Guadalcanal we held a strip of territory about 7 miles long and 3 miles deep. Henderson Field is in the east half of the strip. Having satisfied himself as to the strength and location of our naval forces, on 25 October the Japs made a coordinated attack with land, sea, and air forces on our positions there. The land attack came early in the morning on the south side, but was stopped by our troops.

An enemy naval force of cruisers and destroyers arrived (also early in the morning) near Tulagi, which too was held by us. The Japs caught and sank one of our tugs and a small patrol boat. Our shore batteries, manned by Marines, made three hits on an enemy destroyer. The enemy then steamed over to Guadalcanal. Three of their destroyers in the lead became engaged with two American mine sweepers, to whose aid came our air forces. The latter sank two of the three destroyers. The enemy naval force could not be stopped, however, and about the middle of the morning it started to shell severely the north side of our positions, while at the same time Jap land forces continued their attack on the south side. This naval force, having expended its ammunition, then steamed back toward Florida Island (on which is Tulagi), about 15 miles away.

During the afternoon three attacks were delivered by our air force, during which four hits on cruisers were reported. While our planes were thus engaged, enemy planes attacked Guadalcanal, losing 5 out of 25 planes and inflicting only minor damage.

The Japanese land attack made no progress. It was renewed after dark and this time penetrated our south line, but it was impracticable for us to do anything to correct this situation that night. Next morning, the 26th, troops counterattacked and regained the original line. Our Marines attacked on the west flank, and made a small advance.

Another hostile naval force had been located by this time. It consisted of aircraft carriers and an escort, and was 300 to 400 miles northeast from Guadalcanal. During the night of 24/25 October it was attacked by our planes, who believed that they secured one hit on a cruiser. But an American Task Force was approaching, and on 26 October occurred the naval battle of Santa Cruz, north of which island the engagement was fought. The ships of the contending sides did not contact one another. Fighting was by planes against ships and planes against planes. Considerable damage was inflicted by each antagonist.

Japanese and American communiques agreed that the Japs had two aircraft carriers and one cruiser damaged. Our accounts claim hits on two additional cruisers and a battleship, on which the Jap accounts are silent. We do not know whether the enemy succeeded in bringing his damaged ships to a port. Our losses were one aircraft carrier and one destroyer sunk. The Japs according to their accounts lost 40 planes, and according to ours about 100. After this battle both fleets appear to have withdrawn to their respective bases.

On Guadalcanal, the Japanese made minor land attacks for one more night. Thereafter there was reciprocal and extensive bombing of Japanese bases in the North Solomons by us, and of Guadalcanal by Jap planes. On several nights enemy surface ships intensively shelled our positions. Commencing on the night of the 30th, for several nights American surface ships in turn shelled the Japanese positions on Guadalcanal. On the 31st our planes attacked Buin in the North Solomons, sank a heavy cruiser and damaged other ships.

In the night 3/4 November, new enemy troops, estimated at about 1,500 men, landed on Guadalcanal. Our Marines promptly attacked next morning and made a small gain. Then in the next night the Japs attacked but with no gains.

On 10 November another strong hostile naval force was discovered approaching the South Solomons from Rabaul and Buin. It was evident that another attempt was about to be made to recapture Guadalcanal, as numerous transports were reported as being with the enemy. Next day the Japs recommenced air attacks on Guadalcanal, losing 20 out of 52 planes against an American loss of 7 planes. On the 12th an American naval Task Force shelled the Jap positions on Guadalcanal. This was interrupted by the enemy making an air attack on the ships. We report the enemy as losing 31 planes, which seem to be all he had. One of the Jap planes crashed on a cruiser causing substantial damage.

During the night 12/13 November the main Jap naval force arrived off Guadalcanal. A violent engagement began with the American fleet already there. This battle was discontinued during the day, but was renewed the following two nights, in the last of which a second American force arrived. The severest fighting appears to have been on the first and third nights, for on the second night the Japanese were able to shell our land positions without great interference by surface vessels.

No reliable account of the details of this engagement are yet available, but it appears to have been the major sea battle of the war so far.

The results of this long battle are reported as:

For the Japanese:

a. **Out of at least 12 transports, 8 were reported sunk by aircraft during Nov. 13th. There is no claim that they were sunk instantly, and press reports that 16,000 enemy troops were drowned appear to be surmise. It is admitted that transports not sunk, amounting to at least 4, reached Guadalcanal and landed their troops. Japan admits only having 7 transports damaged.**

b. **The enemy's and our reports agree that out of 2 battleships, one was sunk and the other damaged.**

c. **8 Jap cruisers were identified as present. Of these we claim to have sunk 5 and to have damaged 1. The enemy admits the loss of 1 cruiser only.**

d. **10 Jap destroyers were identified, and of these we report 5 sunk and 6 damaged, which exceeds by 1 the total number of destroyers the enemy was supposed to have. Jap reports are that they lost 3 destroyers sunk, plus 1 damaged.**

e. **On the morning of Nov. 15th, 4 enemy transports were discovered beached on the Japanese end of Guadalcanal. Everybody fired at these—navy, air force, and artillery. They made excellent targets, and after the firing was over the ships were gone. Press reports alleging that more thousands of Japanese troops were destroyed on these ships are unwarranted, as there is no evidence that there were any troops on board. There is lack of evidence as to whether these 4 ships may have been part of the 8 transports bombed in a above, and which might have managed to beach themselves. Otherwise it is not clear why they were beached.**

For the Americans, the size of our forces has not been published. Our losses are reported as:

a. **Japan claims sinking 1 transport and damaging 3 others. No substantiation of this from our side.**

b. **The enemy claims to have damaged 2 battleships engaged, but there has been no report as what damage, if any, was received by him.**

c. **Japan claims we lost 8 cruisers, of which 5 sank instantly, meaning presumably that the sinkings were observed. We have admitted the loss of 2 cruisers.**

d. **The Japs claim to have sunk 4 (or 5) destroyers, and to have damaged 3 (or 4) others. We have admitted the loss of 7 destroyers sunk. It is possible that in the night the enemy mistook some of these for cruisers.**

This great battle brings to a close a phase in the Guadalcanal campaign. After three major attempts to recapture Guadalcanal the enemy has completely failed, and the island now seems to be secure in American possession.

* * * *

Another campaign has been going on in New Guinea, of which no details are available. In face of great terrain difficulties, and strong enemy opposition in the later stages, Australian and American troops have crossed the incredibly difficult Owen Stanley Mountains and attacked the Japanese. The enemy has been pinned against the sea, along a strip of coast extending from Gona to Buna, both places in enemy hands. As this goes to press there is apparently an excellent chance of our enveloping attack, reported to be in progress, eliminating this hostile force. If this is accomplished the east half of New Guinea, known as Papua, will have been liberated. It will be probably our first success along this line.

* * * *

In all, our situation in the south Pacific is better now than it has been at any time since war started. The Japanese seem to have been severely defeated on land, in the air, and on the sea, and their advance definitely stopped.

NORTHWEST AFRICA

The United States has made an important political and strategical decision. It has seized northwest Africa with the avowed intention of using it as a base for that long talked of "Second Front," which will be somewhere in south Europe. An invasion army is to be built in North Africa, and at the proper time will be ferried across the Mediterranean to such places as may then be selected.

At the beginning of November 1942 the only part of North Africa held by the United Nations was Egypt, and not all of that. The Axis held Libya and the rest of Egypt. Libya and Egypt together make the east half of North Africa. The west half, Northwest Africa, was under French control.

France has three possessions in Northwest Africa. Commencing at the east, there is Tunisia, about 40,000 square miles ruled by a native Bey under guidance of a French Resident General. Tunis has roughly 2,500,000 inhabitants, of whom all but 200,000 are natives. The people are divided into tribes, each under its own chief.

Some tribes are nomads, others farmers, some live in cities. In times past almost all were nomads. They had a bad habit, very annoying, of raiding into Algeria and stealing women and other valuable articles—the same kind of behavior as our Apaches and Navajos had in our own Southwest. To stop this nuisance France occupied Tunisia, starting gradually in 1881. There has been considerable success in civilizing this country (which is a protectorate) and in raising the standard of living. Raiding has completely stopped.

Algeria, excluding the desert back-lands, has an area of over 200,000 square miles (or about twice the size of Colorado) with about 6,000,000 people of whom 5,000,000 are natives; the balance are mostly French. The natives in all three French possessions are about one-quarter Arabs or Moors and three-fourths Berbers. Arabs entered the country at various times between the 7th and 11th centuries and introduced and established the Mohammedan religion. The Berbers are descendants of the ancient Numidians of Roman times; nobody knows what their origin was.

France entered Algeria in 1830. Her reason was that the then ruler, a Dey (not Bey) had insulted the French consul by hitting him in the face with a fly swatter at a swanky reception. And this too, before a distinguished gathering. The Dey, although afforded an opportunity to apologize for conduct unbecoming an officer and a gentleman, refused to do so. Consequences: French invasion, and prompt exit of the Dey. The French have been there ever since although native opposition was not totally overcome until 1881.

In Roman times Algeria was covered with farms. The French found it a desert, over which wild animals and wilder Arabs roamed and killed. Naturally there was no commerce. The writer has twice visited this country. France has transformed it. The wild animals have been killed off, and the wild Arabs tamed. The country is once again covered with farms and has excellent paved roads and railroads. This has been accomplished by numerous irrigation projects. Streams have been dammed, artesian wells have been sunk, and water has changed into a most fertile area what had been a desert. Marvellous crops of wheat, barley, cotton, and semitropical fruits are raised. Flocks and herds abound. Commerce is profitable. Algeria has exported food, wines, wool, leather, and other products to France and has received in return manufactured articles, gasoline, etc. Trade between France and Algeria is open to French ships only, by a law similar to ours on coastal shipping.

Algeria is not a colony. It is politically part of France and elected its quota of senators and deputies to the French Parliament. There is a Governor-General, a local officer somewhat like our state governors.

About ten years ago there was strong agitation (with very serious riots) in both Tunisia and Algeria for independence. The natives were by now educated; they read modern books, magazines, and newspapers, and a large proportion spoke excellent French. They had become imbued with the idea that they could run their own states, and thought they preferred to do so. The disturbances were stopped after the native leaders had had it explained to them that if they ousted the French it was very probable that Germans and Italians would take over their countries. They saw the point, and quit agitating. So thoroughly convinced were they on this that notwithstanding the weakness of France since the armistice of 1940, the natives have made no attempt to break away from France. They have realized that small states need a protector. They have liked the French personally, have appreciated what France has done, and decided to stick with the French.

Morocco is another French protectorate, of about the same size and population as Algeria. Until after the beginning of this century it was an independent state. In 1904 Great Britain was desirous of securing better control of Egypt and the Suez Canal by eliminating or reducing French influence. It will be remembered that France built the Suez Canal, and she owned most of its securities. By treaty France gave up her special interests in Egypt, and in return the British gave France—Morocco. The French thereupon started necessary proceedings to conquer that state. In 1911 Kaiser Wilhelm sent the cruiser *Panther* to Morocco, meaning "Where do I come in on this French-British deal?" France bought off Germany by ceding certain territories in West Africa. By a series of short campaigns France slowly occupied Morocco, the job having been completed only within the last five years. Morocco is ruled by a Sultan—one of the few remaining despots left in this world. A French Resident-General is with him as adviser.

In all three possessions France has been careful not to interfere with native customs, laws, and religion. The natives rule themselves. At regular intervals, the Bey of Tunis and the Sultan of Morocco have been invited to Paris as guests of the nation. They have been received with all the honors and ceremonies prescribed for sovereigns, and royally entertained. A mosque was erected where the visitors could practice their religious duties. Viziers, caids, sheiks, and similar minor Mohammedan functionaries were also from time to time brought to Paris and shown what civilization is. In the course of years of association with the French the natives, while retaining their customs and manner of life, have become acquainted with the world. They are well informed and intelligent. It is no longer possible to deceive them for long. They are true live wires.

Into what is indeed a strange and curious country, American troops have arrived. Their way was prepared and smoothed for them around the city of Algiers by months of hard work. Detailed information was secured as to roads and routes, military positions and forces. Arrangements were made for guides to meet our troops, for labor to handle landing boats and unload supplies.

Supplementing these efforts, on one night during October, the United States secretly put a small mission ashore in Algeria. It was headed by Maj. Gen. (now Lieut. Gen.) Mark W. Clark. It spent all next day at a rendezvous.

Our troops landed at 0100, 8 November, both east and west of Algiers. Guides met them (some being mounted in cars) and led the troops to predetermined points. Troops seem to have marched in column in route order. According to the correspondent of the Chicago *Daily News*, the commanding officer of Fort Sidi Ferruch (west of Algiers) as the result of previous negotiations was found waiting at the gate; he at once admitted the Americans as did other French commanders also.

East of Algiers the story was the same. American landings were unopposed. Guides were on the beach to help the landing craft in and lead the troops to their objectives. As the columns moved forward, going toward Algiers and with their colors in front, the inhabitants in the villages turned out and cheered.

Algiers was entered by American troops without opposition commencing at 1715, when the French bugler at Fort l'Empereur (at the west gateway of the city) sounded "cease firing." A conference was then arranged between Maj. Gen. Charles W. Ryder (commanding the U. S. troops), General Juin (commanding the French forces), and Admiral Darlan (who "happened" to be in the vicinity). Formal surrender came at 2100.

Easy capture due to the preliminary negotiations did not extend immediately to other places. Another American landing was made in Algeria, east and west of Oran, simultaneously with the landing at Algiers. Strong opposition was met at Oran, and continued throughout the 9th and part of the 10th. No reports as to the fighting have been received. Early on the 9th, negotiations were renewed with French officials at Algiers; as a result Oran surrendered on the 10th. The French officials at Algiers had known in advance of the American plan, but they had not passed this information. However, as soon as the Americans had landed and occupied Algiers they acted promptly, and within two days opposition in Algeria had ceased. One feature of the landing at Oran was that a large force of air-borne troops, stated to be at least 1,500 strong, had flown non-stop from the British Isles to a landing field near Oran and arrived there at the scheduled time.

A third American attack was made on the Atlantic side of Morocco on the same date as in Algeria. This expedition sailed direct from the United States. Due to lack of suitable beaches the landings, which were on both sides of the principal port of Casablanca, covered a front of about 50 miles. There was very stiff opposition, details of which have not yet been published. The French fought bitterly and held out until 12 November, when they agreed to cooperate with the Americans. This seems to have been a result of negotiations at Algiers in which Admiral Darlan played an influential part.

In a space of only 4 days the United States has come into possession of excellent bases, including three main ports—Casablanca, Oran, and Algiers. It has been a political and strategical victory of the first order. The United Nations, counting recent British gains at the east end, now hold three-fourths of the North African shore. The Axis holds the remaining quarter including Tunis and Tripoli.

The invasion of Northwest Africa appears to have taken the Axis by surprise. That an American Expeditionary Force was about to cross the Atlantic appears to have become known to the Axis about 23 October, but was probably believed by them to be in connection with some move toward Dakar. It was not until 4 November, when the advance elements of the naval covering to the convoys were near Gibraltar, that the Axis seems to have known that an expedition to the Mediterranean was in progress. On 11 November the first Axis troop movements were reported. On this day, Axis forces occupied what had heretofore been Unoccupied France, and the island of Corsica. Other troops rushed to Tunisia; at date of writing it is not known how many. It would seem that these movements were not ordered until the evening of the 8th or on the 9th.

The United States has announced that while an invasion of Europe from bases in North Africa is the major mission, pending the organization of the necessary forces our troops already in Northwest Africa will not stand idle. They are to attack Tunisia and Tripoli, and in conjunction with a British attack through Libya completely clear all North Africa of Axis troops. The British First Army has landed in East Algeria; some American troops have been attached to it. The force, as November approaches a close, is advancing into Tunisia.

Officers' Individual Clothing and Equipment

Because of the sustained interest in this topic, the JOURNAL will continue to print from time to time such authentic information on the subject as may become available. It should be borne in mind that such lists can serve only as a guide for planning personal purchases or estimating expenditures. Requirements vary with the theater and the season, and are subject to special "tailoring" to fit special situations. The following list was recently prescribed by the commander of one overseas-bound unit.

In this particular case, the following baggage was prescribed:

(a) 1 bedding roll, weight not to exceed 50 pounds;

(b) 1 piece of hand baggage or clothing roll, weight not to exceed 40 pounds; and

(c) 1 trunk locker approximately 31½″ by 18½″, or similar containers of the dimensions required to accommodate the particular baggage needed for the particular duty—but total weight of baggage, including hand baggage, must not exceed 175 pounds.

For further details on this latter point, see Par. 3a(2) of AA 30-1210 and Sec. II of Cir. 133, WD, 1942.

INDIVIDUAL EQUIPMENT (authorized for issue)

1	Bag, canvas, field, OD, M1936
1	Bar, mosquito, sandfly type, .032″ mesh
1	Belt, pistol or revolver, M1936
3	Blankets, wool
1	Book, message
1	Can, meat, M1932
1	Canteen, M1910
1	Case, dispatch
1	Cover, canteen
1	Cup, canteen, M1910
1	Goggles, all purpose, clear lens, with additional colored lenses
1	Helmet, combat, winter (for certain officers)
1	Helmet, steel, M-1, with liner
1	Headnet, mosquito
1	Holster, pistol
1	Fork, M1926
1	Flashlight, TL-122-A
1	Jacket, combat, winter (for certain officers)
1	Knife, M1926
1	Mask, gas, disphragm
1	Packet, first aid
1	Pocket, magazine, double, web, M1923
1	Pistol, cal. .45 automatic
1	Pouch, first aid packet, M1924
2	Ropes, shelter half
1	Roll, bedding, waterproofed, M1935
1	Respirator, dust
1	Strap, carrying, OD, bag, canvas field
1	Suspenders, belt, M1936
1	Spoon, M1926
2	Tags, identification
1	Tape for identification tags, 40″ length
2	Tent shelter halves
1	Pair trousers, combat (for certain officers)
1	Whistle, thunderer
2	Poles, tent, shelter-halves
10	Pins, tent, shelter, wood

CLOTHING AND EQUIPMENT TO BE PURCHASED

	Required	*Optional*
Bag, sleeping		1
Bathrobe		1
Belt, QM 1921, or Belt, Cloth, Officers'	1	
Belt, web, waist	1	
Book, memo, pocket, with pencil	1	
Boots, officers' leather		1
Breeches, service, cotton, serge, or wool		2
Brush, clothes		1
Brush, hair		1
Brush, shaving		1
Brush, shoe		1
Brush, tooth		2
Bucket, canvas, folding	1	
Cap, garrison, officer's, wool	1	
Cap, garrison, officer's, cotton	1	
Cap, service, officer's	1	
Cleaning material (shoe and brass)		1
Coat, wool, service	1	
Comb	1	
Drawers	6	
Gloves, leather, light russet	1	
Gloves, wool, OD	1	
Handkerchiefs, cotton, white or khaki	12	
Hat, service, OD		1
Insignia, collar, officer's	2	
Insignia, collar, U. S.	2	
Insignia, grade	2	
Jacket, field	1	
Kit, sewing	1	
Knife, pocket		1
Laces, shoe, extra (per pair of shoes)	2	1
Leggins, leather		1
Lighter, fluid, and extra flints		1
Locker, trunk	1	
Mattress, air		1
Mirror, trench		1
Muffler, wool		1
Necktie, cotton mohair, OD	2	
Overcoat, OD		1
Overcoat, trench		1
Overcoat, short		1
Pen, fountain		1
Pajamas		2
Pillow, feather or cotton		1
Pillowcases		2
Raincoat	1	
Razoe	1	
Shirt, cotton, khaki	3	1
Shirt, wool, OD	2	1
Shoes, service	2	
Shoes, low quarter		1
Slippers or gym shoes		1
Soap, hand	4	
Soap, shaving	2	
Socks	10	
Suit, one-piece herringbone twill	2	
Towel, face	3	1
Towel, bath	3	1
Trousers, cotton	3	1
Trousers, wool, OD	2	
Undershirts	6	
Watch, at least 7-jewel	1	

TIME FIRE

Using Shell Fuzed with Fuze M54 or M55

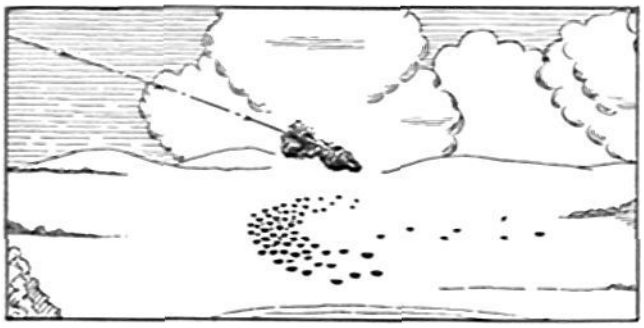


Figure 1.—Effect pattern of time shell

GENERAL

1. GENERAL. The greater part of the effect of a shell bursting in air is directly under the burst, extending laterally in a curved path. This pattern may be seen in Figure 1. The procedure in time fire is designed to place bursts directly over the target, at a height giving maximum effect.

2. COMMANDS. *a*. Commands follow the sequence given in FM 6-40, par. 53. *Corrector* and *time* are announced as the command for *fuze*.

b. The command for corrector is CORRECTOR (SO MUCH). Normal corrector is 30. Corrector for the day is obtained by firing. A change in corrector is effected by announcing the new setting. Increasing the corrector setting one point decreases the time of burning 1/10 second. Decreasing the corrector setting one point increases the time of burning 1/10 second. For observed fires, a site correction is fully as satisfactory as a corrector for the day.

c. The command for *time setting* is TIME (SO MUCH). The time setting is habitually the tabular value corresponding to the elevation or range setting, and is given to the nearest tenth of a second. A change in time setting is effected by announcing the new setting.

d. The command for site is SITE (SO MUCH). Horizontal, or normal site, is 300. Changes in site are effected by commanding UP (SO MUCH) or DOWN (SO MUCH). Change in site is considered to raise or lower the burst vertically.

e. The command for elevation is given to the nearest mil, taken from the firing table. An elevation change is made by taking from the firing table a new elevation corresponding to the desired new range. The factor *c* is used only for the calculation of adjusted elevation.

3. SENSING FOR RANGE. *a*. Range is sensed as *short, over, target, range correct, range approximately correct, lost*, or *doubtful*. Positive range sensings may be obtained from burst on impact beyond the target, from burst in air short of or beyond the target, from the shadow of the smoke, or from dust or mud kicked up by shell fragments.

b. In all time fires, *with the exception of a precision registration*, a sensing of the point where the trajectory meets the ground surface is of no importance. A range sensing is that of an air burst, or of the air burst which would have resulted had the round been allowed to continue until detonated by action of the *time fuze*. The range to the point of burst in air is a function only of time of burning of the fuze. A burst on impact short of the target is sensed *doubtful*. Referring to Figure 2, a burst on impact at A must be sensed doubtful for range. Had the ground not interrupted and had the projectile continued in flight until detonated by action of the time fuze, the point of burst might have been short for range at B or over for range at C. A positive range sensing can be obtained by increasing site so as to give an air short at B', an air over at C', or a graze over at D. The burst on impact at D is over because, with further increase in site, an air burst beyond D would be over.

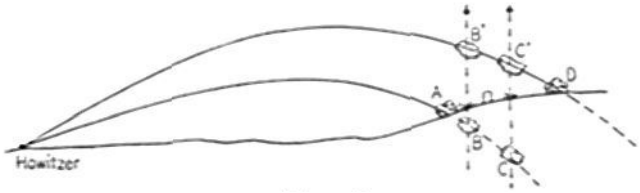


Figure 2

c. In a precision registration for determination of corrections, a burst on impact short of the target is sensed *short*. A burst in air, short of the target, is sensed *short* only if the burst is no higher than the target. In this type of fire, the trajectory is to be adjusted on the target (see par. 10-17).

TIME BRACKET FIRE

4. AXIAL TIME BRACKET, ADJUSTMENT. *a*. Initial commands correspond to those for axial percussion bracket, with the following exceptions: (1) The command for fuze is corrector and time setting. (2) The site should be determined accurately and announced to the next higher 5 mils. Corrector is taken as 30 (or corrector for the day, if known). It is not changed during the problem.

b. Range only is sensed. Deflection, distribution, and range are adjusted in the same manner as in axial percussion bracket, except that the factor *c* is not used. Time, to the nearest tenth of a second, and elevation, to the nearest mil, are taken for range to the nearest hundred yards. When range is changed a certain number of hundreds of yards, the new *tabular* values of time and elevation are used.

c. The methods used in adjusting height of burst depend largely on the appearance of bursts and effect in the particular

problem. A guide for procedure, based on appearance of the first salvo, is as follows:

Sensing of first salvo	Remarks	Appropriate action
All doubtful.	All graze.	Up 10 (or 20). Repeat elevation.
One or more over, none short.	All graze.	Up 10 (or 20). Decrease time setting and elevation boldly.
One or more over, none short.	One or more air.	Decrease time setting and elevation.
One or more short, none over.	One or more air.	Increase time setting and elevation.
All doubtful.	All air.	Down *r/R* times height in mils. Repeat elevation.

If all bursts of the initial salvo are in air, but range can be sensed, the adjustment may be completed without changing the height of burst.

5. AXIAL TIME BRACKET, FIRE FOR EFFECT. *a*. Direction, distribution, method of fire, and range are handled in the same manner as in axial percussion bracket.

b. A mean height of burst of 30 yards is taken as normal for fire for effect. If the mean height of burst has been established at or near zero during the adjustment, the site is raised 30/*R* on entering fire for effect. If the observed mean height of burst of the last round of the adjustment was *n* mils above the ground, the site is raised (30/*R*—*nr/R*) mils, or lowered (*nr/R*—30/*R*) mils.

c. If zone fire is to be used, time setting for each elevation is taken from the table. Since time shell is partially effective on impact and at heights as great as 100 yards, it is not necessary to vary the site to follow the profile of the ground when firing through a zone on a slope. Since burst range is dependent upon time of burning, it is not affected by the profile of the ground.

6. LATERAL TIME BRACKET, SMALL-*T*. Range and height of burst are handled in the same manner as in axial time bracket. Deflection and sheaf are handled in the same manner as in lateral percussion bracket, small-*T*.

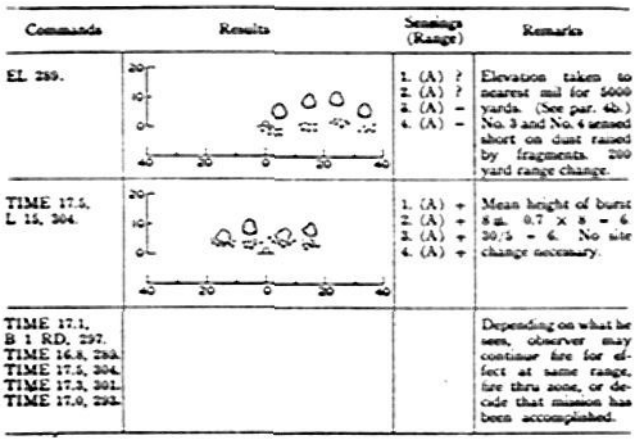
7. LATERAL TIME BRACKET, LARGE-*T*. The procedure for lateral time bracket, large-*T*, is the same as for lateral percussion bracket, large-*T*, with these exceptions: (1) A height of burst adjustment accompanies the deflection adjustment. (2) The bursts are placed 30 yards above the target on entering fire for effect. (3) Time setting must be given with each elevation in zone fire.

8. ADJUSTMENT OF TIME FIRE BY GROUND OBSERVER USING AIR-OBSERVATION METHODS. a. The procedure for adjustment of deflection and range is the same as for adjustment of percussion fire by a ground observer using air-observation methods.

