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EDITED BY
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THE FIELD ARTILLERY JOURNAL

VOL. XVII MARCH–APRIL, 1927 NO. 2

FRENCH ARTILLERY

A LECTURE DELIVERED AT THE COMMAND AND GENERAL STAFF SCHOOL IN MAY, 1924

BY MAJOR EMMANUEL LOMBARD, FRENCH ARTILLERY

THE general object of this lecture is to give a summary view of the matériel situation in the French Army.

Many factors are responsible for this situation. Among the most important are:

The pre-war doctrine;

The hasty and strenuous work of improvisation during the first months of the war;

The emergency building program by which the French High Command was supplied with a powerful and modern artillery;

The post-war doctrine derived from the study of the teachings of the war.

Consequently this lecture will be divided as follows:

1. Conditions and ideas prevailing before 1914;
2. Developments during the war;
3. Situation at the armistice;
4. The post-war doctrines—the resulting matériel situation up to 1924.

It is not within the scope of this very simple talk to discuss the tactical principles which govern the assignment of certain weapons and guns to given organizations and units. No reference will be made to tactical employment of artillery which has been studied thoroughly in this very school. To dwell upon this would simply mean a loss of time.

The principles on which we base the characteristics of our different matériels are identical to those which govern the building program in the United States. However, the application is sometimes different. Among the reasons for these apparent discrepancies, the following are obvious: objectives and military laws; the French political and geographical situation are quite different from those of the United States. Here the tremendous development of

the railroads and of the automobile industry, the relative scarcity of the roads, the nature of the coasts, and the relative isolation make the defense problem a very different one. *"Couverture"* is a question of hours for France. Continuous entrenchments may still be found in the next European war. Without leaving his own territory, the eventual enemy of to-morrow may deal deadly blows on vital and tempting targets such as big frontier cities. The French may have to retaliate on similar points existing within the enemy borders. Consequently the matériels corresponding to such warfare and such objectives have to be built.

Therefore when, in this lecture, a discussion occurs concerning certain designs and the principle on which existing models have been built, it must be remembered that such observations or criticisms, based on the opinions of French experts, refer to French matériel *only* and relate to the French problem exclusively.

1. SITUATION IN 1914

Prevailing Ideas.—On account of the prevailing principles of offensive—I mean tactically—mobility was required from the gun: 8 kilometers an hour on roads was considered as the average speed for matériel not placed in an infantry column. Trotting behind reconnaissance detachments and galloping to firing emplacements was the accepted rule. Fire had to be delivered a few seconds after getting into firing position. Such fire was instantaneous, torrential and spasmodic. The battery commander from a position of a few meters ahead or on the side of the battery observed his own rounds at ranges which seldom were more than 3000 or 3500 meters. As soon as he had delivered six or seven salvos for adjustment and ten for effect, he was supposed to have obtained definite results (neutralizing effect at least). In a single day he could not expect to repeat many similar firings. Should he do so, the following days would see his guns speechless on account of shortage of ammunition.

For it was required that guns not only be light, but that they be accompanied by as limited a number of caissons and service wagons as possible, so that artillery columns should not become too cumbersome.

Explosive shells were given to the field artillery in a very shy proportion. Nobody believed in field entrenchments, for our doughboy's only tool was a *pelle-bêche* with which he was able to play with dirt as children do in public gardens.

The previous wars in the Balkans and in Manchuria had not taught a different lesson, for the lack of observers, the exceptional character of the wars and the heterogeneousness of the belligerent

nations prevented the stronger nations from deriving positive conclusions.

We therefore find in France in 1914:

(*a*) The 75-mm. gun, a splendid, rugged, light, quick-firing and accurate gun. It could not, however, fire further than 5500 meters with its shrapnel and had a maximum service range of 6500 meters. It was not provided with means of delivering fire at the maximum range allowed by the tube. What would be the use of such mechanism since the eye would not be able to observe the fire? The existing 3800 75-mm. guns were distributed as follows: 9 batteries to each infantry division; 12 batteries to each army corps regiment.

(*b*) One hundred and four howitzers, caliber 6″ (155-mm.), were called heavy field artillery. Practically their maximum range was 5000 meters; exceptionally, with a matériel-straining charge, a range of 6000 meters could be obtained. A transport wagon was used for the road transportation of the tube, model 1890. Such was the Rimailho which easily followed infantry columns and which could trot for short distances; the rate of fire was 5 or maybe 6 rounds a minute. The number in an army was from 3 to 6 batteries, or less than *one battery per army corps*.

In the drawers of our technical staff we could have found the designs of Schneider matériels; in the factories we were building a few samples of the 105-mm. rifle, having a range of 13 kilometers and a maximum elevation of 30 degrees, a previously unknown feature. But they were not yet ready.

In fortresses we possessed a collection of the "de Bange" rifles, howitzers and mortars, all models of the years between 1877 to 1890. They were mounted on carriages of a crystallized unmovable and imperturbable type. The tubes were endowed with remarkable precision, but these matériels were quite heavy and of little range, the mortars and howitzers firing from 2 to 3½ miles, the rifles about 7 miles.

2. SITUATION DURING THE WAR

The Lesson Learned from the Enemy.—As soon as we began to fight and more exactly during the crossing of the Meuse and of the Aisne by our retreating troops, our infantry suffered from the 105-mm. howitzer and our miniature heavy artillery was overwhelmed by the enemy's greater number and superior range. But the weapon that seemed to obtain the greatest efficiency during the retreat and at the Marne was the howitzer which, on account of its larger caliber, its precision and great angle of fall, caused us very heavy losses.

It was seen that our superiority in light field rifles did not compensate

for the matériel and moral effect of the enemy's field howitzers and mortars.

This shortcoming was accentuated in early September when the trench warfare began and when also appeared another unknown weapon, the trench warfare mortar or Minenwerfer.

If such concise judgments were acceptable, one could say that "1914 and 1915 were the years of howitzer and mortar omnipotency." The German 150-mm. was then reinforced by the 210-mm. mortar, a most effective weapon; for heavy destruction and counterbattery work the ranges used were very short as opponents were only a few hundred meters apart and their lines were less than a mile or so deep.

Upon the crystallization of the front during the latter part of 1915 and in 1916, the use of concrete, the depth of the defensive lines, the immunity provided by wire entanglements, the power of observation from balloons and by the young aviation, engendered powerful howitzers, long-range rifles, quick-firing trench mortars, firing from the map, sound ranging and gas shells.

We should have followed the pace, but our industrial provinces were occupied by the enemy and we had to use the old guns, the de Bange as position batteries on their siege carriages. Those having a sufficient range were mounted on modern carriages (an operation that we call "Schneiderizing"). The 155-L and the 155-C were thus rejuvenated. But they were still lacking in range, in power, and in rate of fire; their tactical mobility was not then questioned as there was no change in the situation for days and months and the gains of ground resulting from localized drives were limited to a few hundred meters.

But from a strategical standpoint, the question was quite different. We had no mobile artillery other than the 75-mm. gun; the first solution adopted in the drive of September, 1915, was tractor artillery (120-L, 120-C, 155-C, 155-L). It seemed rather a pity to draw behind excellent tractors such obsolete matériel, but those automotive engines were to become the nucleus of the future—the ten motorized heavy artillery regiments that we shall find in the armistice inventory.

Navy guns were at the same time mounted on railroad trucks and on barges and we thus created the counterbattery and long-range destruction matériel that were so badly needed. Trench mortars with winged shells were built and 75-mm. guns were placed on all around fire platforms for anti-aircraft defense.

I shall neither go into the details of the improvements of the weapons, nor comment upon the matériel that was brought to the front before the armistice. But I want to say a few words about

the surprises of 1918 when the apparently petrified front became a quickly moving line and, soon after, no line at all.

We found ourselves unable to follow the infantry with effective accompanying fire; the counterbattery work ceased in many instances because the guns were too heavy to follow; the long-range guns themselves were rapidly out of breath. The big Bertha was shelling Paris. Ammunition dumps often exploded. The complexity of transporting and storing ammunition of multiple calibers was a nerve-breaking job. Tanks had to be fought; columns had to be mobile, and firing snappy.

In many instances the command was tempted to leave in rear all the heavy matériel and to keep mobile guns alone. The difficulty of repairing or rebuilding railroad tracks imposed their use for supplies and ammunition only. Consequently railroad artillery was looked upon as an undesirable impediment.

After the armistice began, special Boards were appointed to study the situation. After tabulating the existing matériel and obtaining advice from the various branches, they began to prepare programs for the future, according to accepted new ideas. Let us look into their work more closely.

3. SITUATION AFTER THE ARMISTICE

First, what was the situation in matériel, at that time?

We find, as far as organization is concerned, two big classes:

a. The artillery assigned organically to the large units;

(1) In each division:
- 1 regiment of 75-mm.
- 1 battalion of 155-mm. C.S.

(2) In each corps (4 divisions):
- 2 battalions of 105-mm. rifle.
- 1 battalion 155-L model of 1877.

(3) Army: No organic artillery.

b. The artillery at the disposal of the Commander-in-Chief.

(1) R.G.A. (Réserve générale d'artillerie):

A.L.G.P. (High power artillery)	7	regiments
Tractor artillery (heavy)	10	regiments
Navy crews	13	regiments
Foot artillery and trench artillery.....	4	regiments
75-mm. portée	34	regiments
Horse-drawn heavy artillery.....	30	regiments

(2) Anti-aircraft artillery ..... 6 regiments

(3) Anti-tank artillery ..... 1 regiment

If we study more closely the total number of batteries, we find the following numbers:

		Number Batteries	Remarks
75-mm. guns		1041	Model 1897
Trench guns		158	War models
Horse drawn heavy artillery 825 batteries	105-mm. guns	159	New
	155-mm. how.	461	Of which 22 are old
	120-mm. guns	20	All old
	155-mm. guns	175	Of which 115 are old
Tractor heavy artillery, 584 batteries	75-mm. porté	342	
	155-mm. guns	102	Of which 35 are old
	145-mm. guns	17	
	8″-how.	104	British model
	220-mm. how.		
	270-mm. mort.		
	280-mm. how.		
	Others	19	
A.L.G.P. 50 batteries	*16*, 220, 240, and 270; guns 293, 370 how.	50	
A.L.V.F. (railway artillery) 54 batteries	*19*, 240, 274, 305, *32*, 340 guns	54	
	370, 400, 520 howitzers		
Naval batteries	*10, 14, 16*	21	
Position artillery	80, 90, 95, 120, 155: guns 155, 220, 270: how.	272	All old

Calibers *italicized* are expressed in centimeters.

To summarize this table, after deducting the units used for training and without mentioning trench guns, tank and mountain artillery, we find on the front:

75-mm. guns	5480
Field heavy artillery	5000
A.L.G.P.	740
Anti-aircraft	404

Let us compare the above with that of August, 1914:

75-mm. guns	3840
Field heavy artillery	308
Others	0

These figures do not give the real value of the increase, for whereas the 75-mm. was limited in range to 5500 meters in 1914, it could reach ten kilometers in 1918, by overcharging the recoil cylinder and by using projectiles of finer shape.

Also old model heavy artillery had profited by the use of recoil systems and appropriate projectiles. The gain in range with new matériel reached in some cases 100 per cent., for instance, in the 155-mm. matériel:

155-L 1877 maximum range	10 kilometers
155-L 1877 Schneiderized	14 kilometers
155-L G.P.F.	18–19 kilometers

4. NEW IDEAS

The war had been a very long, expensive one. The lack in matériel, in munitions, in adequate means of artillery transportation had been cruelly felt. In order to spare the nation hardships of the same kind in the future, it was necessary to get rid of narrow conservatism, to discard the false theories, to acknowledge the errors and to reject the imaginative suggestions of the freaks.

It was still very obvious and much to be regretted that the interpretation of the facts with respect to artillery matters, on account of the multifold aspects of the war, could not be made absolutely uniform and that some partisan ideas were still prevailing among the various branches.

The battery officer was not aware of the difficulty of quantity production and also of the staff problems. The Ordnance expert saw nothing but mechanical and ballistic problems. As for the Staff, one of our ranking generals likes to repeat the following incident of which he was a witness. When a heavy artillery battalion commander expressed doubt concerning the strength of a bridge which he had to cross with his unit, a young staff officer who had been ordered to attend the crossing and who could not stand the hesitation and the delays, impatiently burst out: "You pass first, you compute afterwards."

But the most interested partner in the whole fighting corporation is the infantryman. Let us see what he thinks. Well, he naturally wants to be supported at all times; he complains sometimes with reason about the shells that fall short in range and hit or threaten his men. But he is often very greedy and also does not give enough consideration to probable errors as is illustrated by this incident.

One day, in Champagne, an infantry battalion commander who wanted to show appreciation of the work of the supporting unit, told

its commander that the adjustment of the guns was extremely good. "After the sixth shot all rounds fell exactly at the same place." The artillery officer was simply shocked for he had been spending an hour in a disagreeable spot in order to improve that adjustment which was extremely trying on account of varying weights of shells and of a supply of heterogeneous fuses. And the mean point of impact had been displacing itself in a most disconcerting way, even after the fiftieth round!

(To be continued.)

SIX MONTHS WITH A JAPANESE ARTILLERY REGIMENT

FALL MANEUVERS

BY MAJOR WILLIAM C. CRANE, JR., F.A.

(Continued from last issue)

THE training year of a division ends with combined field exercises which may be either "Special Grand Maneuvers" or "Fall Maneuvers." The former is the big military event of the year, participated in by as many as six divisions, and attended by the Emperor or his representative. The location of the Grand Maneuvers and the divisions taking part are changed each year, so that all divisions have a chance to participate at intervals and the people of all sections have the periodical thrill of watching this carefully staged spectacle. The troops of divisions not in the Grand Maneuvers have two weeks of field exercises during which the size of opposing units gradually increases until the division is functioning as a unit against an outlined enemy, or against a neighboring division when one is conveniently near.

From November 6 to 20, 1925, the 16th Division held the ordinary "Fall Maneuvers" in the beautiful country generally east and southeast of Kyoto. Unfortunately, following our return from service practice, an epidemic of typhoid fever broke out in the regiment and we were not released from quarantine in time for my battalion to take part in the exercises planned with the 33rd Infantry of the 30th Brigade from November 6 to 8, inclusive. The schedule for the remainder of the maneuver was as follows:

Nov.	9	Rest Day.
"	10 to 12	Maneuver between regiments of the 30th Brigade and attached troops.
"	13	Assembly march for the interbrigade maneuver.
"	14	Rest Day.
"	15 to 17	Interbrigade maneuver.
"	18	Rest Day.
"	19 to 20	Interdivision maneuver with the 4th Division from Osaka.

The original plan had been for the 2nd Battalion, to which I was attached, to be sent by rail to join the 33rd Infantry but due to the repeated postponement of our release from quarantine and departure, the trip by rail was abandoned and the battalion less one

battery still in quarantine left Kyoto on November 7th, marching to Kameyama where we met the 33rd Infantry upon the conclusion of their first three days' exercise. The route followed *via* Otsu, Ishibe, Seki, to Kameyama, was particularly interesting as being the old "Tokaido" connecting Kyoto and Tokyo and used for centuries by daimios and their retinues in making their periodical journeys to and from the capital. Even now there are a few of the daimios' old stopping places still standing and the villages and farm houses along the route are so picturesquely old fashioned that it was only natural that we released our imaginations and tried to picture the costumes and stately progress of the daimio trains that might have been seen in the same surroundings only seventy years or so ago.

In order to provide mounts for members of the various details improvised for the maneuvers, caissons were left behind and only such animals as were necessary for the gun and battery wagon teams were in draft. The march table for our small command, which was strictly followed, showed 37½ and 43 kilometers for the two days' march to Kameyama. On the first day there were seven halts and on the second day eight, including those for the night, at distances of from four to six and a half kilometers apart, which required from fifty minutes to one hour and twenty minutes' marching. This inequality is due to the custom of making all halts in villages to take advantage of better watering facilities there in the shape of wells and streams. Water for animals is not a problem in Japan with its countless wells, streams and irrigation ditches and full advantage is always taken of the excellent facilities available. Each driver has two canvas water buckets on his off horse and each individually mounted man, except officers, has one, so that watering is quickly accomplished, especially in villages where each house has its well and the villagers themselves assist by drawing water and lending their own tubs and buckets. When advance notice has been received that troops are coming it is usual for local veterans' associations and others to have tubs of water for the animals and tea for the men ready by the side of the road.

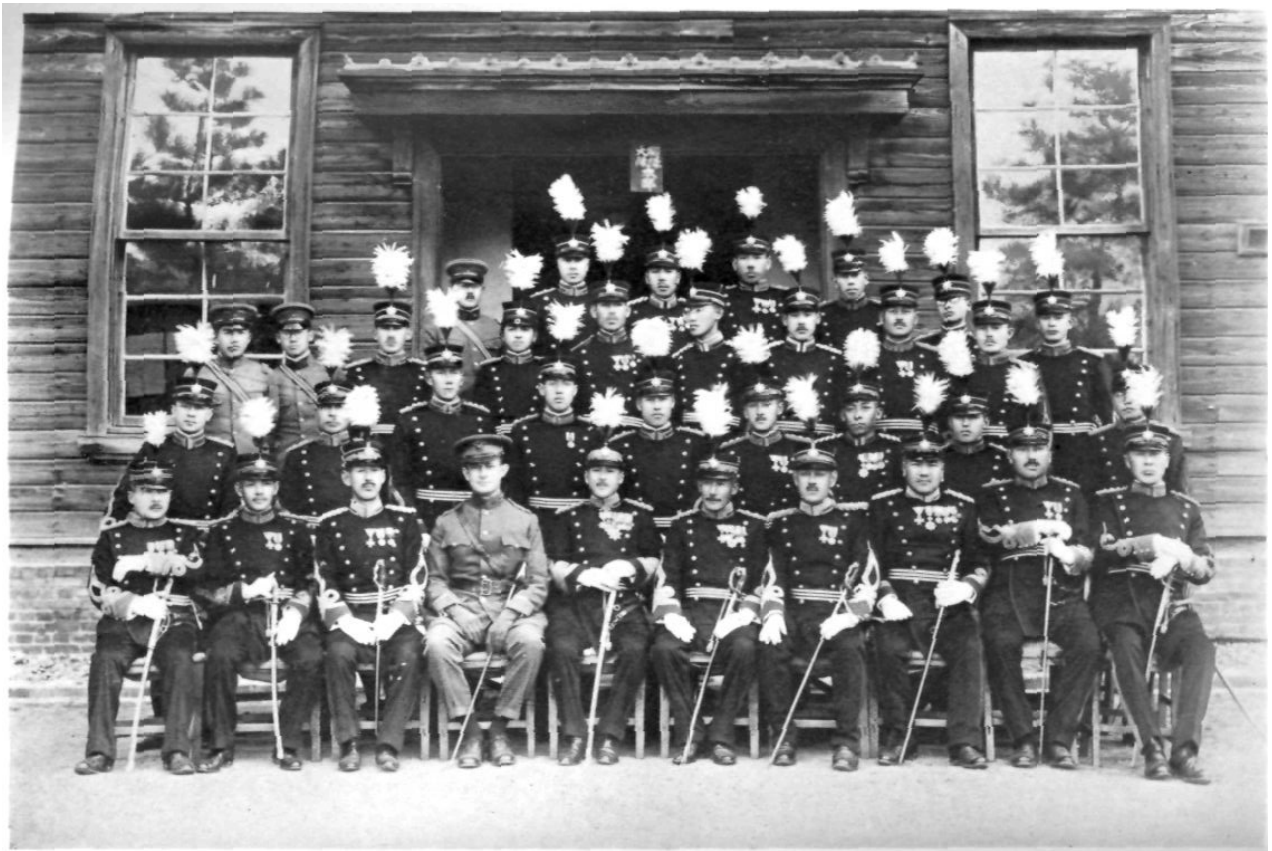
At all halts shoulders and breast collars were washed and at the noon and last halts hoofs were carefully cleaned and washed. At all halts pressure from collar pads was invariably relieved by sliding collars forward. As there were numerous cannoneers available to assist the drivers in their care of animals the work was well and quickly done. The great number of cannoneers compared to the few seats on carriages forced all marching to be made at a walk, monotonous to both men and animals. The Japanese cannoneer is always dismounted except at increased gaits, and as his knapsack is packed on a limber or caisson and the walking gait is that of infantry, he

A HOLIDAY

SUKIYAKI AND SAKE

OFFICERS AND THEIR FAMILIES AT A REGIMENTAL PICNIC

LIMBER AND CAISSON PACKED WITH KNAPSACKS



OFFICERS OF THE 22ND (JAPANESE) FIELD ARTILLERY, NEW YEAR'S DAY, 1926

should have no difficulty whatever. However, as a matter of fact, he, as well as the infantryman, suffers from sore feet caused by his thin soled, poorly shaped, though well made, marching shoes.

It is very seldom that satisfactory gun parks and picket lines can be found on the march. Practically every inch of ground is either under cultivation or is so steep and wooded as to be worthless for such purposes. After the rice has been harvested and if there has been no rain for a week or more, and the ground is well drained, the stubble dotted fields are fairly satisfactory, but a little rain is enough to turn them immediately into axle deep mud. As a consequence the artillery is severely inconvenienced when it halts for the night and usually has to content itself with leaving the carriages by the side of the road and stretching section picket lines here and there in yards, school playgrounds and along comparatively broad sections of the road. Harness is wrapped in saddle blankets and stored near the picket lines.

Except in the mountainous districts where towns are scarce and widely separated, the housing of men for the night in billets is simple, satisfactory and comfortable. Both the troops and the civilians are used to the system and unite in making it work smoothly. Based on local conditions, appropriate rates are fixed for billets for officers and men. Town offices keep records of houses and their capacities, attend to the distribution of payments by the military for billets, and if desired, have forage collected and ready for the troops on their arrival.

The battalion billeting officer with a noncommissioned officer representative from each battery and the battalion intendance officer preceded the battalion by a couple of hours and had billets marked and forage arranged for prior to our arrival. Small cotton scrolls with appropriate marking were used to indicate various headquarters while paper markers posted on doorways showed the numbers of various ranks to be housed in the building and the organization to which assigned. Paper markers pasted on telegraph poles and walls pointed the directions to unit billeting areas which also were marked clearly on a sketch furnished the battalion commander. Of course when a larger unit than a battalion was quartered in a town, regimental and later battalion areas were allocated by the headquarters concerned.

A billet included a hot bath, a bed on the floor, two meals and a lunch to carry on the march. In sections not much frequented by troops the welcome received was particularly hearty, but everywhere they were well taken care of and town officials, ex-soldiers and boys' clubs were tireless in their assistance. Guides were furnished to conduct men to their billets, watering facilities were provided for, and information about roads, bridges, etc., was always quickly

obtainable. Being the one and only foreign officer present, I received special attention and consideration. My billet was always the best available and invariably the mayor, the head of the reservists' association and other dignitaries, came to call and were most solicitous about my comfort, thinking it impossible that a foreigner could be happy with nothing but straight Japanese food and accommodations. On the contrary, a hot bath every night, plenty of good Japanese food and sake, fresh sleeping kimonos, deep beds of quilts under a good roof made the maneuvers very luxurious "field service."

During the three phases of the maneuvers in which the artillery participated, the men were not as fortunate as I was in being billeted every night, but the nights were rare when they did not have some form of permanent shelter over their heads for a few hours at least.

There is a very characteristic Japanese custom which requires that a man who has been billeted in a private house write back in a few days to the head of the house and thank him for the hospitality received. This custom was carefully observed by both officers and men.

For some time prior to the maneuvers the health conditions in the area in which we were to operate were examined by the division medical service. The tail end of a small cholera epidemic was located and orders were promptly issued requiring officers and men to be inoculated before leaving their permanent stations. I was invited to take the protective inoculation and accepted at once. Besides the temporary danger from cholera in a comparatively restricted area, there were the ever-present venereal diseases and trachoma in the vicinity of Nara against which the men were warned. The inoculation and warning were successful and none of the diseases mentioned showed themselves on our return to barracks.

The three sets of maneuvers were similar in that the forces actually engaged were represented as detachments from, or subordinate units of larger imaginary forces. The commanders during a particular maneuver had had no part in the preparation of "situations" and were supposed to be ignorant of the exact territory over which they were to operate. However, in some cases at least, fairly exact knowledge of the theater of operations was obtained and pre-maneuver reconnaissance was practiced under one excuse or another. Commanders received their general and first special situations the day preceding the opening of their particular maneuver and so had ample opportunity to study the problem carefully and issue their initial orders. Supply during the entire period of the successive exercises had been carefully planned and arranged for by the division supply agencies long before the maneuver began, with the result that commanders had no worry on that score, and

under the supervision of the umpires the action always developed so that troops ended the day in the area where arrangements had previously been made for supplies.

As before noted, the first and second maneuvers each lasted three days while the third and final one was completed in two days. A full day of rest was allowed between successive maneuvers. Each of the holidays was welcomed and needed by the troops as they were worked hard and continuously while the exercises lasted and at the end of each one were very tired and footsore. Marches of three and four hours without a halt were not uncommon. Frequent rains kept clothes damp and shoes soggy and added to the discomfort and fatigue of the troops. A day of rest restored spirits and revived the weary but was not long enough to completely repair blistered and bruised feet, and in spite of the efforts of the medical personnel and the careful attention of the men themselves there were a great number of men who were hobbling painfully at the end, and it was not at all unusual to see men shuffling along in straw sandals with their marching shoes strapped to their knapsacks.

Space does not permit a lengthy description of the details of the maneuvers. Briefly stated, all fighting was under open warfare conditions.

Each maneuver began with a march toward a more or less definitely located enemy, followed in a couple of hours by a meeting engagement whose progress was so influenced by the umpires that commanders had opportunities to issue orders for both offensive and defensive action, and in two out of three maneuvers the troops of both sides actually engaged in both types of combat.

Infantry formations for the attack and the defense were comparatively shallow. Artillery was invariably put in action well forward without depth and usually had a small security detachment of infantry or engineers attached for close protection while in position. Practically no attempt was made to maintain close infantry-artillery liaison. Cavalry was used almost exclusively in reconnaissance detachments. A few observation planes appeared for a couple of hours on the first day of the last maneuver but disappeared before combat began. Telephones and runners were the means of signal communication with principal reliance placed on runners. All lines were laid by the lower units to the next higher. Command posts of brigade and lower headquarters were always located at the best observation post available.

The numerous, well instructed umpires contributed greatly to the success of the maneuver, but the annual experience of all ranks in such exercises, and the uniformly high state of training of the various organizations were primarily responsible for the smoothness and rapidity of the whole affair.

The critiques which followed the three maneuvers were as formal as those given during service practice, though the method was somewhat different. Our first three days' maneuver was prepared and directed by Major General Hayashi, the commander of the 30th Brigade, and as the exercise was divided into two phases he critiqued each phase upon its conclusion. The numerous umpires of each side submitted notes on the operations witnessed by them to the chief umpires, one for each side, who in turn presented consolidated reports to the brigade commander. Based on these reports and on his own observations and those of his staff, Major General Hayashi gave his critique. The same system was followed throughout and each critique consisted of a detailed review of the operation up to date with both praise and censure of the actions of commanders and units freely expressed. Major General Hayashi, and later Lieutenant General Yamada, the division commander, expressed general approval of the maneuvers and each in turn announced a holiday for the troops as a reward for their excellent work. These holidays seem to be pretty much a matter of course, for not an officer questioned on the subject had heard of the troops not being so rewarded for their efforts during the fall maneuvers.

