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THE FIRST BATTLE OF ROMAGNE

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REORGANIZATION

WHEN the battle of Montfaucon ended on the evening of September 29, 1918, a reorganization of the American forces for a further advance was started. General Petain, commanding the French armies, to which the American First Army was then attached, recommended to Marshal Foch, Allied Commander-in-Chief, that the American I Corps be relieved from duty with the American Army and, together with the French XXXVIII Corps on its left, be assigned to the French Second Army. He made preliminary arrangements, including the drafting of a General Order, for placing this into effect. This idea was disapproved by Marshal Foch, on the day following, September 30th. The Marshal did not desire to raise the question as to reducing General Pershing's command.

In a letter sent September 30th, General Petain revised his plan. He now directed General Pershing to extend his operations to east of the Meuse River, utilizing the French XVII Corps, already in line holding Verdun, for this purpose. The corps was to be reenforced by two or three American divisions. At the same time General Petain desired that one or two American divisions be sent to reenforce the French XXXVIII Corps. General Pershing agreed in principle to reenforcing the French corps, but raised objections to doing it at this time. On the other hand, he promptly accepted the proposition as to the French XVII Corps, and at once sent for its commander, General Claudel, to place General Petain's instructions into effect.

Regarding operations west of the Meuse River, General Pershing did not wait for the preparations for attacking across the river to be completed. By orders already issued on September 29th and 30th, relief of divisions considered to be exhausted had

been provided for. In an order issued October 1st, the plan of the next battle, to take place on a date to be announced later, was published. It provided that the I Corps should seize the east edge of the Argonne Forest and prevent hostile enfilade fire from this direction; at the same time it was to seize the high ground north of Exermont. The V and III Corps were ordered to seize the ridge around Romagne-sous-Montfaucon extending to Cunel. The artillery was to fire a barrage advancing 100 meters in 4 minutes, but to rest 20 minutes on the south edge of the Bois de Money, Bois de Cunel, and just south of Cunel. The heavy artillery of the Army was to concentrate fire on these same positions until H plus 1 hour; thereafter they were forbidden to fire except on request from corps, inside of a line which was beyond all known battle targets. Mustard gas was ordered to be used freely on enemy positions east of the Meuse; west of that river, non-persistent gas was to be employed according to weather and targets. Artillery information officers (not liaison officers) were ordered to accompany the advancing infantry, with the mission of sending direct to the artillery the latest and most accurate information as to front line conditions. No artillery preparation was ordered. The Air Service was directed to report lines correctly, and avoid confusing enemy lines with our own. On October 2nd, the order to use gas east of the Meuse was revoked.

The front of the attack was approximately 17 kilometers. Due to retirement of French artillery belonging to their General Artillery Reserve and due to reenforcing the French XVII Corps for its expected offensive, the amount of artillery in the attack zone was considerably reduced over what it had been at the beginning of the battle of Montfaucon on September 26th. There was now available.

	Trench mortars	75mm guns	Heavy guns	AAC guns	Total	%
Army Artillery			292	45	337	10.22
I Corps	67	336	219	—	622	18.85
V Corps	48	188	228	—	464	14.07
III Corps	48	264	245	—	557	16.88
Total, attack front	163	788	984	45	1,980	60.02
French XVII Corps	18	180	201	19	418	12.67
Other Corps	52	300	441	20	813	24.64
Reserve	—	48	40	—	88	2.67
Total, First Army	233	1,316	1,666	84	3,299	100.00

Guns indicated under "Other Corps" were in line from east of Verdun to the Moselle River, the old St. Mihiel front, which was still under the First Army. Guns shown in "Reserve" were en route or changing position and not yet ready to enter the line.

For the attack front the number of guns per kilometer of front was:

	Now	Sept. 12	Sept. 26
Trench Mortars	9.6	14.9	13.1
Light guns	46.4	54.6	36.0
Medium and heavy guns	57.9	76.9	47.1
Total (less AAC guns)	113.9	146.4	96.2

It was expected that the enemy would make a strenuous resistance. He was reported by G-2 as follows:

"Indications point to the conclusion that the enemy is holding the Kriemhilde Stellung as his main line of resistance from Brieulles to the Bois de Valoup, southwest of Romagne-sous-Montfaucon. Between this position and our lines he maintains a deep outpost zone. From the Bois de Valoup the enemy line runs south to a point north of Gesnes, where it turns west on the ridges along the Exermont stream to a point west of Exermont. From here it crosses the Aire River, and follows the ridges one kilometer northwest of Apremont, and one kilometer northwest of hill 245."*

On October 3rd, it was ordered that the attack would occur the next day, starting at 5.25 A. M., without any artillery preparation.

The four days of preparation were utilized by the artillery to replace materiel, bring up ammunition and in establishing advance ammunition dumps well forward, with a view to having them available whenever batteries next displaced forward. Circulars of instruction were issued to correct tactical faults which had been noted and to avoid having them occur again.

An important fault had been the improper use of artillery. Some examples were:

assigning a balloon as a target to a battery of 240mm howitzers;

ordering a battery of 8" howitzers to send out a roving gun;

ordering 75mm batteries for long range harassing fire;

a platoon of 75mm guns was ordered to change position forward. It did so; and all its horses were killed, resulting in its mission not being accomplished. The latter could have been better performed without any change of position;

*Hill 245 is shown on map as le Chene Tondu, southwest of Apremont.

a regiment of field artillery was ordered to advance. It did so. While marching it was ordered to fire a barrage immediately;

an artillery brigade commander was ordered to detail four batteries to fire on as many targets, with a particular kind of gas, at a specified rate of fire, and for a specified length of time. The targets varied in nature and in range, and in no case was the fire ordered correct;

one brigade of artillery delivered all its fire in the form of a barrage, regardless of the nature of the target;

rolling barrages were ordered for excessive lengths of time. In one case the barrage was ordered to roll at a constant speed for 9 hours without a stop, instead of being regulated on the progress of the battle;

requests for artillery fire were sometimes sent direct to lower artillery units, avoiding brigade and higher commanders. They were occasionally broadcasted. For example, a general SOS call was sent to all artillery units to fire on Montfaucon. This was answered by a miscellaneous lot of batteries, some of them very distant. A regiment of 155mm howitzers, which had not fired that day, was close to the target, and which was just what was needed, never got the SOS call.

counter-battery fire was frequently ordered, when there was no information as to the location of the targets.

Another frequent fault included indefinite orders, no orders at all, or orders issued so late as to leave insufficient time to compute firing data involved. Requests for artillery fire had been received from troops which failed to state their own location, or the time the message was sent, or asked for the fire desired in terms so general that no one could tell what the target could possibly be.

Some organizations showed a lack of consideration for the needs of others. One corps and several divisions were reported to have refused to assist adjacent units when called upon to do so. One division refused permission to its neighbor to counter-battery in its zone of action. Instructions were given that when requests for fire were received, they should in general be complied with, and if not complied with, report thereof should immediately be made to the next higher artillery commander.

Artillery commanders had their attention invited to the danger and confusion resulting from disregard of traffic regulations. In their haste to advance rapidly, some units had caused traffic jams and considerable ill feeling. While speed in battle is commendable,

it was pointed out that it must be orderly and in accordance with existing regulations, otherwise it might do more harm than good.

Many battery commanders were found to habitually expend, on their reports, all ammunition as fast as received, showing none, or almost none, on hand. Such reports led to improper distribution of new stocks, batteries reporting none on hand receiving a large supply, when in fact some of them did not need it, while other batteries with small supplies but correct reports received less than they otherwise would. Officers were detailed to check daily a group of batteries in the same general vicinity. Upon receipt by telephone of the 8.00 A.M. munition reports, each of these officers was given a memorandum showing the amount of ammunition reported on hand by the batteries he was to inspect. The inspectors proceeded rapidly to the designated locality, and personally checked the ammunition present. When it appeared that grossly erroneous reports had been made, the battery commander was taken aside, shown his false report, and had it explained to him how unjust such action was to other battery commanders who were honestly making correct reports. It was never necessary to take disciplinary measures. In every case battery commanders saw the point, and thereafter made correct reports.

Artillery officers complained of lack of liaison with the infantry. They explained that shortage of wire and the continual changing of position of infantry CPs and infantry units made liaison difficult. At times batteries received requests for fire on certain targets, and just before fire was about to be delivered, the infantry would advance into the area about to be fired on. Instructions were given to determine battle conditions independently of reports from other arms and to use the information officers recently ordered for this purpose. Reconnaissance was not to be limited to occupation of positions, but was to be continuous and active.

Artillery commanders had it impressed on them that they must seek for battle information and not wait for it to arrive. With an independent and complete set of signal communications, numerous OPs, liaison officers and the new information officers, they were in a position to obtain battle information from their own sources and ought not to depend on others to do this for them. Requests

for fire were not to be waited for. Experience indicated that requests for fire generally arrived after the damage had been done, and frequently so long afterwards that it could not be acted on when received. Instructions were given to anticipate needs for fire, so that requests would be unnecessary. Artillery commanders with knowledge of the number and caliber of guns available and of the amount of ammunition on hand were made primarily responsible for providing that fire be delivered in battle constantly, when and where needed.

Efforts were made to have the various headquarters send requests for fire, especially when a great volume was desired, through chiefs of artillery. These artillery generals knew what artillery units could best perform the mission desired and could issue the required instructions. Promiscuous use of batteries, without regard to the artillery chain of command, resulted in waste of ammunition and useless wear of guns and personnel.

Complaints of the infantry as to occasional unsatisfactory artillery support were investigated. Some complaints were found justified; most were not. The most common complaint related to our artillery firing on their own infantry. In some cases the complaint failed to show where the friendly infantry was, or state the caliber of projectiles falling upon them, or give the direction from which they came. Nothing could be done on such reports, but where they were explicit very careful investigation was made. In a few cases batteries were at fault, but in general the firing complained of was enemy fire. For example, one complaint stated that friendly artillery was firing shrapnel at a certain locality, the bursts among our men being due to defective fuzes or fuzes cut short, so as to burst within our lines instead of over. At the particular time none of our batteries within range was firing time fire.