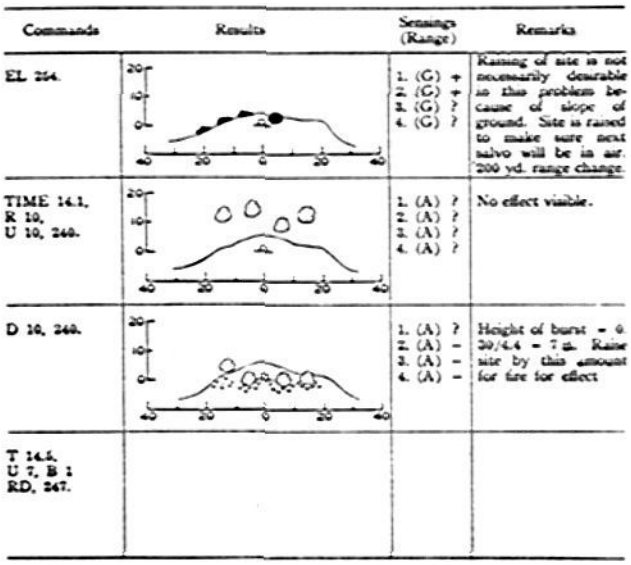
b. In addition to the usual deflection and range sensings, the observer reports height of burst. Since site is an important consideration, the observer must include in his target designation the number of yards that the known point (base point, check point, previous concentration, etc.) is above or below the target. This difference in altitude is announced before the range sensing of the known point. No report is required if target and known point have the same altitude. If an adjusting salvo gives both air and impact bursts, the observer makes no report for height of burst. If all bursts of a salvo are on impact, the observer reports *Graze*, and the site is raised an arbitrary amount to secure a height of burst bracket. If all bursts are in air but sensings can be made on visible effect, no report is made during adjustment. If all bursts are in air and there is no visible effect, the observer estimates the mean height of burst in yards and reports (*So Much*) *Air*, and the site is decreased (*So Much*)/*R*. The height of burst sensing precedes the range sensing.

c. When the observer requests fire for effect, site is raised 30/*R*, with the following exceptions: (1) If the height of burst of the last salvo of the adjustment was approximately 30 yards, the observer reports, for example, *Air, Range Correct, Fire for Effect*. (2) If the mean height of burst of the last salvo of the adjustment (all air bursts) was measurably greater or less than 30 yards, the observer reports the total height above the ground as (*So Much*) *Air*, and the site is raised or lowered a sufficient amount (par. 5b) to secure a 30-yard height of burst.

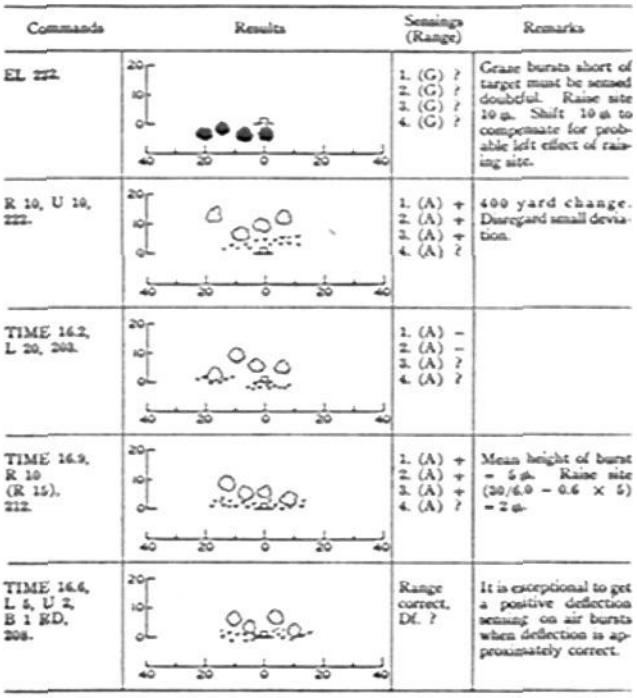
9. ILLUSTRATIVE EXAMPLES. *a*. Example 1. Target: Infantry in fox holes in the vicinity of an adjusting point. Mission: Neutralization. Materiel: 105-mm howitzer, HE shell, charge 5, fuze M54. Observation is axial. *r* = 3.5; *R* = 5.0; *r/R* = 0.7. Initial commands: B ADJ, SH HE, CH 5, KR 30, TIME 16.8, BDR 280, ON NO. 1 OP 2, Si 305, BR,



b. Example 2. Target: OP activity. Mission: Neutralization. Materiel: 105-mm. howitzer, HE shell, charge 5, fuze M54. Observation is axial. *r* = 4.0; *R* = 4.5; *r/R* = 0.9. Initial commands: B ADJ, SH HE, CH 5, KR 30, TIME 14.9, BDL 150, ON NO. 1 OP 2, Si 320, BR,



c. Example 3. Target: Working party. Mission: Neutralization. Materiel: 105-mm. howitzer, HE shell, charge 7, fuze M54. Observation is lateral, small-*T*. *T* = 280 mils; r = 4.0; *R* = 6.4; *r/R* = 0.6; *s* = 4 (use 5). Howitzers on right of observer. Initial commands: B ADJ, SH HE, CH 7, KR 30, TIME 17.5, BDL 320, ON NO. 1 OP 1, Si 295, BR,



d. Example 4. Target: Infantry assembling for counterattack. Mission: Neutralization. Materiel: 105-mm. howitzer. Ammunition: HE shell, charge 5, fuze M54. Battery on right of observer. *T* = 600, *r* = 4.0, *R* = 5.2, *r/R* = 0.8, *s* = 14 (use 15), *d* = 14. Initial commands: B ADJ, SH HE, CH 5, KR 30, TIME 17.5, BDR 180, ON NO. 1 OP 2, Si 300, BR,

Commands	Sensings	Remarks
EL 304.	(4A) Df. ?, 40 R	Mean height of burst 25 mils. Deviation/d = 40/14 = 3. Increase range 300 yards.
TIME 18.8, D 20, 328.	(4G) Df. —	Graze bursts may be sensed short for deflection.
TIME 19.6, R 30, U 10, 344.	(1A, 3G) Df. + (10 R)	2-s and 200 yd. change.
TIME 19.2, L 15, 336.	(2A, 2G) Df.— (5 R)	30/5.6 = 5 mils.
TIME 19.4, R 5 (R 10), U 5, B 1 RD, 340.		Commands beyond this point depend upon what the observer sees.
TIME 19.8, 348.		
TIME 19.0, 332.		
TIME 19.2, 336.		
TIME 19.6, 344.		

e. Example 5. A forward observer has been given the mission of firing his battery on machine guns pointed out by the staff of the supported infantry unit. The location of base point is known to the observer.

Messages, sensings, and commands	Results	Remarks
Obsr to BC *Base Point is 400 right, 20 above, 500 over, machine guns, will adjust.* BC to Obsr CONCENTRATION 37, BATTERY C. TIME FIRE.		Adjusted data, based on percussion registration on base point, using SH HE, CH 3, FQ = Si 300, EL 277.
BC to Btry C B ADJ, SH HE, CH 3, KR 30, TIME 10.3, BDL 130. ON NO. 1 OP 3, Si 295. BR, EL 223. BC to Obsr BATTERY FIRED. Obsr to BC *200 left, graze, repeat range.*	All bursts on graze, estimated to be 200 yards left and 200 yards short of target.	Raising to air may change range materially. No range change indicated.
BC to Btry C R 80, U 20, 223. BC to Obsr BATTERY FIRED. Obsr to BC *50 Air, 100 short, fire for effect.*	All bursts in air, estimated mean height 50 yards. Range approximately 100 yards short.	Arbitrary increase of 20 mils in site. Bold change preferable, in order to establish bracket early.
BC to Btry C TIME 10.7, D 10(8), B 1 RD, 233. TIME 11.2, 244. TIME 10.3, 223. TIME 10.5, 228. TIME 10.9, 238.		(50 — 30)/2.6 = 8.
BC to Obsr BATTERY C FIRING FOR EFFECT. Obst to BC (later) *Mission Accomplished.*	Fire is observed to be effective.	

TRANSFERS OF TIME FIRE BASED ON REGISTRATION

10. GENERAL. *a*. In a registration for transfers of time fire, the following corrections are sought:

(1) Deflection.
(2) *K*.
(3) Time of burning (Corrector for the day).

b. Accuracy of vertical control is very important for the base point or check point upon which the registration is made, but is only moderately important for the targets to which transfers are to be made.

11. PROCEDURE USING PRECISION REGISTRATION. *a*. The site, as determined from the chart, is used throughout the registration.

b. Adjustment is started using fuze quick, M54. Corrector 30 and time setting corresponding to the elevation are commanded when splitting a 200 yd. range bracket or when making a 100 yd. range change, when using axial or small-*T* methods. When large-*T* methods are used, time fire is started when splitting a deflection bracket of *2-s* (32 mils) or when making a shift of 1-*s* (16 mils). Fire by single round is continued throughout the registration.

c. While the adjustment for elevation and deflection continues, the corrector is changed by multiples of 4 points (see footnote, p. 22) until a 4-point corrector bracket (an air and a graze) has been established. Two or three rounds are fired at the center of this bracket. If all are airs or if all are grazes, more rounds are fired at the appropriate limit. If mixed sensings are obtained at the center of the 4-point bracket, fire is continued with the same corrector setting.

d. Fire for effect is continued by single round until there have been obtained:

(1) A suitable deflection adjustment.

(2) 6 range sensings within a ½-*c* bracket.

(3) 4 height of burst sensings within a 2-point bracket, or a corrector setting giving both airs and grazes.

e. Adjusted elevation is computed by the usual method. Short sensings based on high rounds are disregarded.

f. A corrector setting giving mixed sensings (air and graze) is taken as corrector for the day. If airs are obtained at a corrector setting and grazes at a setting 2 points more than or less than the first setting, corrector for the day is the average of the two settings. A more accurate method of determining corrector for the day, based upon 6 sensings for height of burst, is as follows: Find the difference between the number of airs and the number of grazes. Add (subtract) this number of twelfths of 4* to (from) the mean corrector used. This corresponds to the method used in determining adjusted elevation. Corrector is taken to the nearest point.

g. In subparagraphs *b* and *c*, above, a procedure is outlined wherein the adjustments of deflection, elevation, and corrector are conducted simultaneously. This procedure may be simplified, for the use of inexperienced officers, at the cost of more time and more rounds, by deferring the adjustment of corrector until the adjustments of deflection and elevation have been completed.

12. EXAMPLE OF PRECISION REGISTRATION. Target: Base Point. Mission: Registration for transfers of time fire. Data from firing chart: Range = 3320; altitude of howitzer — 314 yards; altitude of base point = 340 yards. Battery has been laid on base point by survey methods. Base deflection has been recorded. *T* = 260; *r* = 2.5; *r/R* = 0.8; *s* = 8. Howitzers are on left of observer. Initial commands: NO. 1 ADJ, SH HE, CH 3, FQ M54, BD, Si 309, NO. 1, 1 RD,

(Note.—Complementary angle of site has been considered.)

Commands	Sensings	Remarks
EL 311.	? (12 R)	0.8 × 12 = 10.
L 10, 311.	+	On *O-T* line. 200 yard range change.
R 16, 288.	— (4L)	Disregard small deviation. 200 yard bracket has now been obtained. Time setting for 299 = 13.5.
KR 30, TIME 13.5, L 8, 299.	(G) —	100 yard bracket has now been obtained. Enter fire for effect.
KR 38, TIME 13.7, L 4, 305.	(A) + Df. ?	
KR 34, 305.	(G) + Df. ?	4-point corrector bracket has now been established.
KR 36, 305.	(G) + Df. +	3 range sensings in same sense have now been obtained,
TIME 13.5, R 4, 299.	(A) — Df. —	
L 2, 299.	(G) + Df. +	
R 1, report adjusted deflection.		Deflection correct when splitting 2 mils deflection bracket.

*If the height of burst probable error (column 9) be compared with the displacement of burst for a change of 5 points in corrector (column 22) for various charges and for various ranges, it will be found that on an average a corrector change of 4 points is roughly equivalent to 4 height of burst probable errors. Example: Charge 5, range 4000, height of burst probable error = 2 mils, 5 point corrector change displaces burst 9.3 mils. Four probable errors = 8 mils, which is displacement caused by 8 × 5/9.3 = 4.3 points corrector change.

An initial change of 8 points is suggested following the first round fired with time setting, with the following exceptions: (1) If the first burst is less than 10 mils above the ground, a change of 4 points should be made. (2) If the first burst is more than 20 mils above the ground, a change of 16 points should be made. In both (1) and (2), the number of mils above the ground is as calculated for the guns, or *r/R* times the observed height of burst.

Adjusted deflection = BDL 3; Deflection correction = L 3.
Adjusted elevation = 302 — (2 × 12)/12 = 300. *K* = (300 — 313) × 8/3.3 = —32 yds/1000.
Corrector for the day = 36, which gives both air and graze.

Note that elevation and time for initial round correspond to nearest hundred yards of range. Computation of *K* is based upon elevation for map range to nearest 10 yards.

13. HIGH-BURST REGISTRATION, GENERAL. *a*. A high-burst registration consists of the following operations:

(1) The firing of a group of rounds set to burst in air with constant charge, corrector, time setting, direction, site, and elevation.

(2) Locating the burst center vertically by angle of site measurements taken by an observer.

(3) Locating the burst center horizontally by means of an intersection.

(4) Computing deflection correction, *K*, and corrector for the day.

b. The procedure for performing operations (1) to (3), above, is not repeated here. The mechanics of operation (4), above, are illustrated in par. 14, below.

14. EXAMPLE OF COMPUTATION OF CORRECTIONS FROM HIGH-BURST REGISTRATION. *a*. A high-burst registration has been fired with the following settings: Charge 5, KR 30, TIME 16.3, BDL 220, Si 330, EL 280. Altitude of battery = 415 yards. Altitude of OR = 424 yards. OR reports average instrument reading 208, average site 320. OL reports average instrument reading 6312.

b. The plot of observers' reports gives measured shift to burst center = BDL 228; measured range to burst center = 5170 yards; distance OR — burst center = 4500 yards.

c. Deflection correction = R 8 (from L 228 to L 220).

Altitude of burst center = 424 + (20 × 4.5) = 514 yards

Angle of site, howitzer — burst center
= (514 — 415)/5.2 = + 19 mils

Complementary angle of site
= 19 × (+.08) = + 2 mils

Site = +21 mils

Adjusted quadrant elevation (280 + 30) = 310
Site +21

Adjusted elevation = 289
Map elevation = 302

Elevation correction = — 13 mils

$$K = \frac{-13 \times 13}{5.2} = -33 \text{ yards/1000}$$

Adjusted time setting (time setting used) = 16.3 seconds
Time setting corresponding to elevation 289 = 16.8 seconds

Time setting correction = —.5 seconds

An increase of 1 point of corrector equals a decrease of 0.1 second in time of burning.
Corrector used was 30.
Corrector for the day is 30 + 5 = 35.

15. TRANSFERS OF TIME FIRE. *a*. Map data are prepared as for percussion transfers.

b. Corrections for direction and for range are applied as for percussion transfers.

c. The announced corrector is the corrector for the day as determined by precision registration or by high-burse registration. In the case of metro transfers without registration, the

corrector for the day must be known at least approximately from previous firing. The correction for time of burning may be applied as a constant correction in time setting if a corrector scale is not available to the battery.

d. Time setting is the tabular value corresponding to the elevation, for each elevation to be fired.

e. The site announced to batteries for fire for effect combines: (1) Site determined from chart, and (2) Site to place bursts 30 yards above ground (+ 30/*R*).

16. EXAMPLE OF TRANSFER OF FIRE, BASED ON REGISTRATION.

a. Materiel: 105-mm. howitzer. Ammunition: HE shell, charge 5, fuze M54. 20 rounds have been allotted for concentration No. 108.

b. The following corrections have been determined by registration:

(1) Deflection correction at 4500 = R 2.
(2) *K* = + 39 yards/1000.
(3) Corrector for the day = 28.

c. Map data for concentration No. 108:
Map range = 5270 yards.
Altitude of battery = 224 yards.
Altitude of concentration No. 108 = 242 yards.
Measured Shift = BDL 185.

d. A deflection correction scale may be made, and the deflection corrections determined for several targets. For a single target, the deflection correction may be determined by applying the difference in drifts to the correction for base point or check point. For concentration No. 108, the deflection correction is R 1.

Measured Shift	= BDL	185
Deflection Correction	= R	1
Shift to Center Sheaf (50/*R*)	= R	9
Corrected Shift	= BDL	175

e. Elevation Correction

= (5.3 × 39)/13 = +16 mils

Elevation for 5270	= 310
Corrected Elevation	= 326
Time setting for El 326	= 18.7

f. Angle of site = (242 — 224(/5.3 = + 3
Site for height of bursts = 30/5.3 = + 6
+ 9

Complementary Angle of Site
= 9 × (+.10) = + 1

Site = + 10, or 310

g. Commands to fire concentration No. 108 at a single range: B ADJ, SH HE, CH 5, KR 28, TIME 18.7, BDL 175, ON NO. 1 OP 2, Si 310, B 4 RDS, EL 326.

h. Commands to fire concentration No. 108, firing through a zone:

(1) B ADJ, SH HE, CH 5, KR 28, TIME 18.7, BDL 175, ON NO. 1 OP 2, Si 310, B 1 BD, ZONE 8 MILS, EL 326. In this case, the executive gives the successive times and elevations listed in (2) below.

(2) B ADJ, SH HE, CH 5, KR 28, TIME 18.7, BDL 175, ON NO. 1 OP 2, Si 310, B 1 RD, EL 326; TIME 19.1, EL 334; TIME 18.2, EL 318; TIME 18.5, EL 322; TIME 18.9, EL 330.

17. USE OF GRAPHICAL FIRING TABLE. *a*. The battery commander, computer, S-3, and battery executive will find that the use of the graphical firing table (GFT) for time fire gives them more speed and less chance for error, contrasted with the use of a firing table in book form.

b. The advantages of the GFT for determining corrected elevations, under a variety of conditions, are magnified by the ease of reading directly the corresponding time setting. In observed time fires, the slide is set with *K* = 0. The elevation for the initial round or salvo is taken to the nearest mil for the nearest hundred yards of range. The factor *c* is not used. When changing range, the user moves the indicator the desired number of hundreds of yards, and reads time and elevation.

c. The 33/*R* scale may be used for the 30/*R* height of burst factor.

EXAMPLE OF MASSING TIME FIRES OF A BATTALION

18. *a*. Observed fire chart is to be used initially. All batteries of a battalion of 105-mm. howitzers have registered on the base point using HE shell, charge 5, fuze M54. Sites have been computed with instruments. Adjusted data, as sent to the fire direction center, are as follows:

Battery	Adjusted elevation	Site	Adjusted compass	Base angle	Corrector	Time
A	245	+ 8	3065	1628	37	14.4
B	238	+ 5	3153	1538	35	14.0
C	241	+11	3276	1420	36	14.2

The observed fire chart is constructed. GFT's are set with *K* = 0. A battery observer sends in the following fire mission: *Base point is 400 right, 30 below, 800 short, infantry heavy weapons, will adjust.*

Battalion commander orders USE BATTALION, 4 VOLLEYS.

S-3 directs CHARGE 5, TIME FIRE, CONCENTRATION 1, BATTALION, B, 4 VOLLEYS, CENTER RANGE, WHEN READY.

HCO announces B 5090, L 80
A 5230, L 63
C 5080, L 98.

VCO announces (on call) Site B + 11
A + 14
C + 15.

Initial commands to batteries are as follows:

	B	A	C
BATTERY ADJUST			
SHELL HE			
CHARGE	5	5	5
KR	35	37	36
TIME	17.1	17.6	17.0
BASE DEFLECTION	L 70	L 53	L 88
ON NO. 1 OP	2	2	2
SITE	311	314	315
BATTERY	RIGHT	4 RDS, DNL	4 RDS, DNL
EL	296	307	295

(Note: Deflection sent to battery includes measured shift and shift to center sheaf (50/*R*).)

Subsequent sensings and commands are as follows:

Obsr: *200 left, graze, 400 short*. (Graze bursts well short of target may be sensed short if it is obvious that there was a large error in range determination.)
B: TIME 18.7, R 40, U 20, 327.
Obsr: *200 over*.
B: TIME 17.9, 311.
Obsr: *50 right, 70 air, 100 short, fire for effect*.
B: TIME 18.3, L 10 (9) D 7, B 4 RDS, 319. CORRECTIONS: R 30 (31), U 13, PLUS 23.
A: TIME 18.9, R 30, U 13, 330.
C: TIME 18.2, R 30, U 13, 318.
B: *Map data for replot: L 50, site 317, 5390.*

(Note: B computer strips 30/*R* from site which B is using for effect to arrive at the ground site of 317. Complementary site has been considered.)

Obsr: Mission Accomplished.

b. Firing chart based on survey has been constructed, and will be used for transfers of fire.

The following data are taken from firing chart:

Btry.	Range to base point	Altitude of btry.
A	4230 yards	292 yards
B	4100 yards	304 yards
C	4180 yards	285 yards

Altitude of base point = 326 yards.

The following corrections must be applied to data taken from the firing chart:

Btry.	*K*	Elevation	Range	Corrector
A	+ 36 yds/1000	245	4230	37
B	+ 44 yds/1000	238	4100	35
C	+ 32 yds/1000	241	4180	36

(*K* is used when corrections are being determined by computation. When GFT is used, elevations are set opposite corresponding ranges.)

c. A hostile command post has been plotted on the firing chart. Altitude, from a small scale map, is 313 yards. Battalion commander directs USE BATTALION, 5 VOLLEYS, SURPRISE FIRE.

S-3 announces CHARGE 5, TIME FIRE, CONCENTRATION 12, BATTALION, 5 VOLLEYS, CENTER RANGE, AT MY COMMAND.

HCO announces CORRECTION ALL BATTERIES L 1
B 5300, R 172
A 5370, R 188
C 5450, R 140.

VCO announces (on call) Site B + 2
A + 4
C + 6.

Commands to batteries are as follows:

	B	A	C
BATTERY ADJUST			
SH HE			
CH	5	5	5
KR	35	37	36
TIME	18.9	19.0	19.3
BD	R 180	R 196	R 148
ON NO. 1 OP	2	2	2
SI	308	310	312
B	5 RDS, AMC	5 RDS, AMC	5 RDS, AMC
EL	330	332	338

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Britain's 3.7-inch gun is useful against aircraft and tanks.

SMASHING THE PANZERS

By Maj. Gen. H. Rowan-Robinson, CB., C.M.G., D.S.O.

The antitank gun was cultivated, originally, by those nations which could either not afford or (like the Germans then) were not allowed to indulge in mechanization. In 1936 (when the British army hardly owned a single one of these weapons) the Germans, who by that time had also built tanks, possessed in each division as many as 76 antitank guns, which thus outnumbered their field guns. Since those days there has been a further increase.

For a long time calibers ranged from 25-mm. to 37-mm., but as tanks grew in armament and armor calibers increased to 50-mm. The Germans appear to rely chiefly on a 50-mm. gun firing a 4½-lb, armor-piercing (AP) HE shell. This gun is accurate up to 2,000 yards and, at ranges under 1,000 yards, can penetrate the armor of most existing tanks.

The most powerful German antitank weapon is, however, the 88-mm. AA gun, which has a devastating effect at short range and a penetration of nearly 70 mm. of armor on perpendicular impact at 4,000 yards. At the other end of the scale, the 25-mm. gun is useful as a protection for infantry against light tanks. These vehicles, owing to their vulnerability, are not much used now, though they are likely to be found among the weapons of air-borne troops. The British 2-pounder, though first rate in its class, has no great effect beyond 1,000 yards against the German Mark III and Mark IV tanks, and except at short range failed completely against those which had been fitted with a specially thickened front plate. Consequently, in Libya, much of the British antitank work fell on the field gun—the 25-pounder.

LURING TANKS TO POINT-BLANK RANGE

Both British and German tank attacks when delivered head-on against positions armed with field guns or heavy antitank guns have usually failed, except under powerful support from their own artillery. To mitigate this difficulty, British infantry sometimes undertake "cutting-out" operations against forward enemy guns by night, prior to the tank attack in day. The Germans, many of whose tank guns have an effective range of 2,000 yards, try to solve the problem of attack when not opposed by field guns by cruising up and down out of range of the 2-pounders. In this way they hope to draw their fire and, after thus discovering their positions, overwhelm them in succession with a hail of projectiles. Both sides have used strategems to draw opposing tanks into range of field guns in masked positions.

On the march the antitank guns, warned as far as possible of hostile tank activities by reconnaissance machines, are grouped mainly towards the dangerous quarter, but the need for all-round protection for a column can never be ignored. In a fighting advance they are used to assist infantry to consolidate each successive position won.

In defense, a few guns are placed far forward in order to punish the leading enemy tanks and to sustain the morale of the infantry. The remainder are in part sited

in depth (not less than 600 yards back from the front so as to escape the initial barrages), and larger numbers on wheels serve as a mobile reserve. The value of concealment, camouflage, and the use of cover when moving into action cannot be overstated. Fire that is reserved until the enemy is within 300 to 400 yards is incomparably more effective than fire at the longer ranges.

GUARDING AGAINST SURPRISE ATTACK

In general, antitank guns are sited where there is no obstacle, for where there are minefields or other obstructions machine-gun fire will suffice for preventing tank crews from emerging to remove them.

When a field gun takes up a position, it normally aims at having a clear view of front and flanks of 1,000 to 1,500 yards, as a precaution against surprise attack. If that is not possible, it must be afforded protection by antitank guns or mines. As a general rule, however, it is advisable not to fritter away antitank guns in defending this or that unit, but to organize them on a reasoned scheme for area defense.

As field guns must always be used to a considerable extent as antitank weapons, they should carry a proportion of armor-piercing shell. The explosion of ordinary HE causes so much dust and smoke that the target quickly becomes invisible—a dangerous matter when it is advancing at 600 yards a minute. Field guns should also carry smoke shells so that when sited in rear positions they may be able to blind enemy tanks while the latter are advancing through the zone—2,000 to 800 yards—in which their fire may be more effective than that of the British antitank gun.

In a tank battle in which both sides are on the move, antitank batteries are best despatched ahead, to a position on a flank and parallel to the line of advance, preferably where they may take the waves of enemy tanks in enfilade. This, however, is a counsel of perfection. It implies action even more difficult than that of horse artillery supporting cavalry in similar fashion—often advocated, obviously sound, seldom achieved.

If one side receives the charge in hull-down position it will normally keep its antitank guns close by on either flank. By this means the fire of the latter will not be obstructed, and their vulnerability in an exposed position may not prove a serious danger, for the assailant's fire will be directed on the tanks as the major target. Supporting an attack against stationary tanks, however, antitank guns must be far to a flank, otherwise their fire will soon be masked. In fact, in every maneuver it has to be remembered that the antitank gun is a weapon of flat trajectory and short effective range.

ANTIAIRCRAFT EFFICIENCY INCREASES

The efficiency of antiaircraft fire is increasing with all the belligerents, both in static defense and in mobile warfare. Better instruments are partially responsible for the improvement, and their nature is naturally shrouded in a veil of secrecy. The main advance, however, has been through an increase in the number of guns. In static defense that is a costly matter, for the consequent increase in idle man-hours between attacks has long reached astronomical figures. For this reason it is still held, in some quarters, that static antiaircraft defense should be absorbed into the vast organization of civil defense and be manned largely as a part-time occupation.

A German dual purpose 88-mm. gun put out of action by British artillery

In static warfare, AA weapons vary from the one-pounder, sometimes a multiple weapon, those most commonly met being of the 3″ or the 3.7″ types. In the field the top limit of caliber is about 3.7″, and the favorite weapons are the 3″ and the Bofors 2-pounder or others of similar nature.

It has hitherto been customary on the line of march to picket important points, such as defiles, with small groups of AA guns. Now there is a tendency, especially in armored formations, to distribute these groups (so far as the smaller calibers are concerned) throughout the column and for the column to keep on the move during attack. Unsuccessful onslaughts by enemy aircraft then cause no waste of precious time. On the other

hand, it seems that columns in their unavoidable passage through villages might be heavily punished unless a fighter canopy were provided.

The 88-mm. is the principal German AA gun in the field. It is a first-rate weapon with a ceiling of 30,000 feet and a ground range of 18,000 yards. As already mentioned, it has proved most efficacious against tanks. Britain's corresponding weapon — the 3.7″ — has also proved useful in this respect, and it seems likely that there will be a tendency in future to construct dual-purpose guns, each with a principal and a subsidiary role.