While the officers were attending the last critique of the maneuvers the troops under warrant officers began their journey home, some by train but most by marching, as the majority of home stations were only a few hours' march away.

Back in barracks the regiment set to work and cleaned continuously for several days until equipment, animals and clothing were back to normal cleanliness. The few days remaining until the end of November were spent in getting ready to muster out the class whose period of service expired on November 30th.

Early in the morning of the 30th, friends and relatives began to gather at the gates of the regimental area to receive the men as they were mustered out. The time-expired men formed by battery in front of barracks, some in civilian clothes, some in cotton reservists' uniforms presented by their home towns.

Battery groups marched to the gate escorted by comrades still in the service carrying their small parcels of personal belongings. At the gate packages were turned over to their owners, farewell salutes and bows were exchanged and the ex-service men surrounded by waiting friends and relatives started back to civil life. It was all very quiet and orderly, and impressive in its simplicity and lack of demonstration.

With the regiment reduced to about half strength it kept those remaining busy preparing for the next class of conscripts and caring for the animals and equipment. Time was found, however, for

special instruction of noncommissioned officers and selected privates chosen to handle the recruits arriving January 10th.

New Years is the great holiday of the year in Japan. The officers of the garrison at Kyoto began the day by attending the division commander's annual reception in their full dress uniforms and there drinking a few toasts proposed by the General. Immediately following the reception, general and field officers went next door to the division commander's quarters where more sake and sandwiches were served. This was only the beginning of the celebration, for colonels, majors and captains all gave parties one after the other, and officers drifted down the "chain of command" from party to party as far as they could go.

My attachment was over the end of January, so soon after the opening of the New Year the farewell parties began and continued until the end of the month. General Yamada, Colonel Fugino, division and brigade staff officers and commanders of organizations stationed in Kyoto entertained me most delightfully at several of the famous tea houses of Kyoto and vicinity, with the joyousness of the occasion added to by the presence of some of Kyoto's best geisha. The officers of the regiment insisted on giving me some sort of present and finally decided on a beautiful complete Japanese archery outfit of bow, arrows, glove and quiver as a reminder of the days we shot together at the butts beside the officers' club. This remembrance was presented at a most enjoyable party given in the officers' mess.

As practically all officers of the regiment were to be away the last few days in January, I had planned to give the customary farewell speech at the officers' mess the day before their departure, have a free day or so to pack up and leave Kyoto quietly before their return. The news spread quickly and so many officers from the colonel down objected to my plan that finally Mrs. Crane and I were forced to advance our departure to enable all officers to see us off at the station. When train time came not only the active officers, but many of their wives and even a recently retired lieutenant-colonel of the regiment, who had come with his wife all the way from Nara, were on the platform to see us off. Such kindness was typical of the attitude of all with whom I came in contact during a most unusual and enjoyable six months with the Japanese Army.

GAITS

WALK

KEEP 'em walking out there, drivers.
Walk 'em till their legs will warm up.
Walk 'em out in steady draft,
'Till you see the B. C.'s arm up.
Morning's crisp and road is good.
Sit your saddle square and ride on
Up ahead where gold and red
Moves the idly flapping guidon.

TROT

Lift 'em up into a trot
With rattling single trees and toggle
Chains and blankets growing hot,
And bumping carriages that joggle
Cannoneers from out a doze.
While hoofs upon the road are drumming,
The guidon flutters out and shows
Batt'ry "B" is up and coming.

GALLOP

Galloping on at the gallant pace
Of the Field Artillery,
While the horses snort at the reins held short
And the zest of it's keen on ev'ry face
And your heart is high and free.
The rumbling guns raise a cloud of dust,
Made gold by the sun's bright beams,
And the guidon beckons and knows no check,
As up and forward its staff is thrust
And out in the wind it streams.

FAIRFAX DOWNEY.

SUB-CALIBER FIRING IN TRAINING FIELD ARTILLERY

By MAJOR FRANCIS T. COLBY, F.A.

[Since this article was written, the Chief of Field Artillery has recommended that .30 caliber sub-caliber tubes be made standard for issue to 155-mm. howitzer units. This equipment to be in the form of a .30-caliber rifle action and barrel suitably supported to allow its use inside the bore of the howitzer. It was further recommended that if there is no immediate prospect of improving the standard sub-caliber equipment for 75-mm. units, equipment similar to that recommended for the 155-mm. howitzer be devised for test in the 75-mm. gun in comparison with standard equipment.—EDITOR.]

BEFORE discussing the application of sub-caliber firing to training, it is well to reduce the principles of training of Field Artillery to their basic elements. In the first place, I think most officers who have served long with the guns will agree that Field Artillery training is simple, certainly in no way complicated, and that efficiency depends on endless repetition and constant practice.

Leaving aside the question of marches, tactics involving movement, and interior economy—care of men, animals and equipment in which sub-caliber cannot help us—the basic elements of training would appear to be:

1. Training of Battery and Battalion details.
   - (*a*) In communication.
   - (*b*) In the use of instruments.
   - (*c*) In reconnaissance.
2. Training of the Firing Battery.
   - (*a*) Training of gunners.
   - (*b*) Training of gun teams to work together.
   - (*c*) Consolidation of the gun teams into a "Battery Team," a true firing battery.
3. Training of Officers to conduct fire both technically and tactically.

Now, taking these elements, let us compare the possibilities of sub-caliber firing with other methods of training.

Let us suppose we have a battery in position at one yard interval on a good sub-caliber range. The Major is directing fire and has ordered a telephone operator at each gun and a telephone line from each gun to an observation post just back of the guns. There are four more telephone operators a few yards apart at the observation post. An officer of the Battalion is assigned to each gun. These four officers are at the observation post and report to the Major. He says to them, "Gentlemen, you have studied the rules of fire. I want you to learn to apply them. Pick out your own targets, fire

percussion precision adjustments, and critique your own problems. No one will bother you. Pay no attention to me. I shall watch you shoot, going from one to another and will answer any questions. When any one of you thinks he can shoot axial all right, let me know, and if you shoot all right for me, I'll pass you on to lateral." Turning to the Battery Commander, the Major says, "Captain, you have your executive. What we're after in the battery are telephone operators, gunners and a spirit of teamwork at the guns. Commence firing!"

Now turning back to what we called the basic elements of training, let us see what we have in action and what we are getting out of it.

Under "1a" we have eight telephone operators and for every shot that is fired, two of them repeat fire commands. That is, two telephone commands per shot. Furthermore, these operators are really working as part of a team and are interested. They are making mistakes, but are being corrected.

"1b" and "1c" are not being trained.

Under "2a and b" we have four gunners at the guns and four No. Ones who change with them. Every shot means a sight setting. The gun squads are getting together on trail shifting. "2c" is not being trained.

Under "3" we have four officers firing at once. They make errors, but in nearly every case they recognize the error when made by the result of the next shot and correct their fire.

Bearing in mind that speed and efficiency depend largely on repetition, let us examine the volume of training. The number of shots per hour is a good measure. Each shot means a command by an officer firing a problem, two telephone repetitions, and a sight setting. During the past two years, in the 2nd Battalion of the 11th Field Artillery using sub-caliber (both 30 and 22 calibers) in the 155-mm. howitzer, we averaged between 500 and 700 rounds per battery per hour. That was with lateral observation. Axial is faster. In the 2nd Battalion of the 7th Field Artillery with the 75's, we shot quite a little more rapidly. I haven't the figures at hand nor have I the figures for other units, but 600 rounds per battery per hour will do for a basis and is roughly correct for a good outfit.

On this basis, let us see what we are getting in the various elements and how this compares with other methods of training.

Taking the telephone operators under "1a" and disregarding the series fired in improvement fire on one command as being offset by additional messages such as "ready to fire," "fire," "round

complete," etc., we find a total of 1200 fire commands repeated by the eight operators per hour.

Now, to get anything like this volume by running a telephone net for separate telephone training, we should have to use the services of officer and noncommissioned officer personnel to give and receive the commands which would not be available without stopping training in other elements. Even then, personal interest and teamwork would be absent. In brief, it would appear that so far as the training of telephone operators in fire commands is concerned, sub-caliber firing can be used to the exclusion of practically all other training.

Now, taking up the training of the firing battery under "2a and b," we find that we have 600 sight settings or 150 per gunner per hour—the number of trail shiftings is small in axial fire, but very large in lateral fire. The other possible method of training is standing gun drill. Standing gun drill is too slow to make fast gunners. The number of sight settings is roughly one-tenth of that in sub-caliber practice. It is necessary to have the gunner stand back and have his setting verified, then his error has to be shown to him on the sight. While this is being done, the other gunners are idle, *i.e.*, three-fourths of that particular minute is wasted. In sub-caliber firing, the gunner and the whole squad can see the shot strike and can see the gunner's error if he makes one. The error is corrected as a part of a problem and no one's time is lost. The gunner is tremendously interested and is working his hand wheels so hard that the sweat is running into his eyes. At standing gun drill he is bored to death, and spends more than half of his time waiting for somebody else's sight to be checked.

There can be little question but that gunners and good gunners can be made with sub-caliber firing in about one-quarter of the time needed in a combination of standing gun drill and service practice. The same thing is true of the gun teams and the firing battery as a whole. Lateral adjustments give the essential speed and efficiency in trail shifting, while bracket adjustments give training in the use of the sheaf and teamwork of the battery as a whole.

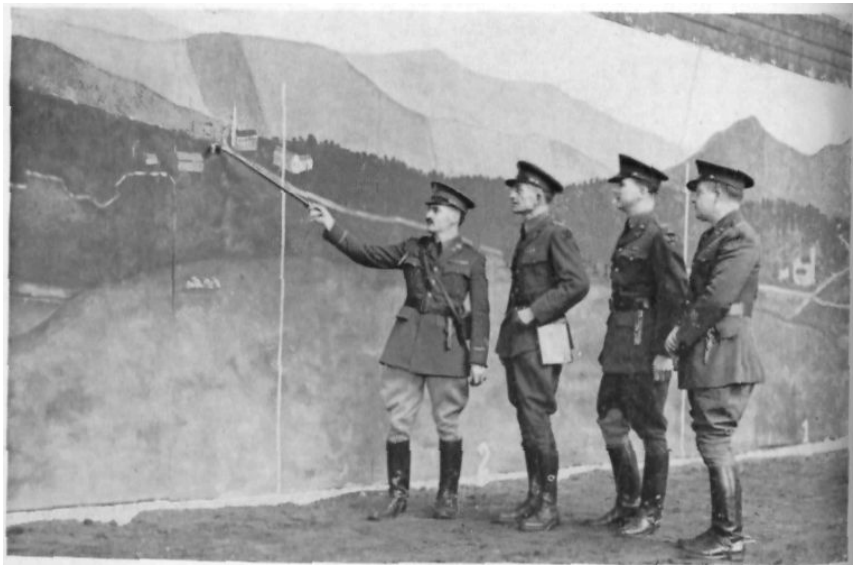
The conduct of fire by officers ("3") is perhaps the greatest asset of sub-caliber fire. Taking our assumption of 600 rounds per battery per hour and 15 rounds per problem, we have 40 problems per hour or 10 problems per officer. Let us compare this method with black board, terrain board and smoke bomb instruction. In the first place, we usually carry out the last three methods at officers' school. The officers are taken away from their units which need them, and which are not being trained properly in their absence. One officer shoots at a time, the others follow in theory, at least,

his problem. How well do they follow it? Not very well. They do their best, but are fighting a desire to sleep. In any case, only one officer is giving commands and giving commands is what counts. When an error is made, all have to listen to the instructor's remarks. For those that know all about what he is saying, their time is wasted and worse than wasted, for they lose interest. All of these methods are slow. From three to six problems per hour is not far wrong for smoke bomb and terrain board. The black board is faster and therefore usually better, but even here, if you divide the number of problems by the number of officers present, you get with the average school about one-fourth of a problem per officer per hour. These methods are essentially *instruction and not training*. They have only one advantage—the height of burst in time fire. For teaching this, they should be used, but only for officers who are already highly proficient in percussion fire learned at sub-caliber practice. Such officers can give their whole attention to the height of burst. Others are confused by too many elements of fire at once. The use of smoke bomb because of the similarity to a service burst would not seem to be justified, first because it really is not like a service burst, and second because we only get about five per cent. errors in observation of burst in service practice. The observation of live ammunition is after all the only true way to learn to sense bursts. Smoke bomb has another great drawback. It necessitates the use of a trained enlisted personnel, who are taken away from other training. It needs a range and long telephone lines. When you think of some ten or fifteen officers all taken away from their men, and another officer and eight men working the smoke bomb outfit with a total result of six problems for the afternoon, it simply is too expensive in time and man-power to justify the result. In the same time spent at sub-caliber, you could train most elements of a battery together and fire some 70 problems with only six officers, or using the battalion and your sixteen officers, around 150 problems.

In training in the conduct of fire, one of the most important sides to sub-caliber fire is its relation to the mental attitude of the officer and his psychology in shooting. Take the average officer who comes to our batteries. He is usually instructed but not trained so far as conduct of fire is concerned. All through his career he has had an instructor at his elbow every time he has ever given a fire command, either in the school room or on the range. He has had whistles blown in his ear. He has invariably been criticized afterwards in the presence of others—usually for mistakes which he realized as soon as he made them and which came from lack of practice. He has a deep rooted and deadly fear of the instructor and his whistle and very little confidence in himself at the firing

SUB-CALIBER FIRING IN THE 11TH FIELD ARTILLERY, SCHOFIELD BARRACKS

OFFICERS' SCHOOL AT THE COMMONWEALTH ARMORY, BOSTON
SUB-CALIBER FIRING.



COLONEL NEEDHAM, COMMANDING 101ST FIELD ARTILLERY, EXPLAINING TO HIS STAFF A PROBLEM ON THE NEW SUB-CALIBER TARGET AT THE COMMONWEALTH ARMORY
THE TARGET IS OF SHEET IRON, 60 FEET LONG AND 12 FEET HIGH. THE 22 CALIBER EXPLOSIVE BULLETS GIVE VISIBLE BURSTS

point. When he shoots he's like a man trying to write a letter with some one looking over his shoulder. He feels he's up for examination, he's nervous, and "all fussed up." Now, if that man is ever to be a really deadly shot with the guns, his mental attitude has got to be changed, his confidence restored and further, he has got to be made to *like* to shoot.

If you say to this man, "Mr. Dookrow, I know you know the rules of fire. Ninety per cent. of the errors made are in applying them. Here's a gun and 100 rounds of sub-caliber ammunition. Go ahead and shoot and I won't bother you." He's like a child with a new toy! He learns to shoot and he trains the gun crews while he's doing it. When he comes up to shoot for you, he's lost his nervousness and he can shoot. All he needed was a little friendly instruction between problems and practice, practice, practice. Sub-caliber is the only way you can give it to him.

Now, on the psychological side of the thing—why is it that we all make mistakes in applying the rules of fire, which we know, when we are green or out of practice? I've got an idea that it's because we mentally jump back and forth from the subjective to the objective and *vice versa*. A man sees a burst and senses correctly—objective—then, he fishes around in the back of his mind for a rule to tell him what to do about it—subjective. He remembers the rule, forgets what he saw and jumps his bracket. There is not space to really go into the theory of it here, but the cure would seem to be, by practice and repetition to practically eliminate the use of the primary centers of the brain in firing. In short, to shoot by the same mental method that you eat or dodge a motor car. A man so trained could shoot when he was half asleep, when he was wounded or exhausted. When an officer's commands follow a burst instantly without pause or thought, I believe he approaches this mental method. Sub-caliber is the only method where there is sufficient practice to get this almost automatic skill, except in long warfare.

Now, to go back to our battery which we left firing on the sub-caliber range when we decided to examine the results it was getting, let us suppose that the Major has had this kind of training several times, that the telephone operators are getting good, that the gun squads are together and his officers can shoot percussion precision, both axial and lateral with few errors. He has had the last practice using an angle i of over 300 mils to get more trail shifting. What he now wants is to keep up this type of training but to add to it the training of those elements previously omitted. To do this, he issues the following order to his staff and battery commanders:

"Gentlemen, day after to-morrow we will continue our sub-caliber firing, this time as a battalion problem, with a view to training

all possible elements of the command. The Battalion command and observation post will be established on the rise (or platform) just back of the present gun positions. The Battalion Reconnaissance Officer will make and issue to each battery a map of the range, made to scale. On it will be marked the approximate battery positions and other elements of the Battalion, but not enemy targets. The Battalion Intelligence Officer will issue a Battalion panoramic sketch of the area with polar coördinates and enemy targets as seen from the Battalion observation post, including the Battalion reference point. The Battalion Plans and Training Officer will issue a sketch showing the battery zones of action, normal and contingent. The Battalion Communication Officer will establish communication to the battery command posts and will place his radio station just behind the Battalion command post. He will coördinate with the radio of the 1st Battalion and be prepared to carry on dummy airplane problems. The Battalion Munitions Officer will issue to each battery the amount of ammunition normally carried with a firing battery and will direct the Combat Train Commander to take station in rear of the position and be prepared to send up ammunition when called for by Battalion Headquarters.

"The batteries will take position at 7.45 A.M. They will choose their own command posts and observation posts having observation posts for both axial and lateral adjustments. They will be prepared to identify targets as designated from the Battalion panoramic sketch and also from coördinates on the scale map. They will choose their own base points and register at once. The Executive Officer will command the Battalion. I will issue to him situations calculated to keep all the guns firing all the time and the radio in operation. These situations will call for percussion precision adjustments both axial and lateral, for bracket adjustments, for barrages and counter-preparation concentrations, also for interdiction and harassing fire. I will circulate around and see how you get on, but I want you to pay no attention to me. Just carry on. There's another thing—gas training. The Battalion Headquarters and the batteries will establish gas signals. When the gas alert is sounded, gas masks will go on and stay on until the alert is declared off by Battalion Headquarters. The periods will be short, but I want the men to learn to do their jobs in masks, not merely put them on to cover the regulations. One thing more we are going to do, and I shall not call for it often—that is, night firing. I want you to learn to use the night lighting devices. The first part of this exercise will stop at 11.30 A.M. and we will re-occupy the position at 8.00 P.M. The Plans and Training Officer will see that the range is lighted by automobile

headlights, or otherwise, and each battery will shoot at least five problems at night. That's all, gentlemen."

Now we will consider what has been covered and what has not been covered, based on the elements of training.

Under No. 1, all the communication elements are working and all the instrument men are working, except range finders. The reconnaissance and intelligence people are hard at it on maps, targets, etc. Under No. 2, the batteries are training gunners, gun squads and the battery as a whole. Under No. 3, the officers are conducting fire. The Battalion Staff, including the Munitions Officer, is functioning. What haven't we got First, range finders and calculating data at normal distances. Second, fuze setting. This is being done with dummy cartridges and checked by the Chiefs of Section, but it's not too good. There's no work on height of burst, and the anti-aircraft machine guns are not in the picture. There is no actual handling of service ammunition, and if it is a 155-mm. Battalion, no ramming home of projectiles. Leaving these out, and a few other minor things, it looks as if we'd covered most of the essentials of training and command on the sub-caliber range up to the Regiment.

Now, there's another thing about sub-caliber which ought to appeal to any practical battery or battalion commander. It's a "get rich quick" method of training for inspection, when you have to use it as such. Our method of training is progressive based on the European conscript armies, but our recruitment is also progressive, which is the opposite to theirs. They get all their recruits together and progressively train them to a high efficiency and then discharge them and start over again. Our recruits drop in at all times during the period of progressive training. The French Foreign Legion, the Navy and the Fire Department get their recruits as we do, but their system of training is different. It is based on assimilation and doing the whole job all the time. With progressive training and progressive recruitment, we often have a battery largely made up of men of two and a half years' service, and there is a period of six months' elementary training ahead. Your old men go out and you get a batch of "blues." Result: You've got nothing and you are supposed to be good, and have to go out and shoot for the General. Intensive sub-caliber firing is the only way I know of to get by with a whole skin.

So much for the use of sub-caliber in training. Now, a word or two about the technic and matériel. For the 155-mm. howitzer, there is issued the 37-mm. sub-caliber tube and ammunition. The projectile is all right. You can see it from the ground and from the air at all reasonable distances, but the dispersion is about twenty-five

per cent. of the range and you cannot shoot a problem with it. It is utterly useless. You can, however, make most excellent sub-caliber tubes by getting slightly defective infantry rifles and setting the barrels and actions in wooden blocks in the breeches of the guns. In the 2nd Battalion of the 11th Field Artillery we used both the 30 caliber and the 22 caliber gallery practice rifles and both were of great service, the former using the 30-caliber gallery cartridge.

For the 75-mm. guns, there are issued the regular 30 caliber sub-caliber tubes, shooting a Krag cartridge with extra heavy primer cup to stand the artillery firing pin, a 220 grain jacketed bullet having a velocity of 1900 feet per second. This matériel is not very good. It has the following disadvantages:

1. The shell heads and primers split and the firing pins are apt to break.
2. The velocity is too great, and coupled with the jacketed bullet make a much too elaborate range necessary.
3. The accuracy is too great to give a proper similarity to the dispersion of the gun, *i.e.*, your first series of improvement fire is either all over or all short.

It is more satisfactory to discard these tubes and use infantry barrels and actions set in wooden blocks in the guns, shooting the gallery practice cartridge with a light, lead bullet and an 1100 foot second velocity and a dispersion more nearly like that of the artillery projectile. There is also issued to the National Guard, but not to the Regular Army, a 22 caliber sub-caliber tube. This tube is a modification of a 22 caliber tube developed by the writer in 1913. As modified, the extractors have to be taken off as they do not fit the rimless adapter used. The shell, however, can be easily extracted with the fingers. The other faults of the 30 caliber tube are not present and it is a very serviceable piece of matériel. This 22 caliber sub-caliber tube has many advantages. In the first place, the ammunition is *very cheap* and easy to get. Second, the target range is small and easy to build and elaborate safety precautions are not necessary; third, the dispersion at 100 yards is about right. Fourth, an explosive bullet giving a visible burst against a vertical sheet metal target can be obtained. If a landscape is painted in this target, very satisfactory adjustments can be fired. The armories of the 104th and 105th Field Artillery, N. G., N.Y., are equipped with such targets, and one has just been built at the 101st Field Artillery in Boston, where most successful sub-caliber training is now in progress.

Ranges are not hard to find and if possible several are desirable

in order to give variety. In Hawaii, we used to march to various camping places for one or two nights, taking both the 30 caliber and 22 caliber tubes, and we were always able to find a shoot for one or the other. All you need is a gentle slope toward the guns with land or dry dirt to show the "splash" of the bullet. Cinders or ashes are good for this purpose. With sand or dusty terrain, very satisfactory problems can be shot at night by throwing automobile headlights on the adjustment area.

It will be seen that a certain amount of trouble and energy is necessary to get your batteries equipped with proper tubes, ammunition and ranges, but once this is done, you are repaid many times by the results and no battalion or battery commander will ever regret the trouble he has taken to get equipped for sub-caliber firing.

THE RESERVE OFFICERS' TRAINING CORPS---MISSION AND METHODS

BY MAJOR JOHN N. HAUSER, F.A.

As I write this paper, the first half of my last year on R.O.T.C. duty is ending. A number of reasons impel me to put my experiences in print. While there can and should be no greater joy for a line officer than to spend his lifetime in command of troops of his arm, still in our army as now constituted, the joys of troop duty come to us at rare intervals, and we are forced to seek pleasure elsewhere. R.O.T.C. duty offers the opportunity for four years of happy service, similar in many respects to troop duty. One of the reasons for this article is the hope that it will be read by officers who have scant knowledge of this type of duty. There are many such, and many who are inclined to receive news of a detail with misgivings. I write also slightly in the spirit of the reformer, as I have a mild quarrel with those officers who in their zeal to impart perfect instruction along a few or all lines ignore the mission of their work. My ideas on the subject to-day are not the same as they were three years ago, and I confess that I am still learning something new every day about this work. Such ideas as I have are set down here, however poorly expressed, in an effort to further the interests of what I believe to be the most important, by far, "extra-military" activity of the Army.

The mission of the R.O.T.C. is to make dependable second lieutenants of the Officers' Reserve Corps in sufficient quantity to meet the demands of the national defense program. The raw material consists of college and university students, who devote a portion of their time to military studies. Under the law, they must devote three hours per week for the two years of the basic course, and five hours per week for the two years of the advanced course. That amounts to a total of about five hundred hours of instruction, which time is supplemented by additional hours spent on such activities as the Cadet Officers' Club, military sports, etc. In the carrying out of the mission, the fact must not be forgotten that the student is primarily interested in preparing himself for one of the vocations of civil life, and that his military activities, while of great importance, must and should take second place in his plans.

A consideration of what might happen to the finished product of the R.O.T.C. is of help to one planning the undergraduate courses. Let us assume that a second lieutenant of reserves is called to active service two years after his graduation. One of several things might happen to him. If he were assigned to a regular regiment, upon the

outbreak of war he would be immediately called, and he would perfect himself professionally by what might be called the apprentice method, very much as the newly graduated cadet receives his initial training as an officer. Or he might be sent to an officers' training school for a refresher course of two or three months' duration before being assigned to an organization. Or he might be ordered to join his regiment in a concentration camp, in advance of the arrival of the men and equipment. Any or all of these eventualities lead me to define a dependable reserve second lieutenant as one who has a thorough understanding of the demands which will be made on him, and whose training will enable him, after a short period of strangeness, to perfect himself rapidly in his duties as an officer. To ask more would require a course of training almost as thorough as that given a cadet at the U. S. Military Academy.

Our student must receive his training in approximately five hundred hours, spread over four years, which training equips him to measure up to a certain standard of proficiency. In studying the problem of what subjects should be taught, and how much time should be devoted to each, I have divided all subjects into two classes, one class consisting of purely technical or professional subjects, which the student can learn only from the Army, and the other consisting of those subjects where civil professions and occupations are applied to military needs.

In discussing subjects which apply knowledge used in civil vocations, I can in this article only list the most important, and select one only for detailed discussion. The line of reasoning applies equally to all, with the possible exception of military law. That is a subject which in my opinion should be taught from the military viewpoint, which proposal in fact is similar to the attitude of many eminent lawyers engaged now in an attempt to reform civil legal procedure. I regard the subjects of communications, motors, and topography as among the most important in the group of subjects under present discussion, and my example for elaboration of argument is the course in communications.

At this institution there are about twenty hours during which this subject forms part of practical training or the solution of map problems. Individual officers might feel that the subject was important enough to warrant a greater allowance of time. However, any increase in the number of hours which would allow for a really thorough teaching of the subject would be made by shortening the time allotted to other subjects, many of equal or greater importance. Within the time allotted there are lectures, demonstrations and operation of equipment by students, including the establishment of the battalion telephone net. Communications play their part in the solution of tactical problems. In short, the student is introduced

to communication equipment, and is impressed with the importance of the subject. Upon completion of the course he is far from being a trained communications officer, but there must be taken into consideration the training he will receive as an officer when called into active service. If needs be, he has enough information to fight his way through, and learn his duties in the school of experience. The chances are, however, that in his regiment or in a refresher camp he will find himself in a communications school, under either a regular officer, or an emergency officer who is also a graduate electrical engineer. His emergency course of training will, of necessity, be intensive, and his undergraduate schooling will enable him to go ahead much more rapidly than if he had to learn the subject from the ground up.