The number and location of ammunition dumps were investigated. It was found that there were too many and that some were inconveniently located. Munition officers were instructed to study this question with care, make careful reconnaissance and relocate dumps as roads were opened or improved or changing tactical conditions required. Improperly located dumps led to

their non use, with a consequent accumulation of ammunition, which exposed to the weather rapidly deteriorated.

Correct route reconnaissance for forward displacements was urged. It was found that incorrect conclusions had been made from actual reconnaissances. As a result, movements that were intended to have been made by echelon were executed otherwise. Entire brigades had been on the road at the same time and unable to fire, as the march schedules, due to poor conditions of roads and terrain, had become impracticable and in turn had made it impossible to carry out the intended firing schedules. Some divisions had ordered forward displacements at night without previous notice and when no proper reconnaissance had been made, resulting in bad marches, with batteries going into position before daylight, with incorrect orientation and resultant inaccurate firing.

To facilitate correct orientation rapidly, the engineers established bench marks at convenient intervals in forward areas. The positions of these BMs were published, giving their correct coordinates and elevations. Their locations were selected close to roads and there were enough of them to make extensive traversing for artillery orienting details unnecessary.

THE BATTLE

The new line of battle was as follows:

				I			I				I		
				I			I				I		
Divisions in line	77	28	1	X	32	3	X	80	4	33	X		
				X			X				X		
Corps	—	I		X	V		X		III		X	Fr. XVII	
				I			I				I		
Divisions in Reserve	82	Fr. 5 Cav		I	91	42	I		None		I		

The French Cavalry Division was posted in the Aire valley, ready to start a pursuit if the battle succeeded in breaking through the enemy's defended position.

The battle started according to schedule. Without any artillery preparation in advance of zero hour, the infantry moved forward, accompanied by a rolling barrage and heavy accompanying artillery fire on the heights of which Romagne-sous-Montfaucon was the center. Notwithstanding the absence of a preparation, the infantry was immediately met by a most severe German barrage which stopped the advance everywhere except at the Montrebeau

woods, where our 1st Division, in spite of terrific losses, swept on and through the woods. It suffered less from artillery fire for a while, protected by a misty, rainy morning, until it cleared up about 10.00 A. M. At this hour the Division had crossed the Exermont ravine, and was strongly holding the north side. It now was unable to advance and the men took shelter wherever they could. The German artillery seemed to fire regular problems, bracketing small groups of men in shell holes. They seldom secured direct hits, but they did cause numerous casualties. This almost unbearable condition continued until a small force of infantry outflanked and captured the high ground of Montrefagne on the east of the Division zone, while at about the same hour, 2.00 P. M., another small party of infantry reached Fléville on the west edge of the division zone of action. Immediately the German artillery fire on the men in shell holes stopped and the line was strengthened and prepared for defense.

The left of the I Corps made only slight progress. Repeated attempts to advance in the front of the V Corps had no appreciable success. Very heavy concentrations of artillery fire were made on Romagne-sous-Montfaucon and vicinity between 1.30 and 3.00 P. M. and again from 4.15 to 5.45 P. M., in an attempt to secure the possession of Romagne to our forces. A great amount of counter-battery fire was undertaken, but the German artillery fire remained strong throughout the day, with no signs of weakening, and the attack against Romagne made no progress.

On the right the III Corps entered the Bois de Fays during the morning. The fighting here was severe but it could not be observed and the early success was not held. Believing that the infantry which had entered the woods had made a considerable advance, the III Corps at 2.45 P. M. requested that all artillery fire be lifted to the north of coordinate 288, by reason of a message stating that our infantry at 1.30 P. M. were about to cross the Romagne-Cunel road and would continue on to the day's objective, which was near the coordinate given. Fire was lifted as requested, although the artillery had at the time a heavy program and numerous targets south of coordinate 288. It subsequently appeared that the infantry failed to advance beyond coordinate 283 and the suspension of artillery fire caused a local

crisis, and the Germans recaptured the Bois de Fays, between 4.00 and 5.00 P. M. About 5.00 P. M. an attack was ordered against the Bois des Ogons. It was delivered by the 319th Infantry, of the 80th Division, at 7.15 P. M., but broke down under terrific artillery and machine gun fire.

To return to the left, the 1st Division was counter-attacked. It reported an attack threatening its left flank at Fléville around 4.00 P. M. A heavy concentration of artillery fire was placed on points around Fléville from 4.15 P. M. to 5.15 P. M., but failed to stop the counter-attack. The Germans swept south and by night had reoccupied both Fléville and Montrefagne. Even with the loss of these two places, the gains of the 1st Division this day were noticeable. The 80th Division on the opposite flank again attacked the Bois de Fays after dark and succeeded in taking it, but this fact was not known to the division headquarters until the next day.

Notwithstanding heavy losses from enemy artillery fire, the Air Service, on October 4th, located no hostile batteries. Based on their reports G-2 of the Army announced that "the enemy had pulled his artillery back behind his second line of defense."

The III Corps suffered seriously from enfilade enemy fire from east of the Meuse. From reports from the OPs and some other sources, they stated that 52 enemy batteries were in action against them and posted north and northeast of Consevoye. The III Corps artillery and one brigade of army artillery were issued 3,500 rounds of non-persistent gas shells and directed to fire them during the ensuing night to neutralize the hostile artillery across the Meuse.

At the end of the day the line reached was the Exermont ravine (incl.)-Gesnes (incl.)-Bois des Ogons (excl.)-Bois de Fays (incl.). Our losses were 5,999 killed and wounded for artillery, infantry and engineers only. Of this loss 2,057 were in the 1st Division infantry. This was the only division which made substantial gains. That evening the First Army ordered a continuation of the attack at 6.30 A. M. the next morning, October 5th, with the same objectives as before.

The battle started at the prescribed time, once more in a dense fog. Although artillery information officers were operating, the

information received on this day was if anything less than before. During the morning the OPs reported absolutely nothing to be seen. Up to noon, the Air Service had nothing to report. Information from the front line and from liaison and information officers was meager, confusing and sometimes contradictory. The following is an example:

11.45 A.M.: The V Corps announced that, from all reports, their 80th Division, at 10.20 A. M., had made no progress. (This division was opposite the Bois de Fays and Bois des Ogons.)

12.50 P.M.: The Air Service reported that a flight at 11.30 A. M. had called for the line, but that no panels or friendly infantry had been located anywhere. They had seen enemy infantry at 07.4-84.1, thence east in trenches to north edge of the Bois de Cunel.

The line given was shown on our maps as a prepared entrenched line defended by wire. It was, on the strength of the above message, taken under fire by the division and corps artillery.

1.50 P.M.: The Army ordered its artillery to fire on the above mentioned hostile infantry, stating that the Corps was unable to handle the situation.

1.55 P.M.: Right brigade, Army Artillery (General E. D. Scott), received the order to fire on the east sector of the above target.

1.57 P.M.: Center brigade, Army Artillery (General W. C. Davis), received the order to fire on the west sector of the above target.

It took some time to send this order down through intermediate commanders to batteries and compute necessary distributions of parts of target and firing data. The fire had just gotten well started when, at

2.33 P.M.: the chief of staff, V Corps, reported by telephone that that corps had two companies of infantry across the Romagne-Cunel road and beyond the reported position of the Germans. He therefore requested that the artillery fire be called off.

Orders were at once sent out to stop all fire on the positions in question for fear of hitting our own infantry.

2.50 P.M.: The V Corps reported that it was certain that they had no infantry near Romagne-sous-Montfaucon, and they now requested that a supposed hostile CP near there be taken under fire.

A battery was duly detailed to fire at the enemy CP.

4.00 P. M.: The V Corps announced that they were now satisfied that the information furnished by the Air Service as to the enemy occupying a line of trenches between Romagne and the Bois de Cunel was correct and they requested that, in addition to fire by division and corps artillery, army artillery be placed on these trenches as directed by the Army at 1.50 P. M.

All artillery available was directed to fire on the reported occupied enemy trenches. Around 4.15 P. M., this fire was falling heavily.

During the time the artillery fire was suspended the enemy made counter-attacks along the boundary between the V and III Corps and succeeded in pushing our line back slightly. On its left, during the afternoon, the V Corps obtained a foothold in the Bois de la Morine and in the Bois du Chene Sec, just beyond Gesnes. Otherwise there was no special change in the positions of the V and III Corps on this day. In the I Corps, the 1st Division had the major success of the day. It cleared the Germans definitely out of Fléville and retook Montrefagne.

Our losses on October 5th totalled 4,569 killed and wounded. In the evening the First Army ordered a temporary discontinuance of the attack, pending a new reorganization, the ground gained to be in the meantime consolidated and defended.

THE GERMANS

On the morning of October 4th, the German front was Apremont (excl.)-Montrebeau woods (incl.)-a line roughly parallel to and 400 meters north of the Exermont-Gesnes road-Bois de Cunel (incl.)-north part Bois des Ogons-Bois de Fays (incl.)-Meuse River at 1½ kilometers southeast of Brieulles. This line was from one to two kilometers south of the line believed by the American Army to be the line of resistance. Only weak outposts, for information and security, were in front. The plan was to hold everywhere, maintaining counter-attack forces to drive out any troops penetrating positions. Nine divisions were in line, with parts of three others.

Before noon of October 3rd, the forward displacement of American artillery had been noted, balloons having observed ten batteries. This was interpreted as forecasting an early attack.

To determine its date, a raid was made that night by the 115th Division, which captured five prisoners from our 32nd Division, who revealed the intent to attack that very next morning. Preparations were made, and the 37th Division was detailed as a counter-attack force and placed north of the Exermont ravine.

When the attack came at 5.30 A. M. on the 4th, the Germans were ready and their barrage came down immediately across vulnerable parts of the front. Our accompanying artillery fire only slightly affected the line of resistance, the bulk of fire falling on the ridge line in rear of positions held. The barrage was quite successful and attacks failed to get by it, except in front of the 5th Guard Division, which was holding the Montrebeau woods. Here our 1st Division broke through and slowly and steadily advanced. The morning being foggy and misty, visibility poor, it was impossible to adjust artillery fire on the Americans and they reached and crossed the Exermont ravine. About 10.00 A. M., visibility had become fair to good and artillery fire was now sufficient to temporarily stop the hostile advance.