Coastal Defense Artillery

The artillery of coast defenses consists of guns, howitzers, and mortars ranging in caliber from 2″ to 18″. The larger guns are mounted, singly or by pairs, in turrets. Howitzers and mortars obtain their protection by firing from pits provided with head cover. This armament is supplemented in many cases by railway artillery of 8″ to 14″ caliber. Unless sufficient warning has been given, however, to enable these guns to reach their selected site and then be secured or mounted, they are liable to be late for the fray. Their all-round defense in a number of alternative and sometimes isolated positions also presents difficulties.

The part played by coast defense, as distinct from shore defense, in the present war has been normal—namely, that of a deterrent from sea attacks on naval bases. Actually, naval bases — Singapore, Surabaya, Manila—have been captured, but by ground and aerial (not by naval) assault. Of course, maritime command was an essential prelude to success.

Although purely naval attempts to capture bases have not been made, there have been some very successful combined naval and aerial attacks on them. In all cases, the main factor in success has been surprise. At Cherbourg, Genoa, and Rhodes, the ships made rendezvous opposite each port just before dawn and overwhelmed the defenders with a torrent of small and medium shell, at the same time turning their heavier metal, roughly ranged by aircraft, on to the important targets—shipping, quays, railroad junctions.

After a short burst, and before the enemy had time to organize counter-measures, the fleet steamed away, having, without loss to itself, effected considerable material damage. The brilliant destruction of Italian warships in Taranto harbor was a purely aerial affair carried out by the British Fleet Air Arm. In general it may be said that owing to the advent of aircraft as a principal arm, never have coast defenses provided less immunity from attack than in the past three years.

On the other hand, the most wonderful example of continued resistance against what seemed overwhelmingly adverse conditions has been provided by Malta; and Manila, though its defenses were eventually broken, ran the island fortress a close second.

Lessons Learned

The outstanding lessons appear to be that:

(a) Coast fortresses must have a true all-round defense.

(b) All their installations must be protected against overhead attack.

(c) Gun defenses must be remodeled, both in power and speed of action, to meet the devastating superiority of naval armaments in a sudden and brief attack.

(d) Coast defenses must realize as much as field armies that surprise is the greatest of all war weapons.

Coastal fortresses will add greatly to their capacity for resistance by taking to heart all these lessons. They can, however, never be regarded as invulnerable against an enemy who possesses both command of the sea and ascendancy in the air.

A British Bofors antiaircraft gun in Libya

EMPLOYMENT OF TANK DESTROYING CANNON

Well-located antitank gun

By B. T. B.

In order that the tank destroying cannon may be efficiently employed, it is of primary importance that the commanders who plan, direct, and supervise, as well as those who execute, the missions of the tank destroying units on the battlefield have a complete understanding of the conditions under which the target—the tank—is employed to accomplish its battle missions.

First there should be realized the nature of this offensive weapon—the tank. Primarily it is simply a self-propelled vehicle in which are mounted guns with calibers varying from 7.7- to 75-mm. To enable the self-propelled gun to pass through the projectile-beaten zones of the battlefield to the place or places where its own weapons may be effective against the resistances of the ground troops, it has been necessary to armor the transport. The thickness (and consequently the weight) of the required armor has almost continuously increased because the power of the tank destroying cannon has likewise increased and the organization of the tank destroying cannon into special units has rendered its employment more effective. This increase in weight of armor has caused the light tank's weight to be increased from 5 to 7 to 10 to 15 tons. The heavy-tank weight of World War I has become the medium-tank weight and has been further increased to the range 25-35 tons, while present-day heavy tanks are all in excess of 50 tons. Despite improvements in tracks and internal combustion engines, the weights of tanks greatly restrict their tactical cross-country mobility.

Since few roads in this or any other country in which the Army of the United States may be expected to engage in serious combat have bridges with a capacity in excess of 10 tons, these weights generally cause tanks to be advanced to the immediate vicinity of their place of employment by rail or over first-class highways. In addition, these large weights have restricted most tanks to a speed not in excess of 10 MPH when advancing to the assault.

It should also be realized that the tank, in order to pass through the zone of rifle and machine gun bullets, must have a minimum of apertures. Consequently the tank affords its crew very little view of the terrain over which it must advance, and the conductor is limited to the view afforded by a periscope or by a port fitted with a rapidly revolving shutter; his view is also greatly restricted by the dust and smoke which are inescapable incidents of combat. It has been found that the motion of the tank and crews while crossing even favorable terrain is such as to render its fires relatively ineffective at ranges above 200 yards; it appears that the German tanks always halt prior to opening cannon fires. Thus at distances in excess of 200 yards, tanks act largely against morale.

The limited experiences of World War I and the available information of tank actions in World War II indicate that tanks are generally employed in large masses. It has been found that the proper density is approximately 400 tanks per division attack front of approximately 3,000 yards. The tanks are launched in the attack by battalions in platoon waves of five tanks each with an interval of about 75 yards between tanks.

There has been a continuous effort to provide tanks with radio equipment for communication within the company. Experiments to date have shown that within the assault waves the radio cannot be depended upon to operate satisfactorily under battle conditions. Consequently, communication within waves or between waves depends on some simple visual system. Because of lack

of visibility even this system is restricted to a few simple instructions such as to indicate rallying points, to continue the advance, or to withdraw to assembly areas.

On account of these restrictive factors, large scale tank assaults must be launched from clearly marked lines of departure along distinct lines to definite objectives.

Tanks can be employed effectively only over favorable terrain and roads. They are incapable of attacking across such obstacles as water more than four feet deep, ditches wider than half the length of the tank tread and having exit banks sloped 45 degrees, swamps and bogs, stumpy and rocky areas, and woods. It is admitted that individual tanks or columns of tanks are capable of maneuvering through woods, but the lack of vision which is afforded to the operating personnel of a tank which is closed and prepared for combat prevents the use of such areas for tank assaults. These limitations of terrain reduce to a considerable degree the frontages which will be available for successful tank attacks. Available information on the operations of the German "Panzer" divisions during May, 1940, indicates they were employed only on favorable terrain and that they made no attempts to attack any properly protected tank obstacles.

In the exploitation phase of the defeat of the French 9th Army which was holding the line of the Meuse it appears that there were two efforts, divided by the upper part of the Oise River. The force north of the Oise on the first day advanced from 40 to 60 kilometers, the furthest advance being on the north flank; on the second day, however, it encountered hostile resistance along the canal connecting the Oise and Sambre Rivers, was immediately stopped, and was unable to advance for a week although it was heavily reinforced by infantry and artillery. On the other hand, the exploitation force south of the Oise advanced only 20 to 40 kilometers on the first day, while on succeeding days its advance was restricted only by inherent factors. It was indeed the operation of this force which permitted the subsequent advance of the northern effort by attacking the lines of communication to the canal position.

The experiences of the United States Second Army in the September, 1941, maneuvers show that of the 50-mile front between the Red and Sabine Rivers from the vicinity of Natchitoches to the Red, only that small portion between Robeline and Many, less than 14 miles, was favorable for even small tank unit assaults. While the Louisiana terrain was exceptionally unsatisfactory for large scale tank assaults, these handicaps (streams, swamps, and heavy woods) will exist to a considerable extent on practically all probable battlefields.

Tanks have the mission of breaking through the infantry defensive system to attack the artillery and the larger command and supply installations. Attainment of this objective will permit the hostile ground forces to subdue the disorganized infantry, capture artillery and the command, capture or destroy all supplies, and thus render our forces impotent. Contact with hostile tanks on the following missions can be expected under the following tactical conditions:

a. As part or all of a combat reconnaissance force endeavoring to obtain information regarding the size and dispositions of our forces for the hostile commander to plan a general attack.

b. As part of a general assault force composed of infantry, artillery, tank, antitank, and air forces.

c. As the principal part of an exploiting force seeking to reap the full harvest of its initial successes.

Because of the mission of the combat reconnaissance force, it should be countered with great caution in order that that mission not be accomplished. One of the principal things such a force seeks to determine is the number and distribution of our tank destroying cannon, as antitank defenses must be neutralized prior to launching a tank attack. Hostile reconnaissance combat forces should be countered primarily by subterfuge in order to conceal our dispositions, and by combat only when there is a reasonable chance of capturing or destroying the entire hostile reconnaissance force. Where use of antimechanized weapons is required it should, if practicable, be restricted to .50-cal. machine guns. Hostile reconnaissance elements will generally contain only lightly armored vehicles, and the armor-piercing .50-cal. bullet has sufficient penetration to disable such vehicles and to kill or wound the crews. After each use these weapons must be moved to alternate positions previously selected and prepared in order to protect them from hostile artillery or mortar fires based upon information obtained by the reconnaissance.

Because of the mission of large scale tank attacks, they must be countered with every available means. Successful defense against such an attack requires primarily that our forces not be surprised by the offensive methods employed, by the location of the hostile main effort, or by the size and composition of the hostile forces. Hence,

the conduct of the defense will be determined by the effectiveness of our reconnaissance agencies (aviation-reconnaissance patrols, observation battalions, and observation and listening posts) in the performance of their assigned tasks. Defense against large scale attacks requires the close coordination of every available weapon. The primary task is the determination of the number of infantry battalion tasks into which the contact front should be divided, and the subsequent assignment of troops in accordance with these conclusions. All weapons with each battalion tactical center of resistance must then be coordinated both therein and with those of adjacent battalions. The defensive infantry battalion framework having been established, it must be complemented by the projectiles of the artillery and antitank and air forces.

Aerial reconnaissance in areas of probable tank assaults is greatly simplified by the weight of the medium tank (between 20 and 30 tons), which will require the tank divisions to move to the immediate vicinity of their assault assembly areas over first-class highways or by rail. Examination of any army combat frontage (which will, on the defensive, be not greater than 50,000 yards—approximately 30 miles)—will disclose that with very few exceptions such a front will be served by not more than two first-class highways and one railroad. Under the assumptions that the tank assault will occur at daybreak (the most favorable time to the enemy), that the movement to assault positions will be conducted under cover of darkness, that final servicing of tanks will require one-half hour, and that the movement from the highway to the assembly area will require another half-hour, the problem of determining the presence of hostile tank forces within striking distance is made very simple. The air force will have the easy mission of checking the primary road system by flares for 60 miles beyond the line of contact. With the modern high speed pursuit plane this task can be accomplished for each line of probable tank advance in less than 30 minutes, so unless the hostile force has *complete* domination of the air, any high commander who permits himself to be surprised by the hostile employment of tanks has simply failed to employ his eyes—aerial reconnaissance.

To retain freedom of maneuver and hence the ability to act offensively at propitious moments, a defensive force must emplace only a part of its forces, the proportions varying with the terrain conditions and the accuracy of the commander's information of the strength and dispositions of the hostile force. These well established principles which govern the conduct of defensive warfare are equally applicable to all arms and weapons. Employment of tank-destroying cannon is similar to that well established through centuries of experience for forces defending a river line. Following the determination of priorities regarding the probable areas in which the hostile effort is to be expected, only a minimum of cannon are emplaced initially and the majority are held in positions of readiness so selected that the road system will facilitate the advance therefrom to the probable combat positions. The road system is improved to the greatest possible extent. In addition, all probable gun positions—to reinforce the emplaced guns in the forward area and to limit tank penetrations within and adjacent to the divisional zone—are selected and prepared in advance for quick occupancy.

To sum up, effective employment of tank destroying cannon requires only the age-old methods which have made efficacious the use of all other arms: reconnaissance, analysis of hostile data obtained, analysis of the terrain, plans to meet hostile capabilities.

MAPS AND PROTRACTORS

A 1/25,000 uncontrolled photomap is being reproduced by the Field Artillery School. The Chief of Engineers has agreed to produce a controlled photomap, scale 1/25,000, of the Fort Sill Military Reservation; a metric grid, with the British system of numbering, will be superimposed.

The Chief of Engineers has informed the Commandant, F.A.S., that the following items of equipment are being manufactured and will be issued to ground forces:

1. A protractor, scale 1/25,000.

2. A coordinate scale, 1/25,000, in meters; it will be imprinted on the reverse side of scales having 1/20,000 and 1/62,500 measurements.

—F.A.S. Information Bulletin

THE ANTITANK SUBALTERN*

By An Antitank Regimental Commander

Antitank gunners are never satisfied! After knocking out a Mk. III, this crew is seeking more victims.

WHAT AN ANTITANK SUBALTERN REALLY IS

It is likely that he will have been ordered to contact the CO of some battalion, and to act as that officer's antitank adviser. Having heard the CO's appreciation (and given his own), he will be asked to site his guns to meet the requirements of the situation. At this stage he becomes really important. He must view the ground carefully, and decide where he wants enemy tanks to encounter his guns; to this end he will use any natural tank stops, and probably antitank mines, which he must be careful not to forget later. He will then site his guns, keep them hidden, and his job has begun in earnest.

Leave for the moment the many things he has to do to make the best of his position. He was important before, when he conferred with the infantry CO; now he is all-important. On his skill and training he has drawn for his appreciation and the deployment of his guns. At any moment these will be tested by the onslaught of enemy tanks. He, and he alone, is responsible for stopping them. He cannot fall back on anybody, he cannot ask for advice—he has drawn on his skill and training, he must draw now on his cool courage and determination. The infantry look to him, and to him alone, to help them. They cannot offer serious resistance to any but the lightest tanks, and therefore must rely on the guns supporting them. The whole battle literally stands still until the tanks have been smashed, or smash through. If they smash through, the battle on that particular front, and possibly on the divisional front, has been won by the enemy. If they are smashed out of existence, the day is with the antitank subaltern and he has done his job. There is no other answer.

In the antitank regiment there can be no such thing as an officer who is "all right, but" or "a decent chap, but" or "he'll be all right in action, but." There is no such thing as a second-rate or third-rate antitank subaltern. There is only a first class officer, who looks after his men, loves his guns and his job, is proud of his troop,[1] its skill and his own. An officer who is inquisitive to know what is the other side of the crest, and who from first to last, by day and by night, in defense or in attack, come one come all, is a deadly killer, ever seeking fresh and more cunning ways to kill—to kill tanks by stopping them or stalking them, blowing them up with mines or blasting them with shell, burning them, bogging them, or destroying their resting crews. A killer all the time, that is what an antitank subaltern must be, and is. He must educate his men in all the better killing methods.

How then to reach this stage must be a matter of training and psychology, each of which plays an equally important part in the life of the subaltern and enables him to bring his men to a perfect pitch to support him in his cunning craft.

TRAINING

It is obvious that officers and men must be barrack square[2] perfect to instill the same essential, rigid discipline into one and all. The reason why will be apparent when the first shoot in battle is done. Two aspects of basic training, however, must be emphasized, and they are gun drill and waiting.

Detachments must be so gun drill trained that tired or fresh, asleep or awake, drunk or sober, they still serve the guns with accuracy and speed. On this they must

*Republished from the *Journal of the Royal Artillery*.

[1]Equivalent to our firing battery.
[2]We would term it "gun park."

never fail, because there are never two chances in antitank gunnery.

Waiting is the corollary to gun drill, and here comes the barrack square discipline. Hold fire until a hit is a certainty. If it is a heavy tank it must be hit where it is vulnerable, and that will not be done at 800 yards. Wait, wait and wait: at 300 yards it may possibly be a decisive hit, at 200 yards it probably will be, at 150 yards it is a certainty and one will do it. Fire opened too soon is a miss, and a disclosure of the position. Paradoxically, the nearer the tank gets to the gun, the safer is the detachment. The tank cannot "hull down" at 150 yards, and cannot possibly survive the shock of the 2-pdr. impact. This then is the second vital point in basic training: the tight discipline which keeps detachments calmly waiting that most unpleasant menace—the approaching tank.

There are many things taught from the printed word, and necessarily every officer must read and impart the best of the knowledge so gained to his men. But there are many things which do not appear in print, or at any rate are not in the standard text books.

OPERATIONS

Nowhere in print does it say that antitank gun detachments must be scouts, but they must be. They cannot possibly be tank hunters if they are not. The difference between boy scouts and gunner scouts is that in the former case there is a badge for first prize, and in the latter case there is a bullet through the head for a booby prize, but the essentials are the same. The successful overnight discovery of an enemy tank harbor[3] and the destruction of the crews may save the battle next day, but men have to be trained in tank hunting to be able to do it. They cannot learn it from a book. Therefore, training in night operations assumes vital importance. Scouting, occupying gun positions under the enemy's nose, ration and ammunition running—all are night operations, so night mindedness is an essential. It can be put into city-bred brains only by constant regular practice, week after week. If there is a poacher in the battery, enlist his help.

Train the men to conceal themselves. A located antitank gun position is a death trap for the detachment. If men have to walk about or show themselves, do not let it be 'round the real gun position. Much better site the gun, conceal it, and leave it alone except for essential duties about it. Make a dummy position a hundred yards to the flank, where men, not too obviously, may show themselves, and have a track leading to the dummy position passing the true position. When going into the real position see that the men step clean off the track, making no mark at all. It will pay in the end, and the troop commander who ignores this elementary battle discipline will probably have the lives of three or four men on his conscience, and be rather more than a fool; if he observes it he will be cunning, which is as it should be. Therefore, train and train again, until it is automatic.

[3]Assembly point or bivousc.

Train yourself to realize what is going on. If you cannot see what is happening from where you are, climb a tree and have a look. If there are no trees, either go yourself with one man or send two reliable men to where a view is obtainable. Do this on all exercises. The men can signal back what they see. Antitank gunners are not required to do any signallling, so the book says. Don't believe it. Teach all your NCOs and all your men to send and read, however slowly, in Morse. It's an extra, but there is no charge for it; there is a big reward, though, for that extra trouble in learning Morse. Your inquisitiveness can then be satisfied quickly without spending your time running about the countryside, and intelligence will be yours as things happen, not an hour afterwards—vital, when you are expecting (or not expecting) a tank attack.

Train against surprise: it's the enemy's biggest stock-in-trade. When your troop is on exercise, think what you would do if you were the enemy, and do it. Ambush them on the road, declare sudden A.F.V.[4] attacks or dive bombing, make them do a whole exercise in gas masks, cut off the rations and do impromptu feeding, award casualties. It will all happen, but if you and they have practiced properly the reaction to the emergency will be automatic.

Where in the book does it say that you must cross rivers with your guns, or tell you how to do it? Some day you will be faced with the problem, so practice it regularly now. Two ordinary infantry pattern canvas folding boats will do it and do it quickly.[5] Borrow two from the infantry, lash them together, and get the engineers to build you a suitable frame to carry your gun. Then take the detachment for a row with the gun. If they have done it regularly under peace conditions, they will do it automatically and efficiently under war conditions.

And what about gadgets? There are dozens of them. Remember the antitank regiment is young, and good as the weapons and equipment are, new things constantly are being tested and found good. Devise an umbrella to go over your shield to break up the contour of the gun under camouflage. Fit a small wheel under the trail, to make man-handling easier by turning the gun into a tricycle. Always think of the most difficult tasks your men have to do, and then plan some gadget to alleviate them. Develop a gadget mind for the good of your troop.

Finally, on operational training, remember two things. The map must mean to you the whole story of the countryside at a glance. Map reading and ground appreciation are so important that you should forever walk about with a panorama sketch book. Don't admire the beauty of the countryside as you go—that can come after the war. Admire its potentialities for stopping tanks or

[4]Armored Fighting Vehicle.

[5]Or better, see *Aqua-Blitzing* and *Aqua-Blitzing, Continued*, in the FAJ for January and December, 1942.—Ed.

for concealing your guns, and decide how you would site guns and mines. Go out with a friend on a "panorama walk," and have bets on what is the other side of the crest. Try it with maps first, and then do it without maps by studying the general contour of the surrounding country—in the end you will be a first class hand at appreciation, and an invaluable adviser. And all the time sketch what you see.

The other point to remember is your automatic weapons. Make all your men expert in their use. All your men—your servant and your driver—absolutely everybody. If the enemy comes he won't listen to the man who says "I work in the quartermaster's stores and I don't fight"—he will kill him just the same. So train all your men to kill first and ask questions afterwards. Often you will be in a battle where there are no tanks, and you will have to "fight" infantry (and *as* infantry) in the defense of your guns. Train your men to do it. Take them to the rifle range and practice as often as you can get ammunition. Then take them to the other end, to hear bullets arriving: they will recognize them next time, and it won't upset them.

And so for operational training. The few foregoing points are only mentioned to emphasize that it won't "be all right on the night of the show" without perfect rehearsals.

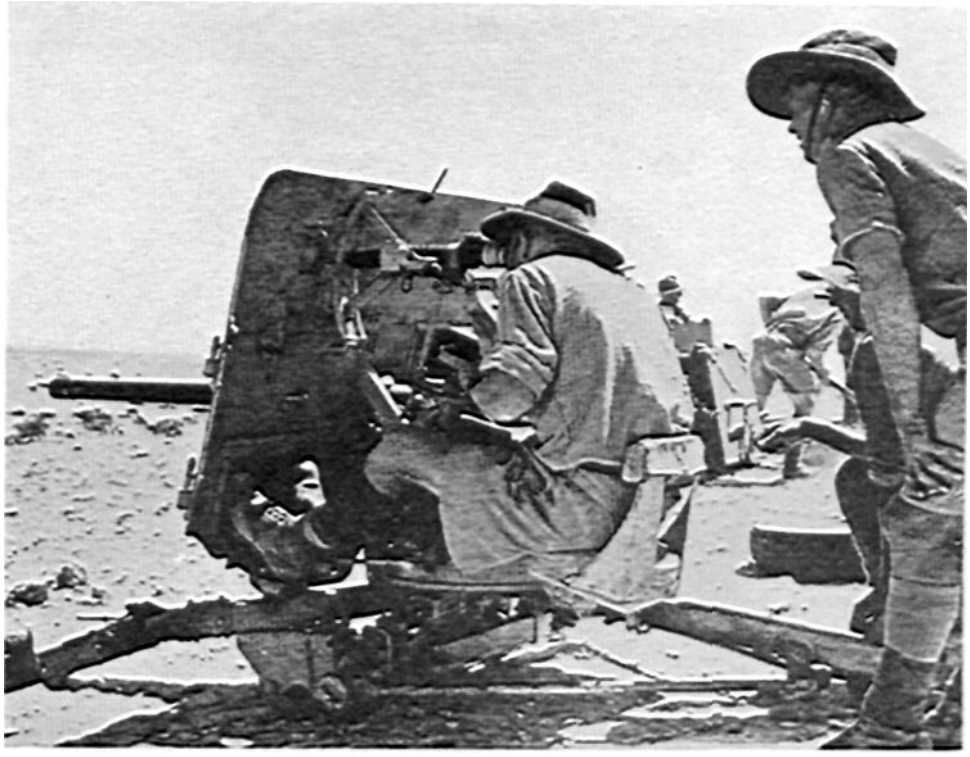
ADMINISTRATION

What on earth is the good of training to be killers when your men cannot be brought to the fight or when in the fight cannot be maintained? An antitank troop commander is independent most of the time in battle. He must know, therefore, not only what his duties are in looking after his troop, but must learn how to exceed the maximum laid down for other arms by at least twice. The soldier of today gets and expects to get better rations than ever before in war, and this presents enormous problems of catering and transport, all of which are borne more by the independent antitank subaltern than probably by any other officer of his rank in the service. Consequently he must train for his job.

Never take "No" for an answer in the case of your vehicles, if you know the answer to be "Yes." Be merciless with men who abuse or neglect them. Care and maintenance are printed in a dozen books, but go miles beyond the printed word. Treat your vehicles as horses were treated in the old days. Daily general attention, and down to the smallest detail regularly. After an exercise have "stables" before the drivers fall out. A quick down, fill up with petrol and oil, and later on, water, and have a look at the tires. There and then collect fault reports so that work can be started on them at once. You will need these vehicles badly one day, and if they break down at a crucial moment have a look at the man responsible by scrutinizing yourself in the mirror—you are the man, through neglect and slackness.

What happens when the ration lorry doesn't get through? It's a grim business going into a fight on an empty stomach, so avoid it. Always have something in the locker at each gun. There is a cooker with each, so have a dixy of cold cocoa and one of cold soup, which latter you get from the troop stock pot, always to be maintained. Only use these when a fresh supply is up, or in an emergency. A cup of hot soup will keep a man going for four hours, and a cup of cocoa for two. Give him a lump of bread or a handful of biscuits with either, and he will fight all day. Never be in the dreadful position of facing your hungry men with "I'm afraid we shall have to wait until the rations come up." If you are father of your troops in operations, you are mother in administration and "nothing in the cupboard" is a weak answer from a weak officer.

Don't be afraid of giving your men raw rations if normal supply fails. You have trained them to cook in their mess tins, or if you haven't you should have. If you are in bush country shoot a buck, but if you are not, still get them meat by local initiative. Give them a



2-pounder manned by Australians

lump and tell them to cook it. They probably don't know very much about it, but they will get a move on if they are hungry. Train yourself to know what to do so that you can tell them. And remember that if available, dried cow dung is as good coal as ever came out of Newcastle.

It's a bad thing to lose a man through ignorance, especially if such ignorance is unnecessary. Don't let the regimental medical officer get away with it until he has taught at least two men on each gun and two in your troop HQ the rudiments of first aid and has taught you advanced first aid. You and your guns will be a long way away from help, and a hurt man will look at you and expect you to help him and to save his life. You must know what to do, and in a quiet confident way. You will never forgive yourself if you lose a man through neglecting your chances to learn. Make up and give to each gun its own first aid box. Put in bandages, lint, cotton wool, iodine, safety pins, a piece of jaconet[6] for fomenting septic sores, a bottle of disinfectant, and a bottle of No. 9s.[7] This outfit will keep your men off the sick reports seven cases out of ten. Here again don't take "No" for an answer when asking the R.M.O.[8] for the contents.

Think of the foregoing points, and do them; then think of a dozen more of your own and do them. And when you have, scrap some of them in favor of still better ones you have thought out for yourself, and then you are beginning to be a good administrator.

[6]Antiseptic gauze.
[7]"CC pills" in our jargon.
[8]Regimental Medical Officer.

6-pounder AT gun

PSYCHOLOGY

It would be hard to find a more overworked word in modern English than psychology, but few words mean more to the fighting soldier, although probably he doesn't realize it. All training is valueless unless the spirit is in it, and the young officer who can get in behind his soldiers' minds is a winner all along the line. So stir them up. They are antitank gunners, aren't they? Then breed pride in being "the leading artillery in action." "The Do or Die Boys." There is an excellent antitank gunners' song—sing it at "Smokers." If you don't know it get busy and make up a topical one, setting it to any old fashioned swinging tune. Make your men realize what their job means—the most important on the battle front, and no weaklings or wasters need apply. Make them realize and be proud of the fact that they are the most thought of and most talked about service there is today, that battle success depends on them. Make them feel they are specially selected, encourage them to make suggestions, give them every opportunity of showing off their handling of guns to the infantry or other artillery; make them feel they are just it.

And when the time comes they will be JUST IT.

MOBILIZATION, AND ON THE WAY

The orders and instructions issued for mobilization and movement are generally so explicit that the junior officer has little to worry about in their actual operation, but he has much to think about as far as his own men are concerned. At the mobilization stage administration is probably more important than training, and a few hints, therefore, may not be out of place.

Are your men complete in clothing and equipment down to the last bootlace? Are their boots sound? If not, get them repaired, or new boots: and get their deficiencies made up. Pester your B.Q.M.S.[9] until you are satisfied. Are you sure of getting comforts for them? Find out. Have you got men trained in purification of water bottles? Are you all right in your first aid instruction? Chase the doctor for these. Is every gunner you have a driver too, and is every driver

[9]Battery Quartermaster Sergeant.

a gunner or an L.M.G. gunner? If not, you have probably three weeks in which to train them.

Has any man a pay or domestic problem? If so, take decisive action to get it settled. Have they got a postal address for the future?

Have all your men been vaccinated and inoculated? The doctor again. And have yet another go at him if you have any doubtful starters on medical grounds, or any dental or eye cases. Get them immediate attention.

Nobody will tell you where the regiment is going, but you can have a good guess. Read up about the country, and think what you want your men to know about. Then tell them, or teach them any special tricks of warfare peculiar to the type of country. Think of your vehicles too. Will there be any additional or different maintenance, due to changed conditions? Practice it. And all the time continue with gun drill and laying practice at moving targets—never stop it.