Much more might be said, but I purpose to leave those subjects which have their counterpart in civil life, and take up those which are purely technically and professionally military in nature. The two most important are, of course, the horse and the gun. The accompanying program shows the time which is allotted to those subjects. To make perfect cannoneers, and experienced chiefs of gun platoons requires more time than can be given, but enough hours are allotted to the gun to make the student well acquainted with his weapon and the duties concerning it. One might say that the horse is just as much a stranger to the average civilian as is the 75-mm. gun. For that reason, our training in horsemanship and draft is as thorough as time permits. At the end of the sophomore year, the successful student is a fair horseman, and a dependable driver. In the advanced course he continues his training in equitation, and is drilled in the duties of all the individually mounted noncommissioned officers and commissioned officers of the battery. He gets a simple course in hippology and stable management, he learns to tack on and pull horseshoes, and he helps to train such remounts as may have been received during his time. Our experience in the summer camps has shown that students can be trusted to take a battery into the field, march, unharness and feed at night, and bring the animals back without injury. Much of this practical work is done with only little supervision.

There are duties other than those concerned with horse and gun which are covered in the training of the candidate for reserve commission. This training can do no more than to give a very good understanding of all that may be demanded of an officer. If it does only that, it has done much to offset the too prevalent opinion that all there is to soldiering is wearing the uniform and carrying a gun, and all there is to being an officer is answering salutes and bellowing commands. It is a pleasant task for an instructor to stimulate thought, and there are countless opportunities to do it. Our student,

for example, has not at first the slightest ideas on the subject of food other than to expect three good meals per day while in camp. When the proposition is advanced that within a year circumstances may demand that he act as battery mess officer, he is at first amused and alarmed both, but from that time on he regards the mess hall, his tours of kitchen police, his contact with the soldier cooks all as sources of information with respect to his future duties. And in his senior year he has a background of practical experience to tie to his course in battery administration. Similarly, the effort is made to drive home facts concerning all the duties he will be expected to perform.

The important subject of command and leadership presents, I think, the hardest problem to solve. In the training of candidates for commission there are two conflicting schools of instruction. One school claims that the student should be given theoretically perfect instruction by professional officers. This method of training requires that the student learn the duties of an officer by observation. The other school would have the student learn by doing everything he would be called upon to do as an officer, and so acquire his experience by trial and error as an undergraduate. The actual method of training followed, obviously, must be a compromise. Every candidate for commission must be given some experience and responsibility of command. What must be guarded against is that the personnel being handled may receive from the candidate, not valuable training, but misinformation. Were the candidate's laboratory material guinea pigs, no harm could result except to the pigs; but he handles men, who are themselves undergoing military training, and are entitled to correct instruction. To take the drill of the battery mounted, for example, if our candidate can be taught to be a comparatively good chief of section, his general training will enable him to develop into a good chief of platoon while on active duty as an officer, but time does not usually permit him to receive ample practice in the duties of chief of platoon or battery commander. Such training and responsibility as he can get in command at mounted drills, dismounted drills, and formal ceremonies are of great value, but the real training in leadership comes, and only then, when the young officer is placed in authority over his unit in his permanent organization on active duty. Lectures on the principles of leadership, the setting of good examples by instructors, practice in command, all help, but I am of the opinion that leadership is really learned only by leading, not laboratory material, but one's own men.

The customs and courtesies of the service are taught by a number of preliminary lectures, but proper training extends throughout the four years of the complete course. Our effort is to turn out a

reserve officer who speaks and understands military language, and who knows how to go about our peculiar way of doing business. He is taught to be a respectful and loyal subordinate, but a social equal. He renders obedience to constituted authority, but he does it without cringing, and without the use of the language of menials, a form of respect still demanded by too many officers of their subordinates. He learns the customs of officers' messes in his Cadet Officers' Club, and there he can be taught much by his commissioned instructors, who are honorary members of the Club.

Each institution of learning has its own method of handling, or avoiding, the matter of standards of honor and conduct. There are schools having honor systems, some satisfactory, some just mockeries. There are schools where the student is regarded as dishonest unless he can prove the contrary. To my mind, there is only one attitude to take on this subject. We must assume that every man commissioned in the reserves as the result of our efforts has measured up to our standard of honor. I have heard freshman sections greet the opening salutation of "Gentlemen" with laughter, but such laughter was never repeated. The men of those sections had never before been addressed as gentlemen, but they soon learned to like the idea, and responded by deserving the title. It is futile, of course, to expect that there will be no cases of lying and cheating; however, it is not too much to expect that every student recommended for admission to the advanced course has been vouched for as honest by his instructors. The student who cheats and gets away with it will usually cheat again, and keep on cheating until he overreaches himself and gets caught. Our honor system is really not a system at all, but rather an attitude of confidence in the sense of decency of the great bulk of the student body. This attitude has been fully justified by results, not only in the standards adhered to by our advanced course students, but in the conduct of the much larger number of basic students as well.

The program of instruction accompanying this paper is admittedly not the best that could be devised. It is the result of the planning of my predecessors and myself, and is not intended to be the last word by any means. Many more years must pass before our project leaves the experimental stage, if it ever does. This program represents, not only the effort to provide the ideal course of instruction in the time allowed, but a compromise with such conditions as storage space for equipment, class-room facilities, drill grounds for mounted training, attitude of faculty and student body, to say nothing about shortage of personnel, matériel, and animals due to causes beyond our control.

A successful unit needs more than a well-planned course of instruction and proper facilities. It needs officers keenly interested

in their work, and in sympathy with the American student. The latter is of the greatest importance. The student will wear his cap on the back of his head, fling his coat wide open to the summer breeze, and otherwise try the patience of his instructors. He violates our conventions because he does not understand them. Many an officer is led to think at first that discipline is absent. To those who know that an underlying spirit of willing obedience has enabled the student military organization here to meet every test, the lack of outward, visible forms means very little. The acceptance of the traditional forms and gestures of military systems follows soon after the student learns that they are not so strange and mysterious as they first appear. Nowhere can an officer find greater opportunity to demonstrate his power of leadership. At this institution, wherever practicable he carries his class from freshman year through graduation. He has no opportunity to grow stale professionally. He learns his men by name, and he handles each one as an individual. The only tendency which he must fight is that of forgetting that he is imparting information to men, and not playing the game of "marks" with his students.

That our methods of training are correct may never be tested on the field of battle. It is encouraging to note that officers on duty with the Organized Reserves speak with praise of the accomplishments of recent graduates during summer training periods, and that National Guard commanders ask for R.O.T.C. graduates for their organizations. That shows that we are on the right track, which should encourage us still more to adequately train those who may some day be our own subordinate officers in time of emergency.

PROGRAM OF INSTRUCTION, 1926–1927

FIELD ARTILLERY UNIT, OHIO STATE UNIVERSITY

FIRST YEAR, BASIC COURSE

Autumn

	Hours
Dismounted Ceremonies	12
Dismounted Instruction	5
Service of the Piece	10
Field Artillery Matériel	7

Winter

Elementary Gunnery	22
Basic Military Subjects	7

Spring

Dismounted Ceremonies	10		
Service of the Piece	10		
Pistol Marksmanship	10	Total number of hours	93

SECOND YEAR, BASIC COURSE

Autumn

	Hours		
Dismounted Ceremonies	12		
Equitation	24		
Winter			
Field Artillery Motors	16		
Animal Management	14		
Spring			
Dismounted Ceremonies	10		
Driving, the Battery Mounted	20	Total number of hours	96

FIRST YEAR, ADVANCED COURSE

Autumn

Miscellaneous F.A. Subjects.	7		
F.A. Communications	4		
F.A. Organization	3		
F.A. Tactics and Technique.	19		
Command and Leadership (Ceremonies)	12		
Advanced Equitation	11		
Winter			
Advanced Gunnery	49		
Spring			
Dismounted Ceremonies	10		
Smoke Bomb Conduct of Fire	20		
Command and Leadership, Mounted	20	Total number of hours	155

SECOND YEAR, ADVANCED COURSE

Autumn

Military Law	20		
Military Policy of the U. S.	4		
Strategy and Tactics	10		
Command and Leadership (Ceremonies)	12		
Advanced Equitation	11		

Winter

	Hours
Administration	8
Organization, Tactics, Combined Arms	30
Gunnery, Indoors	10

Spring

Dismounted Ceremonies	10
Smoke Bomb Conduct of Fire	20
Command and Leadership, Mounted	20

Total number of hours	155
Grand total, hours	499

THE 83RD FIELD ARTILLERY CONSTRUCTS NEW QUARTERS

BY MAJOR ROBERT S. DONALDSON, F.A.

[The Chief of Field Artillery, when recently at Fort Benning, was much impressed with the construction done by the Battalion of the 83rd Field Artillery and suggested that Major Donaldson, commanding, be requested to furnish an article on the work.—EDITOR.]

THE one active battalion of the 83rd Field Artillery, a 75-mm. tractor-drawn unit, is stationed at Fort Benning, Georgia, where it represents the field artillery among the demonstration troops on duty at the Infantry School. There for some years it has occupied the old wooden barrack buildings, built during the recent war. They were makeshift, tumble-down shacks, with which the army as a whole is, unhappily, only too familiar.

On July 13, 1926, telegraphic orders were received to raze the old barracks and other buildings, nineteen in all, and to build new quarters for the men. This was made necessary by the fact that the ground on which the old buildings stood was needed for the construction of permanent brick barracks for other troops. As bids were to be opened August 15th, that was the date specified for completing the demolition and policing the site. Work of demolition and policing had to be completed in one month and two days. A letter from the office of the Quartermaster General, dated July 8th, had given the school warning that such an order would soon be issued. Under the personal direction of the Commandant, Brigadier-General Edgar T. Collins, who took a close personal interest in this matter throughout, plans had been formulated in advance so that there was no delay.

The battalion had completed its field training, including a march of three hundred miles, which marked the close of that period. Due to lack of funds, the work had to be done largely by the personnel of the 83rd. The training schedule was suspended and every available man was assigned to the wrecking crew.

The School Quartermaster, Lieutenant-Colonel A. B. Warfield, lent all assistance possible. His drafting room force dropped other work on hand to draft plans to scale and to turn out blue prints. A civilian carpenter was furnished each battery, masons and plumbers acted as supervisors, and tools were placed at the disposal of the battalion. At later stages of construction, the Quartermaster's detail from the 24th Infantry assisted in laying water pipes and sewers.

The general plan adopted was for each battery to clear the

TYPE OF OLD BARRACKS

WRECKED BY 83RD FIELD ARTILLERY TO MAKE ROOM FOR THE CONSTRUCTION OF PERMANENT BRICK BARRACKS.

A TWO BATTERY MESS HALL

CONSTRUCTED BY 83RD FIELD ARTILLERY.

NEW MOTOR SHED

HEADQUARTERS BATTERY AND COMBAT TRAIN, 83RD FIELD ARTILLERY. PHOTO BY SIGNAL CORPS. U. S. ARMY.

THE OLD MOTOR SHED

HEADQUARTERS BATTERY AND COMBAT TRAIN, 83RD FIELD ARTILLERY.

buildings in its old barrack area and house itself in the new. Blue prints of the camp plan and of the buildings were furnished each battery commander. Battalion headquarters buildings were constructed by details from the battalion under the supervision of the battalion supply officer. Mess halls, offices, store rooms, bath houses, and recreation rooms were to be of solidly built frame construction on brick and concrete footings. The new construction was all located in the vicinity of the motor and gun sheds. Lumber was scarce and it was essential to salvage that in the old barracks in order to use it in the new buildings and in the tent floors, frames and walls.

The work of wrecking began on July 14th, the day following the receipt of the order, and was pushed rapidly in order to finish work within the time limit. In two weeks the troops were under canvas near the quarters being razed, the messes operating from rolling kitchens. As lumber became available through wrecking operations, tent frames and new bath houses and mess halls began to take shape. Sewers, and water lines, too, were constructed.

The next phase was the transfer of camp to the new site. This occurred about August 9th. The men moved into the newly framed tents and the rolling kitchens were set up near the location of the new frame kitchens. By August 15th, on schedule time, the old area was cleared, and on September 1st recruits resumed their interrupted course of instruction, and the motor and gun specialists returned to the general overhaul of matériel.

During the month of October about half of each battery was required to complete the work on recreation halls, store rooms, and mess halls, and in painting the entire plant. Headquarters Battery and Combat Train had also to build a new motor shed, as the one formerly occupied was too dilapidated to be of further use. This labor was carried on at such odd hours as could be taken from training for, and staging, demonstrations for the student body—for the Infantry School opened in the middle of September.

The men are much pleased with their new quarters. The camp is nearer the motor sheds and gun parks than were the old barracks. The structures are more substantially built, and in general more suitably constructed for their purposes than were the woefully sagging and dilapidated wartime buildings.

The battalion has been highly commended by many officers who inspected the work not only for the excellent results obtained, but for having completed the building program within such a short period of time. Much credit is due the Commandant and the energetic drive behind his general plan and to the hearty coöperation of the School Quartermaster. Still more credit is due to the spirit of

loyalty in the men of the 83rd, and to pride in their organizations which spurred on each battery in its effort to outdo the others.

During the last phase of the construction the following bulletin was published by Headquarters, The Infantry School:

"HEADQUARTERS
THE INFANTRY SCHOOL,
Bulletin Fort Benning, Georgia,
No. 21. September 8, 1926.

SUPERVISION OF DETAILS OF THE EIGHTY-THIRD FIELD ARTILLERY

"The following comment of the Inspector of this Headquarters with reference to a report made by the Commanding Officer, 83rd Field Artillery, on training in his command during the period June 1st to August 31st, is so commendatory that it is published for the information of the entire command:

"'1. I observed this organization only during the very last part of the period covered by the report, that is, during construction of barracks.

"'2. The energy and efficiency displayed by all officers in close supervision of work, was very noticeable. Results obtained showed the effect of this supervision.

"'3. In addition, in four days of inspecting I found only a total of two men from this organization apparently idling. Discipline and morale were apparently good.'

"By Command of Brigadier-General Collins:

ROBERT H. DUNLOP,
Major, A. G. D., Adjutant.

Official:
ROBERT H. DUNLOP,
Major, A. G. D., Adjutant."

A MINIATURE RANGE AND ITS OPERATION

BY LIEUTENANT WILLIAM P. BLAIR, F.A.

ONE of the noteworthy features of this miniature range is its amenability to being completely installed in a few minutes and to being as quickly dismantled at the end of an instruction period, redisposing the ground occupied to other uses. The successive efforts and experiences of several officers have contributed to its present stage of evolution.

Various methods have been devised with the object of giving instruction and practice in the mechanism of the conduct of fire. Such preparation is desirable, and even necessary, to minimize ammunition expenditure and to increase the benefit accruing when service firing practice is undertaken. Blackboard, terrain board, and miniature range or smoke bomb simulated fire, preferably in the order given, should be used.

Much benefit from the miniature range described herein was obtained in training Reserve Officers' Training Corps students at a Field Artillery Unit, situated in one of our largest cities. Smoke bomb practice could not be utilized because of unavailability, or nonexistence, of open terrain of the necessary extent for its institution. Recourse was then had to a miniature range in substitution thereof.

No vacant lot or plot of ground was at hand for one of the conventional type, although there was the University campus and a park nearby. The driving of a system of stakes, etc., for such a miniature range at either of these places was impracticable, for the whole thing would have to be removed every time the grass was mowed, and it would be exposed at all times to molestation by children. It being inadvisable to build a miniature range of a permanent or semi-permanent nature, one of a transient or migratory character was devised, such that it could be quickly installed by the class at the beginning of the recitation hour, and be disassembled and returned to the storeroom as expeditiously at the end of the hour.

The range can be operated with such facility, both in speed and accuracy, that its use is particularly appropriate where the recitation period is only of fifty minutes' duration, as is the case at this institution. Students who have received instruction the last few years by means of this miniature range have given such satisfactory performances at Reserve Officers' Training Corps camp service firing that its use in this, or modified, form by other organizations

cannot but be considered with optimism. Hence the plan and operation of this range are submitted.

EQUIPMENT

Field glasses for battery commander and observers.
1 battery commander's telescope.
2 field telephones.
1 roll of twisted pair field wire.
Targets.
2 range stakes and one gun stake.
60 center of impact tags.
1 burst spotter.
1 range stick.
1 deflection stick.
A plot of open ground, fairly level.

DESCRIPTION OF EQUIPMENT

The field glasses, battery commander's telescope, the telephones, and telephone wire consist of regular issued equipment. The remainder of the articles must be fashioned from material at hand.

For the targets it has been found that rectangles of tin, 1½″ × 2″, soldered to steel tally pins, such that the latter can be pressed into the ground at intervals desired, make excellent "battery in position" targets. (See Fig. 1.) These can easily be pulled up for use at different positions and times. Practically any kind of target can be represented by properly fashioning the tin before soldering to the tally pin.

Steel tally pins are used also for the range stakes and the gun stake. The latter has a pennant of red cloth attached to the ring, and the former has a red pennant for one stake and a white one for the other to represent the range flags.

The center-of-impact tags are placed on the ground to accurately show the operator of the burst spotter where to indicate bursts. For a very few cents at nearly any stationery store, little round tin edged tags of cardboard, one-half inch in diameter, can be purchased. Each of the tags has a small perforation in it, such that the tag may be fastened in position on the ground by means of a four-penny nail.

The burst spotter consists of a slender shaft of wood or heavy iron wire, about six feet long, on the end of which is secured a circular piece of tin about one and one-half inches in diameter. One side of the tin is enameled white, and the other black, to indicate air and graze bursts, respectively. (See Fig. 2.)

The range stick is merely a strip of wood about ½″ × 1½″, of a length to represent two forks, or two hundred yards, to the scale

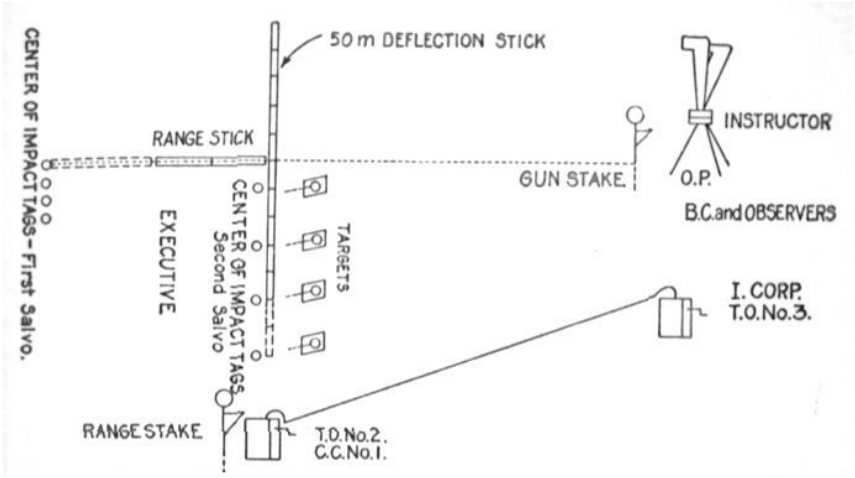


FIGURE 1. DIAGRAMMATIC SKETCH OF MINIATURE RANGE NOT TO SCALE.

FIGURE 2. BURST SPOTTER.

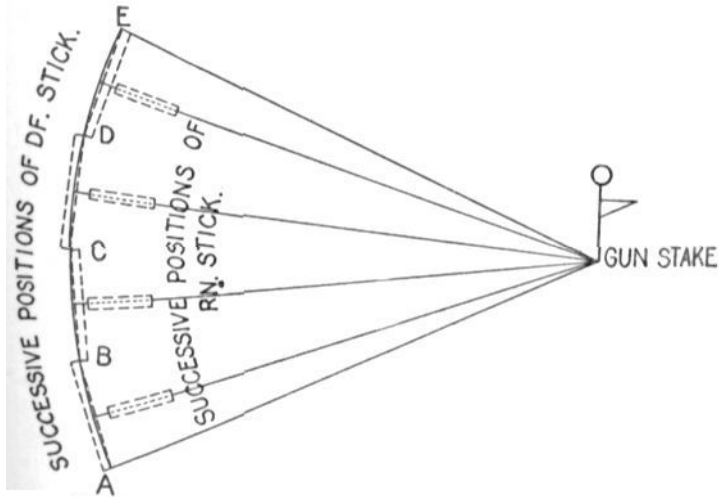


FIGURE 3 ILLUSTRATING MAKING WIDE DEFLECTION SHIFTS. (Mil. intervals magnified.)

of the miniature range. The stick is divided by a line midway across it for measuring range differences of one fork. (See Fig. 1.)

The deflection stick may be of the same cross-section as the range stick. A convenient length is one measuring fifty mils as seen from the gun position. It is graduated in mils, every five-mil line being numbered, beginning from each end of the stick to facilitate the laying off of the proper mil distances to the right or left, at or near the targets. (See Fig. 1.)

EXTENT OF RANGE

The range may be layed off to any convenient scale, depending upon the amount of available ground. When field glasses are used, it should be at least 150 feet long; 200 feet is better. By having the telephone wire of the correct length, the distance from the target area to the observation post is automatically accomplished in the installation of the telephone line.

This range is designed for axial observation—shrapnel time simulated firing, where the observation post and the guns are nearly together. However, with slight modifications, any kind of terrestial observation and method of adjustment may be practiced.

SCALE FOR MINIATURE RANGE, 150 FEET

For range stick.

1 yard – 9/16 inch; 100 yards – 56¼ inches – 4 feet 8¼ inches.

For telephone wire.

Make 3200 yards the medium range. 3200 yards – 150 feet.

For deflection stick.

1 mil – 1.8 inches at 150 feet.
5 mils – 8 inches at 150 feet.
50 mils – 6 feet 8 inches at 150 feet.

SCALE FOR MINIATURE RANGE, 200 FEET

For range stick.

1 yard – ¾ inch; 100 yards – 75 inches – 6 feet 3 inches.

For telephone wire.

Make 3200 yards the medium range. 3200 yards – 200 feet.

For deflection stick.

1 mil – 2.4 inches at 200 feet.
5 mils – 12 inches at 200 feet.
50 mils – 10 feet at 200 feet.

A MINIATURE RANGE AND ITS OPERATION

GENERAL OPERATION

The Range Detail consists of the following personnel:

Battery Commander.
Instrument Corporal.
Telephone Operator No. 3.
Executive.
Telephone Operator No. 2.
Caisson Corporal No. 1.

All equipment and targets are established in place by the class upon going out, and are returned by them to the storeroom at the end of the hour. Upon the meeting of the class, students are designated to man the various positions. The class draws equipment from the storeroom, and reports to the range. Refer to Fig. 1. Upon the class reaching the range ground, the instructor indicates the position of the range stake, the direction of the guns from the latter, and the character, position and width of the targets. Those of the class having no assigned duties proceed at once to the estimated position of the guns or observation post. The other students set to work immediately installing the range. The executive presses into the ground, at the designated place, the range stake with red streamer to indicate that the range is not clear. He sets up the targets as directed by the instructor, assisted by the caisson corporal. Telephone operator No. 2 takes post at the range stake and installs his telephone after receiving the free end of wire from telephone operator No. 3, who then proceeds in the direction of the guns and observation post, unreeling the wire as he goes. He attaches his telephone upon reaching his end of the wire. This marks the position of the guns and observation post, indicates to the instrument corporal where to set up the battery commander's telescope, and to the battery commander and observers where to take post. In the meantime, the instructor shows the executive where to indicate the bursts of the initial salvo, informs him of the width of the sheaf, and the proportion of airs and grazes. The executive places on the ground as a guide for his burst spotter a center of impact tag for each gun to be fired, using his deflection stick to obtain the correct points of burst, and width of sheaf. As soon as communication is established and everything is in readiness at his station to begin the first problem, the executive takes down the red range flag and displays the white one.

When his preparations have been completed at the observation post, the instrument corporal, seeing the white range flag displayed, will display the red flag at the guns, that is, pushes the gun stake into the ground. He then takes his post beside telephone operator No. 3 to record. Caisson corporal No. 1 records at the post of the

executive. The battery commander, upon seeing the white range flag and the red flag at the guns displayed, reports the range in order to the instructor at the observation post. This report should come about three minutes after the class has reached the range position.

The instructor now assigns a target and an aiming point, explains the tactical situation, and gives the range and how obtained, *viz.,* by estimation, range finder, map, etc.

It should be noted that while the targets will be at a certain represented distance from the guns, according to the scale of the range, we are not restricted to using this distance or one approximating it for the announced range in problems in the case of axial observation where the gun position and the observation post are nearly coincident. The range given by the instructor to a student for a target may be any range, because the range and deflection sticks, graduated to the scale of the miniature range, will cause all indicated bursts to appear in a proper relation on the range as viewed from the observation post. However, the distance the targets may be planted from the medium range is limited, but not to an extent as to limit instruction. Also there is a maximum distance which extends on either side of the medium range, enclosing a zone within which the initial bursts must appear in order that the deflection stick may not measure serious errors in mils. In the case of this miniature range, the medium range represents 3200 yards, and the deflection stick is graduated to give proper mil intervals as viewed from that scale distance. Within a scale distance in range of 500 yards on either side of the medium range, the errors in mils as measured with the deflection stick will be so small as to have no appreciable effect upon the efficient operation of the miniature range.

The procedure in firing a problem at the observation post is practically identical with that in firing service ammunition. The indicated bursts do not much resemble real bursts, but this is of small consequence in the training of beginners who must learn the mechanism of the conduct of fire, and get the habit of making quick, accurate decisions, and prompt announcements.

The successful operation of the miniature range depends much upon the efficiency of the executive who receives excellent training at his position. The procedure of the executive in placing his center of impact tags upon changes in deflection, deflection difference, and range, is illustrated in Fig. 1. The initial sheaf at, say 3600, was regular, 15 mils wide, to the right of the target, all in the ground, and over in range. The battery commander gives "Left 5, On No. 1 open 5, Up 10, 3200." Here, No. 1 is the directing burst, so the executive shortens the range a distance representing 400 yards by measuring with his range stick along the line, *Center-of-Impact Tag No. 1—Gun Stake*. (The range stick is of sufficient length to

enable speedy and accurate lining in by eye.) The range stick being left on the ground along this line, the deflection stick is then applied on the ground at right angles by eye and at its mid-point to the range stick. The center-of-impact tags for the new salvo can now be placed. In case of a wide deflection shift, such as that measured by several deflection stick lengths, the procedure is indicated in Fig. 3. Here it is desired to shift from A to E, a deflection change of "Right 200." The range stick is successively placed in the dotted positions, viz., direction *Gun Stake—Midpoint of Deflection Stick*. An end of the deflection stick is pivoted at A until the stick reaches the position perpendicular to the range stick. The other end of the deflection stick will then mark the position B. This procedure is then repeated successively, an end of the deflection stick being pivoted at B, C, and D in turn. The ends of the deflection stick thus are made to take position on the are of the circle whose radius is the represented range started with at A. The theoretical correctness of the operation follows from a corollary in Plane Geometry that "If a line, one end of which is known to rest on a circle, is perpendicularly bisected by a radius, the line is a cord of the circle." The errors in the positions of the bursts, occasioned by the practical application of this corollary are negligible, and correspond somewhat to those resulting from normal dispersion.

The class before any attempt is made to operate the miniature range is required to study and be familiar with every detail of mimeographed sheets or "training regulations." Following in fine print is shown the instructions contained therein, a copy of which is furnished each student. In drawing them up, a compromise was made between the bulkiness of a detailed description and a degree of brevity obtained by a mere inclusion of salient points. Experience showed that better results were obtained by the students having recourse to such a printed guide, the detail being taken up orally by the instructor.