In order to reestablish the front in this sector, the 52nd Division, which had just come into line that morning east of the 5th Guard Division, was ordered to relieve the threatening situation, by a counter-attack in a southwest direction, with the right on Exermont, and retake the Montrebeau woods, thereby cutting off the Americans. Before this attack could occur, the Americans seized Montrefagne, and a little later entered Fléville. In view of this situation, the orders to the 52nd Division were countermanded at 2.55 P. M. and the 37th Division was directed to counter-attack and recapture both Fléville and Montrefagne.

This counter-attack had strong artillery support, which started gradually, so as not to attract attention. About 4.00 P. M., as the attack was forming, our artillery concentration fell near Fléville. It was very heavy and correct for range, but not for deflection, as it fell west of Fléville, while the attack was being made from the north. About 5.00 P.M. the 150th Infantry advanced on Montrefagne, while the 151st Infantry attacked Fléville. Both places were back in German hands by 6.00 P. M.

In front of the German center, opposite Romagne-sous-Montfaucon, numerous attempts to advance were stopped by fire action.

Five attacks made during the morning against the Bois de Cunel broke down, three tanks being disabled by machine gun fire. In the Bois des Ogons, the Americans secured a foothold in the south part, and they entered and made some progress in the Bois de Fays. A counter-attack, made about 4.00 P. M. by a battalion of the 458th Infantry, partially recovered this wood, while another battalion of the same regiment, at the same time, cleared the Bois des Ogons. After nightfall, the Americans again entered the Bois de Fays and this time succeeded in occupying and holding it.

During the course of the day, the American artillery fire was not serious on front lines. It was very severe in rear areas. By 8.00 A. M., lines of communication between corps and lower units were out; and the fire was so heavy on Dun-sur-Meuse and other towns in that vicinity as to stop traffic.

On October 5th, the battle started at daylight with intense artillery fire. On the right, the 37th Division had replaced the 5th Guard Division. The 37th was sharply attacked and severe fighting occurred until noon, by which hour the Americans had definitely reoccupied Montrefagne, but the Germans managed to retain Fléville. Further east an attack by the American 80th Division was repulsed by the German 236th Division before 8.00 A. M. Renewed at 11.00 A. M., the German line was dented to a depth of about 300 meters. By artillery fire, the Americans were forced out of the captured ground, leaving 65 prisoners in German hands. A second renewal of the attack at 1.30 P. M. failed completely, with the loss of three tanks shot down on the field. Only minor fighting occurred during the remainder of the afternoon, the battle gradually dying down.

The German artillery suffered slightly from our counter-battery fire. One battery, near Aincreville, lost all its horses; this was the most serious loss noted. Most of the batteries suffered little or no loss. The Germans did not have 52 batteries north and northeast of Consevoye, opposing our III Corps. There were about 77 batteries opposing this corps, 28 of them being east of the Meuse where they could obtain enfilade fire on our lines. Of these 28, only 12 can be considered as anywhere near Consevoye. They were well hidden in woods and apparently at least 10 of them escaped detection or were inaccurately located.

COMMENTS

Field artillery has plenty of practice in reconnaissance and occupation of positions, but few texts, drills, instruction or inspections as to other reconnaissances. The constant association of reconnaissance with occupation of positions seems to have led some artillery officers to believe that, when they had reconnoitered a position for their guns and routes thereto, they could forget the subject of reconnaissance until another displacement arose. It was necessary to order constant battle reconnaissance and to make it clear that targets must be sought for; no waiting for some one else to perform this important duty.

Much ammunition was wasted on counter-battery fire, which was uselessly fired at places where there were no enemy batteries. Every time that a German roving gun fired and was noted by us it was reported as a battery. Sometimes it was reported as several batteries, due to its being observed by more than one OP, balloon, sound ranging station, etc., who gave locations slightly differing from one another. If the same gun fired from several positions, it was liable to be interpreted as an imposing nest of hostile batteries.

Of the 52 German batteries reported by our III Corps, in the same vicinity near Consevoye, thirty positions were observed between the 1st and 3rd of October, that is prior to the battle, and twenty-two on October 4th, the first day of the battle. Almost all of the positions reported were single guns, sent out from a small number of batteries. If the Germans intentionally sent out these guns for the express purpose of misleading us as to the location of their batteries and causing us to fire away from them, they had considerable success. They also misled some S-2s as to the number of batteries that they really had.

Suspending artillery fire every time it seemed possible that any infantry had gone forward, in order to avoid firing on our own men, resulted at times in a general lifting of artillery fire from the enemy's lines at critical moments for him. Counter-attacks were several times delivered on our infantry, when there was no artillery supporting fire, or very little of it, due to requests not to fire. On the 5th we stopped artillery fire for hours over a deep zone. A long time afterwards it became known that the

infantry had at no time been within 5,000 meters of the inside line of artillery fire.

Our preparatory fire on the ridge line held by the enemy at the beginning of the battle, on both sides of Romagne-sous-Montfaucon, to break his hold on that important position, began at H hour. According to texts, the enemy should have been on the ridge in force. Unfortunately, in general, his infantry was in front of it and his batteries behind it. Our fire did cause damage, as some German elements were on the ridge, but his main fighting units escaped this fire.

The effort to surprise the enemy by omitting an artillery preparation before the infantry attack failed because the enemy discovered in advance the date and the hour of the attack and consequently was prepared for it. The absence of the artillery preparation afforded the enemy an opportunity to make such dispositions as he saw fit. They were suitable and effective. This shows the difficulty of securing a tactical surprise for a large operation under modern conditions.

FORECAST OF FIELD ARTILLERY PROGRESS DURING THE NEXT FIVE YEARS

PROGRESS and development in the Field Artillery during the next five years will be a function of money. However, it will be assumed in this discussion that lack of funds will not be an obstacle to progress.

This brief forecast will be discussed under five sub-heads, as follows: Weapons, Ammunition, Transport, Communications and Miscellaneous.

Weapons: Since the War, development under the recommendations of the Caliber Board has been steady, though slow. The recommendations of that Board are almost as appropriate today as they were on the date they were written. We have reached or exceeded the objective (ideal) set by that Board in the following important items: 75mm gun (light field gun) (with some reservation), 105mm howitzer (light field howitzer) (with some reservation), 155mm gun (heavy field gun), 8″ howitzer (heavy field howitzer) and 75mm howitzer (pack).

We have not yet reached the Caliber Board ideal in the following: Accompanying gun, Anti-tank gun, 194mm heavy gun, 155mm howitzer (medium field howitzer) and 9½″ heavy howitzer.

Development on these items must be pushed. All are important but the 155 howitzer is especially so. Its development since the War has attained the Caliber Board's ideal in every characteristic except weight, which must be reduced.

Five years should see the attainment of the ideal in the last two of these items, but it will probably not see the attainment of the ideal in the first two, due to prevalent conflicting ideas with reference thereto.

In the last analysis, development work with all of the above cited weapons cannot be considered completed until a few selected units have been equipped with them for extended service test. Within the next five years, sufficient of these weapons, developed for high-speed towing, should be provided to equip one battalion, Regular Army Field Artillery, armed with each as follows: 75mm

gun (3 batteries), 75mm howitzer, wheeled (2 batteries), 105mm howitzer (3 batteries), 155mm howitzer (2 batteries), 155mm gun (2 batteries) and 8″ howitzer (2 batteries).

While development work under the Caliber Board's recommendations is desired to give us the weapons that will go into production immediately upon the outbreak of our next war, it must be appreciated that we will begin that war with what we have on hand. It, therefore, has become a matter of great concern to develop a cheap method of "modernizing" these weapons so as most effectively to add to their efficiency. This development has been attained for the French and British 75's but it has not yet been attained for the 155mm howitzer (Schneider) and the 155mm (G.P.F.) gun. This development for these latter two weapons should be accomplished within the next five years, and all active units of the Regular Army and National Guard armed with these calibers should be furnished with the "modernized" equipment.

Ammunition:

Caliber	*Shell*	*Shrapnel*
75mm howitzer	Standardized	Standardized
75mm gun	Under test	Approaching standardization
105mm howitzer	Under test	Standardized
155mm howitzer	Under active development	Standardized
155mm gun	Under active development	No requirement
8″ howitzer	About ready for test	No requirement
9½″ howitzer	Not yet undertaken	No requirement
194mm gun	Not yet undertaken	No requirement

It is doubtful if this development can be completed within the next five years, but much progress thereon should be made.

Summarizing—*Weapons and Ammunition*—(Ordnance):

Five years should see:

a. Development completed and a battalion of Regular Field Artillery armed with each of the following *new* weapons: 75mm gun, 75mm howitzer, wheeled, 105mm howitzer, 155mm howitzer, 155mm gun and 8″ howitzer.

b. Modernized high speed carriages for all active Field Artillery units of the Regular Army and National Guard, as follows: 75mm guns, French and British, 155mm howitzers, Schneider and 155mm guns, G.P.F.

c. A pilot heavy 9½-inch howitzer developed to meet the Caliber Board's ideal.

d. Standardized ammunition for all of the weapons listed in paragraph a above.

Transport: The Field Artillery is actively engaged in determining to what extent commercial and special automotive vehicles can replace its animal transport in Division Artillery, with every prospect that within the next five years, if funds are made available, the horse will be entirely replaced in every Field Artillery function except possibly reconnaissance, where it may prove advantageous to retain him even to the extent of providing motor transport for a few animals per battalion or regiment.

It is essential that the Field Artillery avail itself of the superior status of the automotive industry in this country. Recent tests indicate that the horse, as a means of field artillery transport, must go, and that the arm is now faced with the task of radically modifying its tactical and strategical doctrines due to this revolutionary change.

The prospects are that the greatest threat against the efficiency of a motorized field artillery will be restricted appropriations. Since the advent of field guns, the degree of efficiency of animal transport therefor has remained unchanged. The degree of efficiency of motor transport changes yearly or oftener, and to satisfactorily keep abreast of the progress of the industry at an expense that will not be excessive will be, and will constantly remain, the serious problem of motorization.

As an indication that this has been the case since the War, the 39 batteries of field artillery that are already, and for some years past have been motorized, have only 32.1% of their authorized T/O allowance of automotive vehicles. The tendency is that money for replacements, spare parts, tools, gas and oil, is always likely to be seriously restricted.

Under present plans, if money becomes available, the Field

Artillery will be reorganized, and one-half the light artillery of each Division will be motorized.