And let it be known to your men that any man who absents himself or contracts a preventable disease from now on is a waster and an outsider, and something else as well.

All that done, and nobody having had time to think, the regiment is suddenly on the way. It may be by ship or rail or road. It doesn't matter which way it is—sing your antitank song. Tell them that in peace time they would pay a thousand pounds for this trip which they are now getting for nothing. Keep them in good heart and cheery, and gradually introduce some training if the trip is a week or more. Make them work up their Morse, and make your already trained men practice their first aid. Tell them all as much as you can about the country they are about to see. When it rains or when it doesn't, whether there are hills or plains, rivers (to cross with guns) or dry, hot or cold, and how to keep healthy. Any strange foods they are likely to encounter; and tell them their probable destination. Keep them in the picture. Make plans for the early posting of letters, and tell them when it will be. If you don't know, find out.

Tell them as much as you know or can find out about the enemy they are going to meet. About the enemy methods, which will certainly be dirty, and about their morale. What sort of tanks they have got, and what our antitank guns can and will do to them.

And above all tell them this. They may encounter allies in a friendly country, or just a friendly country, or a country that is trying to make up its mind whether to be friendly or not, according to the way the battle goes. Whichever it is, one thing is a constant factor. The friendly and unfriendly alike judge England or any other country by the men sent out. Every soldier is judged as representative of his country, and the country judged by its representatives. Well-behaved troops conducting themselves as they would in their own homes will create the best of all impressions, strengthening the bonds of allies, converting friendship into alliance, and turning doubt into friendship. But one ill-behaved soldier, and one only, is capable of starting a quarrel with allies, losing friendships, and breeding actual hostility—in a word, the potential friends prefer the enemy.

Keen, alert, clean looking, disciplined soldiers, cheery, courteous, and well-behaved, are the best ambassadors of any country. Get your men to realize this, and to feel that they are indeed representative of their country's best.

Arrival and Preparation for Action

You have done everything in your power (and more than you thought you could) to prepare yourself and your men for action, and now you have actually arrived in the theater of operations. You are preparing to reap what you have sown. If it was a good sowing, yours will be a rich harvest. By this time you have realized what your responsibilities are in getting yourself and your men properly clothed, equipped, and trained for the battle. As opportunities occur you will continue with training, basing it (obviously) on what is most needed in the country in which you have arrived. The antitank common denominator of all countries—"Gun Drill and Laying"—must be done daily to keep in the eye and the hand.

Now you start thinking about your own personal job in the forthcoming operations. In the foreword to this article, tact was mentioned as an essential for the antitank subaltern, and at this time you start laying the foundation for its successful application.

Whip around and meet the field gunners, the sappers, and the infantry with whom you will be fighting in the coming campaign. Get to know them really well, and see that they get to know you even better, and trust you. Listen to their points of view and don't force your own. Although you know the real fact, they all think their own job is the most important and will continue to do so until they see you in battle and realize what you have done for them. Get really friendly. Remember you will want mines and wire from the sapper, you will want to use the field gunners' phone, and possibly a couple of their guns to ferret out some tanks for you to shoot, but above all remember that in battle you are the antitank adviser to the infantry commander. As such, necessarily, you become something of a confidant, and unless very tactful may cause some feeling among the more junior officers of the infantry. You are in fact temporarily acting in a capacity far beyond that which your rank normally warrants, so be careful not to hurt anybody's feelings. If you really get "matey" before the battle you won't, as long as you don't show off. That's fatal. Be confident of course, but not "cockey." Leave that until after the battle, when you have stopped all the tanks, and then you can indulge yourself a little if you wish.

That is the junior officer's personal preparation for action.

Now go back to your men. Don't leave them too long

just before their first battle. Tell them what grand chaps the infantry are, and just how the field guns are going to help. Tell them you have arranged for them to be inside a defended locality, so they won't have perpetual guards—always a hardship for a small detachment—and that the M.G. battalion has a section of guns there. Finally, that the sappers have hundreds of mines for the collecting, so it looks like being a good "party," and everything is well for the antitank guns. And when you have told them all that, tell them what the "party" is all about. Tell them absolutely everything that isn't a breach of security. What they are going to fight, what sort of tanks and how best to destroy them, what the idea of the forthcoming operation is, and how it probably will be done. Tell them who their general is, who their C.R.A.[10] is, two first class experienced officers who have planned this sort of engagement dozens of times. Tell them where the operation will start, and the part they plan, and (vitally) which infantry they are supporting.

For any sake don't forget this. Your chaps are about to meet the enemy, and in all likelihood for the first time; they are entitled to know just what they are trying to do, in the doing of which they may be wounded or even killed. No sane man would try to teach a horse to jump with a hood over its head, and no sane man would ask his soldiers blindly to fight when they didn't even know what it was all about. Never forget this, however hard up for time you may be.

(*a*) In Action—(*b*) The Fight—(*c*) and Afterward

(*a*) *In Action*

You will be sitting in your Mess one night when your battery[11] commander will say he wants to see all officers, B.S.M.,[12] and Nos. 1 at such and such a time. Then you will get your first battle orders. Gone are the days when you plan what you will do the night you get back from the "Exercise," because this time it is real.

The worst time in any boxer's life is when, trained to a hair, he has another 24 hours to wait, and then 12, and then 1 hour, until that ghastly period of 3 minutes when the second gives his last advice, when the referee says his piece, and finally when the boxer retires to his corner and waits the interminable 30 seconds for the first gong. He really is frightened then, and remains so until he starts to fight.

You have been trained to the last hair, you have been brought into the arena; your battery commander "second" has given his last word; the captain administration "referee" has said his piece; and you are waiting for the fight to begin. And you are frightened. There are people who say they have never been frightened in their lives. They are either unique characters or unique liars. Of course you are frightened, but not in the accepted sense. Every healthy man on the eve of his first battle is frightened, not of wounds or death, but afraid of being afraid; that is the feeling you have. You needn't be worried; you won't be noticeably afraid. You think (especially in the early morning, or if you wake up in the middle of the night, or before you go to sleep) "I wonder what I'll be like, I wonder if I shall be a coward, and not able to stick it. What will my men say, or my B.C. say, if really I'm yellow, etc., etc." Don't worry and don't panic. You won't be. You are trained to a hair and so are your men. You'll be nervous to a degree before it starts, and won't have time to be anything but cool and efficient once it has started. When it is over you will laugh: "How damned silly I was to think I should be afraid."

Very well, then, you are now in real action. You have sited your guns and camouflaged them so that they are completely hidden. You have told your men all about the forthcoming battle, where they are, and what they are doing, and with whom. They also are in the ring waiting. Now you think of your battlefield discipline, and start your men doing things to prevent the boredom of waiting—or the fear of the forthcoming battle. You must keep up the morale of the men as well as your own.

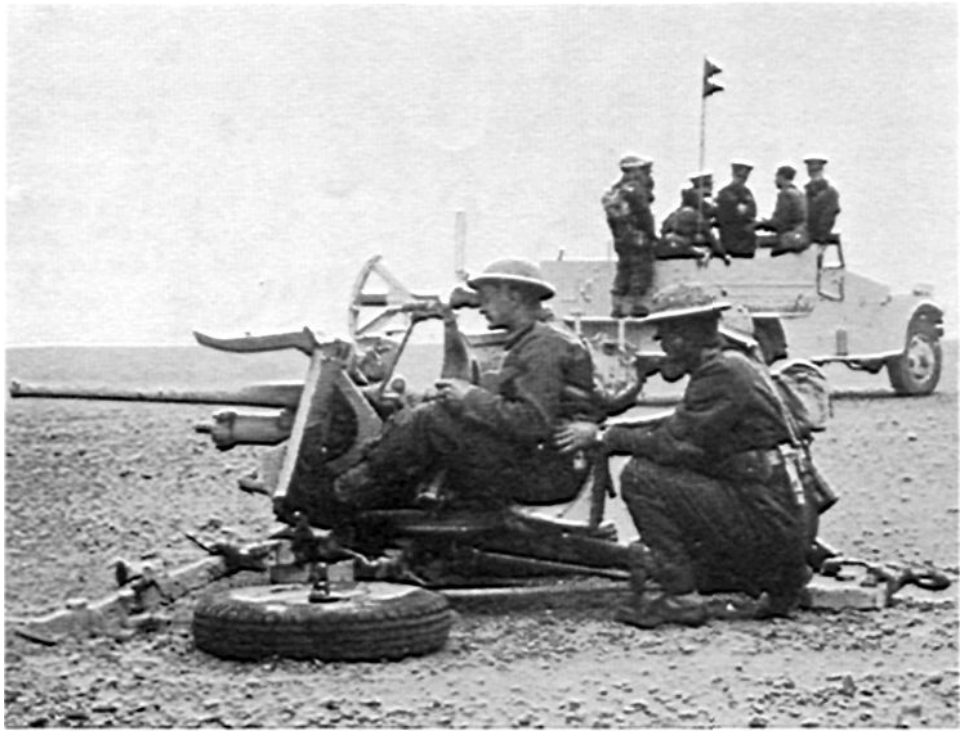
Remember to have dummy positions. You have been told this but don't forget it. Remember not to have vehicles parked nearer than 200 yards from any road, and never clustered together unless you are in a night "laager" in bush country. Then you do it for mutual protection against surprise.

In all probability while you are waiting you will be dive bombed—a particularly unpleasant form of nuisance; it is surprising how few men get hurt, though, if the battle discipline is right. Make your men lie down flat while it is on (unless you are actually fighting), and out of sight if possible, but in any case keeping quite still. The bombers probably haven't seen you really, and are bombing a general area. If they have seen you, and you are fighting, remember your front and side shields stop all splinters (and bullets) and noise can't kill you. The chances of a direct hit are one in ten thousand, and if you can't take a bet on that you shouldn't be a soldier. Incidentally, nowhere in print does it tell the junior officer that the man who walks about under bombing, shelling, or machine-gun fire (unless he is actually fighting) is a fool, but he is for all that. A needlessly dead man is a nuisance, but a needless casualty is something else; he is a double nuisance in that two probably tired men are required to take him away, and he is a direct adverse reflection on the officer who has been responsible for the troop battle discipline. You have already been told not to let your gunners move about the real gun position. Remember it—it's battle discipline.

And then you will be shelled. You will hear the dull thud of the gun, the whine of the shell getting nearer

[10]Commander Royal Artillery.
[11]Equivalent to our battalion.
[12]Battery Sergeant Major.

and nearer — increasing to a roar, and then the colossal crash of burst. You are being shelled, and there will be a lot more of them, so look out. Whether bombing, shelling, or machine gunning is your first experience, be sure of one thing. When it happens you are not an individual at all, you are a commander of soldiers. Be sure, as if actuated by one string, all the men will look straight at you, and what you do they will do. Now is the time, once and for all, to make your name. Grin like hell and keep on grinning. Don't be too funny, but a simple remark like "Who wouldn't be in Piccadilly now" or something equally casual or absurd will raise a laugh when they are strained and you are over your biggest hurdle. They will be funny too, and you will get a crack back like "Mind your heads, boys." Cultivate your troop "funny man"—he's a gold mine. And if you are not fighting your guns, take cover. They will too, if you do, and you are teaching a lesson in battle discipline.



Shield of the 2-pounder can be lowered for better visibility, when necessary.

When you have them like that you can be an individual again and think about yourself. Light a cigarette—it's a great steadier—but when you are doing it, turn your back on your soldiers, because without knowing it you have been strained and the hands do so destroy any impression of nonchalance. And while you are smoking, think whether anything you have done or have not done has been responsible for your being fired at, and if so correct it at once. Apply for permission to change your position even 100 yards, unless you are quite satisfied that it was a general harassing shoot and not an observed shoot to which you were being treated.

There you are. You are in action. You have been fired at, and you are all well. That's all it is, and it's stopped now. All the old soldier stories are a washout. You have earned the select description of "Active Service Experience"—a grand feeling.

But you may not be lucky even in your very first experience of being under fire. Then or later, by sheer bad luck, you will see men killed or badly wounded. Then your men will look at you to see not only how you take it but what you are going to do about it. It's a grim business when some of your friends among the gunners are lying dead or maimed, but you are a man and you have to do a man's job. Remove the dead from the position, after you have attended to the wounded. You know first aid because you have been trained. Apply it, and make a plan for getting any casualty away. If he is noisy, try to quiet him—if he won't be quiet, remove him to where he can't be heard. Nothing is more demoralizing to the survivors' morale than listing to a moaning casualty. The dead you can bury yourself, if no chaplain is available. Do so. Mark the grave, take the map reference accurately, and send all documents and the disc to B.H.Q.[13] And then write to his wife or mother.

Well—that's that. You have been blooded and tomorrow is another day. And you are still waiting to fire your guns. The tanks must come sometime. While you are waiting think of panoramas, range cards, cooking problems, washing clothes, hot baths, hay boxes, something hot to drink, something in hand to eat, and this and that. Without knowing it, you have changed and your men have changed. You came into action a highly trained and efficient team, but really it was only a job of work to become trained, and destroying the enemy was a vague sort of intention behind it all. But the enemy has killed old Jack Snooks, and Bill Jenks and Gunner Blank probably won't live, and those other two are badly hit. "And that damned swine did it with his guns, blast him. May he have a premature in the breech, and blow his own head off, the cursed swine."

Now you are a highly trained and efficient team wanting revenge. You are perfect soldiers, trained and eager KILLERS. Now is the time to print this and stick it under the shield of every gun: "There are no circumstances under which this gun, once having been committed

[13]Battery Headquarters.

to action, will ever be withdrawn. It will be fought until there is nothing left to fight." Gunners have no colors—their guns *are* their colors. And highly trained killers never leave their guns. The notice just reminds them.

You yourself have become more valuable to the Regiment. Therefore, take care of yourself. Never go about unarmed, and never under any circumstances go about alone. Even if you are killed your dead body is intelligence, if you have somebody with you who can say precisely from where the bullet came that killed you. It means the enemy is there, and perhaps Division didn't know it. In any case it's always a nuisance looking for a missing officer.

(*b*) *The Fight*

What is there left to say? You are trained to shoot straight at tanks, and you have plenty of small arms if it's only an infantry battle. You have something to hand back for the killing of your chaps. To make sure of it, wait, wait, and wait; even if you are frantically excited—wait. Then give it them, all you've got, and they won't like it. Shoot their tanks to bits and laugh when they go on fire, and L.M.G. them if they try to get out. Exterminate the swine whilst you've got them. That's all.

(*c*) *And Afterward*

You have had one go and it has been a success because you knew the game, and now you know it backwards. Sooner or later you will be going back into action, you and your soldiers, and it is a thought always with you. You know your trade. You realize what the enemy is. You know what they have done to our Allies' countries. You know what they have done to our Allies' womenfolk. It's not newspaper talk, it's fact. You know what they would do to our countries and your womenfolk if they had the chance. Kill them. If rats attack your granary, you don't close the granary and leave the rats to it. You exterminate them. You send in ferrets to get them out to be killed. Be ferrets. You have terriers to crush their backbones. Your guns are terriers. You have traps to catch them. Make traps. By every trick, device and cunning, defeat their dirty game, and remember that your be all and end all is to KILL TANKS.

Good Luck and Good Hunting.

TRAINING FILMS

Several new training films on field artillery subjects are due to be released in the near future. Under preparation for the past several months, these motion pictures illustrate principles and procedures which will prove of great value in the training of field artillery units.

TF 6-940. *The 105-mm. Howitzer Battalion—The Technique of Fire Direction—Part I.*

This picture is the first of a series of three to be shown in sequence. It deals with the disposition of the artillery battalion, observed fires by individual batteries, the organization and duties of the fire-direction center personnel, and the construction and use of the battalion observed-fire chart.

TF 6-941. *The 105-mm. Howitzer Battalion—The Technique of Fire Direction—Part II.*

This picture deals with the construction and use of a surveyed firing chart, the determination and application of corrections obtained by registration, and the handling of a mission observed from the air.

TF 6-942. *The 105-mm. Howitzer Battalion—The Technique of Fire Direction—Part III.*

This picture deals with the functioning of the fire-direction center during displacement, the preparation of prearranged fires, the use of meteorological data, a center-of-impact registration, and the massing of the fires of the division artillery.

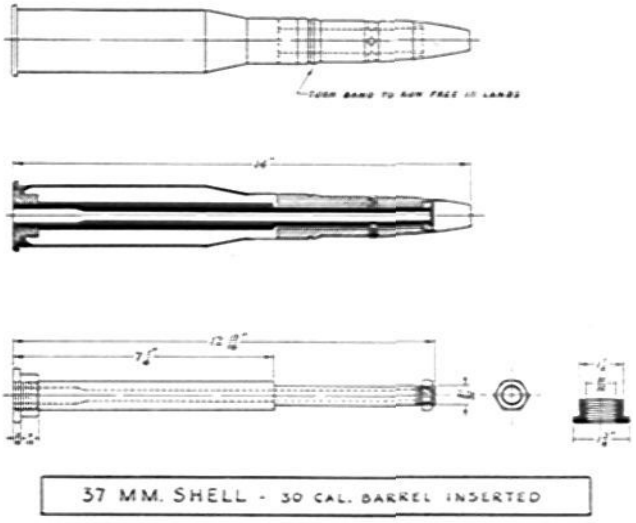
SUB - CALIBER FOR THE ANTITANK GUN

By Lt. Col. Paul B. Bell, FA

In the March, 1942 FIELD ARTILLERY JOURNAL appeared an article on the pencil tracking method of teach-and maintaining manipulative skill on the 37-mm. AT gun. In continuing this training to include the 1000-inch range, we were interested in developing team work within the gun squad. The usual 1000-inch range developed and qualified gunners, but the present sub-caliber equipment trains only the gunner as the bolt breech, clip, etc., are very foreign to the normal functioning of the squad.

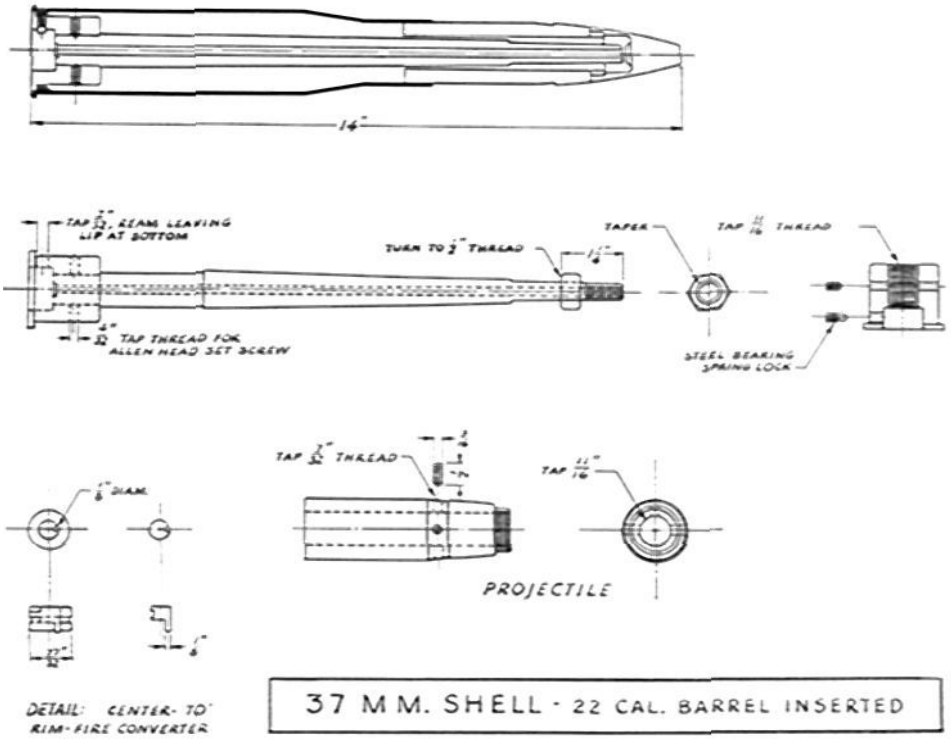
We therefore devised the devices shown in the accompanying drawings and photograph.

Ten rounds of 37-mm. Mark II TP M51 w tracer ammunition were unarmed by removing the shot from the case, emptying out the powder (which was burned in the open), firing the primer in the gun, and firing the tracer by heating with an acetylene torch. The shot being soft, it was easily drilled and bored in a metal lathe as shown in the working drawings. .22-cal. rifle barrels from the Harrington & Richardson factory were mounted as indicated. One critical point in the modification is the turning down of the brass rotating band: if not reduced in size it fits too tightly, and if turned down too much it will not center the 37-mm. projectile and allows the shell to fall low in the barrel, the gun thus firing low.



As shown in drawing No. 2, the .30-cal. barrel can be substituted for the .22 barrel; in this case the adapter (center- to rim-fire) is not needed. Use of the .30-cal. makes it possible to fire tracer ammunition on combat ranges, a very valuable type of training and one which can be adapted for unit rombat tests similar to the GHO Artillery tests.

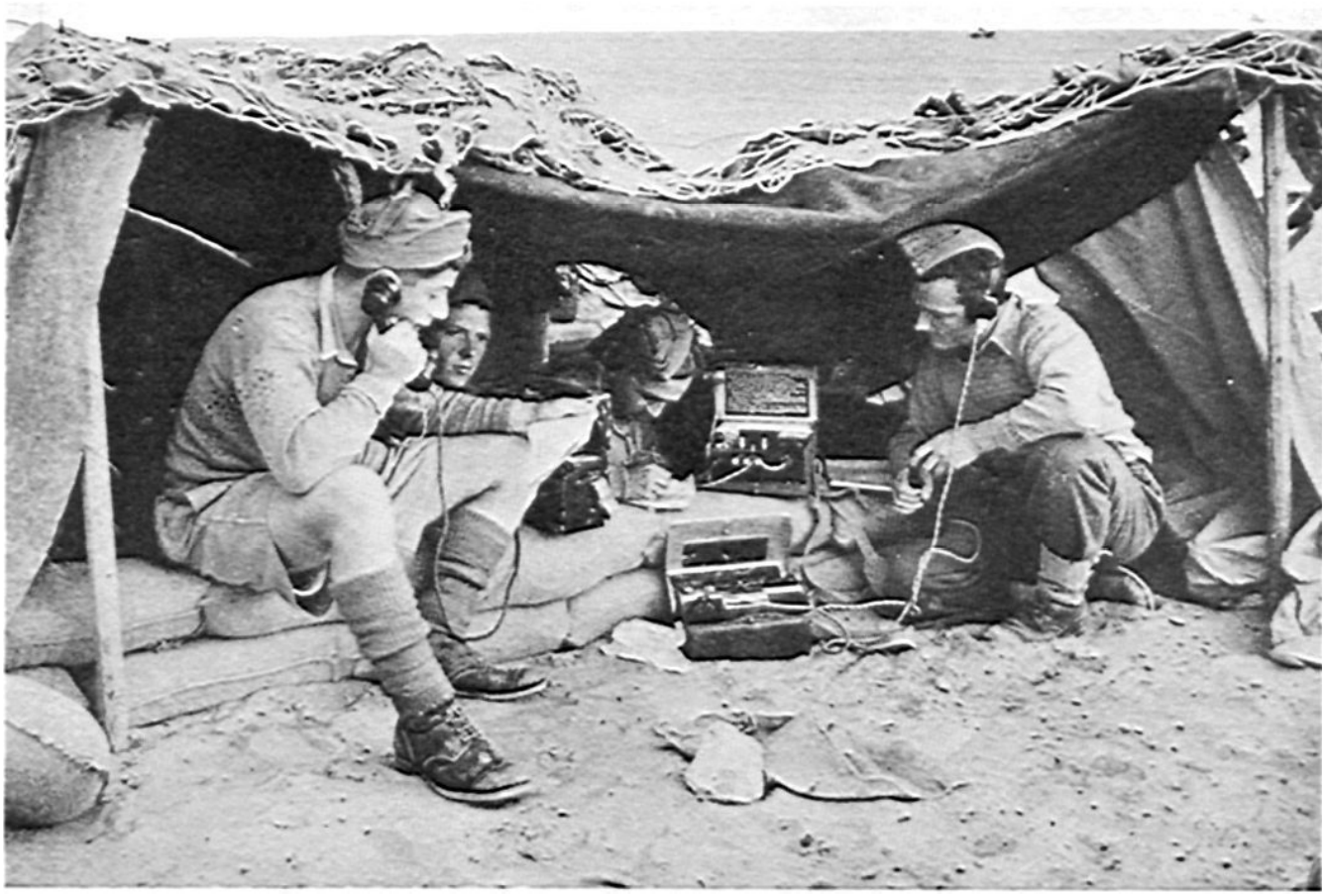
Results with both sizes of barrel have been highly satisfactory. Bore-sighting is simple, with the 4-setscrews arrangement. And by having at least five such rounds per gun, it is possible to fire the normal qualifying course.



Battery (our battalion) CPs are well dispersed. The battery commander (left) has a helping drafts-man, and a subaltern to relay commands to the communications vehicle.

Communications and other vehicles are often well dug in. This protects their running gear, and the lower silhouette reduces chances of discovery.

ARTILLERY



IN THE DESERT

At Battery (*our battalion*) *CP, messages are handled by phone* (*left*) *and also by radio via remote-control equipment* (*right*).

This G.P.O. (*Battery Executive*) *has a well-dug-in position with protection from both splinters and drifting dust.*

Captains Chang and Raymond

Fighting The Japanese

By
Capt. Chang Ten Jen, Chinese Army

As Told to
Capt. Edward A. Raymond, FA

JAPANESE PROGRESS AT A GLANCE

1853—Commodore Matthew Galbraith Perry arrived at Kurihama with U. S. flotilla.

1854—Japan voluntarily opened her doors to Westernization.

1894—Sino-Japanese War. Liotung Peainsula and Formosa annexed.

1904-5—Russo-Japanese War.

- **a. Smashing naval victory under Admiral Togo.**
- **b. Capture of Port Arthur.**
- **c. Annexation of half of Sakhalin and rights in Manchuria.**

1910—Annexation of Korea.

1914-18—War with Germany.

- **a. German garrisons in China and on Pacific islands crushed.**
- **b. "Twenty-one Demands" on China, an attempt to capitalize on post-war military position. A diplomatic defeat for Japan.**

1931-37—War with China—Manchurian Phase.

September, 1931—Guards on Japanese-owned railway seize Mukden, Manchurian capital. Disunited Central China can do nothing to prevent seizure of Manchuria and establishment of puppet state of Manchukuo.

Consolidation of Central Government and Communist forces by Chiang Kai Chek, in the face of continued Japanese pressure.

1937 to date—War with China—Total Phase.

1937—Capture of Peiping (Pekin) and Tien Tsin. Control of Chinese communications above the Yangtse Kiang.

Conquest of Shanghai and vicinity, unwisely crowded with troops by the Chinese.

1938—Guerrilla operations.

Chinese annihilation of 60,000 mobile Japanese at Taierchwang. Japanese capture of Canton and Hankow.

1939—War of attrition. Chinese develop industries in interior and develop Mongolian and Burmese "life lines."

1940—Two "Peace Drives" on Chang Sha by Japan fail.

Japan buys war materials in the United States on an unprecedented scale.

Japan joins the Axis.

1941-42—Japan and Thailand (Siam) invade Indo-China.

Chinese take initiative in small-scale operations over wide front in China.

Pearl Harbor bombed. War with the United Nations.

Seizure of Philippine Islands, Thailand, Guam, Wake, Hong Kong, Borneo, Celebes, New Guinea, Timor, Java, Sumatra, Straits Settlements and Burma.

Concentration of large forces on Siberian frontier.

China's Department of Military Training was sending me to the United States as an artillery student. I had reached Hongkong and was there waiting for a ship when the Japanese attacked. When the British surrendered I remained in the city in disguise for twenty-five days. I escaped through the Japanese lines, and made my way through Burma to Bombay by four months of travel, mostly afoot. So I reached America.

I saw the Japanese Army clearly, better than I had ever seen it in four years of war service. I know it can be beaten, and I am quite certain that it will be. It seems most likely that the Chinese Army will be largely instrumental in bringing this about.