MINIATURE RANGE OPERATION

POSITIONS AND GENERAL DUTIES

1. BATTERY COMMANDER.—General supervision. Reports to instructor when range is clear and battery ready to fire.
2. TELEPHONE OPERATOR NO. 3.—Operates telephone at observation post.
3. INSTRUMENT CORPORAL.—Sets up battery commander's telescope. Records commands and sensings for instructor.
4. EXECUTIVE.—In charge of that part of the detail stationed at the targets. Responsible for the proper indication of points of burst by using the range and deflection sticks, center-of-impact tags, and the burst spotter.
5. TELEPHONE OPERATOR NO. 2.—Operates telephone at post of the executive.
6. CAISSON CORPORAL NO. 1.—Records at post of executive all commands that come down over the telephone. Assists the executive whenever possible.

SPECIAL DUTIES OF MEMBERS OF THE DETAIL

1. BATTERY COMMANDER.—Gets information from the instructor as to the location of the range stake, the guns and observation post. Draws a pair of field glasses from the storeroom, and proceeds to the range. Supervises installation,

and when red flag is displayed at guns and white flag displayed at range stake, reports to instructor "Range is clear. Battery ready to fire, Sir."

2. TELEPHONE OPERATOR NO. 3.—Draws a telephone, an inspector's kit and the roll of wire from the storeroom; proceeds to the red flag or range stake established by the executive; gives loose end of the wire to telephone operator No. 2; proceeds to the observation post, unrolling the wire as he goes. Upon reaching the observation post, he takes the end of wire, instals telephone and reports "Communications established, Sir," to the battery commander when both 'phones are working and in perfect order.
3. INSTRUMENT CORPORAL.—Draws a battery commander's telescope, a red flag, and a notebook and pencil from the storeroom. Proceeds to the observation post and sets up the instrument for the use of the instructor and also for students in measuring deflections. As soon as the white range flag is displayed, will display the red flag at the guns. Takes his post near telephone operator No. 3 ready to record data. Gives the command, "About Face," as indicated below under item 7.
4. EXECUTIVE.—Gets the box of center-of-impact tags, the burst spotter, the range stick, the deflection stick, and the range flags (1 red and 1 white) from the storeroom. Proceeds to the range stake position, marking it with the red flag. Places the targets with the assistance of the caisson corporal. When communication is established, and all is in readiness at his post to indicate bursts, takes down the red range flag, replacing it with the white, to show the range is clear and it is safe to fire. Will in each case, when ready to indicate bursts, cause telephone operator No. 2 to transmit, "Rounds on the way," and start the indication of bursts about ten seconds thereafter.
5. TELEPHONE OPERATOR NO. 2.—Draws telephone and inspector's kit from the storeroom. Proceeds to the red flag at range stake, takes loose end of wire, connects his telephone to it, and gains communication with telephone operator No. 3 without delay.
6. CAISSON CORPORAL NO. 1.—Provides himself with note paper and pencil, and after assisting the executive prepare the range, takes post beside telephone operator No. 2 ready to record data.
7. ALL MEMBERS OF THE CLASS NOT ESPECIALLY DETAILED.—Draw field glasses from the storeroom, and proceed at once to the observation post, neither interfering nor helping the members of the Detail. In order that information as to where the next set of bursts will appear will not be divulged by the executive, the observers and the battery commander will, at the command of the instrument corporal, "About Face," when the battery commander gives the command for the range, and will remain faced about from the targets until telephone operator No. 3 announces "Rounds on the Way." At the command. "Close Station," each man performs the duties listed above in the reverse order, and returns the equipment to the proper place. At the command "Battery Attention," each member of the Range Detail takes his post as designated above. This command will be given between each two problems.

GENERAL INSTRUCTIONS TO THE DETAIL

The men stationed near the targets must remember at all times that a hand or a foot over or short of the target gives the student firing and the observers an idea of the range. *Always Keep Off the O—T. Line*.

The executive must be very careful to keep the range stick lined up so that one end points at the gun stake. He must also hold his burst spotter as nearly perpendicular as possible in order that the shank of the spotter may not get in line with a target and thus divulge the range of a burst wide of the target. Also the range and deflection sticks must be gotten out of the way before indicating bursts.

If you are facing the guns and standing at the target remember that rights and lefts are reversed. If the command is "Right 20," it means that the burst moves to the right 20 mils as *Seen from the Gun*.

The burst spotter should be left at the point of burst only long enough for the executive to count "one thousand one."

The members of the Range Detail, during a problem, must do no talking, except in connection with their work. The same applies to the observers at the observation post.

REMARKS AND CONCLUSIONS

It will be noted that the duties of the personnel operating the range are made as nearly as is reasonable like those performed by the individuals in regular service firing organization. Necessary departure and non-analogies must be explained to the class.

Rosters of duties performed by the class should be kept in order that a constant rotation in positions may be made to insure complete and balanced instruction to all. Each member of the Range Detail should receive a mark for his performance. A spirit of competition engendered among Range Detail teams has been found to improve the work done.

Better instruction will be given by requiring the battery commander and observers to habitually sit or kneel when observing indicated bursts. This will prevent distortion in the apparent height of bursts. The level of the eyes of the average man standing will cause his position to be analogous to that of an observer on a hill about 300 feet high, because of the scale of the range. In that case, bursts in the air beyond the target will appear higher than they actually are, while air bursts short of the target will appear lower. In fact, the latter will often appear as "belows," resulting in confusion to the beginner. An excellent opportunity is here afforded to show the class the distortion in apparent height of burst when occupying very high observation posts.

The telephone operator must be trained in correct telephonic language and strictly held thereto.

An attempt at giving dispersion was found to be of value disproportionate to the sluggishness thereby given the range operation in bracket adjustment. In fact, the inherent small errors of the range operation largely supplies the dispersion. A dispersion stick and hit bag may profitably be used when simulating percussion precision adjustment.

It will hardly be necessary to remark that the results obtained by the use of this miniature range are in direct proportion to the ability and resourcefulness of the instructor. He has at his disposal here, not only a range which because of its transient or migratory nature permits the application of continuous variation to be exploited in accordance with the progress of the class, but one which is both simple and practicable to run. The latter characteristics are largely the result of the coördination of duties, resulting in each member of the Detail and even the observers getting good instruction by participation. Its efficient operation depends much upon the executives' speed and accuracy, but in reference to these attainments, the instructor must be watchful to curb the tendency of many students to fritter away time in an attempt at undue nicety in measuring distances and intervals when acting in the capacity of executive.

LETTERS

BY MARTIN GALE

IT WAS the custom for the men of Battery A to gather in the Day Room after drill, to smoke a pre-lunch cigarette, to gossip over the events of the morning, and to receive the day's mail from the hands of the Battery Clerk. Corporal Tuerney always made a ceremony of giving out the mail. As he advanced into the center of the room holding a sheaf of letters, the clatter of voices would die away. When all was quiet he would hold up a letter and call "Jones." The lucky Jones would receive it from Tuerney gratefully, and the next would be handed out, and the next, until all were distributed when Tuerney would smile at the battery and return to the Orderly Room.

Bill Levige never received any mail. But he was always hopeful and always present at the distribution, and when the last letter had been given out he would ask, "Any for me, Pete?"

And always Corporal Tuerney returned the same reply, "None to-day, Bill. Mebbe you'll have better luck to-morrow."

Levige had begun life in a foundling asylum, passing in turn through the hands of a penurious farmer, a baker, and a pack-merchant, into the Army. To him it was a heaven, a place where a bed and meals were always forthcoming, where the work was pleasant, and men fair and square. He had never before experienced such ease. Yet he was lonely. He had not the gift of making friends. Even in the close association of the battery he was an outsider. His mates tolerated him, that was all. Had he had a home—home-folks to write to him he might have been satisfied. But there was no one to whom he could turn for sympathy. He longed for a home, he longed to receive letters like the other men.

Jim Peet and Rock Bevins were luckier. They received more mail than any other men in the battery. Peet had apparently a girl in every town that he had visited, Bevins twice a week received a fat letter from his Ma on the farm, retailing all of the home news. Whenever either of them received a letter, Levige gravitated toward that one. If Peet were feeling good, he would show his humble companion postal cards, pictures of gay beach scenes or gayer bathing beauties scrawled with "Wish you were here" or "O. U. Kid." Sometimes he would let Levige see the headings of his letters. The coldest began "Friend Jim," the warmest were torrid.

"Gee, Jim, how d'you get the girls that way?" Levige would ask, and Jim would reply, "You got a uniform on. Captivate 'em, kid, captivate 'em."

Or Rock Bevins would call him over to listen to snatches of home news about the white leghorn cock, the deacon's cider, or Lu Macey's store. "Hey, Levige come here," he would call. "I got some interesting news. Listen to this." And he'd read: "'Joe Wall come home with a box of candy for his wife. Folks say he must have touched some of the deacon's cider.' Ain't that so, now? An' this. 'They got a punch board down to Lu Macey's store now and your Pop never brings home nickels no more. He ain't won nothing yet.' Ain't that like Pop?" And so on until Levige felt that he knew the neighborhood as well as Bevins.

How he envied the two men their mail. Often he imagined what a joy it would be to casually take letters from Corporal Tuerney, to stick them nonchalantly in a pocket and stalk off. That would be joy enough.

Tremain leaving the battery by transfer to the Air Service was approached by Levige. "Going to leave us, hey, Tremain? Bet you wish you was back. This is a good outfit."

"Sure it's a good outfit. I wouldn't be leaving it if it wasn't that I'm getting a step up."

"Say, I'll tell you what I'll do." Levige came close to Tremain, almost blushing. "You write me a line now and then and I'll give you all the news of the battery."

"Me write letters? Not me. I never was much of a hand for letter-writing and I ain't going to begin now. When I want news I'll come and get it, see?" And Levige could get no more out of him. He went to Bullwinkle, who was being discharged.

"Say, Bull," he began when they were left alone, "How'd you like to get letters telling you all about the battery?"

"What do I care about the batter? I'm leaving it and I'm not looking for no news."

"Well, you got some friends you'd like to hear about, ain't you? Say, if you write to me, I'll keep you posted on all that goes on in the battery. Come on, will you, Bull?"

"Alright, I'll send you a line," promised Bullwinkle as the easiest way to rid himself of this encumbrance. But he never did write and after several weeks of waiting, Levige gave up hope.

Once he tried to do as Peet advised. On pay day, in his best uniform "slicked up to beat the band," he left alone for town. Later in the evening he was seen with a "swell, painted chicken" by Peet himself, who so described her. But in the morning he appeared crestfallen and unhappy. "Sure, I captivated her, I sure did," he explained. "But she beat it, left me flat. Took my roll and my watch. I'm through with women." He was as good as his word. Not again did he venture in their way.

Two days before Mothers' Day the Battery Commander

announced that it was the desire of the War Department (expressed in a circular) that all men should send letters home and that the afternoon fatigue was suspended to give everyone a chance to write. He added that those who did not take advantage of this opportunity would haul the week's supply of coal which spurred even the older Non-Coms to this unaccustomed effort. The Day Room was crowded that afternoon and there was a steady scratching of pens and pencils in place of the usual tumult of voices. Every table had been requisitioned for the task.

Jim Peet and Rock Bevins were both there busily engaged, and even Levige wrote assiduously. This was so remarkable that the battery took note of it.

"Say, fellers, look at Levige writing a letter," called Henry Briscoe. "Bet he's writing to that girl that threw him down."

"No he ain't," shouted another. "He's keeping off that coal detail, ain't you, Bill?"

"I know," insisted Briscoe. "He's making another date."

Levige blushed red and was about to reply, when Peet called over, "Don't you mind 'em, kid. They're trying to be funny. Go on with your writing, and when you finish come over here and I'll show you my letter. It's good."

Levige folded his missive and strolled over where Peet was still busily writing. "Listen to this," Peet chuckled. "I ain't got no home, so I'm writing to a swell dame I just met. Got a swell home and throws a swell feed, see? This is my first to her. She's some baby and I'm in strong. Listen to what I say." And he read. "'Friend Flora (that's because I don't know her well): I haven't nothing to do next Tuesday night and if you'll throw another feed at home I'll come out. Maybe afterwards we'll sit in the parlor and then O. U. Kid. Ever your Jimmy.' Wait 'till I get an answer to that. Some skirt and some eats I tell you. Now I got to write to my steady. I'll get a feed from her, too."

"Wish I was like you, Jim," commented Levige, and drifted where Bevins was pouring forth reams.

"I'm writing to my Ma," he offered as he looked up and saw Levige beside him. "I got to tell her about the horse show and me riding in the jumping. And the ball game. I wrote and told her I was to play first and I bet she's anxious to know how the game come out. I got lots to tell her."

"I wrote a letter, too, telling all that's going on in the battery and what we're doing, but I ain't got nowhere to send it."

"That's too bad. You ought to have someone."

"Wish I had a Ma like yours to write to," wistfully; but Bevins made no reply. Then—"Say, Rock, couldn't you let me write to

your Ma? Mebbe she might write and answer if you did, and it won't hurt none if you do. Go on, Rock."

Rock vetoed that. "My Ma ain't got no help and she's kept busy. She ain't got no time for any letters 'cept mine and I ain't going to have her bothered. You write to someone else."

Gradually Levige drew farther away from his associates. He was as friendly as ever, but he did not encourage those advances he had formerly desired. His few pleasures—the movies and ball games—he took alone, and spent most of his time in the battery Day Room where he became a reader of magazines, especially those with many advertisements. He could usually be found after work in a corner turning over pages that promised to make one a perfect physical specimen, or an accomplished draughtsman, or a polished conversationalist, with only a few lessons.

Suddenly he began to write. Half a dozen times he was seen to drop letters in the mail-box. But no amount of questioning would prevail upon him to give the addresses to which he wrote.

"Go on, tell us who you got on a string," urged Briscoe. "We won't steal your girl, Bill. Just let us know who you got."

"No, I ain't saying nothing at all. I don't ask you for no addresses, don't you ask me for none. Leave be, I say."

Tuerney arranged the climax. One day at mail distribution the first name he called was "Levige." Casually Levige strolled up and received three fat letters. Nonchalantly he stuck them in a pocket and retired to his favorite corner, while consternation reigned in the battery.

"Levige's got three girls," called the battery humorist. "Can't you make a date for me, Bill?"

And another added: "If Bill keeps on we'll have to raise the postman's pay."

To the corner after the mail was given out came Peet and Bevins. "So you're the guy that never got letters, hey?" asked Peet. "How do you get this way? Where'd all the letters come from? Are you turning mail shiek?"

Levige pulled the letters from his pocket and played with them in his hands. "No, Jim, it ain't that. You see I got kind of lonely seeing you and Rock and everyone getting mail, so I wrote to the ads in the magazines, and now I get lots of letters, too."

THE INTERNATIONAL LEGAL STATUS OF CHEMICAL WARFARE

BY CAPTAIN GEOFFREY MARSHALL, C.W.S.

(Reprint from the October 15, 1926, issue of *Chemical Warfare*.)

IN VIEW of the recent discussion in the press regarding both the practicability and desirability of the prohibition of the use of gas in warfare, this article is believed to be of interest. The conclusions are those of the author.—EDITOR.

THE history of international discussion of the propriety of the use of chemical agents in war begins with the Hague Convention of 1899. While the subject had been previously considered, there had been no exchange of international thought until this meeting was called.

Declaration II of the Hague Convention, 29 July, 1899, was as follows:

"The Contracting Powers agree to abstain from the use of projectiles, the sole object of which is the diffusion of asphyxiating or deleterious gases."

With the exception of the United States, this Declaration was signed by the representatives of all the great powers represented. The reasons for the refusal of the United States to sign are contained in the instructions from the State Department to the delegates and in their report on the Convention. The instructions from the State Department contain this paragraph:

"The second, third and fourth articles, relating to the non-employment of firearms, explosives, and other destructive agents, and the restricted use of certain contrivances employed in naval warfare, seem lacking in practicability, and the discussion of these propositions would probably prove provocative of divergence rather than unanimity of view. It is doubtful if wars are to be diminished by rendering them less destructive, for it is a plain lesson of history that the periods of peace have been longer protracted as the cost and destructiveness of wars have increased. The expediency of restraining the inventive genius of our people in the direction of devising means of defense is by no means clear, and considering the temptations to which men and nations may be exposed in a time of conflict, it is doubtful if an international agreement to this end would prove effective. The dissent of a single powerful nation might render it altogether nugatory. The delegates are, therefore, enjoined not to give the weight of their influence to the promotion of projects the realization of which is so uncertain."

Admiral Mahan's report on the action of the United States Delegates was as follows:

"These reasons were briefly: 1. That no shell emitting such

gases is as yet in practical use or has undergone adequate experiment; consequently, a vote now taken would be taken in ignorance of the facts as to whether the results would be of a decisive character or whether injury in excess of that necessary to attain the end of warfare, the immediate disabling of the enemy, would be inflicted. 2. That the reproach of cruelty and perfidy addressed against these supposed shells was equally formally uttered against firearms and torpedoes, both of which are now employed without scruple. Until we know the effects of asphyxiating shells, there was no saying whether they would be more or less merciful than missiles now permitted. 3. That it was illogical, and not demonstrably humane, to be tender about asphyxiating men with gas, when all are prepared to admit that it was allowable to blow the bottom out of an ironclad at midnight, throwing four or five hundred men into the sea, to be choked by water, with scarcely the remotest chance of escape. If, and when, a shell emitting asphyxiating gases alone has been successfully produced, then, and not before, men will be able to vote intelligently on the subject."

In addition to the Declaration above quoted, all of the States represented at the Hague signed or acceded to Convention II concerning the Laws and Customs of Land Warfare. By Article 23 of this Convention it was agreed not:

"(A) To employ poison or poisoned weapons;

"(B) To employ arms, projectiles or material calculated to cause unnecessary suffering."

When consideration is taken of the non-existence of more than theoretical knowledge of and the lack of experience in chemical warfare at the time of the agreement, it is a very open question as to whether or not these prohibitions had any application to the use of chemicals as we now employ them. In March, 1918, however, representatives of the United States, Great Britain, Belgium, Italy and France stated in reply to the Committee of the Red Cross that the use of poisonous and asphyxiating gases was a violation of the Convention. In the light of conditions existing at the time of this statement the decision should be considered natural and regarded merely as part of the Allies' propaganda against the Central Powers. It should also be remembered that at this time all of the nations engaged in hostilities were pushing their gas programs to the limit and that whatever the meaning of the Hague Conventions, the agreements had been abrogated by their violation and were no longer in effect.

It may be noted here, too, that Germany's original use of gas was technically not a violation of Declaration II in that she did not use "projectiles, the sole object of which was diffusion of asphyxiating or deleterious gases."

In the Hague Convention of 1907 no mention was made of the provisions of Declaration II, but the section of Laws and Customs of War on Land corresponding to Article 23 was identical.

In April, 1915, Germany initiated the use of gas in modern warfare and her example was followed as rapidly as possible by the other belligerents. At the end of the war its use was as extensive as that of any other weapon.

In the Treaty of Peace with Germany signed at Versailles, 28 June, 1919, appears the following provision:

"Article 171. The use of asphyxiating, poisonous or other gases and all analogous liquids, materials or devices being prohibited, their manufacture and importation are strictly forbidden in Germany . . ."

* * * * * * *

The statement, "The use of . . . being prohibited," does not, in the light of what has been said, appear to be based on fact. Beyond the vague provisions of the Hague Convention as to the use of asphyxiating shell, no treaty, declaration or agreement existing at the time contained a statement of a similar nature. The provision therefore must be taken merely as one to insure the disarmament of Germany, which view is borne out by the inclusion in the same article of prohibitions covering "armored cars, tanks and similar constructions suitable for use in war."

In 1921 the United States invited all nations to participate in a conference to discuss limitations of armament. This conference met in Washington in November, 1921, and in one of the Treaties resulting appears this article relative to the use of chemical agents:

ARTICLE V

"The use in war of asphyxiating, poisonous and other gases, and all analogous liquids, materials or devices, having been justly condemned by the general opinion of the civilized world and a prohibition of such use having been declared in treaties to which a majority of the civilized powers are parties,

"The signatory powers, to the end that this prohibition shall be universally accepted as a part of international law binding alike the conscience and practice of nations, declare their assent to such prohibition, agree to be bound thereby as between themselves and invite all other civilized nations to adhere thereto."

The statements in this Treaty also seem to have little foundation in fact. It was signed by the representatives of the United States, British Empire, France, Italy and Japan and has been ratified by all of the Powers mentioned with the exception of France, who has indicated strongly that she does not intend to. As it was not to be effective until ratified by all of the signatory Powers and was not

to be binding in case of war with a non-contracting Power, it is obvious that no agreement or Treaty was effected.

At the Fifth International Conference of American States held in Santiago, Chile, in 1923 a *Resolution* containing the following provision was adopted:

Paragraph C, of Fifth Agreement:

"To recommend that the Governments reiterate the prohibition of the use of asphyxiating or poisonous gases, and all analogous liquids or devices, such as are indicated in the Treaty of Washington, February 6, 1922."

This resolution was adopted by the United States, Venezuela, Uruguay, Equador, Chile, Guatemala, Nicaragua, Costa Rica, Brazil, Salvador, Colombia, Cuba, Paraguay, Dominican Republic, Honduras, Argentine, Haiti.

At a Conference on Central American affairs held in Washington, a Convention dated February 7, 1923, was entered into by Guatemala, El Salvador, Honduran Nicaragua and Costa Rica, in which was the following article:

"The Contracting Parties consider that the use in warfare of asphyxiating gases, poisons or similar substances, as well as analogous liquids, materials or devices, is contrary to humanitarian principles, and to international law, and obligate themselves by the present convention not to use said substances in time of war."

At the Geneva Conference of May-June, 1925, called for the purpose of regulating the control of international trade of arms and munitions in time of war, the United States delegation brought up the question of chemical warfare. After general discussion this protocol was adopted by the Conference:

"Whereas the use in war of asphyxiating, poisonous or other gases and of all analogous liquids, materials or devices, has been justly condemned by the general opinion of the civilized world; and

"Whereas the prohibition of such use has been declared in Treaties in which the majority of Powers of the World are parties; and

"To the end that this prohibition shall be universally accepted as a part of international law, binding alike the conscience and practice of nations;

"Declare:

"That the High Contracting Parties, so far as they are not already parties to Treaties prohibiting such use, accept this prohibition, agree to extend this prohibition to the use of bacteriological methods of warfare and agree to be bound as between themselves according to the terms of this declaration.

"The High Contracting Parties will exert every effort to induce other States to adhere to the present Protocol . . ."

This protocol was to be binding upon signatory Powers from the date of ratification. Fifteen of the nations represented, including France, Belgium, Austria and Hungary did not sign. It has never been ratified by the United States.

The discussions of the question at Geneva brought out very clearly that

1. Foreign nations are definitely settled in their chemical warfare policies and were interested in the subject only through courtesy to the United States;

2. That no agreement or regulations governing the use of chemical agents in war could be adopted unless accepted by all nations (this with particular reference to Russia);

3. That the prohibition of the use of chemical warfare has no standing in international law.

The foregoing is a bare statement of the various agreements among nations relating to chemical warfare. Consideration of these shows that

1. The prohibitions of the Hague Conventions of 1899 and 1907 do not cover chemical warfare as now understood except in one very limited and restricted sense; that under necessity, this point, *i.e.,* the filling of chemical shells with asphyxiating gas, was generally violated during the World War; that, granting that the Hague agreements did apply to chemical warfare in its present sense, they ceased to be of effect by their general violation of all nations;

2. That the net result of all the discussions on chemical warfare since the war in a number of high-sounding but meaningless proposals and two treaties, one of which was forced on Germany and the other binding upon five small Central American Powers who are precluded from the use of chemical agents in war by the lack of a chemical industry. As for Germany, she may well plead coercion.

3. That the Union of Soviet Socialists Republics of Russia, whose chemical armament is one of the most powerful and is being steadily developed, is not a party to any of the Conventions.

Obviously then it cannot be said that a prohibition of chemical warfare is generally accepted, and the possibility of such acceptance seems very remote. In the first place, for any agreement to be of value, the acceptance must be universal. The history of international conference on this subject shows what little possibility there is of this. Russia has not participated in the discussion, and other nations have shown definitely their attitude by failure to take advantage of opportunities to ratify suggested treaties or agreements.

Even should any agreement of prohibition be reached and universally accepted, we have not yet reached that stage of international good faith which would permit a nation to rely for its safety on treaty provisions. Chemical preparations for war are by their very

nature such that they can be carried on secretly, and reliance on treaty provisions alone would be most unwise.

That the Powers do not intend to rely on such provisions, is clearly shown by the remarks of their representatives and their continued activities in chemical warfare. All of the great Powers have chemical warfare establishments, and are conducting extensive research and study into the use of chemical agents and weapons. Some, like the United States, have separate branches of the army for this purpose, and others are organizing such branches. All include chemical warfare in the training of their armies.

Granting peace-time good faith and intent, it is very doubtful that any nation in the face of defeat and offered chance of victory by following Germany's example would refrain from so doing. No man or group of men at the head of a country in such a situation would have the courage or even the right to permit the wreck of his nation and consequent suffering of its citizens because of an agreement entered into many years before and possibly under greatly different circumstances. War, with its vital importance of results, creates a national mentality radically different from that of peace. In war, the fight is for existence and necessitates maximum effectiveness of effort. This means that, once proven effective, no weapon, means or method, will be laid aside until a more effective substitute is produced.

There is, too, the very large probability that misunderstanding will arise so soon as hostilities have commenced and cause one belligerent to sincerely believe that its opponent is using chemicals. Deaths due to shock and carbon monoxide generated by high explosives in battle have been by no means infrequent and might easily lead to a conclusion that gas was being used.

The continued arguments against chemical warfare are based on a failure to recognize the main issue, which is, that all war is crime and that any regulation competent to regulate the manner of committing crime should be able to prohibit crime itself. To attempt to prescribe the methods by which wars shall be prosecuted, seems as futile as would be an attempt to control methods of committing murder. The only way to abolish a particular method of warfare is to prohibit warfare itself, and in our present stage of civilization this appears to be possible only by an agreement among nations to stop an incipient war by force—in other words, by war!

Throughout history new weapons and methods of warfare have been subjected to the same criticisms now being used against chemicals. None, however, have been discarded until better substitutes have been developed, and it would appear that chemicals will be no exception.

REGIMENTAL NOTES

ELEVENTH FIELD ARTILLERY — SCHOFIELD BARRACKS, HAWAII

Colonel Manus McCloskey, *Commanding*

Roster of Officers

Lieutenant-Colonel James P. Barney
Major Harold E. Miner
Major John E. Lewis
Major H. Crampton Jones

CAPTAINS

Wm. D. Alexander
Stacy Knopf
Sidney F. Dunn
Steele Wotkyns
Wm. A. Campbell
Howard F. Long
Waldo E. Ard
Malcom R. Cox
John A. Chase
Peyton Winlock
Frank G. Rogers

FIRST LIEUTENANTS

Edwin S. Brewster, Jr.
Roy L. Dalferes
Emil F. Kolmer
Wm. L. Kay, Jr.
Clyde M. Hallam
Charles A. Pyle
Leslie E. Jacoby
Charles H. Swartz
Selby F. Little
Henry L. Ingham
Fay W. Lee
Russell G. Duff

SECOND LIEUTENANTS

Walter J. Klepinger
Thomas E. Meyer
Sheffield Edwards
Paul R. Covey
George W. Hartnell
James V. Collier
Leonard J. Greely
Lester J. Tacy
Ernest O. Lee
Raymond H. Coombs
Wellington A. Samouce
Francis M. Day
Charles L. Dasher
L. C. Friedersdorff
Robert C. Cameron
James Barry Kraft
Howard J. John
Harold M. Manderbach
George L. Holsinger
Robert P. Clay

CHAPLAIN

J. Burt Webster

IT HAS been said that Hawaii is probably the only place in the world where an army is likely to fight on its own drill ground. The Island of Oahu is a rather large drill ground, slightly less than half the area of the State of Rhode Island, but the 11th Field Artillery has taken this proposition literally, made the whole island its drill ground, and is prepared to realize fully the advantage which would come in war from full and detailed familiarity with the entire area.