Summarizing—*Transport:*

The next five years should see the complete motorization of all National Guard Field Artillery and the complete motorization of all Regular Army Field Artillery, except one-half the light artillery of each Division.

Communications: This matter is of vital importance to the Field Artillery and is receiving constant study and development in cooperation with the Signal Corps.

Radio, telephone and signal lamp equipment are all undergoing improvement.

Present trend is toward an increasing use of radio.

Sound and flash ranging equipment is undergoing rapid development.

Means of electrical transmission of firing data from OP to guns are being tested.

Summary—*Communications:*

It is hoped that within the next five years practical solutions will have been reached in:

a. Radio communication as a thoroughly reliable primary means for control of units on the march, for liaison with supported troops, and for conduct of fire from forward OP's.
b. Sound ranging to ranges of 25,000 yards within reasonable accuracy for counter-battery purposes.
c. Electrical transmission of firing data from OP to guns, with rugged equipment, light and easy to maintain.

Miscellaneous:

a. *Field Artillery School.*

1. *Building Program*—It is expected that the next five years will see the completion of the plans of this office for construction at the Field Artillery School at Fort Sill, Oklahoma. During the last year, some barracks and quarters—the first construction of a permanent nature at this post since before the War—were started. A comprehensive plan has been drawn up, the completion of which will give this school an efficient plant, comparable

to those of the other arms. Further construction, in accordance with this plan, is dependent on funds.

2. *Instruction*—The value of the Field Artillery School as the source of field artillery doctrine—both technical and tactical—is dependent upon the yearly allotment of students. This allotment should be such as to give every officer who comes into the arm the Battery Officers' Course and the Advance Course. If the present quota of students is continued, the result will be either that many officers will have no course at all or that the Advance Course will be abandoned. The Advance Course is of incomparable value. It is our tactical laboratory. Its loss would very seriously impair development along this line and would especially handicap the field artillery in experimenting with and formulating the tactical doctrine of motorized artillery. In view of the great amount of detached service performed by officers of this arm, no known method of keeping them efficiently abreast of their profession is so productive of good results as a year's intensive practical instruction at the Field Artillery School under selected instructors of superior qualifications, and certainly no method of indoctrinating the arm can possibly be so effective.

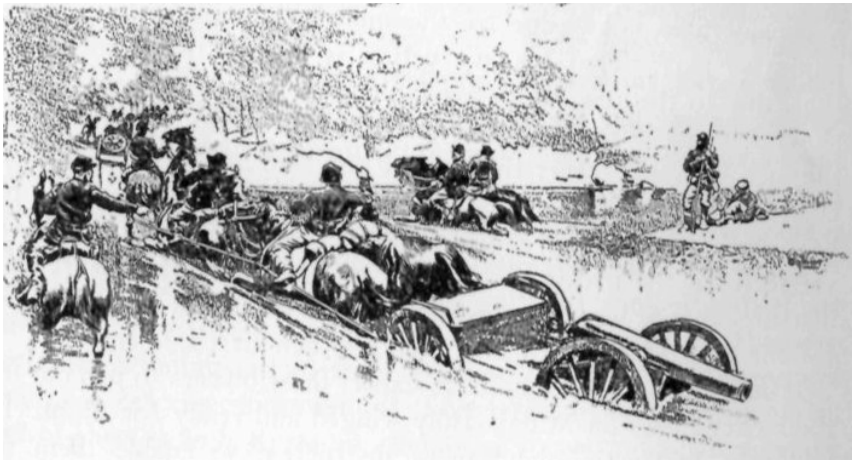
It is hoped that the next five years will see stability, rather than demoralizing uncertainty, in our Army school policy, and that the plan will involve two courses at the Field Artillery School, which will be required of all officers entering the arm.

b. *Antiaircraft Defense*—A continuing study is being made of the best means of combating aerial attacks against Field Artillery troops, both on the march and in position. Our efforts will be to concentrate on the former—defense of troops on the march. The issue of Browning automatic rifles has indicated the probable trend of this effort—a maximum number of rapid fire weapons per battery. This lies in the development of a lighter and more efficient automatic rifle, which is not beyond the realm of possibility, and should prove the chief reliance of Field Artillery troops on the march for their protection against aircraft. In general, the weapons and methods used by Infantry should suffice for the Field Artillery.

c. *Field Artillery R.O.T.C.*—The Field Artillery R.O.T.C. has now reached such annual quota of graduates as to guarantee,

in due course of time, fulfilment of the Field Artillery objective for Reserve officers. The problem is to keep the output up to where it is at the present time. This can be done provided the War Dpartment requires a little more restriction on the Advance Courses of arms that are over-producing and a little greater liberality with the Field Artillery Advance Courses; also that continued effort be made looking to the ultimate withdrawal of competing units in certain selected institutions.

If this matter is properly handled, the next five years should see the needs of this arm for Reserve officers adequately met by the annual increment of graduates from Field Artillery units of the R.O.T.C.



SUGGESTED BATTALION STAFF REORGANIZATION

BY MAJOR S. LEROY IRWIN, FIELD ARTILLERY

THERE has long existed in the Field Artillery a theory that all artillery officers should have a thorough and comprehensive knowledge of all angles of their profession. and a worthy thought it has proven to be for the regular officer. Our constant and most important job is instruction, and to properly fulfill that mission, one must have more than a little exact knowledge of all that goes to make up efficient field artillery. As a result, the level of military knowledge in the Field Artillery is a high one, and, by a comprehensive and thorough school system, may be raised to new levels, if economy does not unduly hamper it.

In a like manner, the field artilleryman in the civilian components is receiving instruction that is enabling him to acquire, according to the time available to him and the energy he displays, a considerable knowledge of the multifarious activities of the game we play. That his instruction is largely theoretical, and that, due to the few hours available, it is somewhat scanty and slow, does not lessen the importance of such work. It means that the men who will officer the bulk of our field artillery in a major emergency are learning what it is all about; what their job is to be; and, in some measure, how to do it. On M day, they will have yet to learn the major part of the application of the theoretical instruction they have received. Many will command actual troops for the first time. A few may even see their first soldier.

It certainly is unreasonable to expect these officers to pop out of their chrysalises on M day, fully winged and ready for flight. It will take instruction, and more instruction to enable them to play their part in the highly technical and exact work essential to adequate performance of field artillery in modern warfare. Many of them may enter battle yet unprepared, and the battle field is a rather advanced school for an unprepared pupil, who is fully aware that a technical error may cost the lives of many men.

There can be but one answer to this problem—specialization. A healthy specialization, however, based on a working knowledge of the part the specialty is to play in the work as a whole.

Our present system of peace time instruction is certainly designed to furnish the general knowledge that should serve as the groundwork for specialization. Our instruction after M day, if competent instructors are available, and adequate preparation for such instruction is made, must do the rest. Careful selection for special jobs, of individuals whose previous training or natural aptitude fits them for such positions will go far towards making the task easier. Finally, the organization of our artillery units must be such as to permit of the maximum use of competently trained men in positions, which not only ensure the adequate performance of the work required, but also enable these trained individuals to carry out the instruction of the subdivisions they may head.

The following list, while far from complete, is at least a group of activities essential to the success of the operation of field artillery, and admittedly those requiring a high degree of specialized training:

Communication, Gunnery, Fire direction, Survey, Liaison and Reconnaissance.

All artillery officers who are thoroughly trained should have a good working knowledge in all of the above, but few are gifted enough to be expert in all of them. To expect officers of the civilian components, however competent their peace time instruction, however earnestly they may have applied themselves, to have a knowledge of the above subjects sufficient to enable them to perform those duties satisfactorily in battle is to show oneself an incorrigible optimist. True, after M day, time may be available to perfect individuals in some of these subjects, but to hope to turn out officers, in the limited time available, well instructed in all of them is as hopeless an attempt as to neutralize an infantry division with a battery.

That fact admitted (though it is realized that a great many readers will not), why not at least give it consideration, and see what can be done about it.

Since the battalion of field artillery is the combat unit, and is, in fact if not on paper, the training unit, let us consider the organization of a battalion of division light artillery from the standpoint of its training and operation in a battle with a view to securing

maximum efficiency under the conditions discussed in the preceding portion of this article.

The present organization of the battalion calls for a staff of nine officers to assist the battalion commander in his duties. This staff is organized generally along the lines of a general staff, with sections corresponding to G-1, G-2, G-3 and G-4, plus a communication officer, a reconnaissance officer, and two liaison officers. In addition there are the three firing battery commanders, each with his three lieutenants, and the combat train commander with his two lieutenants. The battalion is satisfactorily officered, and should be able to handle its affairs with little outside assistance.

The present assignment of duties to these officers is too well known to require repetition here. The duties are essential, and must be performed by some one if the battalion is to function, and this article does not presume to contest this, but an attempt will be made to show that a reassignment of those duties will result in more rapid and efficient training for active service, and more efficient operation in war, under the conditions we must face in a major emergency.

In the performance of active duty by an artillery battalion, there are some definite missions that must be performed by the battalion commander or his representatives, which may be generally stated as follows:

Reconnaissance, involving the selection of positions for the elements of the battalion for the accomplishment of their designated mission, and the establishment of the battalion in those positions, and including, when necessary advance or rear reconnaissance.

Communication, involving the establishment and maintenance of the necessary communication system.

Fire direction, including the preparation of plans of support and their distribution to those concerned; the technical operations incident to control and proper delivery of the fire of the battalion; and the exercise of tactical control of fire power during battle.

Liaison, including the maintenance of liaison with the commander of the supported unit, the front line battalions of that unit, *and an independent determination of the situation of the*

supported unit, where the other liaison agencies fail to furnish that information.

When a battalion occupies position, there is a sequence of events which follow a general line of procedure, the time involved being dependent on the situation, the terrain, and, to a large degree, to the efficiency of the personnel involved. These events, briefly, are as follows:

The battalion commander, having learned his mission and position, moves to that position on reconnaissance, simultaneously, or as soon as possible, sending for his subordinate commanders and their reconnaissance parties, and starting the movement of the firing batteries toward the position so that no time will be lost in getting into position.

On reaching the position, the battalion commander promptly selects his observation, at the same time giving his staff sufficient information to enable them to start, or to make plans for:

Organization of observation posts, Survey, Liaison, Communication, and Preparation for fire direction.