CHINESE MILITARY EDUCATION

My father had been an army officer for a while under the Chin Dynasty, but in those days the system was different and he was glad to take up political interests in Hu Peh Province and act as a merchant of tea. In the old days Chinese merchants did not like to study fighting very much. It has been different for my generation. As a boy I liked military subjects. In 1936, at the age of twenty-two, I entered the Central Military Academy at Nanking.

Our Generalissimo knows that to build China it is first necessary to build an army, and to do that he established the great "Chinese West Point," which has had nearly 400,000 graduates and now, in seven branches, serves all of China. Before World War I, Chiang Kai Chek prepared himself to start the school by going to Japan and completing the curriculum of the Japanese Military School. In 1924 he started the school at Wham Poa. The instructors have been Chinese from the beginning, and have always been returned students from Japan, Germany, France, Russia, and Great Britain. They are military instructors and political instructors at the same time. Doctors, professors, lawyers, scholars, all are glad to take the course.

Since Chinese officers know the importance of fighting, their morale is very high, and the cities full of dead Chinese soldiers show that the morale of the troops, also, is high: they die rather than surrender. At present nearly all military power in China has passed into the hands of students from this school. They are the strength of China, and after they have saved her, they will rebuild her. That is their duty. They do not all come from the upper classes. Men may rise from the ranks, according to age, ability, experience, and merit. Former enlisted men never serve with troops as officers before having gone to the school.

When the Generalissimo became president of China in 1927, he moved the headquarters of the school to Nanking and gave it the biggest building in China, and many smaller buildings. During the war with Japan he gradually developed the branches all over China; in each branch school all arms and services are represented, and near certain of them are graduate schools of the various arms and services. Recruit training takes three months. and then the academic course a little over two years (formerly about four). Only a general idea of the work of an officer's own branch is given at this stage of his training. Cooperation with other arms is stressed, and their characteristics are taught in large-scale maneuvers before graduation. These last as long as thirty days. The High Command gathers all available nearby troops at a branch school for a maneuver, and students rotate in all sorts of jobs, officers' and soldiers'. There is no standing with hands in pockets watching. After the fall of Nanking in 1937, headquarters of the school moved to Chen Tu.

CHINA'S FORT SILL

China's Field Artillery School existed before the unfinished "China Incident" started. It was situated at Nanking, some twenty miles from the Central Military Academy. A firing range, with about fifteen square miles, was cleared of peasants for it, and an observation tower was built. There was also an indoor range of two or three hundred meters on which miniature shells of about 18-mm. length were fired; they actually burst on impact. In this school were many types of guns from different countries, and also divers fire-control instruments. When the school had to move to Kwei Chow the miniature range was broken up and much equipment was lost. Now separate courses are given for cannoneers, warrant officers, lieutenants, captains, and majors, by grade.

The Japanese method of firing is most used for indirect fire. In this the following govern:

OP displaced less than 300 meters laterally from guns—Axial Case.

OP displaced 300-600 meters laterally from guns—Second Case.

OP displaced more than 600 meters laterally from guns—Third Case.

In the Axial Case a round is fired somewhere near the

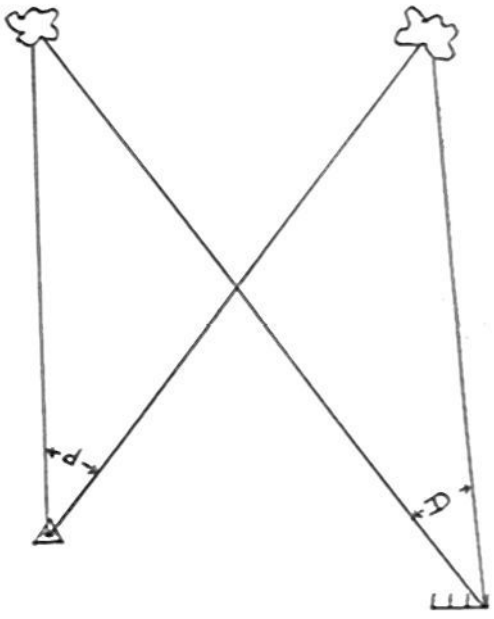


Figure 1

target and the direction proportion (D/d; see Figure 1) is used to correct the deflection.

In the Second Case the direction proportion is used to correct deflection and your r/R range proportion is used to correct range.

In the Third Case the direction proportion is divided by the range proportion to correct deflection and range together.

German survey methods are preferred. The Russian observation system is also taught, for simplicity of operation and economy of ammunition in adjustment. It has two lateral observation posts, and shots are plotted on a grid. This system is difficult for the Chinese Army, because it requires two BC 'scopes and too many telephones, but it is very accurate and usually permits fire for effect after three rounds.

Knowing many methods and many kinds of materiel, we can always use captured equipment. We place a high premium on the capture of equipment.

EXCHANGE GROUPS

I served with troops for six months after being commissioned a second lieutenant from the Central Military Academy, and then took a three-month course at the Field Artillery School. Then, after two campaigns, I had further study at the Foreign Language Institute, which also had moved from Nanking to Kwei Chow. There I learned English; Japanese, German, Russian, Italian, and French are also taught there. The teachers are Chinese, except for some Japanese (wives of Chinese citizens or captives). Most students are at the school to study Japanese, but they also must study German because of the cooperation of those two countries in training. Students of English and Russian do not study more than one language, for these are most difficult. Here all exchange officers to go abroad are trained, later to return to teach in China. In my Exchange Group for the United States was another young officer, and two returned students from Japan, teachers at the Chinese War College. One was General Lincoln Lin and the other was Colonel Yin Hung Chin, Infantry.

The four American officers who came to replace us were to attend the Central Military Academy and then study guerrilla warfare in the War College and go to the Fifth and Sixth Armies in Burma. If living, they must know guerrilla fighting well by now.

FIGHTING

In China an officer usually lives in his regiment during all his service. The regiment means very much to him, and he venerates its traditions and its commander. My regiment is the Eleventh Field Artillery. At full strength it has two batteries of 150-mm. howitzers and one of 105-mm. howitzers. The guns and ammunition all came from Germany, and are of other World War sort. Ten-wheelers (i.e., 6 × 4's) are used to draw them. There are many different aiming circles and pointing devices in the Regiment. There are eight officers, two hundred men, and four howitzers in each battery.

Artillery is very precious to the Chinese, and ammunition also. When it is gone we do not know how to get more. Unless an operation is very important, no artillery is attached. Artillery officers and enlisted men obey the Chinese proverb, "No success means sacrifice." If they lose their guns they lose their lives also. They have the three "no's" taught to Chinese soldiers—no fear when fighting, no retreat when wounded, and no surrender when captured. Even if they were to abandon their guns, our own people would put them to death.

I shall recount two engagements of the Regiment in which I had a part, in order that the lessons we have learned in fighting the strong Japanese artillery with weak artillery may be shown. In the first we lost; in the other we gained.

First was the Wu Han warfare in 1937. We were still fighting position warfare. It took five Chinese soldiers to defeat one Japanese soldier. Then we used to move out guns by day and fire by day, only we would look widely for aircraft and not fire if any were near; we would put the two guns of a section in position together. We were under Ninth War Area command, and were fighting a delaying action after the fall of Nanking. Our battery was about to the surrounded at one particular time. Our colonel, Colonel Lo Ti San, a returned student from Germany, came himself to the position at the support point where were all the clerks and quartermasters and ordnance personnel, took them a hundred or two hundred meters away with rifles, and resisted the Japanese. Making use of the time gained, the section of which I was executive was able to go away, but the other section was not—only certain ones brought off the pointing devices and the firing locks, and then they were shot. At his position my brother officer killed his men with his revolver and then himself. Such events teach that a commander is a very important man, and also that artillery must always have the ability to defend itself, because sometimes the infantry protects the artillery but sometimes the infantry can not do so. If the artillery can not defend itself, enemy encirclement is very dangerous. It also shows that position warfare was not very good, considering our circumstances.

The other incident was at Chang-Sha in 1939. We have learned to move only in the night and not to fire in the day. Our guns are always more than two hundred meters apart. We are all in trenches and turn the muzzles of our howitzers down and camouflage everything very closely. We decide what our initial data will be in the light and remember to fire it in the dark. Then we move to new positions, so that the Japanese sound and flash battalions can not search us out. We know Japanese planes well, but their counterbattery artillery fire is also effective.

At Chang-Sha our army commander was General Pei

Chung Shih. He is the greatest strategist in China, as even Japan's generals recognize. He developed Chinese tactics from position warfare through delaying warfare to consuming warfare, which leaves scorched earth and moves peasants with their food away from in front of the Japanese; and mobile warfare, which retreats in front of the Japanese and at the same time advances around them and follows them when they withdraw; and magnetic warfare, which strikes at many places and draws the enemy troops in many directions; and total warfare, which arms and enlists all the civilian population to help the soldiers. In the beginning, five Chinese soldiers beat one Japanese; today one Chinese beats two or three Japanese. All great victories such as Tai Er Chuan, where Japan lost a corps, with much mechanized equipment, and Kun-Lun-Kwan, have much to do with General Pei Chung Shih.

Chang-Sha was a communications center, very necessary for transportation of food from Hunan Province to the war areas. Without such a central place it would not be easy to move troops from one front to another. Also, Chang-Sha was the last capital of China, and had great morale significance. The Generalissimo decided to defend Chang-Sha at any cost. This decision was made against the suggestions of the High Russian Adviser, who pointed out that Chang-Sha, on the Yangtse, was a favorable point for the Japanese to attack with a combination of land, air, and naval power. Before the battle we gained cooperation between civilians and soldiers and ripped up the communications that the Japanese would have to use. We left them no railroads, no roads; we even blocked the river. We made the roads look like farmland and Japanese aircraft had difficulty in finding our columns. The enemy used parachute troops in this battle for the first time in the world, but not very many. Only peasants who were able bodied were left in the area, and they and all our soldiers were determined to die. The Japanese parachutists came down with perhaps a hundred, perhaps two hundred meters between and they could not get organized before they were all killed by civilians except the few who were taken prisoner. In the main part of the battle the Japanese were surprised that each Chinese line held well and that the Chinese soldiers were not inclined to withdraw as they used to do, by large bounds. Japan's soldiers were disheartened. We still hold Chang-Sha.

When I speak of artillery being used for most important battles only, I do not mention guerrilla guns. They are single pieces of artillery which go beside rivers when our people tell us that a Japanese warship will come by. Then we shoot by direct means, very close, and when we leave, fast, the target we present is so small that it is not easily seen by Japanese aircraft. Guerrilla guns are not often lost, and the work they do is very good.

(*To be continued*)

PHILATELIC NOTE (to D Battery of the 5th FA)

On October 18, 1926, a special 2c stamp was issued to commemorate the 150th anniversary of the Battle of White Plains. It was printed in the red usual for this denomination, and in the upper corners bore 1776 to the left and 1926 to the right. The center of the stamp pictures a cannon manned by a four-man crew who are loading the gun; off to one side is the customary pile of cannon balls. At the bottom are festooned two flags, the American flag pointing to the left, and to the right a Battery flag bearing the inscription "Liberty or Die." Also at the bottom is the figure 2c, besides the wording "2c U. S. Postage."

Unlike some special issues, this stamp was not issued in any large quantity, and was in use only a short time. Alexander Hamilton's battery, however, will remain in our memories long after its many commemorations have been forgotten.

Background for Battle*

By Alexander Clifford

A corner of the War Room, Cairo

Although portraying the preliminaries to the 1941 British push across Libya, this extract is doubtless quite descriptive of the prelude to the 8th Army's magnificent recent drive. It gives, too, a sympathetic picture applicable to other higher headquarters than the one in question.

The process was planned and organized from one small group of offices in Cairo, but the wires that were pulled from there stretched right 'round the world. Air-Marshal Arthur Tedder (he was knighted a few months later) was the brains behind it. And always by his side was Air-Marshal Roy Maxwell Drummond, deputy Air-Officer Commanding the Middle East, an Australian who fought in Egypt and Gallipoli in the last war and commanded a fighter squadron in the R.F.C.

From his spacious, map-hung office in Cairo, his pipe almost always between his teeth, Tedder steadily built up the Middle East's strength in the air. America sent Marylands and Tomahawks at first, and then followed up with Bostons and Brewsters and finally Kittyhawks. From Britain came more and more Hurricanes, Blenheims, Wellingtons, and Beau-fighters. New airfields were carved out of the desert. Pilots and groundstaffs grew from a mere handful to a whole army. Bombs and high-octane aviation spirit, guns, ammunition, and spare-parts arrived in a swelling stream.

G.H.Q., M.E., had become an untidy sprawling growth, tightly tied together with red tape. It had started in an hotel. Then moved into a vast new block of flats. Presently it incorporated more flats. Then a big villa. Then it engulfed a whole street. Finally it became a district and they flung a barbed-wire entanglement 'round it and posted sentries at the entrances. For one whole block the entanglement ran along one of Cairo's main streets, and the plans for beating Rommel were forged with clanging trams and camel caravans and all the clamorous hurly-burly of Egyptian traffic passing by a few yards away.

All day long red-hatted brigadiers, smart girl typists, sunburned Air Force pilots, French, Greek, or Polish officers, bustling orderlies, sinister individuals visiting some obscure branch of Intelligence, would be showing their identity-cards to the Cypriot sentinels at G.H.Q.'s gates. But inside you got an impression of improvisation and makeshift. Its greatest admirers admitted that G.H.Q. was unwieldy and overcomplicated. The atmosphere was that of a big department store valiantly carrying on during alterations.

You might find a shirt-sleeved Brigadier working in a kitchen. Next door, in a partitioned-off bedroom, operational plans would be under discussion around secret maps. You would find yourself constantly passing through bathrooms, which formed the passages between the different flats. Everywhere you came against boarded-up doors and corridors.

It was difficult to realize that the campaigns in Libya, Abyssinia, Greece, Crete, and Syria were planned and organized in this jumble of offices amid the luxurious, hot-house atmosphere of Cairo. For in its spare time G.H.Q. was living a life of comfort and costliness which staggered people fresh from war-time England. The flats were palatial and their prices would have been spectacular in London or New York. Usually a few officers clubbed together and shared the rental, for their wives and families had mostly been evacuated. And naturally these bachelors and grass-widowers were fair game for every housekeeping racket anyone could think up. Prices in the shops were already soaring madly, but they became still more outrageous when they appeared in the officers' housekeeping books. Cooks were making fortunes.

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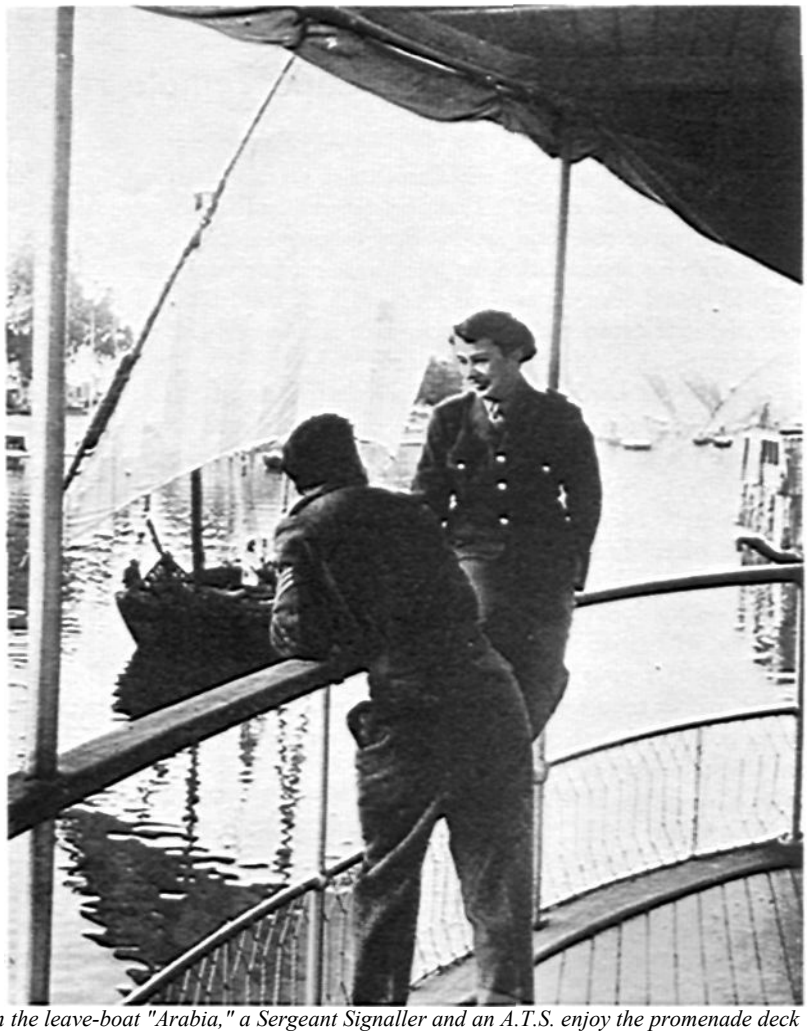
*From Mr. Clifford's forthcoming book, *Crusades*.

Merchants who soaked firewood and melons in water to make them weigh heavier came into their own.

But if you had the money you could buy comfort. You could have bacon and eggs, plenty of butter, and English marmalade for breakfast. Petrol for your car was unrationed. When you joined friends before lunch on the green lawns of Gezira Sporting Club your Scotch whiskey cost you only half what it would have cost in Scotland. You could stroll across the club dining room and eat your fill from a cold buffet which always had unlimited chicken, game-pie, boiled and roast beef, ham, and chops.

The weather was still warm enough for you to put on your smart gabardine uniform—G.H.Q. officers were unkindly nicknamed "gabardine swine" by men from the desert—and take an expensively-gowned girl to dine beneath the stars at an open-air cabaret show, with glamorously shaded lights and slick discreet waiters.

There were times when this luxury produced raging attacks of conscience. It usually started with a letter from home or something read in the papers, and people began to wonder why they should be enjoying this comfort and safety when their families were being bombed and going short of things. Suddenly Cairo's pleasures turned to ashes and one felt an insatiable longing for home.



On the leave-boat "Arabia," a Sergeant Signaller and an A.T.S. enjoy the promenade deck between dances.

Soldiers on leave "window shop" in the "mousky" (*native market*), *Cairo*.

But it was difficult to blame Cairo. It was the capital of a fertile and nonbelligerent country. There was no reason why it shouldn't be safe and comfortable. And it was worth remembering: Cairo had already been the headquarters of five full campaigns on five different battlefronts. Some were victorious, some tragic, but none were comfortable. And from these five campaigns men came back to Cairo on leave. Cairo couldn't give them their homes, which was what they really wanted. But it gave them the next best thing—comfort, food and drink, hot baths, entertainment and color, and a breath of relief from the war. They deserved it and they were grateful for it.

FIELD DAY FOR ROOKIES

By Capt. Temple H. Fielding, FA

In the lush days of 1941, replacements to tactical units had savvy and assurance. Training centers had mushroomed all over the country. When Johnny Pitchfork reported to his organization, he was already a fine young soldier. He'd been exposed to a program of solid basic training. He could grease a truck, man a howitzer, and march in cadence. He knew his stuff.

The cry for hordes of artillerymen has changed the picture. Replacement Centers are no longer able to shoulder the major part of the burden. Though turning out basics by the thousands, their output is strained to capacity. New organizations must take what they can get, often direct from civilian life.

Key personnel at the FARC, Fort Bragg, are constantly on the lookout for fresh methods of instruction. Training of civilian soldiers is their business. They know the obstacles facing the tactical commander with virgin troops and untried cadres. Their mission is to turn out better soldiers faster, and to pass on their methods to units who haven't time to experiment.

Lt. Col. James E. Bush, commanding 1st F.A. Training Battalion, FARC, felt that the instructional cycle should be capped with a climax. Enthusiastic support was given him by Colonel Marcus A. S. Ming, commanding 1st F.A. Training Regiment. Experience had shown them the existence of a let-down during the final two weeks of schooling. Competition was needed to develop unit pride. A goal was needed to banish the specters of monotony and repetition—to make the men *want* to do their jobs with greater efficiency. A mass gymkhana seemed a satisfactory solution.

Webster defines gymkhana as "a meeting for athletic contests, mainly racing." If streamlined to trials in technical proficiency, the Field Artillery version offers exciting material.

The six steps of training are followed as shown:

1. *Preparation*. Headquarters prepares a schedule of events, listing date, time, sequence, place, number of men involved, general rules, and related particulars. This is discussed at a round-table conference of Battery Commanders, who pass down the plans to their officers and cadre. Judges are requested from neighboring units. Two Preparation Officers per battery are appointed, to take charge of individual events. A streamer is purchased for the winning guidon. A Master of Ceremonies, an Assistant to the Judges, and a Recorder are designated. Arrangements are made for use of a PA system. Trial selections of participants are made in each battery, instructors being assigned for every event. Precautions are taken that no man enters twice, except in massed contests.

2. *Explanation*. Groups are now segregated and the officer in charge carefully outlines the event. He clarifies the rules, drives home the fine points, and answers all questions pertaining to the subject.

3. *Demonstration*. An officer, a cadreman, or a selected group demonstrate the event, the real participants acting as spectators.

4. *Application*. Now the men try it for themselves. General corrections are made at once. Stragglers and misfits are eliminated. Pressure is brought to bear on details. Dry runs are made until the unit is a team, smoothly coordinated, fast as lightning.

5. *Examination*. This, of course, is the actual gymkhana. Each team now faces its crucial test.

6. *Critique* and *Discussion*. At the end of the day, the officer in charge of each event offers a critique to his entry. He points out mistakes, compliments good performance. An open forum follows. In practice, it has been noted that the gymkhana is the main topic of latrine discussion for several days. Arguments are rife as to the truck-driving abilities of Johnny Jones, the tilt of the bubble on "C" Battery's howitzer. So much then for the training approach. Let's take a look at the actual program, scheduled for one full working day.

The first event is Mass Calisthenics. All men in the command participate. Batteries are formed separately, at intervals sufficient to permit them to extend without interference. Each organization is handled individually, in plain view of the others. A standard set of exercises is given by one officer. Judges circulate through the ranks, making careful notes on precision of movements and delivery of mass commands. The winning battery scores four points, the second battery three points, the third two, and the fourth, one. Results are posted on a giant blackboard, mounted on stilts above the spectators. All events are tallied alike.

Next is Dismounted Drill. Forty crack men have been selected from each battery, and they lounge on the perimeter of the hollow square formed by the spectators. A lieutenant saunters to the center, nods to the judges, and shouts " 'B' Battery—FALL IN!" The prize platoon races to a point six paces from the lieutenant and forms at normal interval. The drillmaster runs through the position of attention, verbatim (FM 22-5, par. 16). The men stand like statues as the judges note errors. After perhaps two minutes of this, a standard set of marching commands is given. Performance and soldierly appearance are the keynotes. When "B" Battery has finished, "D" Battery repeats, and so on down the line. Order of performance is varied from event to event, to give each organization in turn an opportunity to profit by the other's mistakes.

Manual of Arms is the third event. Ten standard

movements are executed in Battery Mass formation. When errors are spotted, the offenders fall out to the flank, and are counted at the completion of each movement. Scoring is as follows:

1st Command—10 points—X men falling out.
2d Command— 9 points—X men falling out.
3d Command— 8 points—X men falling out.

From the total of these figures, the number of men left X 5 is deducted, and the organization with the lowest score is the winner.

Section Drill, the fourth event, is tops for interest and enthusiasm. This is the Field Artilleryman's specialty, and competition is keen. A prize gun (howitzer) crew from each battery is assembled on one end of the parade ground, mounted, coupled, and ready to go. Care is taken that equipment is standard in all organizations. At the signal, the prime mover races down the field to a designated point, where the cannoneers execute "Action Front." The truck returns to the starting line, and the motor is cut. At "Section in Order, Sir!" time is taken, and materiel is checked by the judges. For each error or omission noted, one second is added to the final tally. Now comes "March Order." At the click of the stopwatch, the truck is cowboyed to the front of the piece, the cannoneers "Couple Front," and tumble over the tailgate. The vehicle takes off in a cloud of dust, and when the starting line is recrossed the event is over. Once again a careful check is made of equipment. Final scores of both parts of the trial are combined, and the battery with the fastest and most accurate crew is declared the winner.

Precision Driving is fifth. An elimination has been run in the Motor Park of each organization and the best driver has been selected. A course has been staked out on the parade ground, in full view of all the spectators. At the signal the first man runs the course in a jeep, returns, and parks. He transfers to a weapons carrier and repeats the performance. Finally he makes the run in a prime mover. Scoring is based on the number of stakes knocked down, the winner having the least to his debit.

The next two events involve tent pitching. In the first, twenty men from each battery pitch shelter halves, with simultaneous display of full field equipment. In the second, pyramidal tents are raised by six men of each organization. Time, appearance, and straightness of lines are points on which the winners are determined.

The eighth is also a novelty event. Five soldiers from each battery are lined up at the starting point, wearing only the mean essentials of uniform. At the signal, the lead men race down the field, don jumpers, leggings, hat, and belt, roll a complete pack, and race back to the point of origin. Each succeeding man starts in relay. Time is again the determining factor.

Gas mask and rifle drill is ninth. Four-man teams are selected. The first entrant runs to a designated line, jerks out his gas mask for wear, falls into the prone position, fires five dummy rounds, and returns on the double. His teammates duplicate his performance, assuming sitting, kneeling, and standing in lieu of the prone position. Errors are marked heavily. Ten seconds are added for each variation or omission from standard. The winning organization is, of course, the one with the lowest time.

The last scoring event is application of chains to a prime mover. Four trucks are driven from a line to a point, where the driver and assistant driver put on chains. They then proceed to a second point, where the chains are dropped. The first vehicle recrossing the starting line is the winner. Use of jacks or other devices is forbidden.

If time permits, interbattery softball games are scheduled at the end of the program. This is an extra feature, non-scoring, to wind up the day.

For the tactical commander with new troops, the gymkhana is superior. It adds the flavor of sharp competition. It develops unit pride. It creates the desire to do a better job. From the standpoint of teaching, it meets all requirements. From the standpoint of morale, it's an excellent booster. There's no better method for training new soldiers.

OCS Prep Schools

A comprehensive 192-hour schedule is being standardized for these schools, which are conducted at Fort Sill, Fort Bragg, and Camp Roberts. Firing battery, preparation of fire, and gunnery math lead the list of subjects, with 35, 24, and 24 hours allotted to them respectively.

—F.A.S. Information Bulletin

SELF-HELP

By Lt. Harold G. Miller, FA

When the "rules committee" formulated the regulations for World War II America was not permitted to sit in on the meeting. Ratification of those rules has been forced upon us, contrary to every code of decency, of sportsmanship that makes Americanism. Whether it be heritage or tradition (call it what you may), the pride of our youth has been to fight fairly. Cowardice in our realm is despised. We have no place for it.

The dastardy of our antagonists in this war has rubbed against our grain as far as the rules of the game are concerned. It is not sheer propaganda that American prisoners have been gored to death, starved, rotted. Men have found their way back to the States after serving terrifying months in dank and clammy prison holes, their

Figure 1

A poke to the chin! This jab, done with every ounce of power in a man's body, is accomplished from close in and is one of the five punches in the club series. The first is a punch in the stomach with the end of the club. The next is shown here, bringing the foe's head back up. If this fails, the third is to bring the club down on the man's face, without changing positions of the hands. A right book to the jaw with the club in hand is the fourth movement. For the fifth, see Figure 2. These five movements are done in split-second precision and should enable a fighter to dispose of his opponent. Any stick or club, if it is big enough, will turn the trick.

Figure 2

The final stage of the club attack. If the poke in the stomach, jab under the chin, clout on the face, and right poke to the side of the head don't eliminate the adversary, this phase of the club attack likely will. Into this cross-bar jab, the attacker throws everything. A broken neck is generally the result.

Figure 3

Fighting fire with fire is not a new trick. This Japanese stranglehold is quick, silent, and fatal. If the attacker wants to break the victim's neck, he can do it. There is no quick defense for such an attack if it is made correctly. Not only is the power of the arm lock applied to the victim's neck, but also the weight of the attacker's body as he brings his opponent to the ground. It's a quick death—no bullets, no blood.