Basic training in garrison has been carried to a high point, but particular emphasis has been placed on training as a field regiment and frequent marches and field exercises give practical application to theoretical and basic subjects. Tactical exercises including actual occupation of position, establishment of communications and preparation of data have been held at least once during the past year in every locality important in the defense plan of the island. In addition, the entire regiment with all matériel has marched completely around the island and numerous combined recreation and reconnaissance trips have been made by several batteries to remote and seldom-visited points. As a result, the enlisted men as well as the officers

are unusually familiar with the geography and topographical features of Oahu.

Much attention has been given to mobility and to tactical exercises. Frequent road marches and movement over difficult terrain have resulted in skilled drivers and excellent mechanical condition in all types of vehicles. Contributing to mechanical efficiency has been the provisional detail of a regimental motor officer who functions as a semi-independent branch of the regimental supply office in drawing and issuing spare parts, gasoline and lubricants.

The system has simplified and facilitated the obtaining of spare parts by the batteries, and creating a central distributing reservoir where parts are always quickly available has eliminated the hoarding of parts by the batteries. As a result, the average time vehicles are in the shop has been cut to a small fraction of that formerly required and the extensive "dead lines" of vehicles for which parts could not be obtained have disappeared.

Every effort has been made to eliminate delay and "red tape." The motor officer or his noncommissioned assistant visits each battery motor shop at least twice a day. Inquiry is made concerning parts and supplies needed and if they are on hand in the regiment they are issued without requisition, usually within half an hour. Parts which have to be drawn from post supply agencies are generally issued within twenty-four hours. Issues are made in duplicating books on the signature of battery motor sergeants. As far as regulations permit, unserviceable motor parts are disposed of by the motor officer without paper work on the part of the batteries. Issue slips are periodically consolidated on debit sheets and sent to the batteries for signature.

The regimental motor officer also handles the dispatch of all vehicles, acts as liaison officer with the post Ordnance and Motor Transport shops and the Brigade Motor School and keeps and loans special tools which are needed only occasionally by the batteries. Upon request he acts as technical advisor in difficult problems of motor repair.

Most of the battery commanders were at first skeptical about the working of the system, fearing that it would be an interference with their prerogatives and would merely add one more to the many administrative agencies with which they have to deal. More than a year of smooth and successful operation has sold the idea to them and the feeling is general that provision should be made for such an agency in tables of organization.

Considerable credit for the increased mobility is also due to the graduates turned out by the Brigade Motor School and to the coöperation of the school with the batteries in their more difficult motor troubles. The 11th regards this school as particularly its own and

is exceedingly proud of its success and its fine reputation throughout the Hawaiian Department. Most of the key personnel of the school staff, both commissioned and enlisted, has been furnished by the 11th ever since the school was organized.

One of the notable and important results of the emphasis placed on mobility has been the development of real interest in motor transportation on the part of the officers of the regiment. The Field Artillery has always been proud of its horsemanship and horsemastership, but motors are so new that there has been a tendency to regard them as a little unworthy of the personal attention of an officer and a gentleman, and they have seldom been given the close and detailed supervision that we have been proud to give to our horses and stables. A very noticeable change in this sentiment is becoming increasingly apparent. Realization of the importance of motor transportation has become general and the regiment is showing an interest in its transportation which approaches enthusiasm. Increased attention and intelligent supervision has naturally resulted in more efficient transportation and less motor trouble. This improvement has been in the direction of higher average mechanical efficiency in all vehicles, rather than the development of a few varnished and highly burnished transportation show pets, while the rest of the transportation languished unlubricated and uncared-for. Stalled motors on the road have become the exception rather than the normal expectation.

Of interest in connection with mobility is a test made by the second battalion over a period of several months last spring to determine the suitability of the three-ton F. W. D. truck for towing 155-mm. howitzers, and to find out whether increased road speed would result in damage to the guns, which are equipped with solid rubber tires. The truck proved adequate over improved and unimproved roads and on the steep and long hills so prevalent in the mountainous country of Oahu, and was reasonably successful in placing the guns in position over difficult ground. Besides towing the 5-ton howitzer, the trucks carried 2000 to 3000 pounds of ballast, representing ammunition, and eight to ten cannoneers per section. Road speeds as high as eighteen miles per hour were attained on hard surfaced roads with no damage to the guns, and it was demonstrated that the trucks could be depended upon to transport the guns two and a half to three times as fast as tractors under average conditions on the island.

The conclusion of the test was a march of the entire battalion sixty-four miles, from Schofield Barracks to Waimanalo, in one day around the windward side of the island. The trip was made in nine hours which included a forty-five-minute halt for dinner. About half of the road was very rough and narrow and speed was

held down to avoid dangerous interference with civilian traffic and damage to trucks and guns from excessive vibration. The next day the battalion returned to Schofield *via* the world-famous Pali road, then down the steep grade of Nuuanu Street, slippery from a driving rain, through city traffic in Honolulu, and to the Post over the hills and through the gulches of the Honolulu-Haleiwa road. A few days later the battalion marched back to Waimanalo by the same route, going down the Pali, the trucks holding the heavy guns with ease.

The Pali road, a shelf cut out of the face of a cliff, with numerous sharp turns and switchbacks, rises 800 feet in 2200 yards and is generally considered a second and first gear hill for passenger cars. So far as known the Pali had never been previously attempted by Artillery with the exception of Portée 75-mm. batteries.

The ascent of the Pali has always been considered impossible for tractor-drawn batteries, as it was supposed that the smooth tracks would slide on the slick tarviated road bed, which is always wet from springs and almost continuous rains which drive in from the Pacific, so that it would be impossible to get sufficient traction to overcome the stiff grade. During the summer rest at Camp Waimanalo, Battery F was given permission to try the ascent. The result was so successful that the Brigade Commander decided to return the entire Brigade to Schofield Barracks *via* the Pali and Honolulu.

In order to avoid interference with civilian traffic, the climb was made at night. The regiment moved to the top without mishap and continued to Schofield Barracks in a single march of forty-five miles. The light regiments later moved over the same route. The feat was considered so noteworthy that it was made the subject of a special report to the Chief of Field Artillery.

The regiment has continued to improve its physical surroundings by its own efforts. The project of tearing down the gun sheds in the old Cavalry Post at Leilehua and re-erecting them near the Barracks was completed successfully. Not only was all the work of razing and reconstruction done by the regiment, but all the utilities, water, electric wiring and drainage system were installed by 11th Field Artillery personnel. Work of surfacing the shed floors with crushed rock and tar road metal, salvaged by the courtesy of the county highway engineer from stretches of the county roads, abandoned in connection with the elimination of grades and curves, is nearly finished and will complete the project. This work has been excellent training for truck drivers, as the movements are handled as military convoys under assumed tactical conditions.

The old wooden barracks at Leilehua, formerly occupied by the Service Battery, were moved intact a mile and a half to the regimental area. A portion was divided into single rooms to provide

suitable quarters for unmarried noncommissioned officers of the first three grades and the remainder are used as recruit barracks and mess. In spite of the fact that the three artillery regiments are crowded into permanent barracks built for two regiments, the 11th has by its own efforts, completely solved the housing and storage problems.

The high state of morale of the regiment and its esprit de corps is shown by the high percentage of officers who have applied for an extension of their tours of foreign service, and of enlisted men, particularly noncommissioned officers, who have either extended their tours of foreign service or reënlisted in the regiment. The old idea of "Making the first possible boat" is nearly a thing of the past. Until comparatively recently the rapid turnover of noncommissioned officers was regarded as a serious problem which might ultimately affect the policy of keeping regiments on foreign stations permanently. To-day it is believed that few regiments on the mainland have a higher degree of permanence among personnel of all ranks.

TWELFTH FIELD ARTILLERY — FORT SAM HOUSTON, TEXAS

Colonel Philip S. Golderman, *Commanding*

Roster of Officers

Lieutenant-Colonel Carl H. Müller
Major Frank K. Ross
Major John A. Hoag

CAPTAINS

Joseph Kennedy
Wendall L. Bevan
Percy G. Black
Robert V. K. Harris
William H. Quarterman, Jr.
Lewis F. Kosch
Philip T. Quinn
Donald B. Rogers
Charles A. Beaucond

FIRST LIEUTENANTS

Lowell M. Riley
James V. Carroll
Burdette M. Fitch
Charles B. Leinbach
Henry L. Kersh
John J. Burns
Francis H. Morse
William H. Bartlett
John G. Howard
Russell O. Smith

SECOND LIEUTENANTS

Walter H. DeLange
James H. Leusley
Eugene B. Ely
William J. Eyerly
John G. Moore
John P. Maher
Joseph Massaro
Peter Sather, Jr.
Wiley T. Moore
Charles P. Cabell
Russell T. Finn
Alexander R. Sewall
Tyler Calhoun, Jr.
William E. Dean, Jr.
Thomas E. DeShazo
Gabe E. Parker

MEDICAL DEPARTMENT

Major Bonaparte P. Norvell, M.C.
Captain Allen C. Wight, V.C.

ATTACHED—SECOND LIEUTENANTS

Mason H. Lucas
Benjamin P. Heiser
Charles O. Wiselogel

A glance at the above list will inform all who have formerly served with the Regiment or are interested in it of the many changes that have occurred since notes were last published in the JOURNAL. Few remain who were listed at that time and by date of publication

of this several others will have left the Regiment. Colonel Oliver L. Spaulding, commanding in January, 1926, left shortly after to take the Refresher Course at the Field Artillery School, on completion of which he was present only until August 8, 1926, when he departed on leave and for reassignment to the Hawaiian Department. During his absence at Fort Sill, Major William R. Henry was in command, and just prior to Colonel Spaulding's permanent departure the Regiment was fortunate in having Colonel Philip S. Golderman report as his relief. Since August, the 12th Field Artillery has functioned under his able leadership.

It has been our lot to have many officers of senior and junior grades with us only long enough to recognize their worth and value before reading their "P.P.C's" on the Bulletin Board. Among the losses of 1926 and to date in 1927 are the following in addition to Colonel Spaulding, already mentioned: Majors W. R. Henry, F. A. Doniat, O. E. Beezely; Captains Albion Smith, J. A. Wallace, George R. Hayman, S. Richardson, A. M. Post, C. A. Haberer (M.C.); First Lieutenants L. B. Bixby, G. D. Adamson, Karl Hisgen; Second Lieutenants John J. Binns, Thomas E. Lewis, Dan Chandler, Joseph Burrill, L. C. Friedersdorff, R. C. Cameron, N. Cureton, W. J. Cleary, K. N. Decker, T. E. Binford, E. C. Cushing (resigned), M. Craig, Jr., G. D. Crosby, W. L. Ritchie, and John F. Bird. The following are now under orders and will leave us in the near future: Major F. K. Ross, commanding the 1st Battalion, Captain Philip T. Quinn; First Lieutenants L. M. Riley, James V. Carroll; Second Lieutenants E. B. Ely, W. T. Moore, J. Massaro, A. R. Sewall, and W. E. Dean. In addition to the above, our replacement depot, the Primary Air School, Brooks Field, has given us from time to time a number of attached officers temporarily who have left our midst for permanent assignments, to our regret.

Notwithstanding the lengthy paragraph above, we feel that the past year has been successful and profitable both in development and in training, giving us a feeling of some confidence as we now face our annual Corps Inspection on February 14th, Technical Firing Season and Maneuver Period of March and April with the Division period following in May. Much credit for our present status must be given the noncommissioned personnel of whom we have about twelve who served with the Regiment in the American Expeditionary Forces. Their experience and morale go far in training the new recruits that are now being assimilated from an increment received early in December. Although the enlisted strength fluctuates almost as much as the commissioned, the 12th is always able to deliver the goods satisfactorily, whether for Division Reviews, hikes, maneuvers, garrison duties, or for more technical training.

The past year was a busy one with six weeks at Camp Stanley for technical firing and tactical training from Battery through Brigade in March and April, followed by a return to Fort Sam Houston for annual Garrison Inspection. Again in May, Camp Stanley was visited for a three-day Corps Tactical Inspection and maneuver, followed immediately by a two weeks' Division march to Kerrville, and return. The march was started under ominous conditions with muddy roads, hail, thunder storms and countless ticks at the first camp site near Boerne. However, things brightened up considerably thereafter, although not entirely unalloyed due to constant airplane menace (tactical situations being assumed on the march, culminating in a two-sided maneuver at Bandera Pass), and an unfortunate situation that sometimes gave the Artillery a camp site a mile from water while the infantry disported themselves along the banks of the stream. Much benefit was derived from the march, however, and it was successful from our viewpoint.

Summer passed quietly and in August we had the pleasure of active duty training with the Reserve Officers of the 438th Field Artillery. These officers seemed to enjoy their stay with us and were especially appreciative of Colonel Golderman's coöperation and the training afforded them in Service Practice by Captain J. Kennedy with Battery F, who journeyed to Camp Stanley for that purpose.

The Regiment entered upon a new line of endeavor in September and October, actively participating in the filming of movies. Practically a month was devoted to our new line at Camp Stanley by the entire Regiment while Battery C, Captain Percy Black commanding, was busy much longer and served everything from minenwerfers to Naval Guns, from dugouts to balloons, as French, German, and American artillerists.

In athletics, while no championships were acquired, all will agree that a most successful year was had. A strong baseball team with our old standby, Sergeant James K. Brought, as star moundsman, and Lieutenant Ritchie as coach, provided us interesting games. The football team, Lieutenant E. B. Ely, coach and officer player, assisted by Lieutenant DeShazo and Sergeant Kristolitis, "the terrible Swede," as full back, was a hard fighting, creditable aggregation, and we beat the 15th Field Artillery (nuff sed). The 1st Battalion staged a successful Horse show and the Polo squad, consisting of Lieutenant-Colonel Carl H. Müller, Captains Black, Bevan and Beaucond, Lieutenants Bartlett, Fitch (team captain), and Moore, J.G., bids fair to make other teams hustle in the Midwinter Polo Tournament commencing in February. The Basketball team now functioning is fighting hard with Lieutenants Morse and Sather coaching.

Among other items of interest might be mentioned the Band,

which, under Warrant Officer Roach, recently joined, is improving greatly; Battery A, Lieutenant Fitch commanding, has just been selected as the representative of the 2nd Field Artillery Brigade to compete in the Post for the American Remount Association Trophy; Battery B, at that time commanded by Captain Robert V. K. Harris, was the competitor for the Knox Trophy from Fort Sam Houston in 1926.

The Regiment is participating socially in the many affairs incident to a large Post and has had several gatherings of its own as well, which have served to draw the personnel closer together off duty as well as on.

THIRTEENTH FIELD ARTILLERY — SCHOFIELD BARRACKS, HAWAII

Colonel Oliver L. Spaulding, Jr., *Commanding*

Roster of Officers

Lieutenant-Colonel William H. Burt
Major Edward C. Hanford
Major Charles D. Daly

CAPTAINS

Richard M. Wightman
David S. Doggett
Nathan E. McCluer
Charles R. Doran
Joseph S. Robinson
William McB. Garrison
Everett Busch
Audley M. Post
Elmer R. Block
Leon E. Savage
Irvin B. Warner

FIRST LIEUTENANTS

Clarence D. Lavell
Eric A. Erickson
Lawrence H. Caruthers
Phil Cass
Charles F. Fletter
Frank A. Henning, Jr.
Allan E. Smith
Creswell G. Blakeney
William E. Waters
Willam L. Carr

SECOND LIEUTENANTS

Clayton H. Studebaker
George E. Burritt
David J. Crawford
Robert L. Taylor
John B. Horton
William R. Grove, Jr.
Charles C. Blakeney
James L. McKinnon
Clint L. Taylor
Raymond T. Beurket
Thomas E. Binford
Vonna F. Burger
Joseph R. Burrill
William J. Cleary
William H. Bertsch, Jr.
Charles L. Booth
Winfield W. Scott
Andral Bratton
James A. Channon
Hubert M. Cole
George R. Helmick

This regiment has just completed one of the most successful and pleasant years of its existence. The flourishing regimental spirit among both officers and men measures the high standard of efficiency the regiment now enjoys.

A sweeping change in the roster of officers was made in the spring of 1926. Colonel Andrew Moses, ordered to duty with the Organized Reserve Corps at Buffalo, N. Y., left us in August. The regiment was then commanded by Major Edward C. Hanford, until October, when Colonel Oliver L. Spaulding arrived.

On May 16th, by reason of a shortage in the Schofield Barracks water supply, the entire Hawaiian Division left its garrison quarters

and encamped on the sandy beaches of Oahu. The 11th Field Artillery Brigade established an ideal camp at Waimanalo, on the east side of the island. Here we were a stone's throw from the beautiful, refreshing water of the Pacific. Everyone enjoyed the bathing and classes were formed for non-swimmers, with excellent results.

The march back to Schofield Barracks was accomplished at night, over the Pali, a precipitous mountain. It was, perhaps, the most difficult march ever made by a motorized regiment of field artillery. The 13th came through with that undying spirit which has kept this regiment "on top" always. In the pitch black of the Pali road, up what seemed to be an endless route of steep grades and sharp turns, the 13th "carried on," led on in spirit by the men of the regiment who, in France, made that famous night march of September 26–27, 1918, from Esnes to Malancourt, which is commemorated by the dragon crest on the arms of our regiment.

We arrived back at Schofield and began an interesting and instructive firing season. The football team, champions of this division for three years, began practicing for what proved to be their fourth consecutive championship season. Second Lieutenant David J. Crawford, assisted by Second Lieutenant James L. McKinnon and First Lieutenant Eric A. Erickson, soon whipped the squad into shape to meet the strong elevens of this division. Some games were undecided until the last few minutes of play, notably the one against the 27th Infantry, but the team spurred on by the organized cheering from the men of the regiment in the stands, put forth a super-human effort and won the game. Seven members of the 13th team were picked for the All-Army team to play the Navy in Honolulu.

The attention of the regiment turned to the Knox Trophy competition. Battery B, then commanded by Captain Albert C. Gale, was again selected for the honor of representing the 13th. While not successful the battery made a most creditable showing.

Captain Wesley J. White, who left in September to attend the Field Artillery School, was a member of the Hawaiian Department polo team which won the first Inter-Island Tournament ever won by an army team. Second Lieutenant James L. McKinnon received a medal for the eighth place in the Department pistol competition. Competing against every infantry, field artillery and coast artillery regiment in the Department, our machine-gun squad placed second, first honors going to the coast artillery. The regimental band gave complimentary and requested concerts to Major-Generals Lewis and Smith, receiving high commendation for the quality of their concert work.

It may be well to state here the spirit of coöperation which exists between this regiment and the 22nd Infantry Brigade, commanded by Brigadier-General Stuart Heintzelman. The teamwork so necessary between infantry and its supporting artillery for success in battle exists because of the coöperation we have received and experience gained from practice problems with the 22nd Brigade.

The 13th Field Artillery has started on a new year, under its new commander. The same success which has been enjoyed by the regiment, both in military efficiency and on the athletic field, will continue; the 13th will carry on *"Without Fear, Favor or the Hope of Reward."*

FOURTEENTH FIELD ARTILLERY — FORT SHERIDAN, ILLINOIS

Major Francis A. Doniat, *Commanding*

Roster of Officers

CAPTAINS

Orville M. Moore
George J. Downing
George R. Middleton
Arthur B. Wade
Peter P. Rodes

FIRST LIEUTENANTS

Richard H. Slider
Herbert E. Baker
James E. Bush
Auguste R. Taylor
William S. Wood

SECOND LIEUTENANTS

Willard F. Millice
Richard S. Marr
Herbert W. Ehrgott
James R. Wheaton
Robert C. Ross
Keneth P. McNaughton

This battalion, less Battery C, is stationed at Fort Sheridan, Illinois; Battery C, commanded by Captain Middleton, is stationed at Jefferson Barracks, Missouri.

In the past year Major Casey Hayes was relieved from the battalion and detailed on the General Staff.

Fort Sheridan and Jefferson Barracks are very pleasant stations to live at but neither one is particularly well adapted to field artillery training. They are located in thickly populated country, in which the surrounding roads are generally of concrete and are much congested by automobile traffic. The posts themselves are small, have very few small drill grounds, and, especially Fort Sheridan, have no terrain available for holding any logical tactical problems.

The Fort Sheridan portion of the battalion takes the field for nearly four months each year, during which time it marches to Camp Sparta, Wisconsin, and return (total distance 500 miles).

Last summer the first five weeks at Camp Sparta were devoted to technical firing and tactical work at the end of which the Corp Area Tactical Inspection took place. Then followed a period of six weeks' work with the civilian components, a Citizens' Military Training Camp for field artillery and basics, an Officers' Reserve Corps Camp in which the reserve officers of seven field artillery regiments were trained, and a Reserve Officers' Training Camp.

Camp Sparta is a little shy on living facilities and absolutely devoid of any natural facilities for amusement. The ground is so sandy that nowhere can a baseball diamond that is worthy of the name be laid out; however, attempts are made to play baseball and other games in this sand, and though the play is unsatisfactory from a technical standpoint, it does afford exercise and pleasure.

During the summer two gymkhanas were held in which every man of the battalion participated; they provided much fun.

The range at Camp Sparta is a very good one and the terrain is very good for tactical work, although draft in the loose deep sand is quite difficult; the latter feature, however, gives men and horses good practice in draft. The summer climate at Sparta is very pleasant.

As may be inferred from the foregoing, the summer season of this battalion is a very full one, and in spite of the absence of any adequate living arrangements, the last summer was a most enjoyable one for officers and men, and all are looking forward again to striking.

"The old trail, the out trail,
The trail that's always new."

FIFTEENTH FIELD ARTILLERY — FORT SAM HOUSTON, TEXAS

Colonel Harry G. Bishop, *Commanding*

Roster of Officers

Lieutenant-Colonel Robert Davis
Major Nathan Horowitz
Major Alexander C. Sullivan
Major Harold C. Vanderveer

CAPTAINS

Arthur S. Harrington
Samuel D. Bedinger
James B. Golden
Edwin A. Henn
John G. White
George E. Cook
Warren H. McNaught
Edmond H. Brown
Michael C. Shea

FIRST LIEUTENANTS

Charles H. Brammell
John Hinton
Robert I. Allen, Jr.
Albert Brill
Seward L. Mains, Jr.
Boyce M. James
Eugene McGinley
Tyree R. Horn
Millard Pierson

SECOND LIEUTENANTS

Charles D. Daniel
Walton G. Proctor
Thomas G. McCulloch
Daniel F. Healy, Jr.
Frank S. Kirkpatrick
William L. Coughlin
George E. Wrockloff, Jr.
Thomas A. Jennings
Frank F. Carpenter, Jr.
Thomas A. Doxey, Jr.
Thomas E. Smith
Raymond C. Conder
John W. Black
John M. Willems
Joseph K. Gibson
Sidney M. Wheeler
John C. Strickler

MEDICAL DEPARTMENT

Captain Ralph E. Henry, M.C.
Captain Roy A. Stout, D. C.
Captain Will C. Griffin, V.C.

The 15th Light Artillery, belonging to the Second United States Division, has had a good year—plenty of training and plenty of

variety: training from cannon-shooting to division marches, variety from baseball championships to weeks in the movies. And through it all, there has been the constant battle with the wartime cantonment barracks, stables and buildings. The interesting thing is that so far as the caring for men and animals is concerned, the regiment is at least holding its own in the contest. The work done in keeping the old stables and barracks in repair has been quite remarkable—especially in the amount of physical labor performed by the soldiers at odd times. Lumber from abandoned buildings in old Camp Travis has been used, and gallons of old wartime paint mixed with crank case oil has been laid on salvaged boards to make them look better and to preserve them from the elements. Married officers living in the Argonne Heights are forced to repair their quarters constantly, and you'd be surprised to see how attractive many of them are. The bachelors are not so particular; and as a result calling at night in the bachelor area may be dangerous from unsteady planks, steps, platforms and porches. One bachelor was sorry that he had no children; the splendid undulations of his long back porch would have made such a speedy roller coaster for any child of about six years.

There is another side to the shield. The regiment has had the rather unusual opportunity of taking part in the making of two very elaborate films—"Wings" and "Rough Riders." The entire month of October was spent at Camp Stanley where the regiment worked with the Famous Players—Lasky Corporation—and represented both American and German field artillery, and in addition American infantry of the late war and infantry of 1898 for "Rough Riders." Thousands of dollars were spent by the movie people in turning the Camp Stanley area near Malone Hill into a trench system with a French village and all the paraphernalia of war. Some one has said that they took enough war scenes for twenty movies. Anyhow, the men got the fun of dressing up in German uniforms and helmets, and some of the regiment's officers posed as members of German Staffs and the like. So instead of the 15th having to go to Hollywood to complete its education, Hollywood came to it.

The first interruption of normal garrison training which occurred last year was the annual target practice at Camp Stanley, Texas, in March. This period was immediately followed by combined tactical problems with the Third Brigade. In May the regiment accompanied the remainder of the Second Division on a march into the hill country of Kerrville, Texas. The march was preceded by a three-day tactical problem, and these comprised the tactical inspection of the corps area commander.

The Summer Training Camps required the services of the First Battalion during June and July. Battery C, under Captain G. E. Cook, operated with the Citizens' Military Training Camps, and the remainder of the battalion served with the Reserve Officers' Training Camps.

Lieutenant Brammell's baseball team again won the Second Division championship. Incidentally the regiment was very proud of having taken first place for its float at the Battle of Flowers—the Fiesta of 1926.

Socially this regiment is very active. It has an excellent officers' club—in good repair—which is attractively furnished and which has a good dancing floor. There is in vogue a scheme of Wednesday Night parties at the officers' club, and they are highly successful. As a matter of fact, San Antonio and the social life of the regiment offer a good deal to the members of the 15th. In addition to the 15th's own club there is a dance every other week at the Argonne Heights; and then within a short distance is the San Antonio Country Club. So Fort Sam Houston has many of the advantages of a small army post and of a fair sized city. It is true that you cannot go to a different play every night in San Antonio, but you can go quite often. San Antonio is admitted to have a splendid winter climate; and, if the promised permanent quarters for the 15th ever materialize, morale should be even higher than it is now.

Major Louis R. Dougherty, who commanded the second battalion for over two years, left the regiment in September to attend the Field Artillery School at Fort Sill, Oklahoma. The second battalion is now commanded by Major H. C. Vanderveer, and the first by Major A. C. Sullivan who has been in command of it for nearly two years.

Colonel H. G. Bishop, the regimental commander, is at present on detached service at the Field Artillery School taking the refresher course. Major N. Horowitz is in command of the regiment while Lieutenant-Colonel Robert Davis is absent on leave.

First Sergeants Epps and John Edwards and Staff Sergeant Samuel Blanton have been placed on the retired list during the past year at the end of thirty years' service. Sergeant Anthony Cone is still First Sergeant of Battery E—many people say a very excellent one.