Coordination of plan of support with that of the supported unit. This will require the battalion commander to indicate his observation post, command post, general locations for batteries, and such other information as he has gained by this time. On receipt of this information, the appropriate staff officers start the operations, including:

Organization of the battalion observation post or posts. (Lateral observer for locations by intersection or for high burst adjustments.)

Location of base and reference points.

Plan for survey in the battalion, and start of that survey.

Location of targets, and details of recording them and assigning them to batteries arranged.

Start of necessary fire direction charts.

S-2 and S-3 situation maps started.

Arrangements made for conference with supported commander.

Liaison officers given the necessary instructions regarding duties, base and reference points, communications, etc., prior to joining their assigned supported units.

Formulation of order, for the battalion commander.

On his return from reconnaissance for battery positions when made, or at this time when such reconnaissance is unnecessary, the battalion commander decides on missions for his batteries, registration, and in general formulates his order, assisted by his staff.

On the arrival of battery commanders, he issues his battalion order, assigning missions and positions to batteries, and such other instructions as are pertinent. At the same time, the reconnaissance officers of the batteries should have explained to them the plan of survey, what assistance they will receive from battalion, and what information they will secure, either by survey or by firing.

As early as the situation permits, the battalion commander or his representative will confer with the commander of the supported unit regarding the part the artillery is to play in the action, and, as soon as this information is secured, starts the preparation of the plan for artillery fires, in form for transmission to batteries for their preparation of data.

As data from registration or from fire on targets is secured from batteries, these, together with data secured from survey are incorporated on the battalion fire direction chart, and record.

Battalion observers, whenever possible, check the fires of batteries to make sure that missions are effectively handled, and that scheduled fires are delivered where and when ordered.

Calls from liaison officers or from observers are answered in accordance with the decision of the battalion commander.

Battalion observers search for appropriate targets, and when located, take the necessary steps to bring fire on them as directed by the battalion commander.

Ammunition expenditures are checked, and resupply made when necessary.

When called for by the situation, forward observing parties are sent out.

The necessary preparations are made for advance or rear reconnaissance, which is started as called for by the situation.

Preparations are made, and warning orders issued for such displacements as may be called for.

That's the story, in a nutshell, and it must be admitted that it doesn't even sound easy, nor is it. A proper performance of the above duties, in open warfare, will require the maximum effort of all concerned if the artillery is to be deliver effective support.

Nor is the above the whole story, complicated as it may seem.

The experience of the World War, and recent investigations at the Field Artillery School have clearly demonstrated the superiority of the "K" transfer over weather corrections as the means of securing effective fire on invisible areas. However a "K" transfer is no more accurate than the survey on which it is based, or the location of the target that has been secured. In our country, maps suitable for artillery are few and far between, and unless our potential enemy will be so obliging as to wage his war around Gettysburg, we are going to be largely dependent on air photographs for our firing maps.

The above means that not only must our battalion survey be rapid and accurate, but also that some officers in the battalion must be able to rapidly secure target locations and firing data from air photographs, which is admittedly a difficult technical operation and one requiring skill and experience.

In the excellent articles of Colonel Lanza in recent issues of this JOURNAL, the paucity of visible targets in modern warfare was clearly shown, and it is running in the face of reason to assume that in our next war we will see any considerable number of suitable objectives for artillery fire scampering around in the open for the edification of our delighted observers.

No! We might as well admit that we will have to search out the enemy in his hiding place, and except for tanks, prepare for transfers of fire rather than for bracket adjustments on the machine gun by the big, lone tree.

That being the case, survey assumes a larger importance than it has heretofore received, and that might as well be conceded.

Modern radio, and by modern radio we must think of sets still in the minds of radio engineers, will play a large part in our control of fire. It furnishes a means of communication whose rapidity and accuracy have been amply demonstrated, and its reliability is increasing steadily. It will permit the use of forward observers, who, with small portable sets, can push far enough

forward to find out what is really troubling the infantry, and can, with the means at hand, and with methods of fire now in current practice at Fort Sill, bring rapid and accurate fire on the offending enemy. Likewise, liaison officers can get their information and their calls for fire back to their battalions in ten minutes instead of the two to ten hours (if at all) formerly required, and can act as observers themselves when other means fail.

All of these things have been done with the obsolescent SCR 161 we now have, so why believe better sets will not achieve as much or more if competently used.

With these advantages the Field Artillery must feature liaison. It must undertake and guarantee support, even if the infantry itself loses touch and cannot itself say where it is and what is happening. We *must* employ our facilities to the utmost to learn the situation in our front, and exploit those facilities for the benefit of our front line infantry who, heaven knows, have sometimes had reason to question our prowess as their best friend and supporter.

In other words, let us concede that we can do more in the way of liaison, and that we must do it.

In fire direction itself, the field is open to unlimited advance. Where formerly a staff officer at battalion spent fruitless tens of minutes attempting to point out a target to a battery commander at some remote OP, now, on the suggestion of a gunnery man with common sense, the staff officer takes over a battery and shoots it himself. The man who sees a target can adjust a battery, if one is available, far more rapidly than he can designate it to some one over a telephone, and why bother to waste time when war demands speed.

Schedules of fire and their accompanying overlays involve a technique of no mean difficulty for battalion, where they must be turned out in time to permit battery commanders to figure their data, and in such form that the long suffering BC will have included everything he must know in handy and understandable form. Too long have we made assumptions in this respect, as in our command post exercises, where battalion schedules reach battery fifteen minutes before the first concentration is due on the way, and so confused, incomplete and inaccurate as to practically guarantee ineffective fire.

The cure for this is obvious. Don't make too many assumptions, and carry out plans of support to completion. However, in a national emergency it is going to be hard enough to train battery commanders who can translate into fire a proper schedule without considering the development of large numbers of battalion staff officers who can make the original overlays and schedules.

So much for the problem. The preceding discussion should at least show the difficulties to be met, and some idea of methods that are being and surely will be developed to meet them.

Now let us see what organization in a battalion can best cope with the situation. The present staff is organized as follows:

Battalion Commander	Lieut. Colonel	In command
Executive	Major	Second in command
S-1	Lieutenant	Personnel
S-2	Lieutenant	Intelligence
S-3	Captain	Plans and training
S-4	Lieutenant	Supply and munitions
Communication Officer	Captain	Communication and commands headquarters battery
Reconnaissance Officer	Lieutenant	Reconnaissance and survey
Liaison Officers (2)	Lieutenants	Liaison

An analysis of these assignments and duties would indicate that some rearrangement is possible, chiefly with a view of freeing some of the staff for the three activities which the previous discussion attempts to prove to be in need of additional attention, namely: survey; liaison and fire direction.

Let us now consider the present staff, as listed above:

Of the above, S-1, and S-4 in his capacity of supply, function as such only when the battalion is operating independently, which is unusual. As munitions officer, S-4 cooperates with the combat train commander who actually secures and distributes the ammunition. It is believed that the combat train commander could easily handle all these duties. His combat train is usually situated on the avenues of supply, or, in stable situations, at the rear echelon of the battalion. He has two lieutenants to assist him. He therefore should be able to handle all of S-4's functions with little difficulty. S-1's duties are so few as to be almost negligible, and, as a matter of fact, he is usually looked on as available for any work that may be required of him.

In units as subordinate as a battalion, the intelligence officer's duties are much fewer than is the case in the general staff. S-2 is required to see that information gained is transmitted promptly

to higher headquarters, but is not expected to attempt to "collect, collate and disseminate" intelligence information to any great degree. He is principally concerned in observation of the zone of action of his unit, in posting the situation map, and in assisting the battalion commander in fire direction. It is believed that S-3, if his other duties were somewhat lightened, could take over the duties of S-2, releasing that officer for other work, as will be discussed later.

At present the reconnaissance officer is expected to make such advance or rear reconnaissances as may be necessary, and in addition, assumes the heavy duty of survey officer. This last involves the expenditure of much time and labor, and in addition, includes the necessary plotting on the battalion fire direction chart. Thus the reconnaissance officer has two widely conflicting duties, of which the job of handling the survey is more than enough for any one man. Experience has shown that not every officer has the ability to conduct surveys accurately and rapidly, as must be done in the battalion, nor can all plot with the accuracy essential to firing charts. In short, it is a specialized job, and as such needs a specialist. Why not assign one to it?

At present, there are two liaison officers on the battalion staff. In the rather unusual circumstance where a battalion supports a regiment of infantry which is operating with its three battalions abreast, another liaison officer must be selected from the staff and a liaison section improvised from the detail. This, however, is an exceptional case, little likely to arise, so that the present assignment is satisfactory, as far as liaison is concerned. However, there is another consideration. Liaison officers, it is contemplated, should be trained as expert forward observers, in order that they may be able, when required by the situation, to observe or conduct the fire of batteries on targets they have located, and cannot effectively designate. Since, in many situations, the battalion will be employing only one of its liaison officers, would it not be advantageous to use the other in forward observation? In fact, would it not be even more advantageous to increase the number of liaison officers by one, and thus have a pool of specially trained observers who could function equally well as liaison officers or forward observers? In this manner, there would be sufficient trained personnel for replacements, for

additional liaison officers where needed, and for the forward observers so essential to the present schemes of fire direction.

Modern methods of fire direction require that, at the battalion observation post there be at least one officer who can, with facility, conduct the fire of batteries on targets that cannot be designated by other means. At present, there are innumerable officers who can do this, but in war time, when our units are greatly expanded, it is doubtful if battalions have available many officers with this qualification. Probably it will be difficult to secure even one, but it should be possible. This officer, in preliminary training, will logically be the gunnery instructor of the battalion. In war, he will be the right hand man of the battalion commander in the phases of fire direction including observation of fire and target designation. It is believed that a need for such an officer on the staff exists, and that such a position should be included in the battalion commander's immediate staff. The designation of this officer would logically be the "Gunnery Officer," though by any other title he would function just as well, if his duties are as enumerated above.