Figure 4

Defense againest the rear stranglehold. The Japanese stranglehold is often dealt with in this manner if the attacker hasn't been permitted to start his break. By grabbing one of the attacker's arms and applying the famous "flying mare," the enemy can often be surprised. Application of one of several tricks will complete the scene after the attacker has been put on the ground.

Figure 5

A kick in the face is good exchange for a strangle hold. Here Lt. Col. Shutter demonstrates the result of a strangle hold. By grabbing one of the enemy's arms and twisting it back, the head is thrown toward the ground and readily brought back up with a death-dealing kick. The kick is made quickly so as not to give the enemy a chance to upset his foe.

feet rotted off, stabbed into a virtual pin cushion, having died a thousand deaths—yet lived.

"Bushido" is the Japanese term for the yellow code of warfare—their Marquis of Queensbury rules. Bushido is not our code—it has been forced upon us. But Bushido it shall be!

Out of the current conflict, especially in the jungles of the islands, has sprung a new phase of combat. It's new to a 1942 edition of civilization. We assumed that stoning, knifing, choking, and clubbing had been buried with the stone age. But the Barbarians have dug it up and today, as much as in the Neanderthal era, such tactics are part of warfare.

In keeping with the principles employed under Bushido, American soldiers are being schooled in close-combat fighting. There will be times when the rifle may be lost or unloaded, when a stone, club, knife, or rope will be the only available weapon. Likewise, these same primitive means will be used against our soldiers and they will have to defend themselves against their effects. How well the American soldier can handle himself under these conditions will depend not alone on his initiative but also upon his preliminary training.

Figure 6

This wrist bend is simple but effective. The chances of getting the enemy in this close, and unarmed, are rare, but should the occasion arise this hold will put him on his back—maybe breaking his wrist. This hold is usually applied to bring a man to the ground; from this point he is finished by other means.

Figure 7

This is the proper way to approach with the knife—not the stab style as shown in the detective magazines. The victim in this case has no defense as far as hand-to-hand fighting goes. If caught in this predicament a quick displacement to the rear (*run like mad*) *is generally the only way out. From this position the attacker can sever an artery in the arms should the attacker attempt to reach for his foe. A kick would only bring a deep gash in the leg. A knife is sometimes the best weapon on earth, and the trainees are taught to regard it as such*.

Figure 8

The over-hand knife attack can be thwarted by a quick defender. Once the stabbing hand is grasped the knife is choked from the attacker's hand as he goes to the ground with an arm lock. Skill and caution are required in this defense, as one slip of the knife will be sufficient. So that speed and precision can be mastered, wooden or imitation blades should be used for these drills.

A successful pattern for close-combat instruction has been incorporated in the training program at the Field Artillery Replacement Training Center at Fort Sill, Oklahoma, under the supervision of Lt. Col. Arnold W. Shutter. And, take it or leave it, the Fort Sill men love it. They prefer the rough-and-tumble stuff to the routine of knee bends and straddle-jumps.

The program at Fort Sill Replacement Center calls for seven weeks of calisthenics. Beginning with the

Figure 9

The knife attack from the rear. When it's knife versus pistol the attacker must get in close without alerting his foe. Applying the strangle hold with one arm, the head is tilted to the left and the knife rammed home down the sentry's neck, inside the shoulder blade. The knee is useful in bending the sentry backward or in preventing, momentarily at least, the drawing of the pistol. This attack, if made quickly and with great power, will be silent and effective.

eighth week, calisthenics are turned into close-combat work. Training in close-combat phases includes both offensive and defensive instruction. Defense against knife attacks, bayonet thrusts, pistols, strangle holds, arm locks, body blows, and clubbing is stressed. The offensive phase covers the proper use of the knife and the vulnerability of the body to the blade, the use of cartridges in fist fighting, use of the hand slaps, knee kicks, strangle and body holds, back- and neck-breaking tricks—anything to eliminate the foe in the shortest possible time with the weapons available.

To elaborate on this phase, take for instance a club picked up during a scuffle. Normally one would beat another on the skull with a sweeping downswing. Such orthodox tactics are not taught today.

There are five quick and effective attacks with the club, all consecutive and pushed together in rapid succession. Grabbing the stick in both hands, the attacker rakes or punctures the foe's midsection. This should bring the head of the enemy downward. The next movement is to throw the end of the club upward under the foe's chin. If this throw misses its mark or only partially connects the force will carry the club and arms into the air. The third step is to bring the butt end of the club down on the opponent's face. A vicious right or left hook to the jaw, with the club in hand, is the fourth phase. The finale is a cross-bar push into the enemy's throat.

If there is anything left of the attacked soldier after this routine a new and different series is readily applied. It is the aim of the instructors to have each man practice each phase until it becomes automatic and instinctive in his campaign. Instruction in this part of the training program at Fort Sill has been handled by men specially trained in this field of fighting. Many of the tricks have been brought to the corps of hand-picked instructors by two sergeants who received training with the British Commandos. This source, coupled with tactics taught by Maj. W. E. Fairbairn, author of the book on hand-to-hand fighting, *Get Tough,* provided excellent background for the instructing officers and noncommissioned officers.

To handle training in the units two officers from each battalion, two from the Officers' School Basic, and a hand-picked noncom from each battery were given intensive preliminary training prior to being assigned to supervise this work in their units.

". . . . . and don't forget behind the cars."

DIG FOR YOUR LIVES

By Capt. Edward A. Raymond, FA

"Oh, when the bullets start flying, the men will dig fast enough"—so say those who shirk habitual hasty entrenchment during training. But entrenching, like every organized activity, improves with practice. Officers can learn field fortifications only by experience. When enemy attack aviation, counterbattery observation, or mechanized units catch a battery in the open, more than enough men are going to be killed just diving for prepared trenches. To be caught with slit trenches half-dug or not dug at all is much worse. Of course protection is secondary to the mission, and entrenchment should not materially delay the delivery of fire after the guns have reached a position.

This article assumes that skeleton crews stay with their pieces, as they would in an active engagement. Losses can be cut down a great deal, however, if hasty entrenchment is made part of "Prepare for Action" and performed by the numbers by appropriate cannoneers. Losses can be cut down still more if a pioneer group accompanies the Executive to the position well in advance of the battery and gets slit trenches ready. Before a deliberate occupation, or a withdrawal, this should be possible.

A good battery officer ought to know the order for entrenching operations stressed from experience: slit trenches, gun pits, pits for ammunition, prime mover pits, pits for other vehicles, and overhead cover for gun crews against machine gunning.* He probably does know this, when he stops to think about it. He probably knows, too, that slit trenches are best constructed within ten or fifteen yards of the piece, near enough for prompt use and far enough apart so that a hit on one will not destroy another also. He lays out cross or chevron trenches so that occupants can get a maximum field of fire and move from one angle of trench to another for better protection. He keeps all trench sections at an oblique to the battery front to minimize the effect of enemy artillery fire brought down on that line. In starting trenches he puts sod or surface dirt aside, and later replaces it above the spoil for camouflage. There are other considerations he may not think of until he has made a study of the subject and has had plenty of actual field experience. Official doctrine is not explicit. These considerations all have to do with the time it takes to dig in. They include soil, working conditions, and tools.

*See *Position Protection*, p. 63, F.A.J., October, 1942.

SOIL

The Corps of Engineers classes soils as soft, average, and hard, depending upon the best proportion of picks to shovels for each type. They publish reference data for the amount of each type of soil which can be moved per man-hour over prolonged periods (30 cu. ft. for soft, 23 cu. ft. for average, and 15 cu. ft. for hard soil for the first hour). The staff officer's rule of thumb for "average" soil is one cubic yard (27 cu. ft.) per man-hour. Those figures are useful knowledge for all combat officers—but do not apply to hasty entrenchment for field artillery, which calls for peak exertion for short periods and replacement of a digger when he tires. The following table is perhaps a better guide:

Fig. 1.—TIME FOR HASTY PROTECTION

Note: These figures will only be attained by excellent crews, working under good conditions.

	Soft Soils (1 pick to 2 shovels)		*Average* (1 pick to 2 shovels)	Gravel, or sand, loam or clay with light roots and stones	*Hard Soil* (2 picks to 1 shovel) Sand or soil with heavy roots or rocks
	Sand	Loam	Clay		
*Cu. ft. min. per man	1.	.8	.6	.4	.2 to .05
Hrs./mins., 75-mm. gun section—180 cu. ft. (4 men per section digging)	45	56	1/15	1/30-1/53	3/46-15/04
Hrs./mins., 105-mm, how, sect.—200 cu. ft. (4 men per section digging)	/50	1/03	1/23	1/40-2/05	4/10-16/40
Hrs./mins., 155-mm, how, sect.—260 cu. ft. (5 men per section digging)	/52	1/05	1/27	1/44-2/10	4/20-17/20
Hrs./mins., 6 × 6 vehicle—400 cu. ft. (2 men per vehicle)	3/20	4/10	5/33	6/40-8/20	16/40-66/40

*This figure may be used in computing time required to furnish protection at OP, CP, outposts, etc., and in planning protection of bivouacs.

WORKING CONDITIONS

One says a good deal about the weather in the course of a lifetime, and a surprising lot of what one says proves wrong. Naturally, heat, cold, and wet affect both the ground and its diggers. Fatigue, hunger, and thirst are other factors, but morale can often cancel these.

Ordinarily, men will only dig half as fast in darkness. Morale is certainly useful here.

TOOLS

New Tables of Basic Allowance give every cannoneer an entrenching tool. Shovels are short-handled, for faster work. The picks are mattock-type. In some places the ground is mostly embedded rock: not a few Oklahoma hillsides are like that, and so are volcanic islands in the Pacific and much of Europe, Asia, and North Africa; in such circumstances there is no substitute for crowbars, and every section could find plenty of use for two. Overhead cover from machine gun fire, siding and bracing for slit trenches, and other pioneer work can be done much faster with the five-foot, two-handled crosscut saw than with G.I. axes. One per section would undoubtedly pay its own freight.

Even with these additions to the hand tools a battery already has, there are two enormous blots on the picture. Biggest is the time it takes to dig. Also, the effort expended is very fatiguing.

Even in horse and buggy days, the pick and shovel were not considered modern means of moving dirt. A horse- or mule-drawn scoop, called a fresno, was rigged in such fashion that it held a desired angle when drawn along, without digging down too hard or slicing out. Nowadays fresnos are commonly drawn by tractors; sometimes they are drawn by trucks. There is no reason why they could not be pulled, as plows and harrows are pulled in Pomerania and Poland, from the sides of muddy fields. Cable is run to a stationary engine on each side of the field, one pulling one way and the other providing power for the trip back.

Slit trenches should be as narrow as two feet; a fresno of this width would be well within the capacity of a truck. Direct tow could be used on hard ground and a winch on soft ground or wherever wheel tracks would be too conspicuous. Teeth, like those in the jaws of a steam shovel, would be useful for roots and stones. A two-foot fresno would be slow for digging-in a truck, even though a trick pit need only be half as deep at the differential as at the radiator and wheel trenches save still more. To speed this up, and perhaps speed digging-in the ammunition also, two two-foot fresnos could be fastened together—pintles would do the trick—to make a four-foot fresno.

What to do with the stout steel scoops on an already fully-loaded truck? One idea is to erect them around the machine gun with which each prime mover is being armed, to provide shields back of the cab. Another is to use them as an outer hood to protect the engine. It would still not be necessary to completely clean the scoops, when pressed for time, if the present hood were left in place.

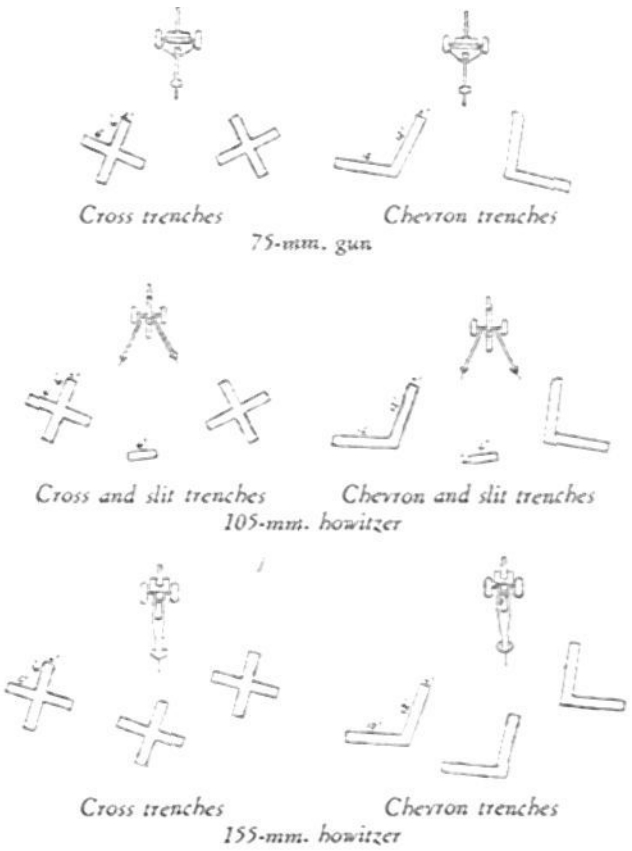
In hard ground (that is, with large roots and rocks) or frozen, fresnos would save no time and little labor; explosives would. A pioneer detail preceding the battery into position could be trained in their use.

HOW GOOD ARE SLIT TRENCHES?

Batteries are favorite targets for air, artillery, and ground attacks. A good idea of the usefulness of slittrench protection—and the uselessness of the spoil in stopping missiles—can be seen from the tables in par. 190, FM 101-10, Staff Officers' Field Manual. The vertical or horizontal penetration of artillery shells in ordinary compact soil is given as 4 feet for 75-mm., 5 feet for 105-mm., 7 feet for 155-mm., 9 feet for 8″, and 14 feet for 240-mm. Protection needed to stop a caliber .30 bullet ranges from 10″ of gravel to 36″ of loam and 72″ of clay. Three feet of packed, watered, and well frozen snow are needed.

Tank attack was probably more feared by artillerymen in France than any other type, and in Libya this seems even more pronounced. Recently an instructor at Fort Bragg had just announced to his class that British slit-trenches in Libya, two feet wide, had saved the lives

Fig. 2.—TYPES OF HASTY ENTRENCHMENTS
(*average depth; 2 feet*)



of occupants when tanks had run directly over them. The class was inspecting demonstration trenches dug in sand. A ten-ton tractor, prime mover for a 155 G.P.F., came clanking down the road. The instructor hailed the driver: "Come over this trench, soldier. The sergeant and I will let you pass over us." The driver started to comply. From inside the trench the tractor started to look bigger and bigger. The instructor thought again. "Hold it a minute, driver." A few feet from the trench the tractor came to a halt. The occupants of the slit trench scrambled out to give the tractor a "dry run" first. The tractor moved forward. In such soft sand it left no trench.

But a trench is a lot safer place to be with enemy tanks about than the top of the ground. In some soils, the sides of a narrow slit trench will hold up a medium tank. When time and material permit, however, the trenches should be well timbered and braced.

It is estimated that good entrenchment discipline will cut battle casualties in half. That is worth a lot of work.

USE OF THE BRITISH GRID

The British grid system differs from our military grid in that

(1) Grid zones are generally small, long and slender, and adapted to the general shape of the country covered. For example, the Netherlands East Indies is divided into long, slender zones running east and west, while East China is divided into zones running north and south.

(2) There is no overlap between grid zones or belts.

(3) Grids are printed as overprints in a distinctive color for each zone, the colors being selected so that no two adjacent zones appear in the same color.

A grid zone is ordinarily divided into squares of 500,000 meters on a side. Each basic square is assigned a letter, the letters being in alphabetical order reading from left to right and down within a zone, but omitting the letter "I."

A	B	C	D	E
F	G	H	J	K
L	M	N	O	P
Q	R	S	T	U
V	W	X	Y	Z

Each 500,000 meter square is further divided into 100,000 meter squares, each of which is designated by a letter following the above-described pattern. A 100,000-meter square of a zone can thus be identified by two letters, the first of which indicates the 500,000-meter square and the second the 100,000 meter square. Some zones are so long that it is necessary to repeat the series of 500,000-meter squares, in which case more than one 100,000-meter square will be assigned the same letter. Other zones are so small that neither size of square appears, hence no letters are used in grid references.

On the face of maps on a scale of 1/250,000 to 1/500,000, the letters identifying both sizes of squares are shown. On maps of scales 1/250,000 and larger, only the 100,000-meter square letters are usually shown, although the letter identification of the larger square may appear in a grid index diagram in the margin of the map.

Spacing of grid lines is controlled by the scale of the map. With scales 1/20,000 to 1/100,000, grids are spaced at 1,000 meters; on those of smaller scale they are spaced at 10,000 meters, and this spacing is occasionally used even on maps of 1/100,000 scale.

In the lower left margin of each map are instructions for giving grid references. The same procedure is used with maps of any scale. There is a tendency to omit the letters from references, but this may be done in the following cases *only:*

(1) Where the instructions in the margin of the map so state.

(2) When the zone is so small that letters identifying the 100,000 meter square are not repeated, there will be no first letter identifying the 500,000-meter square.

(3) When the operation or references are so localized that there is no possibility of misinterpreting a reference if the letters are omitted.

SUMMARY

Write the 500,000-meter square letter.

Write the 100,000-meter square leter. If all pertinent letters are not shown on the map or on an index in the margin, sketch out the basic square arrangement as shown above, to be certain that the proper letters are used.

Write the east-west coordinates from the lower left corner of the appropriate grid square (or of the map, if the map lies wholly within a single 100,000-meter square), estimating or measuring to the smallest reading desired.

Write the north-south coordinates in the same manner, *without* a hyphen or dash between the two coordinates.

Always omit the small numbers which precede the large grid numbers in the margin of the map.

Close Combat Firing with Field Artillery Small Arms*

PURPOSE

The methods of close combat firing with small arms described herein are designed for quick surprise fire at close ranges usually under twenty-five yards. This firing is intended primarily for use under conditions of poor visibility such as at night, in woods, in fog and in smoke, where the first shot is the one that counts. It is to provide adequate protection and confidence where the law of "The Survival of the Fittest" is determined in split seconds. Other types of marksmanship as taught on known distance ranges are in no way supplanted by the technique of close combat firing.

SPEED

This is the governing factor. There is no time to aim. Precise methods of marksmanship used by snipers would be fatal in the time allowed for close combat firing. If your shot is one-tenth of a second ahead of your enemy's, you will get him before he hits you. Should your first shot be a miss, it will be so close as to derange the accuracy of his fire. This will permit you to finish him off with your second shot before he can fire at all. Safety devices on the weapon are disregarded. The index finger of the right hand should be on the trigger at all times. The weapon is carried in such a position as will facilitate rapid employment.

FIRING POSITION AND AIMING

Both are a natural instinctive reaction to imminent danger. When attracted by an unusual noise, the firer, startled and perhaps surprised, moves to a tense crouched position with feet spread and with his entire body aiming in the direction to which his ears or eyes have directed him. The weapon is frozen in the direction of the target and rigidly held in alinement by a stiff controlling arm. The firer exerts pressure on the weapon as if he were handling a very heavy weight. Both eyes are kept open. The sights are ignored. The trigger is rapidly squeezed by an attempt to compress or crush the trigger mechanism against the body or stock of the weapon. The bullet will hit where the firer looks.

SHIFTING FIRE

To shift the fire to new targets, the entire body is moved by a quick jump. It is not done by turning the hips or swinging the arm. In this manner fire can be delivered rapidly and effectively in directions as much as one hundred and eighty degrees apart. Fire is delivered upon the completion of the jump when the feet are on the ground and the body is in position pointing at the target.

*This material was prepared at the Field Artillery School in cooperation with a representative of the Tank Destroyer Command, Camp Hood.

PISTOL OR REVOLVER

Grip

Place the extended right thumb parallel with the bottom of the slide (cylinder) as far along the left side of the gun as possible. Then place the hand around the grip and allow the index finger to fall naturally inside the trigger guard. This will cause the pistol to be in direct alinement with the arm when extended straight and rigidly to the front of the body.

Carrying Position

Extend the arm straight to the front at an angle of 45º with the body. Point the pistol or revolver toward the ground. This is the safest method of carrying either weapon. It also allows the gun to be brought up to the firing position much quicker than it is possible from any other position. Furthermore, it serves to partially disclose the fact that the firer is armed.

Firing Position

Assume a natural crouch, feet apart, weight slightly forward. Do not squat. The head and body face the target squarely. The left arm hangs down naturally from the shoulder, slightly bent, with the hand in front of the left leg, fist clenched. The right arm is raised directly to shoulder height, arm extended and straight in a vertical plane with the firer's nose.

CARBINE

With the left hand grasp the weapon over the hand guard, hand close to the upper band with the fingers encircling the stock, thumb on the right side. The left arm is straight and rigid. Place the right hand around the small of the stock with the index finger inside the trigger guard. Place the butt of the carbine against the body in front of the right hip. The sling is not used.

SUBMACHINE GUN

With the left hand grasp the fore grip in the palm of the hand as far forward as possible with the back of the hand down. Hold the left arm straight and rigid. With the right hand grasp the rear grip between the thumb and fingers with the index finger around the trigger. The butt of the submachine gun is held against the body in front of the right hip.

BROWNING AUTOMATIC RIFLE

Grasp the forearm with the left hand so that the palm of the hand is against the left side and the fingers curled around the bottom and right side. The left arm should be straight and rigid. The right hand is around the rear of the receiver with the thumb on top and the index finger on the trigger. The stock of the rifle is held against the body just above the right hip by the right forearm with the butt near the elbow.

The Browning Automatic Rifle should be fired single shot (semi-automatic). This gives a rate of fire of 100 rounds per minute, sufficiently rapid for close combat firing. Full automatic fire cannot be controlled to give accurate results.

CALIBER .30 MACHINE GUN M1919A4 (LIGHT AIR-COOLED)

For employment in action against parachutists, in street fighting, mopping up, antiaircraft fire, and close defense of a position, a light machine gun can be fired very effectively using small bursts without the ground mount as follows:

Grip

With the palm and fingers of the left hand grasp the machine gun around the barrel jacket with the thumb on top. The left arm is straight and rigid. The right hand grasps the inside of the grip with the forefinger upon the trigger. The grip is held against the body in front of the hip by the right hand.

Position

Face the target squarely and then advance the left foot forward slightly to compensate for the recoil of the gun. It will be found that this recoil is not too great and practice will permit the firer to walk forward while firing.

Ammunition Belt

In firing unassisted, the ammunition belt may be dropped over the left arm or carried over the shoulder. With an assistant, the assistant helps by carrying the belt and keeping it straight as the gun is fed.

If you're ordered out of the country and know your future mailing address, why not send it in before you leave? We won't know where you're going, but if you give us your *name,* a *unit* designation, and an *APO* number, and mark it San Francisco, Seattle, New Orleans, New York, or wherever it is, we'll keep the *Journal* moving your way—that's our job. You send us your correct address—that's part of yours.

Individuals have usually been more prompt than organizations in sending changes of address to us.

Next time your battery is moved, why not let us know where you're going—if it isn't secret—and you know?

Then if you don't know exactly what your new address will be, send it to us as soon as you're settled again.

You battery clerks might add this job to your almost countless others and keep your outfit up-to-date with us.

OFFICERS' TESTS - 3

Prepared by the Fort Bragg Provisional Field Artillery Brigade

BATTERY EXECUTIVES

PART B—Value 65%

Section I

Answer any 5 of the following questions; if all 6 are answered, only the first 5 will be graded.

Wt. *No.*

5 8. Define the following: (Par. 52, FA Book 161)
   a. Fire commands.
   b. Firing data.
   c. Base piece.
   d. Base line.
   e. Orienting line.
   f. Reciprocal laying.

5 9. Give the gun position duties of the following:
   a. Ammunition Sergeant. (Par. 27, FA Book 161)
   b. Artillery Mechanic. (Par. 28, FA Book 161)

5 10. When a gunner sees that his aiming stakes are out of line, and the executive authorizes a correction, what action does the gunner take to make the correction? (Par. 32, FA Book 161)

5 11. How does the executive determine the minimum elevation for the battery when the mask is occupied by friendly troops? (Par. 34, FA Book 161)

5 12. Give 5 ways to lay the battery for direction. (Par. 68, FA Book 161)

5 13. Describe how to measure the adjusted compass with an aiming circle. (Par. 90, FA Book 161)

Section II

Answer all questions in this section.

15 14. You, as executive of your firing battery, want to give your men a one-hour talk on the care and handling of ammunition in the field. Prepare a brief set of notes to cover this subject properly, showing all the information you are going to cover in your talk. When, where, and how your talk is to be conducted is *not* desired, *what* you are going to say *is* desired. List only the facts, in any order. (Par. 13-20, FA Book 161, and appropriate FM on Service of the Piece)

15 15. Your battery occupied a position hastily under cover of darkness and you registered just before dawn. At dawn your battery commander tells you that the indications are that you will be in this position for quite some time. List the measures, in order, and discuss each one briefly, that you would take to improve your firing battery position. (Par. 49, FM 5-15, Pars. 38-43, FA Book 161)

10 16. You are executive of a gun battery in action against the enemy in an isolated pocket. You are part of a relatively large force that is cut off from its own bases. There are no Ordnance troops or Ordnance technicians among your own troops. Considering that you have only your own guns, with no possibility of replacements or repairs for an indefinite period, give a brief discussion of the precautions you would observe, instructions you would give, and inspections you would make to ensure maximum service from your guns for the maximum time.

RECONNAISSANCE OFFICERS

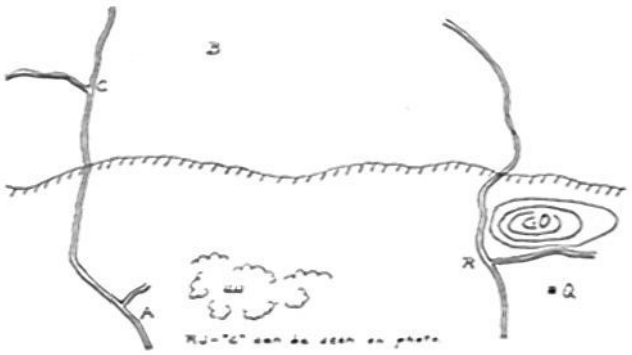
PART B—Value 65%

Section I—Value 45%

Answer all questions in this section.

Wt. *No.*

15 8. The battery of which you are reconnaissance officer is in position as shown on the sketch.



You have a map, but can identify no point in the target area on both map and ground. You are given an air photo of the target area on which *B*, plainly visible from *A*, can be identified. The small building at *A* can be identified on the map and is visible from most points in the position area. This building and the target area can be seen from *O* but not

from road junction *R*, which, with the house at *Q*, can be identified on the map. Center-of-impact registrations are expected. (Par. 143, TM 6-200)

Your mission: To prepare your battery for unobserved fires without registration. Sufficient time is available for precise survey.

Requirements:

a. Detailed description of *what* you will locate.
b. Detailed description of *how* you will locate each element named in *a*, above.
c. Your complete survey plan in detail, describing procedure to be followed.

10 9. *a*. Define "reconnaissance" as affecting the Field Artillery. (Par. 21, FM 6-20)
b. Give four doctrines applicable to all artillery reconnaissance. (Par. 21, FM 6-20)
c. What is the primary requisite in the selection of a battery position? (Par. 3, FM 6-20)
d. Name and discuss briefly the governing factors in the selection of a battery position.

20 10. Define the following terms:
a. Directional traverse. (Par. 60, TM 6-200)
b. Closed traverse. (Par. 60, TM 6-200)
c. Resection. (Par. 67, TM 6-200)
d. Long base intersection. (Par. 71, TM 6-200)
e. Magnetic declination. (Par. 14, FM 21-25)
f. Battle map. (Par. 4, FM 21-25)
g. Grid azimuth. (Par. 15, FM 21-25)
h. Stadia. (Par. 54, TM 6-200)
i. Short base intersection. (Par. 74, TM 6-200)
j. Restitution. (Par. 94, TM 6-200)

Section II—Value 20%

Answer any 4 of the questions in this section; if all 5 are answered, only the first 4 will be graded.

Wt.No.