Among the officers Lieutenant Brammell is the oldest inhabitant, and as yet unmarried. He still lives in the building near regimental headquarters known as the "Switchman's Shack." Captain Shea is the second oldest in point of service in the regiment followed by Captain McNaught, who now has three children and lives in Major Thurber's old house. Bob Crosby has gone to the Ammunition Train and McGinley to Brigade Headquarters.

SIXTEENTH FIELD ARTILLERY — FORT MYER, VIRGINIA

Major Maxwell Murray, *Commanding*

Roster of Officers

CAPTAINS

J. S. Tate
Jas. L. McIlhenny
John Nash
S. F. Miller
R. W. Hasbrouck

FIRST LIEUTENANTS

F. D. Sharp
G. C. Benson
L. W. Bassett
L. B. Ely
W. T. O'Reilly
T. A. Roberts, Jr.

SECOND LIEUTENANTS

D. V. Johnson
C. D. Palmer
S. V. Krauthoff
H. Van Wyk
W. H. Barksdale, Jr.
G. D. Pence

The 1st Battalion, 16th Field Artillery, has completed a year fully occupied with the routine duties incident to station at Fort Myer.

In June, 1926, Major R. E. D. Hoyle, who had commanded the battalion since June, 1924, was ordered to attend the War College, and leaves us with our regrets and best wishes for a most successful year. He was relieved by Major Maxwell Murray, who joined from the Command and General Staff School. Captain Steele Wotkyns has left the battalion for the 11th Field Artillery, in Hawaii, and Captain Edward R. Roberts for the 24th Field Artillery at Camp Stotsenburg. Captain S. F. Miller has joined from the 10th Field Artillery, at Camp Lewis, and First Lieutenant Lowell W. Bassett from the Field Artillery School, Fort Sill. Master Sergeant John O'Hare and Staff Sergeant John T. Garrity have retired after thirty years' service, and there have been many changes in the enlisted personnel during the year.

After the spring training period in the Post, the battalion marched to Camp Meade on July 6th, and remained until August 12th, carrying out its own target practice and being engaged in the training of the reserve officers of the 462nd Field Artillery (Horse), 62nd Cavalry Division. The association with these officers will always be recalled with pleasure by the battalion.

While at Camp Meade, Battery C, Captain Tate commanding, completed the Knox Trophy tests as the battalion entry and made the creditable score of 374 points out of 400.

As breaks in the straight routine, the battalion has entered into many other activities.

The riding hall drills are always a feature of the winter training period, and were opened with a benefit ride for the Army Relief Fund on January 9th. This ride, given by the 2nd Squadron, 3rd Cavalry and this battalion, was followed by a tea dance in the post hop room, and was largely attended.

After the completion of the series of regular Friday "rides," the batteries participated in the Society Circus on May 3rd; this

annual exhibition being for the benefit of Polo and Post Athletics. Two performances were held, and the riding hall was well filled for both the afternoon and evening shows.

Artillery demonstrations were given by batteries of the battalion for boards of officers designated to inspect the Field Artillery R.O.T.C. units, and for the student officers of the Engineer School at Camp Humphreys. The battalion participated in the ceremonies included in the reception to, and fired salutes for, the following dignitaries: The President of the United States, the Queen of Roumania, the Crown Prince of Sweden and the President of Haiti. It was also inspected by a group of Japanese Staff officers on a military mission in this country.

The battalion was well represented in several classes at the National Capital Horse Show, and at the Southern Maryland Horse Show and Fair, taking several trophies in each show. At the National Horse Show in New York, the gray horse battery, C, under Captain Tate, made a splendid showing for the Field Artillery. In compliance with the request of the Horse Show officials, practically the entire battery was taken to New York. While there, the battery was comfortably quartered with the personnel and matériel in the 104th Field Artillery Armory, and the animals in the stables of the 102nd Medical Regiment Armory. The battery worked on a very heavy daily schedule, and the spirit and discipline of the battery was reflected in the way they put over their part in the show. The fast eight-carriage drill was given a great reception every night, and much praise for the effective drill movement and the striking appearance of the battery was given by the spectators, Horse Show officials, and the foreign officers who were present.

In the class for artillery horses in hand the battery repeated their wins of the year before by taking all four ribbons, and also took the blue with the gun team as they did in 1925. Captain Tate won the blue for heavy weight polo ponies on his "Carry-the-News," and the red ribbon on "Virginia" in the heavy weight polo pony brood mare class. Lieutenant Pence made several very creditable performances in the jumping classes on "Buck" considering the great amount of competition this year. The officers of the battery have expressed their appreciation of the many courtesies and the kindness extended them and the battery by the Horse Show officials and officers of the 104th Field Artillery and 102nd Medical Regiment, New York, National Guard.

Polo in the battalion has continued to flourish. The following tournaments were played in:

Southeastern Circuit 12 goal tournament, Rumson Country Club, N. J., June, 1926. Teams entered: Rumson Freebooters, Rumson

Elephants, Sun Eagles and the 16th Field Artillery. In the finals the 16th Field Artillery were defeated by the Rumson Elephants (8–7) in an extra period game.

After the 12-goal circuit tournament, a match game for the Thomas B. Hasler cup was played between the Rumson Elephants, winners of the Southeastern Circuit Tournament, and the 16th Field Artillery. The 16th Field Artillery won this game 6 to 5.

Rumson Club Tournament, Rumson Country Club, N. J., June, 1926. Teams entered: Rumson Freebooters, Rumson Elephants, Sun Eagles, Green River Country Club and the 16th Field Artillery. In the finals the 16th Field Artillery was defeated by Green River Country Club.

Teams were entered in the low-goal and high-goal Fall Tournament, Washington, D. C., in October, 1926. The 16th Field Artillery won the low-goal tournament by defeating the 6th Field Artillery in the finals, but were defeated in the finals of the high-goal tournament by the War Department Whites.

Lieutenant Guy C. Benson, our "Number One," made the Army Junior team this year and played brilliant polo through the entire tournament.

The battalion has taken an active part in local athletics; Battery B won the post baseball championship, and Battery C won the post basketball championship, the latter going through the series without a defeat. While there was no post football league, batteries A and B both turned out very creditable teams and played a number of games on and off the post. Men from the battalion also played on the post baseball team which won the championship of the Northern Virginia league, and on the post soccer team which had an active season of games in the local soccer league.

As the year closed, the work of the battalion was concentrated on the indoor training necessary in preparation of all three gun batteries for the riding hall exhibitions, and the preparatory training for the gunners' examinations. Within the battalion for the year 1926, 156 men qualified as expert first-class gunners, 82 first-class gunners and 44 second-class gunners, a total of 282 men during that period.

SEVENTEENTH FIELD ARTILLERY — FORT BRAGG, NORTH CAROLINA

Colonel Conrad H. Lanza, *Commanding*

Roster of Officers

Lieutenant-Colonel Raymond W. Briggs
Major Gustav H. Franke
Major John G. Burr

CAPTAINS

Charles W. Gallaher
George Ross Rede
Dale M. Hoagland
Sidney J. Cutler
Dover Bell
Oliver F. Marston
Lloyd S. Partridge
James C. Patterson

First Lieutenants	Second Lieutenants
Daniel B. Floyd	Ulysses J. L. Peoples
Osgood C. McIntyre	Bernard A. Tormey
Henry E. Sowell	Valentine R. Smith
Clarles H. Day	Paschal H. Ringsdorf
Clarence J. Kanaga	Briscoe A. Trousdale, Jr.
Clifford C. Duell	Martin H. Burckes
Wilbur S. Nye	Ernest V. Holmes
Francis O. Wood	
William D. Williams	
Louis L. Lesser	

The 17th Field Artillery is a motorized 155-mm. howitzer regiment, and its station, Fort Bragg, North Carolina, is the "Largest Field Artillery Post in the World." A regiment can hike for weeks on the reservation and never use the same road twice. There are gun positions innumerable, and monotony in things military is an unknown malady.

Our routine work is liberally interspersed with experiments for the Field Artillery Board. The most interesting one during 1926 was the formation of a war strength howitzer battery and battalion headquarters. Completely equipped to the last cotter pin, as prescribed in some twenty or more publications, the venerable tractors responding nobly, the battery maneuvered and fired by day and night for ten days with an imaginary division, which, as usual, usurped any good roads available.

Other interesting experiments were continuous, including new guns, tractors, telephones, gas masks, smokeless powders, mechanical flashlights, etc. The Field Artillery Board has been hospitable as well as busy, and for the insatiably curious produced trick after trick in a manner that would bewilder the ablest magician.

Summer training activities began May 30th. The following Field Artillery Reserve regiments trained with the 17th: 397th, May 30th to June 12th; 398th, June 13th to 27th; 427th, July 4th to 18th; 434th, July 18th to August 1st. After a few days of refresher work, the commander would issue his combat orders and the fight would begin with the reserve officers in full charge. Before the summer was over no one felt at home unless in the field. This work was interesting and enjoyable, and the regiment is looking forward with pleasure to its resumption in 1927.

Lieutenant-Colonel Briggs, then commanding, returned the first of June from a refresher course at Fort Sill. Using a battery of three-inch guns and an allowance of 2500 rounds of shell, he began a "refresher" for the officers of the regiment. The addition of this matériel permits instruction in handling the sheaf, and rapidity of fire—a very helpful addition to the fire normally conducted with the 155-mm. howitzers.

Colonel Lanza was reassigned to the regiment and was welcomed back on September 10th, after an absence of about a year.

Battery B again won the post nomination for the Knox Trophy. There is always keen competition both intra- and interregimental for this honor, and the battery is justly proud of the fact that it was selected in 1925 and 1926.

The athletic record for the year included winning the bowling championship in the officers' league, the battery and regimental post baseball championships and the post football championship. No opportunity was afforded our track and field team to show its prowess. It is rumored that this was due to its decided supremacy in the past two seasons. Sergeant Hess again was No. 1 in our annual post pool tournament.

An excellent grandstand of new lumber now graces our athletic field. Many civilian spectators attend our games and we are glad to be able to provide them comfortable accommodations. Unfortunately, during its construction, our baseball team captain, Sergeant Fred A. Nichols, lost his right eye from a steel splinter. In recognition of his sportsmanship and soldierly qualities, General Bowley, the post commander, has named the field "Nichols Athletic Field."

The following officers were "lost" during the year. They have not been forgotten, however, and we take this means of wishing them success in their new assignments.

Lieutenant-Colonel Creed F. Cox to Field Artillery Board: Major Thomas D. Sloan, resigned, Captain Ben C. McComas and Lieutenant Richard T. Bennison to the Philippines; Lieutenants E. T. Owen and J. L. McKinnon to Hawaii; Captain Severn T. Wallis and Lieutenants C. R. Mize and F. W. Watrous to Fort Sill; Lieutenants W. A. Enos and Thomas McGregor to 13th Ammunition Train. Lieutenant F. H. Lanahan transferred to Signal Corps, Fort Monmouth; Lieutenant James Regan to 12th Infantry, Camp Meade; Lieutenant W. J. D'Espinosa to Ordnance Department, Pig Point, Va.

EIGHTEENTH FIELD ARTILLERY — FORT SILL, OKLAHOMA

Major Fred C. Wallace, *Commanding*

Roster of Officers

CAPTAINS

Henry D. Jay
Henry A. Schwarz
Clyde C. Alexander
Samuel Marshall
William Dunckel
George P. Hays
M. Milton Potter
George B. Barth
Walter L. Kluss
Samuel R. Deanes
Lee V. Harris
Francis W. Farrell

FIRST LIEUTENANTS

Frank C. Jedlicka
William W. Murphey
Stuart M. Bevans

SECOND LIEUTENANTS

Albert Svihra
Blackshear M. Bryan
Harold D. Kehm
Harold S. Gould

The 1st Battalion of the 18th Field Artillery completed four years active association with the Field Artillery School on January

1, 1927. The principal function of this battalion during the Academic Year is to furnish details for various problems and demonstrations as required for the different classes at the School.

Corporal Louis J. Arnold, Battery B, 18th Field Artillery, was awarded the Knox Medal for 1926, for excellence as a student at the Field Artillery School.

At the Annual Fort Sill Horse Show, the battalion won eight first prizes and nineteen ribbons and at the Commanche County Fair, four first prizes and seven ribbons.

The Battalion was well represented on the athletic field, finishing well up in the baseball and football leagues.

Organization day was observed on July 15th. The history of the regiment was read, followed by a dinner, a baseball game in the afternoon and a dance in the evening.

The annual inspection and review by the Commanding Officer, School Troops, took place on September 10, 1926.

It is gratifying to note that within the past year numerous applications to return to the battalion have been received from men who had been discharged and reënlisted elsewhere. The indication is that the opportunities for professional training here are being appreciated by those who intend to make the Army their home. This is due to the extremely varied quality of the work, which is always conducted as nearly as possible under field conditions.

TWENTY-FOURTH FIELD ARTILLERY (P.S.)

CAMP STOTSENBURG, PHILIPPINE ISLANDS

Colonel H. W. Butner, *Commanding*

Roster of Officers

Major John O. Lackey
Major John B. Anderson
Major Richard B. Paddock

CAPTAINS

Stanley Bacon
James G. Coxetter
Howard W. Turner
Edward H. Brooks
Ralph J. Canine
Buhl Moore
Edward R. Roberts
Ben C. McComas
William J. Egan
Alston P. Rhett
Charles C. Brown
Russell G. Barkalow
Joseph W. Loef
Howard C. Brenizer
Richard J. Sothern
Harry L. Watson (V.C.)

CAPTAINS

Richard C. Mallonee
Fidel V. Segundo

FIRST LIEUTENANTS

Salvador F. Reyes
John H. Lewis, Jr.
Joseph P. Donnovin
Robert L. Allen, Jr.
Raymond T. J. Higgins
Charles K. McAlister
Lonnie O. Field
Robert R. Raymond, Jr.
Richard T. Bennison
Francis O. Wood
Millard Pierson
Mariano S. Sulit
Edwards M. Quigley
Louis L. Lesser
Henry L. Love
William D. Williams
Richard Sears

ELEVENTH FIELD ARTILLERY ON THE SCHOFIELD–HONOLULU ROAD
PHOTO BY SIGNAL CORPS. U. S. ARMY.

TWENTY–FOURTH FIELD ARTILLERY BASEBALL TEAM
CHAMPIONS OF CAMP STOTSENBURG AND PAMPANGA.

MAJOR SANDS AND LIEUTENANT ROBERSON, 82ND FIELD ARTILLERY
PAIR JUMPING IN THE FIRST CAVALRY DIVISION HORSE SHOW, 1926.

ROLLING PICKET LINE, 82ND FIELD ARTILLERY, FORT BLISS, TEXAS
(80 HORSES.)

SECOND LIEUTENANTS

Amado Martelino
Victor Z. Gomez
Nemesio Catalan
Thomas E. Lewis
Allen L. Keyes
Dan Chandler
Michael Buckley, Jr.
Joseph A. Cella
John E. Adkins, Jr.
Francis A. Garrecht, Jr.

SECOND LIEUTENANTS

Frank Dorn
Alejandro D. Garcia
Eugene B. Ely
Wiley T. Moore
John M. Williams
Howard E. Kessinger
George W. Vaughn

CHAPLAIN (FIRST LIEUTENANT)

John H. McCann

The outstanding feature of 1926, from the viewpoint of the 24th Field Artillery, was the firing of six guns from the topmost peak of Mount Pinatubo on April 1st. These guns were placed in position by sixty men from the regiment under the command of Major Raymond E. Lee. Eleven days were required for the hazardous work and no men nor guns were injured. Each battery furnished one gun and eight men in order that the entire regiment might participate. No battery can claim the honor of having the first gun upon the summit of Pinatubo—as the first gun to reach the summit was a composite one—wheels from Battery A, cradle from Battery B, axle from Battery C, etc. To one who has never served in the Philippines, it is difficult to realize the dangers and difficulties attendant upon the task of Major Lee and his men, but those who have been in the islands, and especially those who have served at Stotsenburg, know that they accomplished the seemingly impossible, and that the 24th Field Artillery has just reason to be proud.

In December of 1925 Battery C, under Captain Stanley Bacon, was sent to Fort William McKinley to represent the regiment in the Annual Department Military Tournament, held at that station.

The Division Maneuvers of 1926 were held in January. The regiment left Camp Stotsenburg on January 5th and marched to Fort William McKinley, where they joined the rest of the Philippine Division. From Fort William McKinley the division marched south and took up a position between Lake Taal and Laguna de Bay for the defense of Manila against an enemy attacking from the south. After two days the retreat on Manila was started and when we reached McKinley the maneuvers were ended. After a few days' rest at McKinley the regiment marched back to Camp Stotsenburg, arriving the first week in February.

February and March were devoted to pistol firing and work on the China Sea Trail. The regiment qualified seventy-one per cent. with the pistol.

The Soldiers' Regimental Pistol Championship was held on October 23rd and was won for the second time by Sergeant Antonio Sazon of Battery D. Having won the championship twice, he

became the owner of the silver shield donated by Major Raymond E. Lee in 1924.

In April the instruction started for Gunners' Examination which was carried on through May. Due to the large number of recruits the regiment only qualified 73 per cent.

The spring of 1926 brought many changes in the personnel of the regiment. With two exceptions all the batteries received new battery commanders and the regimental and battalion staffs were completely changed.

The regiment has been very successful in athletics, having won the Post championship in baseball, soccer football, basketball, indoor baseball and volley ball. In the Annual Post Track and Field Meet, held during the Stotsenburg Carnival, the regiment defeated the 26th Cavalry by a score of 121 to 54. Battery E won the cup for the highest number of points scored by an organization, scoring 34½ points.

In addition the Regimental Baseball Team won the championship of Pampanga after a very close race with the 3rd Pursuit Squadron and defeated a team from the Navy in an exhibition game during the Carnival by a score of 8 to 4.

Our only defeat was in polo where we were beaten by the 26th Cavalry, but the outlook for 1927 is much brighter, as several good polo players are under orders to join the regiment.

In December the Annual Stotsenburg Sports Carnival was held, with track meet, horse show, dances, carnival parades, etc. In the horse show, Battery D won the best turned out gun section, an event which always excites much competition and rivalry. First Sergeant Dadula of Battery A won the enlisted men's jumping event on a horse condemned by the Cavalry and turned over to the Artillery for garrison duty only.

SEVENTY-SIXTH FIELD ARTILLERY (Less 2nd Bn.)

FORT D. A. RUSSELL, WYOMING

Lieutenant-Colonel William K. Moore, *Commanding*

Roster of Officers

Major Orlando Ward

CAPTAINS

Ray H. Lewis
John G. Cook
Claude A. White
Leslie M. Skerry
Frank L. Thompson
Frank G. Chaddock
James M. DeWeese

FIRST LIEUTENANTS

Polk J. Atkinson
Norman J. Eckert
Elmer C. Ringer
Newton W. Jones
Leon V. Chaplin

SECOND LIEUTENANTS

Warren C. Stout
Harvey K. Palmer, Jr.
Frank J. Hierholzer
Archer F. Freund
Harry J. Harper

Wyoming is known throughout the world as the country where horses buck and men are men, but locally it has far greater fame

as the place where winds originate. Our barracks and quarters are good, though, and when we can no longer face the boulders, tumble-weeds, sand and corral dust flying through the air, we can always retire into them in good order and conduct indoor operations until the elements subside.

While it is true that this is no country in which to conduct a winter campaign, the current tales about the terribly cold weather, deep snows, etc., are greatly exaggerated, for we actually miss but little outdoor work from these causes and everyone assigned to this Post, who has heard these stories, has a pleasant surprise in store when he joins, for Cheyenne is a good town and Fort D. A. Russell, a good post.

During the past year from January 1st to April 8th the 76th Field Artillery performed the usual duties incident to garrison training. During this period a course of lectures, conferences and map problems, covering the Tactics and Technique of Field Artillery, were given in the officers' school as preparation for the field work to follow in the spring.

Colonel Daniel W. Hand, representing the Chief of Field Artillery, inspected the regiment on the eighth, ninth and tenth of April while Brigadier-General John M. Jenkins, the Post Commander, reviewed and inspected it on May 3rd.

On May 10th the regiment marched from Fort D. A. Russell to Stone's Ranch, a distance of eighteen miles, and the next day after covering twenty-two miles arrived at Pole Mountain. Pole Mountain Military Reservation is at an altitude of over eight thousand feet or two thousand feet higher than Fort D. A. Russell and, after a night of snow, the shelter tent camp reminded the old timers of their experiences at Valley Forge during the Revolution. After a day of field firing the regiment marched back to the Post, a distance of forty miles, arriving in excellent condition.

The months of June and July were largely devoted to the training of the civilian components. These included the commissioned personnel of the 385th and 386th Field Artillery regiments and those enrolled in the Field Artillery section of the Citizens' Military Training Camp.

During August and September the regiment completed its antiaircraft machine gun practice, using colored balloons filled with hydrogen. Quite a number of people from Cheyenne and the surrounding country came out to watch the gunners and were surprised at the celerity with which the balloons were brought down.

For two weeks in September the regiment was engaged in smoke bomb and service practice with airplane adjustment. The officers of the 76th acted both as observers and as flying battery commanders, spending about two hours each in the air. Two new Douglas

Observation Planes, piloted by Captain A. F. Herold and First Lieutenant Frank D. Hackett of the Air Corps, were ordered from Crissy Field, California, to Fort D. A. Russell for this purpose. Due to the fact that these ships were equipped with improved radio apparatus, a marked speeding up of the adjustments, over those of last year, was noticeable. The following officers successfully completed the course: Lieutenant-Colonel William K. Moore; Captains Ray H. Lewis, Claude A. White, Leslie M. Skerry, Moore A. Stuart, Frank L. Thompson; First Lieutenants Norman J. Eckert, Newton W. Jones; Second Lieutenants Warren C. Stout, Charles C. Blakeney, Conrad L. Boyle, Frank J. Hierholzer, Archer F. Freund, Robert M. Cannon.

Six of the enlisted men of the regiment, who are Reserve Officers, fired a smoke bomb problem satisfactorily as observers while thirteen more took flights with a view to qualifying as such.

Battery C, our black horse outfit, under the command of First Lieutenant Frank E. Kauffman, took a prominent part in the world famous Frontier Day celebration in Cheyenne and in the Weld County Fair at Greely, Colorado, one of the outstanding fairs of the Rocky Mountain region. Although the officials offered to transport the organization by rail, the officers and men preferred to march the 110 miles there and back. One of their interesting performances was an intricate drill at the gallop conducted at night, under powerful are lights, and ending by the battery executing action front and firing three volleys. This exhibition was particularly spectacular and never failed to get the shrieks from the ladies.

Battery A, Captain Frank L. Thompson commanding, was selected to compete for the Knox Trophy this year and acquitted itself very creditably.

In athletics, the regiment has continued to remain in the lead at Fort D. A. Russell, winning several cups and championships of the Post in basketball, football and bowling, the team from Battery A winning the last. The football teams played several outside games and, under the able coaching of First Lieutenant Newton W. Jones, won all but the first without being scored on. Our soldier teams have won high praise for their fine spirit of sportsmanship and fair play and as a result have materially strengthened the bonds of friendship between the regiment and the citizens of this region.

A reawakening of interest in Polo has taken place in that part of the regiment stationed at Fort D. A. Russell, due largely to the efforts of Major Orlando Ward, who is now Post Adjutant and Executive Officer. A field has been completed in the artillery area and we expect that it will be equipped with a club house in the near future.

We were very sorry to lose several of our officers this fall, including Captain Moore A. Stuart, detailed on National Guard Duty at Fort Scott, Kansas; First Lieutenant Frank E. Kauffman and Second Lieutenant Charles C. Blakeney, who went to Hawaii, and Second Lieutenants Conrad L. Boyle and Robert M. Cannon, who were detailed to the Air Corps. Captains John G. Cook and James M. DeWeese, and First Lieutenant Leon V. Chaplin, all of whom have been stationed in Hawaii, have been assigned but have not yet joined.

SECOND BATTALION 76TH FIELD ARTILLERY

PRESIDIO OF MONTEREY, CALIFORNIA

Major John R. Starkey, *Commanding*

Roster of Officers

CAPTAINS

John O. Hoskins
William E. Kneass
Arthur Wilson
Russell C. Snyder
Stanley Richardson

FIRST LIEUTENANTS

LeCount H. Slocum
Albert R. S. Barden
Henry E. Sanderson
Richard M. Costigan
Grant Henninger
William D. McNair
Charles H. Swartz

SECOND LIEUTENANTS

Bruce R. King
George A. Grayeb
William N. Gilmore

As every one is always interested in the whereabouts of every one else, the first thing to be reported is the departure and arrival of officers. The battalion is fortunate in having kept its Battalion Commander for two years, breaking all past records. Two Captains and three Lieutenants remain of those on last year's roster. Captains Charles E. Boyle and Russell H. Dixon departed for the Field Artillery School and Captain Russell C. Snyder, while yet on our roster, is on leave prior to a year with the Air Service at Brooks Field, Texas. We drew in lieu thereof, Captain Arthur Wilson (the man that wrote the book) from R.O.T.C. duties at the University of Missouri, and Captain Stanley Richardson from the Second Division. The mortality among Lieutenants was high. Edgar T. Anderson went to the Tenth at Camp Lewis, while Henry L. Ingham, John B. Horton and Phillip H. Enslow were all heard to say they were sorry to leave this station, even when assigned to that "Garden in Paradise," Schofield Barracks. Lieutenants Sanderson, Swartz, McNair and Costigan came from foreign service and Grayeb and Gillmore, more or less circuitously, from the 1925 West Point Class.

The battalion is keeping up its old pace where athletics are concerned: Battery E won the battalion and post baseball championship trophies after a nip and tuck fight; Battery F the bowling; we supplied three first string players on the Championship Corps Area

Football Team and two to the Post Basketball Team. We won more than our share of the dismounted field meets and one of the mounted meets. In the annual Horse Show at Del Monte we fared exceedingly well. Right now we are engaged in basketball, bowling, tennis and pinochle tournaments and the baseball schedule is being worked out. The past year was the best the battalion has seen so far as polo is concerned. With Barden (No. 1), Boyle (No. 2), Caldwell (No. 3), and King, Horton or Slocum (back) the team put up a beautiful display in the low-goal events at Del Monte and won the Pacific Northwest Championship at Vancouver Barracks. Playing as the Field Artillery Freebooters, with an outside player for the zero handicap man, they outplayed teams that were better mounted and rated much higher. A fairly good practice field has been prepared on the Post the past year and over half of the officers of the Battalion are playing now. Del Monte with its two full size and two practice fields, all turfed, its frequent tournaments and cordial courtesy to the Army, gives our players a wonderful opportunity to observe and compete with the best in the world. At the present time two teams, each rated at 30 goals or better, are playing a series of two games.

Our summer training season the past year was long drawn out but very successful. Four Field Artillery reserve regiments were trained in three camps here on the Post during the period from May to August. Although armed with the French 75, we train gun crews for, and fire, both the 155-mm. G.P.F. and 155-mm. howitzer. With firing positions for the 75's only an hour's ride from the stables, we would be in an ideal position for training reserve officers, were it not for the limitations imposed by th oil pipe-line across the Gigling reservation and the oil heating station in the center. The C.M.T.C. Battery increases each year and upon Battery F was placed the responsibility for its equipment and training. Combined with the remainder of the Battalion and about thirty reserve officers they functioned very creditably in a regimental problem. The brunt of preparing Camp Del Monte and cleaning up thereafter fell on the Battalion and as over 6000 officers and men of the Regular Army, National Guard, Organized Reserve and C.M.T.C. are at the camp during the season, it required not a few "man-days" of fatigue and special duty.