Based on the above, the following is suggested as a new arrangement of the battalion staff, with the new duties assigned to each officer:

Battalion Commander	Lieut. Colonel	Commanding battalion
Executive	Major	Second in command
S-2 and S-3 (combined)	Captain	Plans and training and intelligence
Gunnery Officer	Lieutenant	Assists Battalion Commander in fire direction; assists S-2 and S-3
Survey Officer	Lieutenant	In charge of survey section; performs survey; keeps firing chart; reconnaissance.
Asst. Survey Officer	Lieutenant	Assists Survey Officer; performs survey; reconnaissance
Liaison Officer 1	Lieutenant	In charge of observer and liaison section; forward observer or liaison officer
Liaison Officer 2	Lieutenant	Forward observer or liaison officer
Liaison Officer 3	Lieutenant	Forward observer or liaison officer
Communication Officer	Captain	Commands headquarters battery; In charge of communication section; establishes and maintains communication
Combat Train Commander*	Captain	Commands combat train; performs duties of S-1 and S-4

*Not designated as a member of the battalion staff.

Of the above, certain are key men in the battalion, both during the training period, and during active operations. They can be furnished to newly mobilized battalions, either from the regular army or from specially qualified reserve officers who receive additional instruction after "M" day. These are:

The Communication Officer, who should be capable of taking over the instruction of all communication personnel in the battalion, as well as running battalion communication during active operations.

The Survey Officers, who should be selected for their ability in survey and plotting, and carefully trained in artillery plotting, and in the preparation of overlays. In addition, one, at least, should be trained in reconnaissance.

Liaison Officer 1, who should be trained in liaison, forward observation, and in infantry formations and tactics. He should be capable of instructing liaison personnel, and in forward observation.

The Gunnery Officer, who should be a regular army officer, a graduate of the Field Artillery School, and competent to serve as gunnery instructor for the battalion. He should supervise the preparation of firing charts, schedules and overlays, and is the battalion commander's chief assistant in fire direction.

This organization provides for training during the period prior to operations, and, in the field puts specially trained men where they can do the most good.

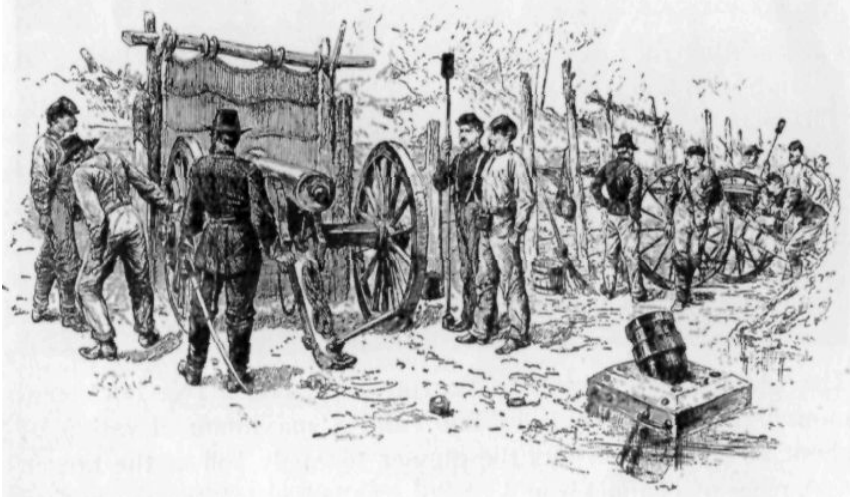
The presence of two survey officers enables one to stay on the job of plotting, while one can go on forward or rear reconnaissance. In addition, with a properly trained group from the detail, better survey should be carried out, and less burden placed on the battery reconnaissance officers.

The three liaison officers provide a pool from which reliefs may be made, or forward observers selected. Liaison officer No. 1 should be in charge, and should serve as instructor of personnel when time permits.

The gunnery officer provides a trained expert whose services as an instructor prior to active operations will be invaluable, and who can, in the field, conduct the fire of the whole battalion when necessary. Thus, even if the battalion is compelled to take the

field before its officers are fully competent in gunnery, it should be able to deliver accurate fire, and, in inactive periods, perfect the instruction of its personnel.

Thus we have resorted to a form of specialization, but not, it is believed, to a harmful degree. The presence of these trained men will compensate for many deficiencies in training in the remainder of the officer personnel, and allow of reasonable efficiency in the battalion's performance. As field service progresses, experience, and the added instruction that can be given should bring the instruction of the other officers to a satisfactory level, and permit of reliefs and replacements for these key men.



MACHINE GUN MOUNT FOR ANTI-AIRCRAFT FIRING

BY CAPTAIN WENDALL L. BEVANS, 83RD FIELD ARTILLERY

THE matter of a suitable machine gun mount for anti-aircraft firing from a caisson has been a matter of experiment for some time. By using the "All Purpose Cradle" (Negrotto) and M.G. Tripod M-1917, it is believed the matter can be solved. Such a caisson mount has been prepared and installed on a caisson in Battery "C", 1st Battalion, 83rd Field Artillery, at Fort Benning, Georgia, and is shown in the illustration below. The "All Purpose

Cradle" (Negrotto) permits a free horizontal motion through a circle of 360° and a maximum elevation of about 90°, which permits the gunner to easily follow the target.

A piece of channel iron 4″ × 36″ was bolted to the caisson trail at right angles to it and 16″ in front of the foot board, two slots were cut near the ends of this iron and one in the trail near the lunette end to receive the shoes on the end of the tripod legs. A large turnbuckle hooked to a U shaped iron on the tripod holds the tripod and gun securely to the trail. The two bolts fastening

the channel iron to the trail can be equipped with large wing nuts and clamps so that it can be quickly removed and placed on another caisson. All caissons would have to have two holes bored in the trail to receive these bolts, one for the turnbuckle and a slot for the shoe on tripod leg. A "T" base bolted to the trail might well be used and thus provide a base for ground firing although the added weight might be unwarranted. If the channel iron was bolted to the lunette end of the trail it might interfere less with the operation of the fuze setter.

The dead space is determined by the height of the wheel drivers and the caisson hand rails. When the carriage halts it is necessary that the limber wheels be not cramped very much to the right or left. If this occurs it may injure the gunner and will limit the space in which he can operate the gun. This is prevented by sliding a 2″ pipe, mounted behind the limber seats, between two spokes and thus locking the wheels of the limber.

Several weeks of road test have proven the mount satisfactory from the standpoint of draft. The mount can be removed and placed on the ground in 12 seconds and replaced on the carriage in 15 seconds.

The caisson door can be opened and the fuze setter operated with the tripod and gun mounted on the trail. With the gun and tripod removed the channel iron interferes but little with the functioning of the gun squad.

Two gunners are required to fire the gun, one on each side of the trail, and on occasion must pass the gun to one another across the trail while firing. A small amount of gun drill perfects the operation so there is no interruption of fire.

Experimental firing was conducted in December, 1931, under the direct supervision of Captain S. H. Negrotto, Infantry Board, firing at a 15 foot sleeve towed-target, with the following conclusions:

EXTRACT

> "It is believed that further test will confirm the superiority of the ground tripod and "All Purpose Cradle" (Negrotto) over the other two methods of mounting (A.A.M.G. Tripod M-1918) and improved Post Mount."

A BRIEF HISTORY OF FORT SILL AND THE FIELD ARTILLERY SCHOOL

IN VIEW of the extensive construction program being carried out at this time, it is believed that the main historical events in connection with Fort Sill and the Field Artillery School will be of particular interest to the readers of THE FIELD ARTILLERY JOURNAL.

The present location of the Old Post was selected by Colonel B. H. Grierson, 10th Cavalry, in June, 1868, and a camp established there under the name of Camp Wichita. Four troops of the 10th Cavalry were selected to occupy it and immediately began the erection of quarters. The camp was selected by General Sheridan as a base of operations against Cheyennes and Kiowas in the winter of 1868-1869. From then on it played a prominent part in the Indian troubles in that section of the country.

In January, 1869, General Sheridan moved his headquarters from Fort Cobb to Camp Wichita. On August 1, 1869, he changed the name of Camp Wichita to Fort Sill in honor of General Joshua W. Sill, who had been a classmate of his at West Point and had commanded a brigade of his division during the Civil War. General Sill was killed in action at Stones River, Tennessee, December 31, 1862.

The construction of what is now called the Old Post of Fort Sill will always be marked as one of the outstanding features of the wilderness service of the frontier troops. Wooden stockades were first erected of rough logs hewn by the soldiers from the heavy timber along Medicine Bluff Creek. Later, with pick and shovel, while companies sat with loaded rifles on lookout, the stone which comprises most of the construction material of the present Old Post buildings was hacked from a neighboring outcropping of limestone now known as "Quarry Hill." This construction, carried on without any appropriations from Congress, was well done and of great benefit to Fort Sill of later days. Of the seventy-one permanent buildings in the Old Post area, thirty-eight were constructed during 1870 and, with little expended since on repair or remodeling, are in use today.