5 11. Give the following information concerning the weapon with which your organization is armed, and state for which weapon you are answering: (Par. 4, TM 6-130)
a. Approximate weight of a complete round.
b. Extreme range.
c. Unit of fire.
d. Rate of fire per minute (prolonged).
e. Approximate time to emplace from traveling position.

5 12. Give the conventional signs or symbols for: (Par. 6 and 7, FM 21-25)
a. Hard surface motor road.
b. Single track railroad.
c. Intermittent stream.
d. CP, 2d Bn, 14th FA.
e. OP, "A" Btry, 18th FA.

Wt. No.

5 13. Give the principal *tactical* duties of the following members of a battery detail: (Par. 5, FM 6-130)
a. Instrument sergeant.
b. Instrument operator.
c. Scout Corporal No. 1.
d. Scout Corporal No. 2.
e. Signal Sergeant.

5 14. Write out the phonetic alphabet. (Par. 6, FAS IM C-1)

5 15. *a*. List the items of firing data which can be measured with:
(1) An aiming circle. (Par. 3, TM 6-220)
(2) A battery commander's telescope. (Par. 27, TM 6-220)
b. List the principal non-optical fire-control instruments used by the Field Artillery. (Par 1, TM 6-220)

BATTALION MOTOR OFFICERS

PART B—Value 65%

Section I

Answer all questions in this section.

Wt.No.

15 8. Define and discuss briefly Second Echelon maintenance, covering the following points: organization, personnel responsibility, equipment, records, and functioning. (Par. 157, FM 25-10.)

10 9. List 10 general road rules and traffic regulations to be observed by all drivers. (Par. 30, FM 25-10.)

10. You are the motor officer of a newly activated separate battalion of Division Artillery. You have only a few vehicles, and have just received your enlisted and officer cadres.

10 *a*. Discuss briefly the dispatch system you would organize to ensure the maximum use and minimum wear and misuse of the vehicles you have.

10 *b*. Same as No. 3, Motor Transport Examination.

Section II

Answer any 4 questions in this section; if all 5 are answered, only the first 4 will be graded.

Wt. No.

5 11. Discuss briefly the most common causes of excessive tire wear. (Par. 45, FM 25-10.)

5 12. Describe briefly the windlass method of having

a dual-wheel truck pull itself out of a bad mud hole. (Par. 142, FM 25-10.)

5 13. Discuss briefly the centralized and decentralized methods of lubrication. (Par. 171, FM 25-10.)

5 14. List 5 maintenance operations to be included in the 6,000 mile inspection and list what items each includes. (Par. 161, FM 25-10.)

5 15. Give the following information about any 5 motor reports and records required by regulations:
a. Name of report or record.
b. Purpose.
c. When required.
d. Filled out by whom.
e. Disposition.

GUNNERY EXAMINATION FOR ALL OFFICERS

Section I

Answer all questions in this section.

Wt. *No*.

15 1. Define the following (FA Book 161):
a. Firing angle. (Par. 125)
b. Declination constant. (Par. 125)
c. Target offset. (Par. 125)
d. Parallel sheaf. (Par. 135)
e. Deflection correct (for precision fire). (Par. 174)
f. Registration. (Par. 146)
g. Deviation of a burst. (Par. 158)
h. Trial deflection. (Par. 181)
i. Firing chart. (Par. 278)
j. Bracketing salvo. (Par. 158)

20 2. Your battery of French 75-mm. guns is in a position which has been occupied for several days. Base deflection has been recorded with wind and drift stripped from the adjusted deflection. There has been no firing since yesterday and you have received permission to register on the base point with Shell Mk 1 Fuze Short to correct base deflection and obtain a new VE (using normal charge).
a. The following data are obtained from the firing chart:

Altitude of battery	940 feet
Altitude of base point	1000 feet
Map range	4020 yards
Y-azimuth of plane of fire	1530 mils

b. The latest metro message is

	3	12	29
0	20	15	02
1	20	20	02
2	22	20	02
3	26	25	01
4	26	27	01

c. The executive reports:
Weight of projectile = One cross (+)
Powder temperature = 35 degrees F
d. You have an old VE of —25 f/s for this lot of ammunition.

Requirement: Initial corrected deflection and quadrant elevation to fire on the base point.

Wt. *No*.

15 3. (Show all of your work, and draw a sketch to illustrate it.)

You are BC of a 75-mm. M2 gun battery equipped with panoramic sights. On going into position your aiming circles were broken but you must open fire immediately. You choose to use a radio tower in rear of the battery as an aiming point; your guns are to your left and slightly to the rear; with the instruments available you determine the following data:

OG: 550 yards Si: 280
OT: 4000 yards Si: 305
OP: 3500 yards
GT: 4200 yards
Perpendicular G to OT (est.): 500 yards
Perpendicular G to OP (est.): 400 yards
Clockwise angle from T to P: 3820 mils, vertex at O

Requirement: Complete set of commands for opening fire on the target, using shell Mk. I.

Section II

Answer any 5 of the questions in this section; if all 6 are answered, only the first 5 will be graded.

Wt. *No*.

10 4. *a*. Distinguish between axial, small T, and large T conduct of fire. (Pars. 160 and 171, FA Book 161)
b. Draw sketches to show *s* (deflection shift) and *d* (deviation). (Pars. 173 and 180, FA Book 161)

10 5. Your guns are to your rear and slightly to your left. Target: Infantry weapons in the vicinity of a terrain feature. Mission: Neutralization. Materiel: 105-mm. howitzer. Ammunition: HE shell, quick fuze. Data: Estimated.
T = 60 p_4; r/R = 0.7; c = 13.
Initial commands: Sh HE, Ch 3, FQ, BDL 90, On No. 1 Op 3, Si 305, BL.
a. Fill in the chart below:

Commands	*Deviation*	*Range*	*Remarks*
Q 350	27 L	4 ?	
		3 Lost	
		2 ?	
		1 ?	
	Line	4 ?	
		3 ?	
		2 ?	
		1 ?	
	Line	4 ?	
		3 Over	
		2 ?	
		1 ?	
	Line	4 Short	
		3 Short	
		2 Short	
		1 Short	
	Line	4 ?	
		3 ?	
		2 Short	
		1 ?	

b. What is your next command?

Wt. *No*.

10 6. Your battery of 105-mm. howitzers is to your left rear. Your mission is destruction of a disabled tank. Angle T = 250 mils. r = 3200 yds. R = 4000 yds. *c* = 5. *s* = 6. F = 3. *s* = 4. Range finder range.

Initial commands: No. 1 adjust, Sh Mk I FS, BDL 90, No. 1, 1 rd.

a. Fill in the chart below:

Commands	*Elevation*	*Deviations*	*Range*	*Deflection*	*Remarks*
Quadrant	130	35 R	?		
		5 R	Over		
		Lost	No sensing		
		6 L	Short		
		8 R	Short		
		5 L	Short		
		2 L	Short		
		4 L	Short		
		6 R	Over		
		Line	Short		
		Line	Over		
		2 L	Short		
		Line	Short		
		3 R	Over		
		4 R	Over		
		Line	Over		

b. What is your next command?

Wt. *No*.

10 7. Your guns are to your right and slightly to the rear. Target: Check point. Mission: Registration. Materiel: 105-mm. howitzer. Ammunition: HE Shell, FQ. Range finder range.

T = 700 mils; *s* = 20; *c* = 8; *c/d* = 0.2

Initial commands: No. 1 adjust, Sh HE, Ch 6, FQ, BDR 340, No. 1, 1 rd.

a. Fill in the chart below:

Commands	*Elevation*	*Deviation*	*Range*	*Deflection*	*Remarks*
Quadrant	240	60 L		?	
		1 L		Over	
		20 L		Short	
		1 R		Short	
		L		Over	
		3 L	Over	?	
		L	Over	Over	
		4 R	Short	Short	
		L	Short	Short	
		L	Short	Short	
		3 L	Over	?	

b. What is your next command?

c. What are your adjusted data?

Wt. *No*.

10 8. *a*. What arrangements should be made with the air observer before he leaves the ground? (Par. 193, FA Book 161)

b. What information is necessary for the observers who are conducting fire using combined observation? (Par. 251, FA Book 161)

10 9. *a*. What is the purpose and use of time fire? (Par. 232, FA Book 161)

b. Describe briefly the procedure followed to register a battery with an air observer by the "lay-on-me-method." (Par. 207, FA Book 161)

MOTOR TRANSPORT EXAMINATION

Section I

Answer all questions in this section.

Wt. *No*.

15 1. Define and discuss briefly First Echelon maintenance. In your discussion, cover the following points: organization, personnel, responsibility, equipment, records, and functioning. (Par. 156, and Section IV, Chapter 2, FM 25-10)

6 2. Define the following: (TM No. 5, I Army Corps, Feb. 9, 1942)

a. March unit.

b. Serial.

c. Column.

10 3. Your battalion commander directs you to prepare a series of one-hour lectures to the officers of your battalion on the following subjects. Prepare a brief set of notes to cover any I of these subjects properly, showing *all* the information you are going to cover in your lecture. When, where, and how your lecture is to be conducted is *not* desired, *what* you are going to say *is* desired. List only the facts, in any order.

Command inspections of motor vehicles.

Driving instruction.

Conduct of motor marches.

Section II

34 4. Answer *all* questions, do not guess. Grading is as follows: minus two points if question is not answered, minus three points if answered incorrectly. Answer each question by circling "T" if the statement is true, or circling "F" if it is false.

T F (1) Military motor vehicles are divided into three classes: general purpose, special purpose, and plant vehicles. Most field artillery vehicles are general purpose vehicles.

T F (2) A chassis type indicated by the expression "6 × 6 (4 dt)" means a vehicle with 6 wheels, 6 of them driving and 4 of them having dual tires.

T F (3) Generally speaking, it is impossible to get too much oil in transmissions and transfer cases.

T F (4) Army motor vehicles are lubricated on a mileage basis only.

T F (5) Army motor vehicles are so constructed that submersion incident to stream crossings can be disregarded as far as lubrication is concerned.

T F (6) A vehicle should never leave its park without an Accident Report, Form 26.

T F (7) A motor vehicle can pull a heavier load than it can safely carry.

T F (8) Tire inflation should be done every ten days.

T F (9) A vehicle which loses its place in column will get back into its normal place as soon as possible by leap-frogging.

T F (10) A driver should be made responsible for the tools and equipment that go with his vehicle.

T F (11) The only attention a good storage battery needs is to see that the electrolyte does not fall below the prescribed level.

T F (12) The driver's trip ticket and performance record (QMC Form 237) is normally kept in the possession of the battery motor sergeant.

T F (13) Other things being equal, the stopping distance of a vehicle going 40 MPH is twice that of a vehicle going 20 MPH.

T F (14) Vehicles are issued to the using services by other than the QMC.

T F (15) A complete record of vehicle lubrication is kept in the service record.

T F (16) Drivers *always* have responsibility for *safe* operation of vehicles.

T F (17) The *maximum s*peed to be observed at night without lights is 20 MPH.

Section III

Answer any 7 of the questions in this section. If all 8 are answered, only the first 7 will be graded.

Wt. No.

5 5. List 4 very common types of every-day vehicle abuse which should be carefully guarded against.

5 6. List 5 rules to be observed in the motor park to prevent common accidents. (Par. 12, FM 25-10)

5 7. List 5 items a driver should check before starting a motor vehicle. (Par. 18, FM 25-10)

5 8. Define the following: (Par. 58, FM 25-10)
a. Quartering party.
b. Route marking party.

5 9. List 5 items which should be carefully noted on a route reconnaissance. (Par. 86, FM 25-10)

5 10. Discuss the general rules to be observed in the adjustment and use of chains. (Par. 32, 25-10)

5 11. Discuss briefly the most common causes of excessive tire wear. (Par. 45, FM 25-10)

5 12. List 5 maintenance operations to be included in the 1,000 mile inspection, and list what items are included in each. (Par. 161, FM 25-10)

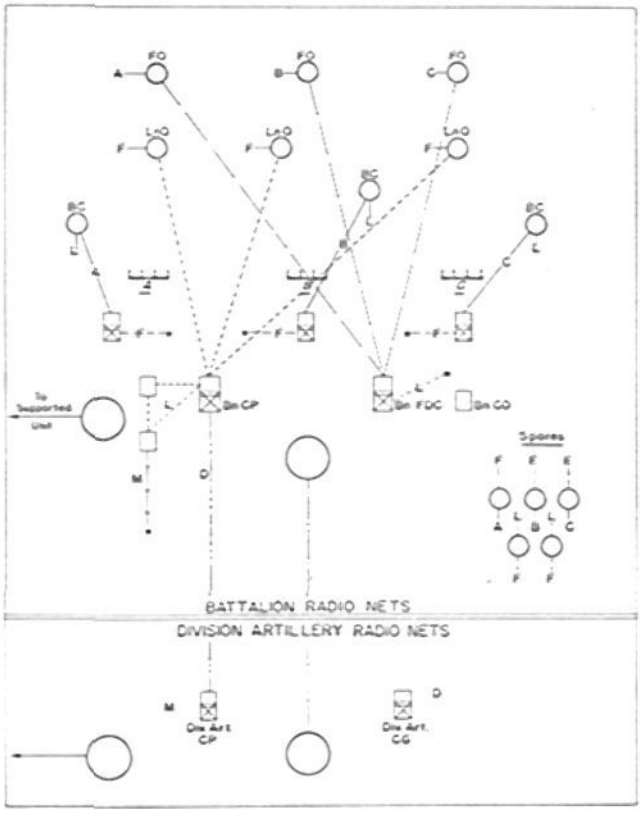
Before long the JOURNAL intends to print a group of hand writing samples that have baffled us. Our staff considers itself just short of expert on deciphering (and guessing at) the dozens of illegible penmanship examples we are given; but some are "impossible." Why not use the typewriter, or spend a moment longer and P-R-I-N-T your name?

Using What We've Got

By Capt. Roger Wilco, FA

In General

You can do 'most anything with this net, and yet still have something left to operate. Even if the FDC and CP went out, the sets at the GP's take over and run for a while. And there are plenty of ready replacements for the other sets. Note carefully how, by having the batteries listen in to the FO nets, they can get immediate assignment of fire missions to their batteries even before FDC informs them. Note also that FDC by listening in to the Ln boys not only keeps abreast of the situation but can start functioning on calls for fire by the Ln O's even before the CP can tell them that this fire is being called for. S-4's and Div CP are listening in so that the Ammo situation and changes of plan in haulage or types needed can be relayed instantly over channel M. And, since the Div CP has one receiver on D and one on M, the CG can issue orders using the dual channel system without the other sets in both of the D and M nets knowing what it's all about or even having to turn their sets off the net.



Notes

1. This net is based on 5 channels available for each battalion, 22 for the entire Divisional Artillery.

2. FO's are part of the batteries but they may be used as observers for the entire battalion; channels set on their sets are so selected that they are able to perform both functions. Ln O's, however, are assigned to Inf Bns.

3. Primary channels are indicated by connecting lines; secondary, by short arrows.

4. All 608 and 628 sets in the battalion have the following channels pre-set on them: A, B, C (battery channels); F (FO channel); L (Liaison); D (Division Artillery command); M (Division Artillery Munitions). All 608 sets in the Division Artillery have pre-set: channels D and M, and FO and or Liaison channels of each battalion.

5. *indicates that the second receiver of set so marked normally listens in on channel shown.

6. Spares are used as needed. Some possible uses are replacement for FO and Ln sets; as FDC sets to work within batteries when 608's are not available; to maintain uninterrupted radio communication during displacement of FDC; additional issue to batteries for special operations (advance guard, landing operations, etc.); use by Bn RO (especially the spare 628); for air observers; for AT Platoon if deemed necessary by Bn CO. They are always kept under Battalion control, however.

7. Dual command channels: This system is simply transmission on different channels, the sender changing channels at will as he is transmitting; the receiver of the message will receive the entire message by having one of the two receivers of his 608 set tuned to one of the command channels and the second receiver tuned to the other. This arrangement assists in secrecy and renders the effects of enemy jamming less disastrous. It can be accomplished in the nets shown. For Battalion dual command channels, use any two of the Bn channels assigned. For Division Artillery command channels, use channels D and M.

THE SWISS SYSTEM

Switzerland, with a population of 4,257,512, maintains proportionately the largest armed force in Europe, at the largest per capita military expenditure of any country in the world. Her army now numbers over 500,000 men and half of this number can be mobilized over night.

When the current World War broke out complete mobilization was effected in record time. Later in June 1940, when France surrendered, the Swiss permitted part of their forces to return to civil life. However, the General Staff makes it a rule to let soldiers resume their every-day duties at regular intervals, calling up others to replace them.

While on active duty the men are being trained constantly. All are expert marksmen and the majority are also skilled in alpine ski-ing.

Every able-bodied Swiss citizen is liable to do military service from his nineteenth to his forty-eighth year. The Federal forces comprise three different units, i.e., the so-called "Auszug," the "Landwehr," and the "Landsturm." To the "Auszug," or Elite, belong the young men up to the age of 32; the "Landwehr," or First Reserve, includes the soldiers from 33 to 40 years of age, and the "Landsturm," or Second Reserve, are men from 41 to 48. From 49 to 60 the men are enlisted, according to a Government decree issued in 1940, for Territorial Reserve and auxiliary services.

The young men of 19 or 20 years, after having passed mental and physical examinations, have to attend a Recruit Training School for 116 consecutive days (cavalry 130 days). Afterwards, as a private, a man is enrolled into a regular unit and is called for 8 repetition courses of 18 days each between the ages of 22-32. From 33 to 40 he belongs to the First Reserve (Landwehr) and is called for another repetition course of 18 days' duration. In addition every "Landwehr" soldier presents himself for annual inspection, at which time he must account for the care he has given his entire equipment. The Second Reserve (Landsturm) from 43 to 48 years of age, is called to the colors only under special orders.

Special courses and training are provided for privates who are aiming at and are recommended for a higher rank. Thus a private recommended for advancement will attend a non-commissioned officers' training course of 18 days or 25 days, depending on the unit to which he belongs. After graduation he will be promoted to the rank of corporal. After having served in that capacity in a Recruit Training Course and two repetition courses, he will become a sergeant and after having served as such in two additional repetition courses he is graduated to the rank of top sergeant.

Men aspiring to become commissioned officers are given the opportunity, after they have the rank of corporal and have served as such in one Recruit Training Course and one repetition course, to attend the "Officers' Training School." Graduates are commissioned as

lieutenants. Further courses and periods of probation are required for advancement to higher ranks up to colonel, which is the highest in peace time.

Swiss soldiers have been drilled in gymnastics from early boyhood on and Rifle Shooting Clubs for boys exist in different parts of the country. Every soldier is obliged to do a certain amount of rifle practice each year under the auspices of a Rifle Shooting Club and according to military regulations. A record of his capacity and results achieved is kept by the Rifle Club. Those who neglect this test must take a special course without pay. The Federal Government refunds the cost of the ammunition used to all those who pass the test and subsidizes the Rifle Club. There is hardly a village which has not its own rifle club. Cantonal and Federal Shooting Festivals, where all these men can show off their skill, are consequently a feature of Switzerland.

Ski-instruction and rigorous winter training have for many years played a vital part in the Swiss Army. Ski courses for officers and soldiers are given in all divisions, not only for mountain service, but also for ordinary field service. The training includes the technique of ski-ing, life saving, transporting the wounded, etc. Ski patrols are clad in white in order to escape attention.

Recent Swiss army improvements are responsible for a considerable increase of the air force. Observation and listening posts are now found in all strategic points in the hills and mountains and nests for antiaircraft and antitank guns are well distributed.

Swiss soldiers, regardless of their political affiliations and four different mother tongues (German, French, Italian and Romansch), are allowed to take their rifles and uniforms home after army maneuvers, together with 200 rounds of ammunition. This fact alone speaks eloquently for the perfect unity of the Swiss people.

So well drilled for any emergency are these men that as soon as the signal is given they know exactly to which post they have to go and what is expected of them.

Foreign armies have come to grief in the Swiss mountains ever since the beginning of the little Republic in 1291. In the year 1815 Swiss independence was guaranteed by international treaty, giving assurance of "perpetual neutrality, inviolability and independence," with the right to organize a Federal Army.

The second World War, too, has found Switzerland well prepared, with three divisions each stationed along the northern and western frontiers and two reserve divisions in the neighborhood of Berne and Lucerne. The 9th Division takes care of the St. Gotthard district, and three independent mountain brigades are protecting the southern and southeastern frontiers.

The Swiss 7.54-mm. light machine gun is air-cooled and recoil-operated, uses a 30-round magazine and either bipod or tripod mount. The gun alone weighs 18¾ pounds, and the respective mounts 4½ and 23½ pounds. Rate of fire: 450 rounds per minute. Ranges: maximum 4900 yards: maximum effective 1600 yards. (*Photo Widmer, Wallenstadt*.)

Since the Swiss Army has no general in peace time, the Federal Assembly, convening at Berne in war emergency on August 30, 1939, elected Colonel Henri Guisan, commander of the First Army Corps (1st, 2d and 3d divisions) as General of the Swiss Army, at that time mobilized for defense of the Swiss frontiers. Guisan, a resident of French speaking Switzerland, is sixty-eight, and one of the very few professional Swiss Army officers.

Be sure we have your *correct address* in our files. If we do, your *Journal* will reach you safely and reasonably promptly, wherever you are stationed.

GENERALS IN ACTION†

By Stephen Vincent Benet

This war has taught us a good many lessons, among them that generalship still counts. Ineptitude, inadaptability, bad staff work, failure of skill in the high command can bring ruin and defeat upon brave and gallant men and, conversely, alert and skillful generalship, backed by a smoothly functioning machine, is of irreplaceable value. The point may be stressed a little. It was largely forgotten by many in the armistice between two wars. But the new machines of war do not run themselves—they call for skill, daring, coordination and strategy of the highest order, and they call for it at the top.

But what is generalship, what are the real problems of command? Two men have equally good records in peacetime soldiering. Why will one succeed and another fail? Why will a good captain sometimes make a bad brigadier, a first-class subordinate fumble and err in independent command? These are the central problems of Douglas Freeman's new book,* the first volume of a projected trilogy on Lee's lieutenants and precedessors, and, as American military history alone, *Lee's Lieutenants* stands in a class by itself. The Army of Northern Virginia was one of the world's great armies; the story of its campaigns already fills many volumes. But, as Dr. Freeman retells them, those campaigns and the men who made them pass before the eyes of the reader as freshly, vividly and livingly as if they had never been written of before. It is a triumph both of scholarship and of style.

A military history, *Lee's Lieutenants* is also a multiple biography. Instead of dealing with his various subjects in a series of independent essays, Dr. Freeman strikes out boldly for the whole organism—the organism of the Army itself. The individuals—Beauregard, Magruder, the Hills, Ewell, Jackson, and all the captains—are introduced as they first attracted notice in that army. You are given their previous records in war and peace and a sketch of their characters. Now, what will they do and how will things turn out for them? Will Beauregard justify the reputation of Sumter? Will Gus Smith, well thought of, well liked, live up to his advance notices? Will the odd, religious Jackson, with his strict sense of military decorum, prove a martinet, a fanatic, or a great captain? Dr. Freeman does not load the dice or anticipate the future. He shows the men, the events and the result. As far as an author may, he tells the story without prophecy or foreknowledge, as if you were seeing it happen before you from day to day.

Each main action is followed by a thorough and reasoned critique. In each battle the reader is told first what the plans of the Confederate leaders were and then what happened to those plans. At First Manassas, for instance, you will get the situation as assumed at headquarters and the actual situation in parallel columns. At Seven Pines you will notice how Longstreet got on the wrong road and, so doing, threw the whole plan of battle out of gear. And yet, in the end, he got credit and Huger got blame, for those things also happen in war. Sometimes, to lay readers, the detailed accounts of troop movement may seem overlong. Yet that detail has its purpose. You watch, with a sense of unwilling fatality, the failure of Seven Pines; you suffer at Jackson's delay at White Oak Swamp. Again and again Dr. Freeman hammers at the need for competent staff; again and again he points out how a muddled or misunderstood battle order may wreck a good plan.

Administration, organization, staff—but still there remains the imponderable, the human factor. Gus Smith, very calm under fire, seems to have suffered the equivalent of a nervous breakdown when responsible command was suddenly thrust upon his shoulders. Magruder, handsome and dashing, when his great opportunity came showed "a weakness not uncommon in war—an excited, overzealous desire to do all his work in person." Jackson drove himself, but needed sleep to be at his best; Longstreet never got tired. In every case Dr. Freeman weighs the psychological factor—and that is one of the reasons why *Lee's Lieutenants* is as exciting to read as a novel. For in every case he gives you not only the general but the man.

Lee and "Traveler"

†Republished by courtesy of the *New York Times*.

Lee's Lieutenants: A Study in Command. By Douglas Southall Freeman. Vol. I. Manassas to Malvern Hill. Lvi — 773 pp. Charles Scribner's Sons. 1942. $5.

The Confederacy, like any people suddenly called to arms, had to improvise a military establishment on short notice. It had a President versed, at least, in military affairs, a nucleus of trained and able professional soldiers, and men of whom Lee said, "They will go anywhere and do anything if properly led." Yet every familiar problem of improvisation was there — friction between field and War Department, jealousy between individual generals, and always the search for leadership. "Proper commanders—where can they be obtained?" Some, like Pender and Rodes, were killed in action before they had a chance to develop their highest capabilities—others, like Beauregard, saw their reputations wane. For real generalship does not consist in merely sending men to slaughter—and real military brains are as rare as any other kind. That is one of the needed and timely lessons taught by *Lee's Lieutenants*.

And yet, what men they were! Johnston with his gamecock jauntiness; bald-headed, piping-voiced Ewell; Ashby, the mythical; Gordon, thin as a ramrod; the lonely and bitter Early; and all the rest! They pass before us in this book like figures in a great fresco, sharply drawn, superbly characterized—a fresco made of the blood and toil and endeavor and hopes of men—made, too, of men's weaknesses, follies, whims, and ambitions.

A note or two on minor details may be in order. One is on the question of age. At the outbreak of hostilities Lee was 54 and so was Joe Johnston. D. H. Hill and Longstreet were both 40, Jackson 37, and Stuart 28. The evidence is not conclusive, but it may fairly be said that the Confederacy was not hampered by overage generals. Another note might be made on the question of rugged health and military efficiency. Hood, Longstreet, Stuart possessed it—but whether Ewell's dyspepsia, D. H. Hill's spinal ailment and Jubal Early's arthritis would have gotten them by a modern medical examination is another matter. And yet all three were admirable leaders in the field.

I have no doubt that some of Dr. Freeman's individual judgments may be criticized or disputed by those to whom every Southern officer of general rank is *ipso facto* a hero. He has not pulled his punches. But where he criticizes, the criticism is a reasoned one. And in *Lee's Lieutenants* he has given us not only a military classic but a book so valuable and timely for the general reader that I hope its general audience may be very wide. For the tools of warfare alter, but its central problems do not—and one of them is the problem of command. Yet *Lee's Lieutenants* is not only a military history. As vivid and fascinating narrative, as a study of men in action and under the stress of action, it will keep any reader enthralled.

Not in the BOOK

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.*

PREPARE FOR ACTION

Considering space, a 6 × 6 truck bed is well filled with a howitzer crew and equipment, but adding 36 rounds of 105 ammunition, either in cloves or wooden containers, presents a real loading problem. To help the cannoneers prepare for action more quickly and to give them more room in the truck, we mounted the section chests on the trails of the howitzer.

The artillery mechanic, with the assistance of Post Ordnance personnel and equipment, mounted the section chests in about three hours. The trails were drilled and tapped for quarter-inch stud bolts, S.A.E. thread, to hold keepers for web straps. These keepers were so placed that the chest would be held against the cradle lock handle catch in order to keep the chest from sliding toward the cradle. To prevent the chest from sliding toward the lunette, two pieces of one-inch angle iron were welded to the bottom of the chest so that they fitted just inside the trails and at the angle of the trails; these angle irons also keep the chest from slipping to either side. After considerable searching and "managing," we obtained eight web straps, one for each trail. These straps, approximately six feet long, secure the chest to the trails. Bedroll straps would be ideal if they are available.