During this time we found a two-day breathing spell to celebrate the Regimental Birthday and journeyed over to Santa Cruz by special train, during which period all work and care was forgotten and everybody had a good time. The impression made upon the townspeople was so good that they invited the Battalion to return in October, to participate in a State Wide Fair. So in October we staged a practice march around the Monterey Bay to Santa Cruz.

There we paraded, staged exhibitions, visited the Big Trees, had a fish barbecue on the beach and theatre party, and marched home with our good reputation intact.

Upon completion of the summer training duties all batteries plunged with great enthusiasm into a preliminary Knox Trophy competition, to determine the Battalion representative. Battery E emerged victorious and but for an unfortunate "short" during the communications test, would have had an excellent chance of winning that coveted Trophy.

While our average strength, in proportion to authorized, was the lowest in the Field Artillery during the last fiscal year, is now only 70 per cent. and dropping about 7 per cent. a month, the morale is high and reënlistments better than ever. If promised recruits arrive the "Bear-Cat" Second Battalion will be more pugnacious than ever within three months.

82ND FIELD ARTILLERY BATTALION (HORSE) FORT BLISS, TEXAS

Major Alfred L. P. Sands, *Commanding*

Roster of Officers

CAPTAINS

John M. Jenkins, Jr.
Patrick E. Shea
William H. Colbern
Wilbur B. Sumner
Irving D. Offer
John M. Reynolds

FIRST LIEUTENANTS

Winfield S. Roberson
Thomas S. Gunby
Albert P. Barnes
Charles R. Carlson
Thomas O. Foreman

SECOND LIEUTENANTS

Charles J. Barrett (D. S. Madrid)
Perry W. Brown
Bjarne Furuholmen
Frederick C. Pyne
Gerald J. Reid
John M. Sampson, Jr.
Burgo D. Gill (D. S. Columbus, N.M.)

MEDICAL DEPARTMENT

Major Milton W. Hall, M.C.
Captain Burlin C. Bridges, V.C.

While service on the border is sometimes arduous, though never monotonous, the morale and efficiency of a certain organization stationed at Fort Bliss, Texas, since December, 1917, can well be expressed by the following verse:

You may have served in many regiments And
served in many lands
But you've never seen the equal for Esprit
Of a bunch of hard-boiled soldiers in This dusty
Texas land
Called the 82nd Horse Artillery.

Long ago the 82nd Field Artillery Regiment (Horse) was made part of the 1st Cavalry Division and was stationed in this far outpost to assist the 7th and 8th Cavalry in maintaining discipline along the Mexican Border and from the records of their performance up to date and statements of past Commanders of Fort Bliss, this Regiment (now a Battalion), through its own efforts, is accomplishing its mission in keeping up the high standard of morals and efficiency—traditional to all Field Artillery units.

Little is known of this Battalion throughout the army, probably due to the fact that it is the only organization of its kind in existence and not because it is shy or retiring (as the rest of the division will admit). Former members recall it with sentiment and affection and take pride in announcing that they once belonged to the 82nd and hope some day to get back to it again.

An Organization Day for this Battalion was chosen as that of June 16th of each year—commemorating the day that Battery A, 82nd Field Artillery Regiment (Horse), fired into Mexico (the Battle of Juarez), June 16, 1919.

The 82nd Field Artillery Battalion (Horse) started in the year 1926 with its training program which embodied instruction for officers and men in all departments incident to their status as Field Artillerymen, and was so successful in its efforts that the Annual Report of Inspecton by the Corps Area Inspector placed the Battalion as a whole "above average."

Due to the rush of summer training with National Guard Batteries, Reserve Officers and C.M.T.C. work, rather than any oversight, the Battalion failed to complete in the Knox Trophy Contest. However, Battery C made the test after the time limit set and the final score showed that the battery would have secured third place in the actual contest.

Although Captain William H. Colbern, 82nd Field Artillery Battalion (Horse), who won the 1926 Remount training contest at Fort Riley, was representing the Battalion in the Eastern Horse shows, the 82nd was ably represented in the 1st Cavalry Division Horse Show held at Fort Bliss in October. The Artillery Team consisted of Major A. L. P. Sands, Captain Burlin C. Bridges (V.C.); First Lieutenant W. S. Roberson, Second Lieutenant Gerald J. Reid, Sergeant Vanderbeck, Hq. Det. and C. T., Corporals Cox and Gest, Battery B, and Corporal Todd, Battery C, and won 8 blues, 5 reds and 7 yellows, against the entire division including the 1st and 5th Cavalry from Marfa and Fort Clark, Texas. Following are some of the events won by the 82nd:

1. Best Team of 16 Polo Ponies—fully equipped—1st place (Polo Stables—Captain Bridges, V.C.).
2. Best Polo Pony—heavy weight—1st place (Polo Stables).
3. Group of 3 polo ponies—fully equipped—1st place (Major Sands, Captain Bridges, Lieutenant Roberson).
4. Best Cavalry Horse—2nd and 3rd place (Polo Stables).
5. Best Artillery Horse—2nd and 3rd place (Privates Casey and Kiernan).
6. Best Ordnance Equipment—2nd place—Battery B.
7. Polo Bending Race—1st place (Captain Bridges).

8. Corinthian Class—3rd place (Major Sands, Lieutenant Roberson, Corporal Cox).

9. Red Carts—1st, 2nd and 3rd places (Batteries B, A, C).

10. Horses suitable to become polo ponies—1st and 3rd places (Major Sands, Captain Bridges).

11. Light Wagon (Radio)—2nd place (Hq. Det. and C.T.).

12. Artillery Sections—1st, 2nd, 3rd places (Batteries B, A, C).

13. Open jumping—3rd place (Major Sands).

Captain Patrick E. Shea, 82nd Field Artillery Battalion (Horse), in charge of the athletics, proved to be skeptics that the Battalion had material for football and basketball by taking third place in the Division Basketball League of eight teams and captaining the football team which ended up by being the Division Champions. Lieutenant C. R. Carlson brought the baseball team through to second place in an eight-team league. The Polo Team consisting of Major Sands, Captain Bridges, Captain Sumner, Captain Jenkins, Lieutenant Roberson and Lieutenant Gunby started the tournament season in fine style by defeating the 7th Cavalry in the first game of the tournament, but due to the fact that the team had just been organized and lacked practice and playing together, finally bowed to the 8th Cavalry in the fourth game of the series and were thus eliminated.

After resting up from a strenuous horse show season, the battalion took part in maneuvers with the 7th and 8th Cavalry in offensive and defensive situations assisted by the Air Service. Battery C, commanded by Captain W. B. Sumner, fired on the Castner Range with Airplane Observation with such excellent results that the Air Service Officers requested a report on the Method of Adjustment of fire used by the Battalion Commander and Observer in order that they might study this method for future use. Lieutenant W. S. Roberson, 82nd Field Artillery Battalion (Horse), acted as Artillery Observer in the plane, and system used was Radio Telephone—plane to ground, and Panels—ground to plane.

In November the Battalion finished the years' Service practice by sending each battery to Dona Anna Target Range, New Mexico, for a week at a time. Problems were given under the supervision of the Battalion Commander and executed in a satisfactory manner and the efficiency and accuracy of the artillerymen was thoroughly realized by the Cavalry Division when two of their officers were present on the last day of firing and witnessed the excellent performance of Battery C in four shrapnel, three shell and four percussion precision problems.

Battery C was the last organization to go to Dona Anna and it fell to their lot to close the camp. They made a night march back to Fort Bliss arriving just as reveille. Distance marched: 27

miles. No trouble enroute and the drivers, with the exception of four men, were recruits with two months' service in the army.

Having successfully carried out the year's schedule in training and sports with the 1st Cavalry Division, the 82nd Field Artillery Battalion (Horse) made ready to receive the Representative of the Chief of Field Artillery, Colonel D. W. Hand, Field Artillery, who arrived at Fort Bliss recently for an inspection of this organization.

A schedule was arranged which included Battalion Review followed by a full field inspection. Battery A took the Knox Trophy Test march and was inspected enroute. Battery B fired at Castner Range and Battery C put on an excellent mounted drill. A thorough inspection of barracks, kitchens, stables, grounds, etc., was made and Colonel Hand also examined the War plans of the battalion and commented favorably on them.

Upon leaving Fort Bliss, Colonel Hand was asked his opinion of the 82nd Field Artillery Battalion (Horse) as the result of his inspection and he replied that he could report to the Chief of Field Artillery with but one word—*Excellent*.

EIGHTY-THIRD FIELD ARTILLERY — FORT BENNING, GEORGIA

Major Robert S. Donaldson, *Commanding*

Roster of Officers

CAPTAINS

George A. Pollin
Charles E. Hurdis
Charles A. Wickliffe
George P. Winton
William B. Weston

FIRST LIEUTENANTS

William H. Barlow
Boniface Campbell
Paul A. Reichle
Harry M. Schwarze
Shirley R. Hurt
Edward L. Strohbehn
John B. Murphy
Freeman G. Cross
Wray B. Avera

SECOND LIEUTENANTS

Stuart A. Beckley
Herbert B. Enderton
Hayden Y. Grubbs
Claude F. Burback
James T. Dawson

In Georgia lies the nerve center of the "Doughboys"—The Infantry School at Fort Benning. With that garrison serves a *Red Guidon* battalion. This is the First Battalion, 83rd Field Artillery. Our mission is to demonstrate the powers and limitations of our arm to the Infantry School students. This we all feel must be done in a manner reflecting credit on the Field Artillery.

The 83rd is a tractor-drawn battalion of 75-mm. guns (French). Battery A is equipped with Holt T-35 two and a half ton tractors, Battery B and Headquarters Battery with Holt 5-ton tractors and Battery C with a modified Holt T-35 two and a half ton tractor. This modification placed rubber shoes on the tracks and made a high-speed tractor of the T-35 by speeding up the gear ratio. Other equipment is that usually found in the motorized battalion, except that we have added three cross-country Ford reconnaissance cars.

Although our motor equipment has proven very satisfactory, plans are now progressing for the conversion of the battalion to horse-drawn field artillery. At the Infantry School we represent the artillery of the Infantry Division, which is, in service, horse-drawn.

Our schedule for the year follows very closely the academic year of the school. From September to May we occupy positions and fire problems the tactical features of which are worked up by the School Staff to illustrate artillery in all phases of its teamwork with infantry. Artillery with advance guard, in attack, and in defense, are illustrated to the students. Naturally, the problems enable us to study approved infantry methods of combat.

A tour with this demonstration battalion gives officers an unusually good opportunity for contact with infantry personnel. We try in every way possible to make our teamwork perfect.

When school is "out"—about the end of May—our demonstrations cease. Not necessarily so does our work. This is the time, however, when we can take advantage of short leaves and furloughs. During the summer we overhaul and paint matériel, hold service practice, get our training in "hiking"—and "build." During the summer of 1926 we marched batteries by various routes, converging on Fort McPherson, near Atlanta. After a week's stay at that hospitable post we hiked for home by battalion. The caissons rolled on very smoothly, usually parking themselves in woods near a swimming hole before evening. The Commandant of the Infantry School inspected us on the road on our last day's march—and wrote a letter commending us on our road discipline and the condition of matériel. We returned to Benning just in time to build ourselves a camp. Our old barrack area was needed at once as a site for permanent quarters, so motor tools were dropped while we took up hammers and saws.

In sports and in social activities Fort Benning is a very active post. All forms of athletics are played in season. The most interesting are probably the series, in each sport, played between battalions. The field artillery has always had well-coached teams on the field that give plenty of thrills to both opponents and spectators.

The 83rd Polo Team, while handicapped by a lack of good polo mounts, is giving a good account of itself in the games being played on the Post. Being a motorized outfit, the number and quality of the horses available for polo has been necessarily rather limited. Several promising remounts have been received recently, however, and some of these have reached a stage of training where they will soon be ready for playing. The recent change in Army Regulations which allows motorized Field Artillery Officers to be placed on mounted status has raised the morale and caused a marked increase in interest in polo and equitation. Our polo squad has improved

remarkably in the past several months and has been making a good showing against the Students, Freebooters and 29th Infantry.

The polo squad consists of Captain Hurdis, Lieutenants Hurt, Strohbehn, Murphy, Grubbs, Enderton, Oliver and Dawson.

During 1926, the following officers have been transferred to schools, foreign service, or to other duty: Captain Basil H. Perry, First Lieutenant William C. Price, Jr., Second Lieutenants LeRoy J. Stewart, John F. Uncles, Giles R. Carpenter, and David J. Crawford.

All officers who have served with us here at the Infantry School have found the detail to the 83rd one of the great professional interest.

We march, train, and fire the year around enough to suit the professionally enthusiastic and there are social activities galore, including hops, hunts and horse shows for those who would while away the hours off duty.

FOREIGN MILITARY JOURNALS A CURRENT RÉSUMÉ

FRANCE

"Revue d'Artillerie," December, 1926–January, 1927

"A Course at the Artillery Center at Metz," briefly describes the work done at the school and then elaborates the ideas of its author, Lieutenant-Colonel Cros, on the relation between infantry and artillery and their tactics as viewed by an infantryman.

The course is of about five weeks' duration and the students, numbering about forty, are older field officers and generals. Although artillery officers predominate, some from other branches, particularly the infantry, are detailed to each class. Emphasis is laid upon the fact that the subject under study is tactics and not technique. As principles of tactics are evolved by the infantry, it is the branch which receives the most attention. Lectures are followed by conferences or arguments between students guided by the instructors. The cycle of work begins with the defensive and follows with all phases of offensive, from the approach march up to an assault of an organized position.

The approach march and the use of artillery in it seems to be a favorite subject of discussion in French military circles and Colonel Clos devotes much writing to it. To quote the French regulations—"The approach march begins as soon as the army corps marching to the battle penetrates into the zone where it can be reached by the enemy's guns." Keeping ever in mind the tactics used beyond the Rhine, the French foresee that the enemy will place isolated long-range guns, guarded by a light screen of infantry or cavalry, well in advance to force the opposing advance guard to take up the approach march at a distance of as much as fifteen kilometers from the nearest enemy infantry. The conventional French method to meet this situation is to assign various lines to be reached during the day's march by the infantry. The artillery is divided into two equal parts—one in position and the other on the march. Leapfrogging is then carried out on a time schedule. As many as seven objective lines, or a total of perhaps twenty kilometers for the day's march, are designated in the division order of the night before.

To Colonel Clos, this is a fatal system and reminiscent of the tragic battles of August, 1914, when the watchword of the French Army was "Forward—full speed." Railways and motor transport

have greatly increased the possible speed in the realm of strategy, but all experience shows that the modern field gun, the beech-loading rifle, and the machine gun have greatly reduced the speed of troop movements and maneuvers on the battlefield.

In place of a long field order covering a day's march, the writer suggests that the division commander select several objective lines of tactical importance on which his troops will consolidate and wait until their artillery can come up and again cover their advance. The first line should not exceed four kilometers from the point of departure and if this is attained, a line of secondary importance should be selected which can be covered by the artillery from behind the point of departure. The field order should only cover the advance to that first line, though the commander should keep his plans for a subsequent advance in his mind. When the advance has reached the first line the commander should at once bring up his artillery either by echelon or altogether, depending upon the situation, and issue his orders for the next advance of the infantry. The method is slow and cautious, but the troops are always supported by artillery—the lower units are kept under control, and there is time for study of the situation by all commanders. Much of this is contrary to the usual military doctrine of a meeting engagement, but Colonel Cros' motto is, "Make haste slowly and keep your artillery with you."

"Death of Lieutenant-Colonel Deport." The inventor of the modern quick-firing field gun and creator of the French 75-mm. gun died in Paris last November in his eighty-first year. Colonel Deport was educated at the Ecole Polytechnique and the Artillery School of Metz and received his commission in 1870. He served in the 3rd Artillery during the Franco-Prussian War and after several battles was wounded at Chatillon. Following the war he entered the technical service of the artillery (ordnance) and in course of time came to the gun shops at Puteaux. Here he began work on a recoil mechanism for light artillery which finally evolved into the famous model of 1897.

In 1892 he was promoted lieutenant-colonel and three years later he was retired at his own request in order to enter an armament firm. He was the inventor of a variable recoil mechanism and a field piece which bears his name.

"Polish Ordnance." Poland is now equipped with at least one factory capable of turning out light artillery. This has been brought out by the recent trials of a new 47-mm. gun for accompanying the infantry, which was designed and built throughout by the "Pocisk Works" in Poland.

"Revue Militaire Française," November–December, 1926

GENERAL CAMON offers the military student an excellent method of study in his article, **"To Learn the Art of War."** He points out that the study of map problems alone does not give the proper insight into the reality of warfare, that this element of realism can be found only in the study of campaigns. Here the student can place himself in spirit in the midst of real events, in the very skin, as it were, of the leader. He sees the leader make his plan, watches the plan materialize in the presence of the enemy and sees it finally succeed or fail.

At Saint Helena Napoleon wrote to his son: "Study the campaigns of great leaders, it is the only method of learning the art of war." Again, he advised: "Follow the offensive tactics of Alexander, Hannibal, Cæsar, Gustavus Adolphus, Turenne, Prince Eugene, and Frederick; read the history of their 83 campaigns; model yourself upon them; it is the only way to become a great leader." In his memoirs, Napoleon regrets that as a student he lost much time in useless study. He felt that a systematic course of military literature and history would make the way much easier for the student of warfare.

All great leaders have been serious students of military history. There is no truth to the legend that the generals of the French Revolution, because of their common sense alone, were brilliant leaders. A close study of their campaigns will disclose hundreds of mistakes. Their success can be attributed to the fact that the opposing leaders were even more ignorant and the fact that the French soldier was superior to the Austrian or Russian. Jourdan, commander in chief during this period, asked permission to leave his command temporarily, that he might devote some time to the study of the art of war.

As a painter studies the masterpieces of his art, the paintings of Raphaël, Rubens or Rambrandt, so should the student of warfare study the systems of the great leaders as portrayed in the history of their campaigns. There is just as much system in military art as in any other art. Napoleon had two general systems: "Maneuver on the rear" and "maneuver on the central position." He also had two systems of battle: "Use of a turning mass" and "battle on a central position." Ignorance of such fundamental systems of great leaders makes impossible an intelligent study of more recent wars. The initial German maneuver in 1914 was merely an amplification of the battle of Leuthen. In the battle of Tannenberg, Von Hindenburg followed the system of Hannibal at Cannes.

General Camon criticizes the policy of studying a single campaign to the exclusion of all others. The study of one phase of warfare

cannot give the student a proper balance. He should study methodically many campaigns, compare them, and arrive at a general conclusion.

The author recommends the following campaigns to the student: the campaigns of Frederick, the wars of the Revolution as an illustration of mistakes and as an introduction to the Napoleonic wars, the wars of 1866 and 1870, and the World War.

"The Three Glorious Days" is a recital by Lieutenant-Colonel Doumenc of the incidents of military importance during the Revolution of 1830. In his memoirs, Chateaubriand writes that "The due de Raguse, a man of intelligence and merit, a brave soldier, a learned but unfortunate general, proved for the thousandth time that military genius is insufficient in civil disorders. Any police officer would have been more capable of handling the situation than was the marshal."

Although the author refutes this exaggerated statement, in relating the story of these three days of civil disorder, he points out how at times the clumsy application of the usual rules of warfare adversely influenced the outcome of the revolution. He hopes this study will impress upon all officers the necessity of a knowledge of this special type of warfare.

"Campaigns of a Division of Infantry," by Lieutenant-Colonel Laure is the war history of the 13th Division, and a study of its problems of organization and tactical employment. He describes the rôle played by the infantry regiments and the auxiliary troops, the relative strength of each at the beginning of the war and how this relative strength varied during the course of the war. In this number the author describes in detail the maneuvers of "Danon" and "de la Chipotte" which occurred from August 2 to September 2, 1914.

The physical training and the tactical formation of the French Army at the outbreak of the war were adapted to a war of rapid movement supported by light matériel (rifles, machine guns, 75's). This superior mobility, however, was of no value against the greater fire power of the enemy. To support the 10,800 infantrymen of the division (54 companies of 200 men each), there were only 30 machine guns (1 section for each battalion) and 36 pieces of light (75) artillery (3 groups of 3 batteries each).

Colonel Laure criticizes the excess of offensive spirit shown early in the war by French officers of the division, who unnecessarily exposed themselves to enemy fire. This practice led to excessive casualties and indirectly to poor leadership. It seemed to be a point of honor with the infantry leaders to attack the enemy wherever he

was to be found in force. The leaders should have realized that they were engaged on a wide front with an excess of infantry and a lack of matériel. The enemy had organized the defense of the region by a system of infantry posts, reïnforced by a powerful system of fire. The French infantry should have sought to pass between these posts, utilizing all available cover. It had only to observe the elementary tactical rule "Do not attack the strong points; advance through the weak points of the enemy defense."

In the November number Commandant Cottard continues **"One Man is Everything."** In studying the great leaders he proposes to point out certain qualities of leadership common to all of them. One man in a position of supreme command who lacks one or more of these essential qualities may be the sole cause for the defeat of an entire army. McMahon's actions at Sedan bear out the author's point. He wished to abandon his well-known march to the east. For a moment he followed his better judgment and changed his direction of march to the north. But when he received an order from Paris to abandon this plan, he resumed his march eastward, knowing that it led to certain defeat. In such a crisis he should have possessed the force of character to disobey, even at the peril of his life, since his orders came from a distance and were issued by men ignorant of the true situation.

In summing up, the author mentions as the four essential qualities: (1) intelligence, which enables the leader to study, to prepare plans of campaign, to foresee all emergencies; (2) knowledge, which gives him the power to solve problems of war, to understand the terrain, to know men and the art of using them; (3) character, which dares, after the mind has weighed and resists all temptations, criticisms and hesitations; (4) physical and moral energy, which permits no rest for the leader or for others.

In the November number Commandant Jansen concludes his article **"Maneuver in Automobiles."** He gives a detailed account of the action of the 50th Division of infantry (mortarized) during the maneuvers of 1925.

The author concludes that the automobile cannot for some time entirely replace the cavalryman any more than the tank can replace the infantryman. The cavalry will remain for many years as the element of security for the infantry on foot. For any motorized divisions which may be used, in the meantime, as corps or army reserve, the cavalry will not be suitable as reconnaissance and security elements. This mission must be turned over to light armored cars and tanks of the type described by Commandant Jansen in the October number.

Lieutenant-Colonel Bailles continues **"Evolution of Ideas on Tactical Employment and Organization of Terrain."** He notes the growing importance of fire power during Napoleon's last campaigns. The later invention of the Chasse-pot and the machine gun led the French to over-emphasize the importance of fire power during the war of 1870. In this war the French command adopted a policy of passive defense, which permitted the more mobile German Army to win in spite of many grave tactical errors.

The French profited to some extent by this unfortunate experience of 1870. The regulations of 1875 properly emphasized the necessity of both fire power and movement. Unfortunately a school of military writers, called the "neo-tacticians," grew up before the World War who over-emphasized the importance of movement. Their sole doctrine was "attack." Because it was simple this doctrine naturally had many followers. The result of the triumph of this school was that France entered the war in 1914 with no sound doctrine of terrain organization.

Colonel Bailles also criticizes the tendency in the military schools before the World War of establishing a marked distinction between seige warfare, war of position and war of movement. He maintains that it is dangerous to use these and other such absolute terms and formulæ.

"The Automobile Show of 1926," by X is a discussion of progress in the production of the various types of touring cars and trucks.

In the November number, Commandant P. Janet concludes his article, **"Action of a Division in a General Offensive."**

In the same number appears **"Organization of Communications and Supply in an Army,"** by Colonel Lemoine.

GERMANY

"Artilleristische Monatshefte," May–June, 1926

"Modern Methods of Fire," by Otto Schwab, C.E., formerly instructor at the Artillery School at Wahn, is a continuation of the author's article begun in the March-April number. The author describes how the methods used during the war by the special artillery observation units can be applied to-day in a battalion using only such fire control equipment as is available in the ordinary battery, such as B.C. telescope, aiming circle, firing chart and the necessary plotting devices.

When a small scale map is used such as the 1/100,000 map, the method can be applied: (1) to expedite adjustment on a visible target by lateral observation; (2) to verify a previous adjustment made by

ground or air observation so that fire can be reopened by day or night even under unknown weather conditions.

When a large scale contoured map is used such as the 1/25,000 map, the method can be used to: (1) adjust fire quickly on any target, whether visible or concealed, that can be located on the map, independently of any other method of observation; (2) check the accuracy of fire of any or all of the guns of a battery; (3) deliver an unobserved time fire for effect by day or night on any concealed target that can be located on the map; (4) replace the service of special observation units, making the latter available for more important missions.

The author gives several examples showing in detail the technical operations involved in adjusting fire using high-burst ranging methods with lateral and bilateral observation.

"The Question of the Most Suitable Caliber for Anti-aircraft Artillery," by Lieutenant-Colonel v. Keller and Major F. Sandkamp. This article is a discussion based on a previous article by Lieutenant-Colonel v. Keller which appeared in the July-August number, 1925. Therein v. Keller emphasized the following points:

(1) Fire on aerial targets is far more difficult than fire on ground targets, and our experience in combating ground targets is usually of little practical value when we attempt to apply it to anti-aircraft fire.

(2) Anti-aircraft fire involves only the ascending branch of the trajectory. Therefore, it is advantageous to have a projectile that can traverse the lower air strata in the minimum of time and reach its maximum ordinate with the highest possible remaining velocity.

(3) These two conditions can be met only by increasing the initial velocity and improving the form of the projectile without increasing the caliber and weight of the projectile.

(4) A caliber of about three inches is the most suitable from both technical and tactical considerations. Only one caliber should be adopted.

Major Sandkamp makes the following argument:

(1) Tactical considerations will always outweigh technical ones. Since the missions of anti-aircraft artillery are so various, they can not be solved by a single caliber.

(2) Whereas, in the beginning of the World War, we found only single observation planes and balloons, we now find the air service using flights and squadrons. It has developed a sound system of tactics involving the employment of different types of planes such as observation, attack, pursuit, bombardment, etc., flying principally in formation.

(3) The question of a single caliber came up during the war but had to be abandoned because it was found that three calibers (light, medium and heavy) were necessary to meet the rapid development of air tactics.

(4) Aircraft is now capable of flying at greater heights and of carrying out its missions from higher altitudes. On the other hand, with the aid of optical and acoustic fire control instruments, the anti-aircraft artillery is capable of combating aerial targets effectively at much higher altitudes.

(5) Effect of the projectile is increased by enlarging the fragment zone. This can be accomplished only by increasing the caliber and weight of the projectile.

(6) In some situations anti-aircraft artillery must have great mobility; in others, it is more or less fixed but, from its position, must be able to cover a wide area. Under these circumstances the missions can not be executed by a single caliber.

Major Sandkamp then discusses the missions for which each of the three calibers should be used and points out that every first-class power has adopted three calibers for its anti-aircraft artillery and has fixed the relative proportions of the different calibers.

In rebuttal Lieutenant-Colonel v. Keller replies:

(1) To the anti-aircraft gunner, it is immaterial what the tactical mission of a hostile plane may be. To him every plane is an unprotected target to be combated by fire.

(2) The adoption of several calibers during the war was not the result of a scientific study but merely a matter of expediency resulting from the shortage of suitable anti-aircraft cannon and the conversion of a large number of captured Russian field guns.