The famous blockhouse on Signal Mountain, which has been

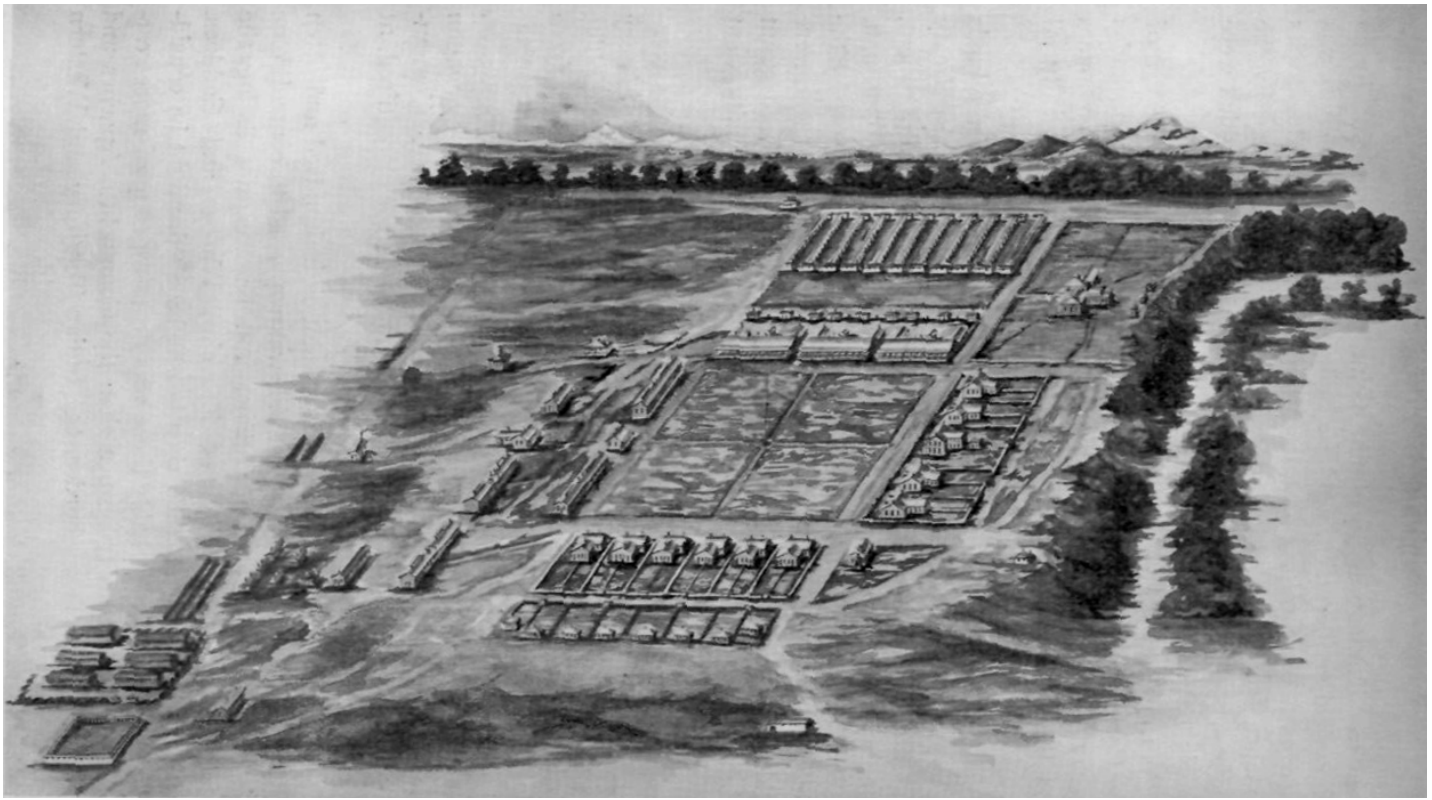
used to advantage as an aiming point, or reference point, by so many field artillerymen, was also built in 1870. Originally it was used as a meteorological station, but was abandoned due to its distance from the Post. Later, it was used as a lookout by the Indians, smoke signals being sent up from this point, which were visible for many miles.

As the Post became more secure from the ever watchful eye of the Comanche or Kiowa, it was found that the old log stockades were no longer needed. The logs were used to construct quarters for the non-commissioned officers, and, as such, practically all are in use today.

The land originally assigned to the Post was part of the lands reserved for the Kiowas, Comanches and Apaches by the Treaty of October 21, 1867. With the assent of the Interior Department, the reservation was formally surveyed by Lieutenant Orleman, 10th Cavalry, in February, 1871, and was declared a Fort by the President on October 7, 1871. Further additional tracts were added in later years. These were reduced afterward to grant right-of-way strips to the two railroads which eventually went through Fort Sill to the Red River.

The early days of the Post were fraught with hardships comparable to most of the outposts which have gone down in history as examples of the hardiness and tenacity of the pioneer. The little garrison, surrounded by Indians, was 329 miles away from the nearest railroad point, Fort Harkness, Kansas. Communication with this point was subject to interruption of high water, bad weather and Indian attacks. Mails were received by wagon route from old Boggy Depot, over the Indian Territory. Communications between the Post and the War Department required, at the minimum, ten days or two weeks.

The small garrison, never larger than eight hundred and often reduced to less than three hundred, was supposed to control some six or eight thousand Comanches and Kiowas, not listing the affiliated bands of Wichitas, Keechies, Wacoes and Caddoes, which, if any Indian could then be so classified, might be considered "friendly." Probably there was never a group of more restless and dangerous tribesmen than the Comanches, Apaches and Kiowas of the Texas border, the Indian Territory and Western



BIRD'S-EYE VIEW OF FORT SILL, I. T., QR. MR. GEN'S OFFICE, RECEIVED DEC. 12, 1877

Kansas. These Indians committed many depredations against the settlers and wagon trains along the Red River and in to Northern Texas.

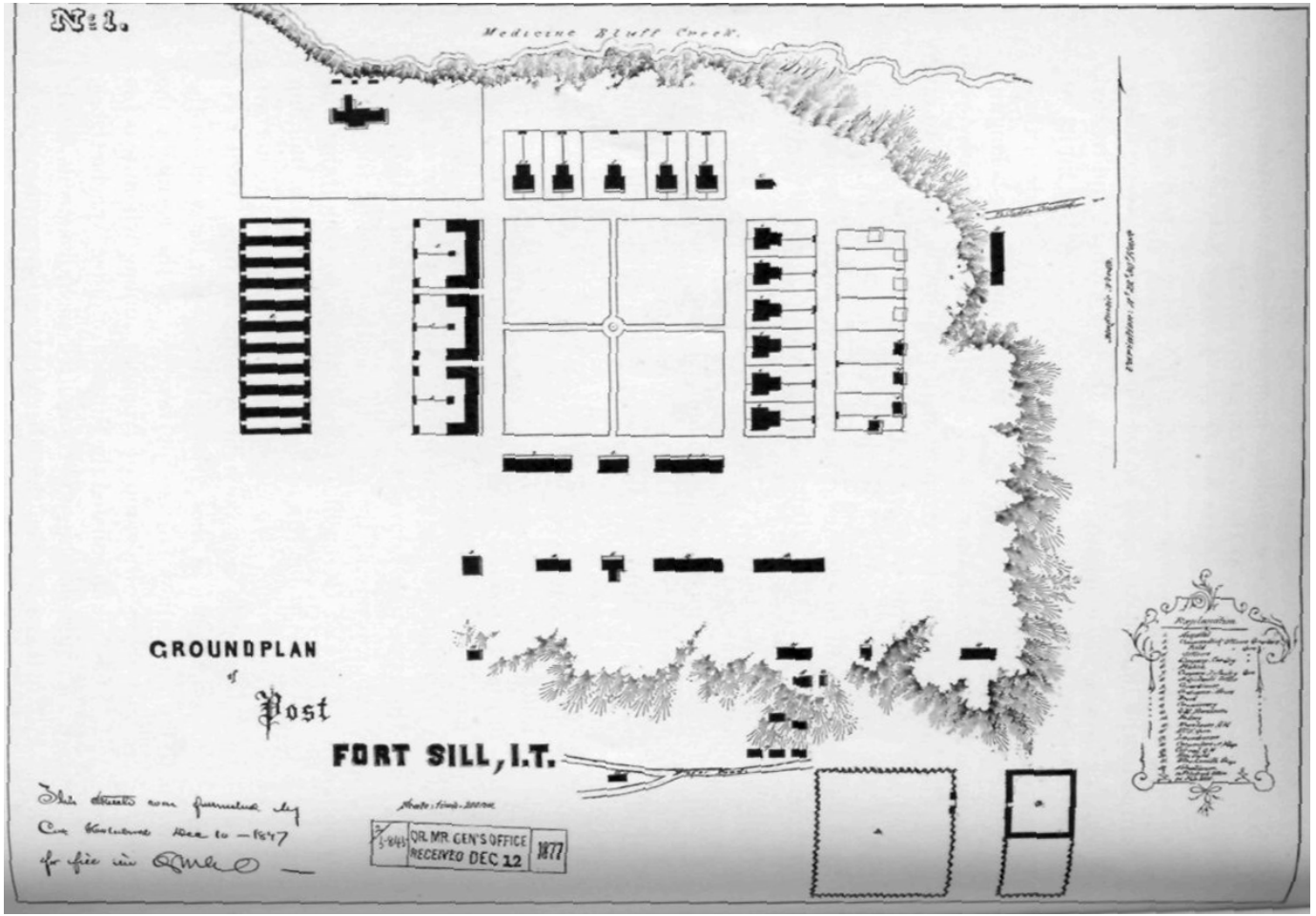
In 1873-74 sixty persons were killed, five wounded and one captured by the Indians belonging to the Fort Sill Indian Reservation. At this time these Indians were fed by the Government and treated as friendly. Their pursuit and punishment within the limits of the reservation was prohibited. In addition to the murders, these Indians had stolen large numbers of horses and mules belonging to the settlers on the frontier.

The patience of the Government with these Indians came to an end and arrangements were made to put every available soldier in the department into active pursuit of the hostile bands. Three columns were put in the field, one of which, under command of Lieut. Colonel Davidson, 10th Cavalry, was to operate westward from Fort Sill.

A dispatch was received by Lieut. Colonel Davidson on July 26th from the Commissioner of Indian Affairs which turned over the Indians to military authorities. This authorized all friendly Indians not participating in late outrages to turn in to Indian agencies and receive protection. As a result of this, many Indians reported and were enrolled. Along with them came women and children, and many horses.

Although many Indians held out and caused trouble for a considerable time, by the following June the last band of Indians absent from their agencies came in to Fort Sill and surrendered, giving up at the same time a large number of ponies and mules.

It seems appropriate at this time to mention some of the main points in the life of Geronimo, the noted Apache Chieftain, who spent several years of his life at Fort Sill in the old stone building known by the soldiers as "Hotel Geronimo." According to his own statements, Geronimo was born in Arizona in June, 1829. He came into prominence in the early eighties, when he went on the warpath in a relentless search for revenge, as the result of the massacre by Indians of a camp of Apaches, among whom was his young wife. Geronimo enlisted the support of other Apache tribes, assumed personal leadership and committed such disastrous depredations in Northern Mexico that the Mexican Government put a price on the head of all Apaches.


No. 1.
Medicine Bluff Creek.
GROUNDPLAN
of
Post
FORT SILL, I.T.
OR MR GEN'S OFFICE
RECEIVED DEC 12
1877

The reverse side of the map on page 532 contained the following legend:

U. S. QUARTERMASTER DEPARTMENT

Post, Military Reservation on Kiowa and Comanche Indians Reservation, Indian Territory;
Location, Latitude 34° 40′ N, Longitude 98°25′ W, 1700 feet above the sea, near the confluence of Cache and Medicine Bluff Creeks, on south bank of latter, 157 miles N. W. from Caddo, nearest R. R. station, on Missouri Kansas and Texas R. R.;
Capacity, 700 Men and 20 Officers;
Stables, for 850 Horses;
Material, Gray Limestone;
Roofs, Shingles;
Built, 1869-70;
Condition, Not good, much in need of repairs;
Occupied, by F. S. and Band and 6 Companies 4th Cavalry, and 2 Companies 16th Infantry.