To spread the trails two cannoneers place themselves on opposite sides of the trails, loosen the straps, drop them over the end of the chest, and then remove the chest from the trails. The chest can be removed in 10 to 15 seconds. The time and effort required to remove the chest from the bed of the truck is eliminated and, very important, the crew gains several precious cubic feet of space.—LT. JOEL W. CRAIN, FA

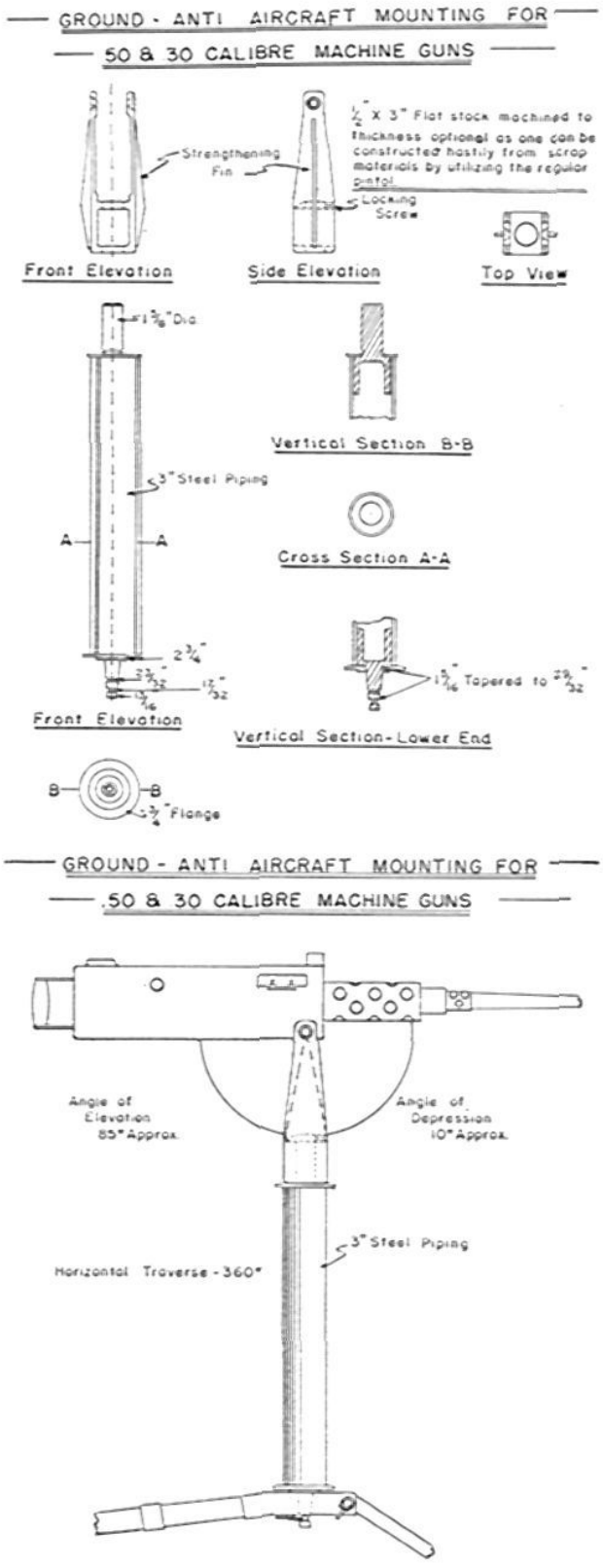
DUAL-DUAL MOUNT

The .30 and .50 caliber machine guns were primarily designed for ground defense and offensive weapons. In a comparatively short time, and by using only scrap materials that are almost bound to be about any unit area a simply constructed mount may be fabricated and welded (see sketches) to utilize both machine guns as ground and antiaircraft weapons from the same mount.

This mount can be mounted on any vehicle, and in most cases valuable space that is now being taken up by complicated mounts can be utilized to a much more important and practical purpose.

The most important feature of the mount is its portability and its interchangeability, i.e., changing from either the .50 or .30 caliber tripod without any modifications. The weapon can be dismounted from the vehicle and put into position any distance from the bivouac area, thereby preventing both gun and vehicle from being vulnerable to fire at the same time.

—CAPT. FRANCIS G. SCHOLL, FA



Elevation Showing Method of Mounting 50 Machine Gun

Diary of War Events

NOVEMBER, 1942

1st 2 Jap carriers, 2 battleships, and 3 cruisers damaged and 100 planes destroyed in fight near Stewart Islands. Large Jap naval force withdrawing northward.

2nd Germans advancing in Russian Caucasus
Australians take Kokoda, New Guinea.
Our Marines advance on Guadalcanal.
Jap supply ships sunk by U. S. subs.

3rd Jap reenforcements land on Guadalcanal.
Germans stopped at Stalingrad and in the Caucasus.

4th Rommel in full retreat; Gen. Ritter von Thoma captured. U. S. fliers in the fight.
7,000 U. S. troops arrive in Middle East.
Japs retreat toward Buna in New Guinea; Yanks advance on Guadalcanal.

5th Rommel still giving ground. British announce, "Complete victory is almost in sight."
New Japanese landing on Guadalcanal reported, Americans continue attacks west of Henderson Field.

6th 3 Italian Libyan divisions surrounded.

7th Powerful American forces landing on Atlantic and Mediterranean coasts of French North Africa.
R. A. F. attacks Genoa; Italians admit notable damage.
Russians start offensives at various points.
U. S. bombers hit Rangoon; Army forces attack in Guadalcanal.

8th Landings in North Africa proceed with little resistance: fighting ceases around Algiers.
Naval battle reported off Moroccan coast near Casablanca.
Gen. Henri Giraud makes radio appeal to French to assist Allies.
Vichy breaks diplomatic relations with U. S.; Rommel retreating through Libya; Genoa bombed again.

9th President tells Bey of Tunis that U. S. troops will cross Tunisia; fighting heavy on Moroccan Atlantic coast.
Gen. Giraud in North Africa to command French forces, joins United Nations armies.

10th Oran falls to Americans; Yanks in outskirts of Casablanca; Vichy naval forces cease fighting.
Admiral Darlan our prisoner of war at Algiers; Marshal Petain assumes command of French armed forces.

11th Germans occupy all France; Italian troops land in Corsica.
Casablanca capitulates; German air-borne troops arriving in Tunisia.
Churchill promises European second front; Russian lines hold.

12th British units join Americans around Algiers.
Maj. Gen. Mark W. Clark's secret mission to Africa described by Licut. Gen. Eisenhower. French fleet remains at Toulon.
Germans start new offensive on Stalingrad.
MacArthur announces 4 loaded Jap transports hit.

13th French fighting Germans in Tunisia; German twelve-ton tanks reported brought in by air; Allied lind troops cross border from Algeria.
British retake Tobruk: Darlan resuming responsibility for French interests in North Africa.

14th Heavy fighting in Tunis between French and German troops: Axis army in Libya retreats beyond Detria; R. A. F. again attacks Genoa.
Rickenbacker and companions (except one) found alive in Pacific.

15th Allied and German troops make contact near Bizerte.
Darlan appoints Gen. Henri Giraud as French military chief in North Africa.

16th U. S. Navy sinks 23 Jap ships, including battleship.
Rommel's forces heading for El Agheila.

17th British parachute units act against airdromes in Tunisia; supply difficulties face British Eighth Army.
Franco orders partial mobilization of Spain's army, navy, and air force reserves.

18th American parachute troops in action in Tunisia; British near Bengazi, chasing Rommel.
Fighting French reported moving northward from Lake Chad.

19th Eighth Army losing contact with retreating Germans; R. A. F. again active over Northern Italy.

20th German troops digging in around Bizerte and Tunis; Fighting French from Lake Chad head for Mediterranean coast; Axis abandons Bengazi.
Vice Admiral Halsey nominated for promotion to full admiral for decisive victory over Japs.

21st Red army on offensive in Caucasus.
Heavy fighting in the Buna-Gona area of New Guinea; U. S. troops advance to the west on Guadalcanal.

22nd Red Army troops break through German lines in major offensive.
Britain's First Army met and defeated German armored column on the Tunisian north coast.
U. S. planes attack railroad yards and repair shops at Mandalay. Japs fall back in New Guinea.

23rd Dakar and French West Africa join Allies.
State Department makes "satisfactory agreement" with Admiral Roberts at Martinique.
Russians continue advance, take thousands of prisoners; Aussies take Gona.

24th Germans face disaster in Stalingrad salient; Russians advance over broad front, siege broken.
Americans bomb Mandalay railroads again.

25th Russians break through German lines near Rzhev.
2 Jap destroyers sunk by Allied bombers off Buna. New Guinea British announce sinking of Jap raider in Indian Ocean.

26th Russians moving west from Stalingrad.
Joint British U. S. Forces closing on Bizerte and Tunis; Germans preparing defenses at El Agheila.
U. S. heavy bombers hit Bangkok in 1,500-mile flight, R. A. F. attacks Burma.

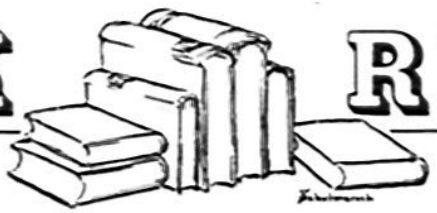
27th Germans take Toulon; French Navy sinks own fleet in Toulon harbor; Marshal Gerd von Rundstedt to rule France.

28th Russians continue old offensives and open new one on Central Front.
Subs sink 9 Axis ships in Mediterranean.
British troops land on Reunion Island, east of Madagascar.
U. S. planes make night dive-bombing attack on Hankow docks.

29th Allies take Djedeida, 12 miles west of Tunis.
Japs repulsed in attempt to reinforce trapped troops on New Guinea.

30th Allies cut Bizerte-Tunis communications.
German troops pouring into Greek ports.

BOOK REVIEWS



BEHIND BOTH LINES. By Harold Denny. 209 pp. The Viking Press, 1942. $2.50.

Having served with the Rainbow Division in five campaigns, and later covered as a reporter seven other wars, revolutions, and campaigns, Harold Denny is wise in the ways of war. Although nearly captured by the Panzers during the battle of France, a year ago he deliberately took the risks of front-line coverage of a tank battle when the relief of Tobruk was under way. That time he was not so lucky, but he had a unique opportunity to see behind the scenes. "Borrowed" from his Italian captors by the Nazis, he spent five weeks in Berlin in the hands of the Gestapo, then mysteriously returned to Italy.

Mr. Denny shared the first part of his captivity with Lt. Col. "Mike" Buckley, who was captured at the same time while serving as an observer for the Chief of Field Artillery. Together they trekked to Benghazi, Crete, and Italy, becoming cell-mates after the United States entered the war.

Then Denny was taken by the Gestapo to Berlin for a harrowing five weeks. He was not mistreated physically, but the mental torture of solitary confinement was even worse for one with a mature mind. Perhaps the most interesting part of Mr. Denny's account is his stark, frank description of actions and reactions during this period, how he tried to slow down his mental processes to help time to pass.

Life in an Italian prison camp is told magnificently—its daily routine, how the prisoners organized and managed their internal affairs, their ways of passing time and developing themselves instead of stagnating. And Mr. Denny's sense of humor raises its head more often than one would expect in a tale of this type.

In short, the best book on the captive phase of war which has yet been published.

THE YEAR OF THE WILD BOAR. By Helen Mears. 346 pp. J. B. Lippincott Co., 1942. $2.75.

"What they beheld was a world not yet condensed, but looking like a sea of filmy fog, floating to and fro in the air."

That is what a god and goddess saw as they stood on the "Floating Bridge of Heaven" before they had completed their task of giving birth to the islands of Japan.

Helen Mears, a writer and editor from New York, spent a year with an English friend living in Tokyo. This friend, also a writer, not only shared her home with Miss Mears, but introduced her to many interesting and helpful people.

In the Before-Perry period Japan, like China, had recorded time—years, months, days and hours—by using the signs of the Chinese zodiac, namely, the rat, ox, tiger, rabbit, dragon, snake, horse, sheep, monkey, cock, dog and the wild boar. These signs are still used in the Orient for the purpose of marking familiar annual festivals. Twelve years, each named by a symbol, made a cycle. Nineteen hundred and thirty-five, the year Miss Mears spent in Japan, ended a cycle and, as Mr. Soto explained, "A cycle of crisis for my country. No thinking Japanese but must tremble for what the next cycle may bring."

This is a valuable book in that it shows the working of the Japanese mind. Not the mind of the ruling class,

but of the "little men," for Miss Mears lived among them in their cities, towns and fishing villages; she went with them to worship at their shrines; she attended their festivals; she roamed through their countryside and studied their way of life.

The police are busy in Japan, for no one there may have "dangerous thoughts" and the strict supervision is justified by the government "because of the crisis." The restrictions and rigid supervision that the totalitarian governments have tried so hard to enforce with the Gestapo and the prison camps is taken as a matter of course by the Japanese. To them it is "shukan" or custom, and they are surprised that the westerner should resent it. Never was a country more bound by custom than is Japan.

There are two co-existant Japans—one very old, thoroughly oriental Japan, the Before-Perry Japan, and the other a very young, superficially westernized Japan, the After-Perry Japan. And there is the national religion, the Shinto, the Way of the Gods, and the worship of the Divine Emperor or the Kind Father, who has ruled in an unbroken line since the beginning of time!

The superstition and belief in mythology is seen on every hand and Miss Mears makes many references to the mythological legends that are so much a part of the education and beliefs of the Japanese; that strange intermingling of fact with fancy, history with legend, imaginary objects with actual objects. Even the soldier, bowing at the Yasakuni Shrine, bows to himself, deified, a soldier killed in battle.

The Year of the Wild Boar gives a splendid picture of the country and the people we are now fighting and why they will never surrender.

C. T. W.

THE WAR IN MAPS. Text by Francis Brown, maps by Emil Herlin. 159 pp. Oxford University Press, 1942. $1.50.

Maps and text fit each other like paper on the wall in this atlas of maps from the New York *Times*. That newspaper has long published about the clearest and most lucid, up-to-the-moment maps; their effect is even heightened by thus bringing them together, many considerably revised and others drawn especially for this book. It is good, too, to have Mr. Herlin emerge from his anonymity and with Mr. Brown, one of the Sunday editors of the *Times,* give this running story of the world on the eve and under the impact of war.

These maps are varied. Some underline political change, others indicate industrial areas and communications systems. And still others clearly indicate the sweeps of the campaigns through last summer, and the war at sea. Text gives background for the 74 maps, and lucidly—and in adult, not "here-my-children" style—indicates the importance of events.

A grand book to use in following current developments, as well as refreshing on what has been going on.

THE ARMY CLERK. Published by The Adjutant General's School, 1942. 120 pp., 148-page appendix of forms, index. 75c.

Every battery office should have a copy of this grand little book. Although prepared primarily to serve the Enlisted Branches of the Army Administration School, it surely will help any Army Clerk, regardless of the echelon in which he is serving.

The Army Clerk was written for the inexperienced clerk, and it does a fine job of taking him step-by-step through the procedures with which clerks in any headquarters should be familiar. It describes office habits which should become second nature, and even makes practical suggestions on improving typing technique. Of constant, day-to-day value are the many model forms, with detailed annotations, which will prevent many a stumble.

THE CRIPPS MISSION. By R. Coupland. Oxford University Press. 91 pp. $.75.

Singapore had fallen, Burma was reluctantly being abandoned, the Philippines were crumpling under the final hammer blows, and the Japanese navy was prowling in the Indian Ocean, even in the Bay of Bengal. The world-conscious minority in India were wondering whether they or the Australians were scheduled as the next victims. At this point Sir Stafford Cripps arrived in India bearing a proposal called the "Draft Declaration" which was the British cabinet's answer to the Indian demand for independence.

This book is the story of a mission that almost succeeded, of a proposal that was almost accepted but was finally rejected by all of the major groups in India. Mr. Coupland is a well qualified observer, since he has a considerable background of Indian scholarship and, as a members of Cripps' staff, was in Delhi throughout the negotiations.

Four of the five clauses of the Declaration dealt with the form of government which it was proposed India should have when it achieved independence after the war. The fifth provided that Britain should retain responsibility for the defense of India, subject to consultation with representative Indians. Despite rumors to the contrary and the curiously active non-violence doctrine of Mr. Gandhi's followers, the mission did not founder on the rock of who was to defend India. Instead, it appears that the fundamental disagreement was over the question of the character of the national government. The Congress Party, India's most important political group, desired a cabinet-type government, with the Viceroy assuming the position of the English king. This would have required a major constitutional change which the British, locked in a multi-front battle for life, were not willing to undertake. The huge Moslem minority (90,000,000) feared Hindu domination and held out for

a separate state on the great subcontinent. All the other groups opposed the large voice in the councils Britain would have granted to the independent States.

Perhaps Cripps lacked the authority necessary to continue the negotiations after the first breakdown, perhaps the British cabinet or the Indian groups were lacking in the spirit of compromise. This little book covers the exciting story of those critical weeks.

L.B.C.

AERIAL PHOTOGRAPHS: THEIR USE AND INTERPRETATION. By A. J. Eardley. 200 pp.; index. Harper & Bros., 1942. $2.75.

Lucidly written, and illustrated with magnificent reproductions of aerial photos (many with explanatory line drawings), this first volume gives Harper's new Geoscience Series an auspicious start. Its author has had unusual experience in teaching this subject; indeed, *Aerial Photographs* represents the greatly expanded eighth edition of the text he has used at the University of Michigan.

Although simply written and thus easily understood, the text is in unequivocal terms. Explanations of the procedures used in interpretation are detailed, and in all cases the examples of actual analyses are outlined step by step. An understanding of the subject is greatly aided by the care with which the illustrative photographs are reproduced. Another good feature is the construction of exercises around regions for which aerial photographs are available despite wartime restrictions. Each chapter is followed by a bibliography of outstanding publications on the particular subject.

The first half of the book will be of great value to artillerymen, as it is devoted to the use and reading of aerial photographs—including the methods of combining them into mosaics. Omitted, however, is the Army azimuth and grid system, but this data is readily to be had elsewhere. The second portion is primarily geologic, with definite although secondary application to our operations.

THE BRITISH COLONIAL EMPIRE. By W. E. Simnett. W. W. Norton and Co. 255 pp. $3.00.

In case there still lingers in the minds of Americans other than professional Anglophobes the notion that Great Britain owns and despotically rules most of the earth's surface, this book should go a long way toward dispelling it. *The British Colonial Empire* rather successfully combines the qualities of tourist guide-book, capsule history, geography, and sermon. The moral of

the latter is that if more people knew more about the British Colonial Empire, the responsibilities of trusteeship (which is the attitude Britain has in regard to her colonies) would be considerably lightened for the mother country.

The author makes clear the distinction between the three parts of the British Empire: the Commonwealth, the Indian Empire, and the Colonial Empire. Mr. Simnett treats Britain's colonies in geographical order, starting with the West Indies and girdling the globe. It is remarkable how many of the colonies fell to England simply to benefit by the protection of her preeminent navy. The Colonial Empire contains some 40 territories, with a total population of 65,000,000, more than double that of the Dominions. There is an excellent exposition of the character of the Colonial Service, which administers that part of the British Empire.

The eventual aim being independence for all of the colonies, Mr. Simnett describes the stages of "colonial tutelage" which the various colonies are now passing through. A colony's political maturity is measured by the extent of native participation in the governmental councils. This is a thorough study of a vexed problem.

L. B. C.

MILITARY AND NAVAL MAPS AND GRIDS. By William W. Flexner and Gordon L. Walker. 93 pp.; bibliography; index. The Dryden Press, Inc., 1942. $1.00.

The purpose of this small booklet is to introduce to students without extensive mathematical background the general principles of the construction and use of maps. This is well done, in a clear and direct style.

An effort is first made to break down the idea that distances and angles on a map necessarily portray truthfully the same quantities on the earth itself. Then the properties of five kinds of maps are built up, with emphasis on their use in solving military or naval problems. The chosen projections include the great majority of maps made by the Coast and Geodetic Survey and the Hydrographic Office, and used by the armed services: the Gnomonic (or Great Circle), the Mercator, the Lambert Conformal Conic with Two Standard Parallels, the Stereographic, and the American Polyconic. Only the basic mathematical properties of the maps are dealt with, as other elementary books well cover such details as contour lines, shading, and symbolism.

Except for one subsection and its dependent exercises which call for spherical trigonometry, only a first course in plane trigonometry is needed to understand and follow through this text. Even in this instance, however, alternate methods are provided so that this subsection can be omitted without effect on the rest.

In short, a book well designed to meet current needs.

THE MAN WHO DARED TO CARE. By Mary Tarver Carroll. 216 pages. Longmans, Green and Company, 1942. $2.00.

The story of James Edward Oglethorpe (1696-1785) is an expansion of what you learned in high school history. It is an expansion, true; but, more than that, it is an absorbing story of Oglethorpe and his youth, of Oglethorpe and his entry into the New World, Georgia.

In addition to the tale of the great settler and his adventures, there is constructive information on the international situation of that period.

Little and numerous problems of settling a new country and the big job of obtaining supplies and equipment and financial backing are told in a fascinating story.

There is no bearing on the present war, there is no concern with late affairs, but for a picture of the New World about 1770 and the portrait of a gallant pioneer and soldier, the book is good.

A. V. R.

ALASKA UNDER ARMS. By Jean Potter. 200 pages; index. The Macmillan Company, 1942. $2.00.

It is amazing that we can go through high school, college, and more, and still fail to learn enough of world cartography to estimate correctly the importance of our northernmost territory, Alaska.

It is difficult to realize that the mainland of Soviet Russia is only 56 miles from the mainland of Alaska, when we have always thought of it as being just across the Atlantic.

Alaska's geographic importance can be shown by comparative distances:

Chicago to Fairbanks	2,780 miles
San Francisco to Fairbanks	2,210 miles
Difference	570 miles

Would you have believed Chicago was so close? Now look at this:

San Francisco to Tokyo, via Hawaii, Midway, Wake	6,925 miles
Seattle to Tokyo, via Aleutians	4,800 miles
Difference	2,120 miles

It doesn't take much of that to show Alaska's importance. But location isn't the only noteworthy reason for our interest up there. Alaska is one-fifth as large as the United States. She has a fabulous wealth of lumber, minerals, fish, and wild life. She is our last great frontier.

Alaska Under Arms tells a story of the recent development of the military and naval establishments in that country. Necessarily there is no mention of numbers of troops and locations of camps, but there is much of the

beauty of the land and the difficulties encountered by anyone who goes there.

Transportation problems on land and water have forced Alaskans into the air, so development of flying has progressed until it is now the accepted means of travel. Too, planes now haul much freight and supplies.

The story includes a succinct chapter on the development of education up near the Arctic Circle. We learn from it that the University of Alaska started with 6 students in 1922 and in 1941 had an attendance of 300, about one-third of whom came from the States to work their way through college in Alaska.

Politics and government, mining and farming take up another small part of the book. Also a little on the Alaskan natives—that is, the Eskimos and the Indians.

Miss Potter's work is a welcome contribution toward a more sensible and realistic understanding of Alaska and her relations with us.

A. V. R.

ARMY FOOD AND MESSING. Military Service Publishing Co., 1942. 381 pp.; appendices; index. $2.00.

In line with its practice of printing useful books and keeping them up-to-the-minute, Military Service has rewritten, reillustrated, expanded, and dressed up its excellent old *Manual of Mess Management*. This new book contains the latest information on all phases of mess management and cooking. Of particular interest to artillerymen are the suggestions and illustrations, to help assemble a mess truck so it will truly be a kitchen on wheels. Appendices include an issuing table of provisions per man per meal (for example, how much bologna if it is to be fried? served cold? with or in an omelet? made into hash?); tables and other useful information; and a minimum standard two-day menu. *Army Food and Messing* is well subtitled *The Complete Manual of Mess Management*. Every battery should have at least one copy.

GREEN FIRE. By Peter W. Rainier. 296 pages, map. Random House, 1942. $2.75.

Somewhere on the Libyan desert, Peter W. Rainier is fighting with United Nations troops. By latest accounts he is a Major in the Royal Engineers. But this story of *Green Fire* does not concern his war effort. Rather, it covers most of those years from World War I, when he came to the United States as a mining Engineer, to 1940, when he went to help the British.

The story of his mining ventures in Colombia offers one of the very best adventure stories on the book market.

After a few years in the United States, Rainier was sent to Colombia by a New York agency. There he

worked an emerald mine which had closed down after hundreds of years' operation. The Spanish conquerors of South America had worked the mine for scores of years and the stories of their successes were legend.

Rainier went to Chivor, the mine, fought a native bandit for possession, found the emeralds, and won world wide recognition for his achievements. In four years, working 300 men, he flooded the emerald market.

His family joined him in Colombia and they bought a large tract of timbered land near a great waterfall not far from the mine. There Margaret (Mrs. Rainier) both started a coffee plantation and began the first commercial tea growing in the New World.

Sidelights of his story rank high. He embalmed a man, using rum and a pressure pump. He drove bandits from his mine with sticks of dynamite. He helped stuff the intestines back into a split belly and stitched a man up so that he lived. In his few years in Colombia, he traveled thousands of miles across South America, horseback, alone or with a few friends. The natives liked him—some of them—and finally led him to an old Spanish mine that had been lost for three centuries. After the war he will go there to work it, no doubt.

Much of the book is similar to the exploits of our own pioneers of 200 years ago, but this story is new, the writer and leading character still lives. It is a worthy tale of true adventure.

A. V. R.

ARMY GUIDE FOR WOMEN. By Marion May Dilts. Longmans, Green and Co. 214 pp. $2.50.

Mrs. Dilt's fact-crammed book will satisfy the curiosity of the most inquisitive woman. Written to acquaint the women of this country with the most important information about the Army, its customs, habits, and habitat, *Army Guide for Women* covers everything a woman who is new to the Army might need to know about. The subject matter runs from uniforms and insignia through soldiers' mail. On the way it touches on military courtesy, religion, recreation, pay, duties of various types of troops, furloughs, military law, honors and decorations, and (last but not least) "the possibilities of living with your man." This little book should make a lot of women better informed about the Army and more comfortable in their minds.

L. B. C.

THE FLYING TIGERS. By Russell Whelan. 224 pages; illustrated. The Viking Press, 1942. $2.50.

"February 13. I got a day off! Played golf at Mingaladon Club and had a heck of a good time with my caddies—five of them, no less. One bag carrier, one umbrella wielder, two ball spotters, and a guy to fan me!"

". . . and we got plenty of booze and cigarettes, canned

food and a couple of Tommy guns. When they set fire to one *godown* (warehouse) containing twenty thousand cases of Scotch whiskey, we knew the end of the world was near. Twenty thousand cases! How many wonderful drunks would that make?

"February 21. A wild and woolly day. We flew as escort to four Blenheims . . . and ran smack into 40 Jap fighters and twelve bombers . . . it scared the pants off us. . . . Japs all over the sky . . . tried to shoot them all down myself but only get two in a full hour of fighting. It was a wild scramble. . . . Some fun! Still, we're kind of like wild beasts. Seem to do nothing but eat and sleep and fight."

"Eat and sleep and fight"—those words tell much of the story of the Flying Tigers, the AVG's, those intrepid Americans who gave up their quiet peacetime jobs in the U. S. Army, Navy, and Marines to fight under Brig. Gen. Claire Chennault.

Every man was hand picked, every man was an expert in his own right. Forty-one of our states were represented on the AVG roll. They were the cream of the crop, real Americans, fighting for a cause.

Their job—to protect the fifteen-hundred-mile Burma Road against one of the strongest air forces in the world. They did that job for 65 days while thousands of tons of supplies reached China.

How they did their job, where they came from, who they were, and how they died is the scope of this book. What they did *for* China and the United Nations and *to* Japan and the Axis is near a miracle.

The box score:

JAP LOSSES

286	Japanese planes downed officially (probably that many more not accredited)
1,500	Jap fliers killed

AMERICAN LOSSES

8 men and most of their few planes

There has not been another fighting team like them. Their niche in history is assured, a place for this book in the interests of readers is certain.

A. V. R.

ILLUSTRATION CREDITS

(If not listed, unsigned illustrations are from authors, by the *Journal* staff, or from special sources. References are to pages.)

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