(3) It is well known that both the heavy 8.8 cm. and the medium 7.62 cm. anti-aircraft guns are faulty in design and construction. In both cases the form of the projectile is ballistically inefficient for anti-aircraft fire.

(4) In the 8.8 cm. gun the wear in the gun tube is very great necessitating frequent replacement. Its ammunition supply is also a difficult problem.

(5) The necessity of mounting heavy anti-aircraft guns on trailers will greatly limit their mobility and preclude their employment on the march or near the front lines. This lack of mobility will also prevent their timely concentration in a critical area and their entry into action at the decisive moment.

(6) A trailer type of mount is unsuitable for anti-aircraft artillery because it involves a great loss of time in change of position and increases the difficulties of movement on the road.

(7) The naked eye is unable to spot a pursuit plane at a distance over 10,000 yards. The first observation will have to be made with

the naked eye which at 10,000 yards is six times superior to the ordinary field glass, due to the narrow field of view of the field glass and the difficulty encountered in covering the whole field of observation and quickly picking up the target.

(8) The necessity of a small caliber anti-aircraft weapon whether 50 caliber machine gun or a 37 mm. anti-aircraft gun is admitted.

(9) But for long range anti-aircraft fire, a gun of about three inch caliber with a projectile of suitable ballistic form will meet all technical and tactical requirements of modern anti-aircraft combat.

"Artilleristische Monatshefte," July–August, 1926

"A New Method for Calculating High Angle and Long Range Trajectories," by Prof. O. v. Eberhard. This is a purely ballistic study. In calculating trajectories, most ballisticians have generally assumed that the density of the air is constant as we go aloft and, therefore, remains constant throughout the trajectory, an assumption which does not apply to trajectories that attain high maximum ordinates. In his ballistic text, Doctor Cranz tried to correct for this diminution in air density by dividing the trajectory into several altitude zones, and assumed a different average air density for each zone. This method, however, involved many tedious and time-consuming calculations. Later, Doctor Cranz indicated that by using Runge's method of graphic integration, the differential equations of the ballistic problem could be solved graphically while properly evaluating the observed variation in air density at different altitudes. This method also involved many calculations and graphs, but it suggested to the author a way of solving the problem on simpler lines, whereby the calculation of an innumerable number of differential equations and graphs of trajectories could be obviated. The simplification was accomplished by adopting a mathematical expedient in the use of Everling's exponential function for variation of air density. The form of this function is $C_H = C_o^{10\text{-}0.000046h} = C_o^{10\text{-}ah}$, in which C_H is the ballistic coefficient for altitude, C_o at sea level and h the exponent for altitude. This function closely approximates the normal curve for density of air for altitudes under 10,000 meters, and for altitudes over 10,000 meters can be replaced by a similar exponential function based on Cranz's theorem given on page 101 of the latter's text on ballistics.

The author has solved the problem graphically for vertical trajectories upward and downward, and for curved trajectories, using initial velocities up to 1600 meters per second and altitudes up to 16,000 meters. The results are presented in nine graphs accompanying the article.

In conclusion, the author takes an example from page 250 of

Cranz's Ballistics and shows how this example can be solved by the use of his graphic charts. His method produces results that very closely approximate those obtained by Cranz.

"American Railroad Artillery of the Post War Period," by Dr. Gustav Graefer, Lieutenant of Reserves. In this article the author presents the specifications for railroad artillery as laid down by the Westervelt Board and discusses the steps and tests that have been carried out to date by our Ordnance Department to develop the 14-in. railroad gun (50 cal.), Model 1920; the 8-in. railroad gun (35 cal.), and the 12-in. R. R. howitzer (20 cal.), Model 1918. He points out that the United States is not making any special efforts to keep secret its experiments in developing this railroad artillery and that the results are being published in different professional journals that are available to any one interested in this problem. The United States artillery is devoting its efforts not only in developing its railroad artillery but also in improving existing systems of fire control, observation of fire and communications.

The author makes the interesting observation that our coast line is served by so many excellent railroad nets that exceptionally favorable conditions exist for a wide and successful use of railroad artillery. These nets, he observes, are connected by numerous transcontinental lines that permit the rapid concentration of our railroad artillery at any threatened point of our coast line. Since most of our railroads have roadbeds and bridges that will carry freight cars of 50 to 120 gross tonnage, the movement of railroad artillery from one coast to the other should not be very difficult. He concludes that the United States will have little difficulty in establishing an effective defense of both its coasts.

"Is the Highest Initial Velocity Attained in the Model 98 Rifle?" In this article the editor solves two very interesting ballistic problems in order to disprove the fallacy entertained by many persons in the military service that a projectile begins to lose velocity in the bore or tube as soon as all the power is converted into gas. He shows that for all modern small arms rifles and cannon, the projectile continues to gain in velocity until it leaves the muzzle. If the bore or tube were made longer, a point would be reached at which the maximum velocity would be attained. This would occur when the gas pressure in the bore or tube became equal to the frictional resistance of the projectile in the bore or tube. Beyond this point the projectile will lose velocity until finally, if the bore or tube could be made long enough, a point would be reached at which the velocity of the projectile became zero and the projectile remained sticking in the bore.

The author then proceeds to determine at what distance from the forcing cone a rifle bullet will attain its maximum velocity, and at what distance the bullet would remain sticking in the bore, provided the tube could be made long enough. For the German S bullet fired in the Model 98 rifle, he finds that the bullet would attain its maximum velocity at a distance of 118 cm. from the forcing cone, or at a distance of 149 calibers. At this point it will attain a maximum velocity of 916 m/sec. This is only 21 m/sec greater than the present 895 m/sec attained with the existing length of bore which is 74 cm. In other words an increase of 60 per cent. in length of bore will produce an increase of only 2½ per cent. in initial velocity of the rifle.

The distance at which the rifle bullet would remain sticking in the bore was found to be 8.68 meters or at a distance of 1100 calibers. For guns a similar study can not be made because no data are available on the resistance due to friction of the projectile in the tube. The author, however, believes that a greater maximum velocity could be attained for all cannon if it were technically possible to increase the length of tube in number of calibers. For field cannon, the question of mobility is a determining factor and we, therefore, find that they do not exceed 35 calibers in length. For naval cannon, the accepted length is 50 calibers. The German long-range guns that bombarded Paris were 100 calibers in length which enabled them to attain the maximum initial velocity.

CURRENT FIELD ARTILLERY NOTES

New Ration for Horses and Mules

DUE to the fact that the Army animal has been subsisted for over three years now on a reduced ration without any harmful results, the Quartermaster General was called upon to make a report on a change in the ration and submitted the following:

"1. Replying to letter of your office dated June 22, 1926, on the foregoing subject, the following is submitted:

> "(*a*) Due to the necessity for the utmost economy in the handling of Quartermaster Corps appropriations, and due also to the enforced saving ordered to be made in the forage ration for horses and mules, this office, for the past three years, has devoted much study and attention to the question of forage. From this careful study, from the opinion of the Quartermaster Corps officers experienced in animal management, and from data obtained from a number of the best officers of the mounted branches of the Army, the following conclusions have been reached: first, that the grain component of the ration for both horses and mules is more than sufficient to meet the needs of work in garrison; second, that the hay component of the ration is about what it should be for work in the garrison and in the field; third, that the allowance of bedding (one hundred pounds per month per animal) is not sufficient in garrison and is not necessary or used in the field, except in permanent camp, in which case the garrison ration would apply.
>
> "(*b*) The method of effecting savings in the forage ration through the medium of a yearly order, in the opinion of this office, is a most unsatisfactory way of enforcing economy. When such instructions are complied with literally, under varying conditions, without intelligent administration and proper care and attention to feeding and handling of the ration, hardship and abuse of both horses and mules are likely to result. If, therefore, the ration for horses and mules is to be reduced in the interest of economy, and if the experience of the past three years, as would seem to be the case, shows that no general harmful effects have resulted from such reduction, this office believes that it would be both good and proper adminstration to change the ration allowance

of both horses and mules so as to effect economy and at the same time obviate the present objections to enforced savings made regardless of varying conditions in garrison and in the field.

"(*c*) Before fixing a ration for a horse, there are two factors which govern the amount of grain necessary; viz. (1) the size and weight of the animal; (2) the amount of work required of the animal. In civilian life one pound of grain for every one hundred pounds of live weight of the horse is considered essential for an animal in reasonably hard work. Fourteen pounds of hay and sufficient bedding to keep the animal confortable in its stall are also provided. Experience in this office and observations of the method of feeding animals in civilian life, therefore, lead to the belief that this general rule is correct and can be applied to the Army so as to effect considerable economy and at the same time keep the horses in the Army in proper condition.

"In considering the effect the application of this rule will have on the present Army ration and using ordinary common sense, we will see glaring faults in our present ration allowance. For instance, no horseman thinks that a 1280 pound horse needs only as much grain as a horse weighing 950 pounds, or that a horse weighing 1300 pounds needs two more pounds than a 1280 pound horse weighing only 20 pounds less. The present forage ration therefore provides too much grain for the ordinary Army riding horse whose average weight is about 1000 pounds, and slightly less than is needed for an Artillery (draft) horse whose average weight is about 1250 pounds. Also, in the present Army ration the fact has been overlooked that by keeping a horse comfortable in his stall at all times and warm in winter, much of his energy can be conserved and less grain may be fed. It has been determined recently in experiments by careful and experienced officers, that a five-pound bedding allowance (being an increase of 1⅔ pounds per animal per day) will permit of a reduction of one pound of grain and keep the horse in better condition, both as to flesh and appearance. As a pound of oats is worth slightly more than 2⅓ pounds of bedding, a considerable saving can be effected and beneficial results obtained by such a change.

"(*d*) In regard to the ration for the mule, the present prescribed ration of grain is much less than that for a horse,

and a mule, to be kept in proper shape, must have plenty of roughage (hay). In garrison it is believed that the grain ration can be reduced one pound if extra bedding is allowed, but experience shows that a mule in the field needs more grain than a 9 pound ration, and at least 14 pounds of hay.

"(*e*) The ration for the small horse or pony now used in the Philippine Islands has been the subject of close study by this office ever since the supply of these small horses was authorized. It is believed that the grain ration for this class of horse in garrison should be fully five pounds less than the present grain ration prescribed for horses and should not exceed nine pounds in the field. This belief is substantiated by the records of the forage ration which is prescribed by the Department Commander and now being fed in the Philippine Islands. These records show that six pounds of grain and sixteen pounds of hay and grass have been sufficient to properly maintain this class of horse. The present Director of the Veterinary Corps, Office of The Surgeon General, returned from the Philippine Islands in 1923, and during his tour in the Islands made a close study of this subject, and he states it as his belief and experience that seven pounds of grain in garrison and nine pounds in the field, with fourteen pounds of hay, would be quite sufficient provided authority for variation in the ration to meet local conditions is prescribed.

"The savings that could be effected for the 626 horses of this class now on hand in foreign possessions, based on the cost of the ration in 1926, is about $20,000 per year, and as the larger type of old horses now on hand die or are disposed of, replacements with small horses will occur, and the total number of animals which will be fed this ration will eventually number 1500, at a yearly saving of $45,000 to $50,000.

"(*f*) In fixing a ration for a horse or mule at a very close minimum under average work, great latitude should be allowed commanding officers in the handling of the rations. Savings effected at certain times of the year when the work required of horses and mules is at a minimum, should be used in the periods of the year when the work of the animals would be increased.

"(*g*) In the case of idle animals, the grain component of the ration can be reduced as much as 50 per cent. and applied to feed those animals that need more than the average ration, or else turned in as a saving.

"2. Because of the facts stated above, this office believes:

"(*a*) That a garrison and a field ration could be adopted at considerable saving to Government.

"(*b*) That the amounts of the various components for each class of animal should be:

GARRISON RATION

	Small horses for foreign poss.	Horses under 1150 pounds	Draft horses over 1150 pounds	Mules
Grain	7 lbs.	10 lbs.	12½ lbs.	8 lbs.
Hay	14 "	14 "	15 "	14 "
Straw	5 "	5 "	5 "	5 "

FIELD RATION

Grain	9 lbs.	12 lbs.	14 lbs.	10 lbs.
Hay	14 "	14 "	15 "	14 "

"(*c*) That the various classes of horses and mules in the Army are supposed to and usually do perform the same class of work regardless of what particular branch of the Army they may be assigned to, and that there should be no variation of ration because of assignment. In case less work is required in some particular instance, less grain is needed and should be saved by proper administration.

"(*d*) That the advantages of the proposed change in ration are as follows:

"(1) Effects economy in Regular Supplies of $300,320, as is shown by tabulation in sub-paragraph (*f*) below.

"(2) Requires closer supervision of feeding and animal management by officers and non-commissioned officers, and promotes thrift and economy.

"(3) Provides a better bedding allowance, which has long been needed in the Army.

"(*e*) That the disadvantages in the proposed ration allowance are as follows:

"In certain instances it may work hardship on certain classes of animals which may be over the average weight or which are required to do more than the average amount of work; such as the animals at service schools. It is thought, however, that such instances can be corrected as they arise by proper administrative action.

"(*f*) The British are recognized the world over as superior horsemasters, and the British Manual of Animal Management

states as follows in regard to the amount of feed necessary:

"'The weight of food required by a *hard-working* horse varies from about twenty-four to thirty-two pounds, of which about half is generally corn, and the remainder must make a sufficiently bulky ration for the class of animal. Bulk is an essential for a horse's diet; concentrated foods, no matter how nourishing, will not maintain condition alone, and although an unlimited supply of corn will sensibly diminish the amount of fodder consumed, it cannot take its place, and the digestion will not permit an unlimited corn ration unless a sufficient bulk of fodder accompanies it. This is a notable fact in the practical feeding of horses, and must not be lost sight of. Horses in moderate work required twenty to twenty-four pounds of which ten to twelve pounds should be corn. As a subsistence ration, half this amount of corn and a full allowance of hay should be allowed.'

"'Feeds and Feeding,' by Henry and Morrison, which is a recognized text-book used in practically all Agricultural colleges in the United States and in many other parts of the world, states, 'In computing rations, the following will help to show the proportion of concentrates and roughages for the various classes of animals:

"'Mature idle horses and mature cattle and sheep being maintained at constant weight may be fed chiefly or entirely on roughage, unless it is of poor quality, when some grain must be used.

"'Horses at work should be given 2 to 2.5 pounds of feed (dry roughages and concentrates combined) daily per 100 pounds live weight, the *concentrates* ranging from about 0.7 to 1.4 pounds per 100 pounds live weight for horses at medium to hard work.'

"In addition to the above studies made on authorities on feeds and feeding, this office has consulted with the Bureau of Animal Husbandry, Department of Agriculture, and that office states that the amounts of forage as prescribed in paragraph 2 (*b*), above, for the various classes of animals, are *liberal*.

"3. Attached hereto are the changes in Army Regulations necessary to put these recommendations as to the forage ration into effect, and the comments and concurrences of the Chiefs of interested Branches."

These changes in the ration were concurred in by the Office of the Chief of Field Artillery and were approved by the War Department to take effect July 1, 1927, with the beginning of the New Fiscal Year. It is believed that the new ration is not only economical but that it will be more satisfactory than the old forage ration which has been in effect for many years.

Classification of Our Battle Casualties in the World War

DURING the early winter, a number of articles appeared in newspapers and magazines in which erroneous statements appeared regarding percentages of casualties caused by various weapons in the World War. The following, published in a Washington paper, is an example:

"WAR WEAPONS"

"The Adjutant General of the Army recently has compiled revised statistics regarding battle casualties of American military forces during the World War, from which it is possible to obtain a general idea of the comparative effectiveness of the various weapons used. Of every 100 soldiers wounded or killed, 62 received their wounds from gunshot. The next most effective weapon was gas, which accounted for 33 casualties out of every 100. Only 5 of each 100 wounds were caused by shell, only 11 of each 1000 by air raid, and 7 of each 1000 by bayonet.

"In the entire American army approximately 37,000 deaths occurred in battle and 13,000 from wounds received in action. There were more than 193,000 cases of non-mortal wounds among over 182,000 individuals, of whom 18 were wounded four times, 436 three times, and more than 10,000 twice. More than half the battle casualties occurred in the Meuse-Argonne offensive, and slightly more than one-sixth in the Aisne-Marne offensive.

"Apparently the oldest form of weapon, descended from the swords and spears of antiquity, the bayonet, has become the least effective of all offensive weapons, whereas gunshot continues to be the chief cause of casualties. Gas, the newest of all weapons, seems to be only a bit more than half as effective as gunshot, with shells almost out of the running as far as their danger to the individual is concerned.

"It should be borne in mind that figures indicate what occurred eight years ago. So rapidly does the science of war develop that World War statistics would be of little value in accurately estimating the relative deadliness of war weapons.

"It is significant that Senator Borah yesterday obtained the

consent of the Senate to return the "poison gas treaty" to his committee. Obviously the reason for recommitting the treaty is that it would be rejected if brought to a vote. More than two-thirds of the Senators doubtless feel that the United States would be merely concurring in a hypocritical act if it should ratify a treaty pretending to outlaw the use of gas in warfare. The use of gas by any belligerent would compel its antagonist to retaliate by using the same weapon. An equally important fact to bear in mind, in view of the foregoing figures, is that "poison" gas is less dreadful than guns. The suggestion that the use of gas is inhumane, while the use of shot and shell is humane, is arrant humbug. The Senate does well to shelve the poison gas treaty."

Presumably this editorial is based on the "War Department's Press Release, December 12, 1926, Battle Casualties of the United States Army in the World War," as this release contains tables of casualties and the following paragraph:

"The Tables also show that 195,556 individual members of the American Expeditionary Forces in Europe (including those who died of wounds) were wounded once, 10,535 twice, 436 three times, and 18 four times. Of the grand total of 206,545 wounds, 127,228 (61.60 per cent.) were caused by gunshot, 68,975 (33.40 per cent.) by gas, *9486* (*4.59 per cent.*) *by shell*, 229 (0.11 per cent.) by air raid, and 164 (0.07 per cent.) by bayonet. In the remaining 463 cases (0.23 per cent.) the records do not show the nature of the wounding agency."

By classifying the causes of wounds under several different headings, one of the headings being "shell," an inference is created that all wounds inflicted by shell are included under this heading, and that no wound inflicted by a shell is included under any other heading. To the man in the street and the average newspaper reader, the terms "shell wound" and "artillery wound" are synonymous. The average reader, therefore, concludes that the artillery inflicted only 4.59 per cent. of the wounds in the World War. This is not only wrong, it is actually dangerous. For everyone who does not know the facts, immediately underestimates the necessity for artillery in modern war. He therefore becomes an advocate, active or passive, of an inadequate number of guns, with the consequent result of greater casualties to our troops in war.

In the paragraph quoted from the Press Release there also occurs the heading "Gunshot wounds 61.6 per cent. and under this heading are many wounds inflicted by artillery missiles, but this was not made clear. To this lack of explanation must be attributed the erroneous figures circulated regarding the causes of our World War

casualties. To a lesser extent, some explanation might well have been made regarding the large number of casualties by gas—since most of this was fired by the artillery.

This erroneous interpretation was called to the attention of the War Department and a later release "Battle Casualties of the United States Army in the World War" was given out. This stated in part as follows:

"Since the publication of these figures (Release of December 12, 1926), question has arisen as to their interpretation in determining the comparative effectiveness of the various weapons in modern warfare, and at least one editorial has been noted containing erroneous deductions in this regard.

"Records made by medical officers at the time of treatment were used in formulating the statistics. The figures for "shell" above include only those specifically recorded as such. The records of gunshot wound do not indicate the type of missile and therefore, include wounds from rifle, pistol, grenade, trench mortar, machine gun, or similar fire and also wounds from shell fragments and shrapnel. The figures for gas include gas conveyed by shell.

"From the foregoing it will be seen that the statistics compiled form an exact picture of the showing of the records in connection with wounds, but the type of weapon causing the wound is, in greater part, not specifically shown by the records. For this reason, the statistics cannot be used to gauge accurately the effectiveness of the various weapons used in the World War."

Information as to the weapons causing the casualties is a matter of considerable import and the following is believed to be the most reliable data at present available.

General Herr, in his "L'Artillerie, Ce Qu' Elle A Éte, Ce Qu' Elle Est, Ce Qu' Elle Doit Etre," page 230, shows the per cent. of French casualties for nine selected periods of the World War by shells, rifle balls, and other causes. The average for these nine periods is quite enlightening, being as follows:

Shell	68.1 per cent.
Rifle ball	21.6 per cent.
Other causes (unclassified)	10.3 per cent.

The percentage of casualties caused by artillery wounds varies from a maximum of 78.3 per cent. in Flanders in July, 1917, to a minimum of 51.7 per cent. in Picardy in March, 1918, while the percentage of casualties caused by rifle balls varies from a maximum of 34 per cent. in Picardy in March, 1918, to a minimum of 6.1 per cent. at Verdun in August, 1917. In every period selected except

two, the casualties caused by shell were more than twice as great as those caused by rifle ball. And in every period except three, they were more than twice as great as those caused by rifle ball and all other causes combined.

In comparing these statistics with the American statistics, it must be borne in mind that according to the European practice all projectiles fired by modern artillery are shell. The projectile known to us as shrapnel is generally spoken of abroad as the shrapnel shell.

In American statistics it has been the practice to differentiate the wounds caused by shell and cannon ball from those caused by grape, canister and shrapnel. It is necessary then in order to compare American statistics with European statistics to add these two classes of artillery casualties in order to compare them with the European shell casualties. Performing this addition, we find that the Surgeon General in his Report for 1920, on page 63, reports casualties of the A. E. F. in the World War as follows:

Artillery casualties	34.7 per cent.
Small arm and hand grenade.....	14.6 per cent.
Unclassified	50.7 per cent.

This tabulation refers only to casualties caused by gunshot missiles and does not include other weapons.

Unquestionably, a large proportion of the unclassified casualties were caused by artillery projectiles and would have been reported by the French as shell casualties. It is believed that these statistics quoted by the Surgeon General when viewed in this light will be found to substantiate those announced by General Herr as quoted above. This is as it should be, since both the French and Americans were fighting the same enemy.

Machine Gun Caisson Mount

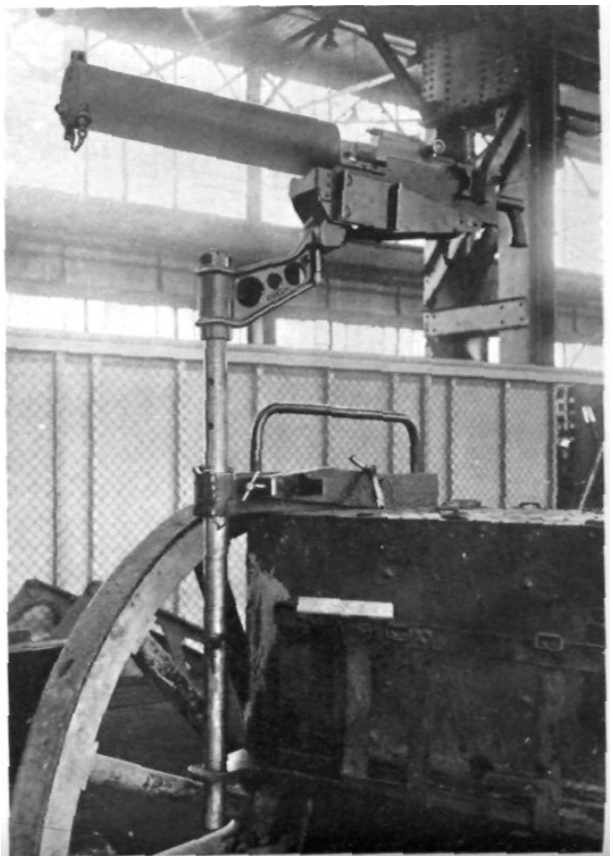
The matter of a suitable machine gun mount for Field Artillery use, although of great importance, has not as yet been satisfactorily solved. Some type of caisson mount is clearly preferable since it is important that field artillery units on the march be provided with immediate protection against low-flying airplanes. A machine gun mounted on a trailer is objectionable due to the increase in the length of column that would be caused thereby. It may eventually be necessary to adopt the trailer mount, but it is not believed this will be done while there remains any likelihood of obtaining a caisson mount of the desired characteristics.

Tests of the machine gun caisson mount illustrated were made by the Field Artillery Board. This mount was supplemented by a

76TH FIELD ARTILLERY FOOTBALL TEAM

REAR ROW, LEFT TO RIGHT: LT.–COL. WM. K. MOORE (REGIMENTAL COMMANDER), SANKEY, PRIDDY, BUTRICK, HALE HEWITT, LIEUT. JONES (TEAM MANAGER.) MIDDLE ROW, LEFT TO RIGHT: FILLINGER, BENNER, PALMER, STOUT, KLINE AND YORK. FRONT ROW, LEFT TO RIGHT: MAHER, BARTON, DALEY, BOOKIL, BICE, BARTOSAVGE AND WILSON, PROIETTI, NOT IN PICTURE.

EXPERIMENTAL CAISSON MOUNT FOR .30 CALIBER MACHINE GUN
FIRING POSITION.



EXPERIMENTAL CAISSON MOUNT FOR .30 CALIBER MACHINE GUN
TRAVELING POSITION.

modified anti-aircraft tripod carried in a boot at the rear of the caisson for use when it is not desired to fire the machine gun from the caisson.

In general, the test of the caisson mount was satisfactory except in one important respect. While a traverse of 360 degrees was available, there was at certain deflections, a considerable amount of dead space due to inability to fire at all elevations.

It was felt that for this purpose the machine gun should be able to fire in any direction and at any elevation, and that the mount illustrated had too limited a field of fire. Furthermore, with this bracket attached to a caisson, it could not readily be transferred to another. If anything should happen to the particular caisson to which the bracket is attached, the machine gun would be without a mount. The caisson being essentially an ammunition carrying vehicle, there can be no assurance that the caisson with the machine gun bracket attached will be available when the unit moves.

It was recommended that effort be made to design a mount having the following features:

1. Can be quickly attached to, or detached from, any caisson.

2. Will allow the machine gun to be fired in any direction and at any elevation by a gunner seated on the caisson.

3. In the traveling position, no element of the machine gun or its mount be more than approximately six feet six inches above the level of the ground.

76th Field Artillery Football Team

Under the able coaching of First Lieutenant Newton W. Jones the football team of the 76th Field Artillery (less 2nd Bn.) completed a very successful season.

Although the team gained twice as much distance as the University of Wyoming Freshmen in the opening game, it did not have the necessary punch at the critical moments, so lost by the score of 16 to 0. Hard work and careful coaching eliminated this weakness, however, and in the four remaining games of the season, one of them a return game with the same team, the 76th Field Artillery rolled up a total score of 74 to their opponents' o.

The scores in the five scheduled games played were:

76th Field Artillery	0	Wyoming University Freshmen	16
76th Field Artillery	6	13th Cavalry	0
76th Field Artillery	39	Union Pacific Shops	0
76th Field Artillery	3	Wyoming University Freshmen	0
76th Field Artillery	26	13th Cavalry	0

The men played the game as sportsmen and elicited much favorable comment from both the spectators and the opposing teams for their strict adherence to clean football.

The regiment not only backed the team financially, to the last man, but displayed its enthusiasm on the side lines in no uncertain manner. It was an ideal combination of a good team and good support.

The outlook for next year is very encouraging as the team has become well known in this vicinity and it will be possible to arrange a better schedule and secure better financial guarantees for supporting this activity which is considered quite an essential one at this post where, as in the old days, we are thrown largely on our own resources for providing amusements for the members of the garrison.