About this time the recognized War Chief of all warring bands, Mangos Colorado, was killed by Mexican soldiers and Geronimo was elected to succeed him.

Cooperation between American cowboys and Mexicans who had seized Apache cattle caused Geronimo and his people to turn upon American settlements in Arizona, causing United States troops to be called into service against him. In 1884 General Crook, at the head of a small force, induced the Apache Chief to agree to a truce. But, as soon as the troops had withdrawn, the Apaches fled across the Mexican border. From here they renewed their depredations on both sides of the border.

In 1885, General Nelson A. Miles, then in command of the Department of the Missouri, with headquarters at Omaha, Nebraska, organized the campaign which ultimately succeeded in capturing Geronimo.

An expedition consisting of the 4th, 5th, 6th and 8th Cavalry, and the 2nd, 8th and 9th Infantry was organized. Before this force the Indians retreated into the Arizona hills. Captain Henry W. Lawton, in command of two troops of Cavalry, took personal direction of the last phase of the campaign. Before long the horses had to be abandoned, but Lawton continued with his men on foot. Then followed a most remarkable pursuit. Several times the fleeing Indians were surrounded, and, apparently, within the hands of the troopers, but just as often they would mysteriously disappear. Weeks passed, with many soldiers falling by the way. Finally, the end came.

One evening an Indian appeared in Lawton's camp and announced

that his Chief would talk with the white men, but only one must come. Lieutenant J. B. Gatewood, who spoke the Apache language, volunteered to go. After a talk with Geronimo, he took the Chief to Lawton, who accepted his surrender.

Geronimo and his Apaches were taken at first to Fort Marion, Florida. But they died in such large numbers from disease that, a year later, they were removed to Mount Vernon Barracks, Alabama. At this place everything possible was done to direct their progress toward a state of civilization, but the reservation was too limited to permit much instruction in agriculture. During their confinement, on account of unfavorable climate and other conditions, the original number was reduced nearly one-half by death.

As a result of this, efforts were made by the Secretary of War to transfer these Apaches to some place where the climate would be suitable and opportunity would be offered to instruct and employ them in agriculture. Full investigation of all conditions convinced the War Department that the reservation at Fort Sill was best adapted by climate, nature and extent of land, military garrison and other considerations, for a permanent agricultural settlement of these Indians.

Therefore, in September, 1894, the Apache Indian prisoners, including a company of Apache soldiers, were transferred from Mount Vernon Barracks, Alabama, to Fort Sill, arriving October 4, 1894. They were encamped on the military reservation under the control of the troops stationed there. Such of these men as were strong and able-bodied were enrolled as Indian soldiers and were held under strict military discipline. The women, children and disabled numbered two hundred and forty-six, leaving fifty available for duty as soldiers. The band comprised about seventy families. In spite of their improved situation as to climate and sanitary conditions, their numbers slowly decreased by death.

It is interesting to note that Captain Hugh L. Scott, 7th Cavalry, later Chief of Staff of the Army, was placed in charge of these Indians and did everything possible to improve their condition and settle them happily in their new homes.

Even though these Apaches were much better satisfied at Sill than at their previous location, they hated confinement to the reservation. Twice Geronimo and a few of his followers attempted to effect their escape, in the hope of returning to their former

happy hunting grounds, but without avail. The last attempt was made at the beginning of the Spanish-American War.

In 1905, Geronimo, with several of his warriors, was taken to Roosevelt's inauguration. In the President's audience chamber, he made an eloquent, though simple and dignified, appeal to be allowed to end his days in freedom. But this was denied, and Geronimo returned to Sill in captivity.

At the time of his death Geronimo had lost all influence with the strong men of the tribe. He passed away on February 17, 1909, in a little rock hut back of the Post Hospital at Fort Sill.

In 1913 the Government granted liberty to its band of Indian prisoners at Sill. The 257 Apaches were given their choice of allotment in Oklahoma or transportation to an Indian reservation in New Mexico. One hundred and seventy chose the latter, while eighty-seven were given allotments of eighty acres in Oklahoma.

I-See-O, the last of the Indian Scouts, who was known personally by many field artillerymen who had been stationed at Sill, died on the reservation a few years ago, thus removing the last Indian family from Fort Sill.

To return to the development of the Post, we find that after the preliminary construction program in 1870, very few buildings were erected. Appropriations were few and far between. When a new building was constructed, several old ones were usually torn down to furnish the material. It is interesting to note that one of the best buildings in the school area of today is the present library, formerly the old Post Trader's Store, which figured so prominently in the early history of the Reservation. While fire has destroyed most of the buildings in the school area, the old Post Trader's Store still stands, through some miraculous turn of fate.

Fort Sill, from the time of the first construction of permanent buildings thereat in 1870, was destined to be a permanent post. Practically all of our Army Boards, employed with various surveys to do away with many frontier posts, were unanimous in their decisions to retain Fort Sill.

The Chief of Staff, in his annual report of 1905, stated, "The reservation at Fort Sill is reported as being especially suitable for the station of a full regiment of field artillery; this, owing to its size, its varied terrain, and the availability of the adjoining ground

belonging to the Government, included in the Indian reservation, which, without detriment to the Indians, can be used for artillery maneuvers."

The decision having been made to use Fort Sill as a permanent post for a regiment of field artillery, orders were issued to organize a provisional regiment of field artillery at Fort Sill to consist of the 2nd, 8th, 13th, 14th, 15th and 21st Batteries of Field Artillery under command of Colonel Walter Howe. On June 29-30, 1905, the 2nd, 14th, 15th and 21st Batteries, also Headquarters, Field and Staff of the Second Provisional Regiment of Field Artillery arrived at the Post.

In 1907, Headquarters, Field and Staff, Band and Batteries A, B and C of the 1st Field Artillery were stationed at Fort Sill.

Since the Reservation had been selected as a permanent location for regular troops, the question of constructing the necessary additional buildings to accommodate a regiment of field artillery arose. The proposal to modify the Old Post to provide for this new construction was met by a storm of protest from its former garrisons. The desire to retain the Old Post intact for sentimental and historical reasons was very strong. Furthermore, the area occupied by the Old Post buildings was too restricted for the new plans. Hence, the decision was made to construct the new buildings on a sheltered strip of prairie to the west of the Old Post, the site of the present New Post, According to the Indians, the selected area always had been protected from cyclone and storm due to the magic of the four Medicine Bluffs to the north.

The majority of the buildings in the New Post, excellent examples of reinforced concrete and brick, were completed in 1911. From that time up to the beginning of 1933, there has been very little permanent construction in the New Post area. The World War brought its toadstool growth of temporary buildings, most of which have disappeared by now. The Liberty Theater and Officers' Club stand out among those remaining from this era of hasty construction.

As the Fort Sill of today is known principally as the home of the Field Artillery School, it seems pertinent to present some facts concerning the origin and development of this school, which means so much to the Field Artillery.

Previous to 1908, the Field Artillery was handicapped seriously by having no place in which to develop new and uniform methods of fire and in which to instruct properly its officers. As a result, there was no uniformity in artillery firing throughout this arm, as each regiment had its own school, causing many varied ideas in instruction. Therefore, in 1908, the decision was made to establish a School of Fire for Field Artillery, to be based, generally, on the principles of the Musketry School. It was believed that through the medium of such a school, instruction in the conduct of fire for field artillery would be much more thorough, comprehensive and uniform than under the conditions existing at the time.

In 1908-1909, Captain Dan T. Moore, Field Artillery, had been making extensive studies of the various foreign field artillery schools, in preparation for the organization of the school of fire for the Field Artillery of this country. After his return to the United States, Captain Moore was sent to Fort Sill by War Department orders, dated November 23, 1910, for the purpose of formulating detailed plans relating to the establishment of the Field Artillery School of Fire.

Finally, General Orders No. 73, War Department, dated June 5, 1911, listing the service schools which would thenceforth comprise our military educational system, authorized "The School of Fire for Field Artillery." By another order, Captain Dan T. Moore was designated, July 19, 1911, as the first Commandant of the Field Artillery School.

As a result of these arrangements, the Field Artillery had revolutionized its former existence and this arm can trace the greatest strides toward its present development from the establishment of the first school. It had achieved a specialized course of training and had been fortunate enough to have one of its most able officers as the first commandant of the school. The beneficial effect of the school was soon felt throughout the service.

One great handicap to the School, at the time of its establishment and throughout its entire life, has been the great shortage of school buildings and quarters for personnel so sorely needed. In 1911 facilities for the School were furnished in the Old Post. These were soon outgrown, so they were increased by quartering the School in unoccupied buildings in the New Post. Under these conditions,

it would have been able to carry on its work in a comparatively satisfactory manner for a limited time. However, changes in the garrison made it necessary to move the School back to the Old Post in the midst of the fall term of 1914 and it was forced to accommodate itself to these outgrown quarters under trying circumstances.

The requirements of the School of Musketry forced the School of Fire, in the summer of 1915, out of its cramped and temporary quarters in the Old Post to less suitable quarters. Again, the old Trader's Store figured in Fort Sill history. The Commandant moved his staff and school to this old monument and continued to turn out efficient field artillery officers, all highly enthusiastic over the courses at the School. In this ancient one-story, one-room building, some of our best field artillerymen received their initial training in the mysteries of accurate calculation of data by the use of the parallel and the P minus T methods. During this period, 1915-1916, the students and enlisted personnel of the School lived in tents.

When the Mexican border trouble arose in 1916, one of the first acts to meet the emergency was to close all service schools. The School of Fire for Field Artillery was closed and all officers and men were sent to their regiments, leaving only a few soldiers to act as caretakers.

When this country entered the World War in the Spring of 1917, the Field Artillery, and the whole Army, awoke to the fact, due to so few officers having had a chance to receive the course of training at the School, that our officers were sadly deficient in the knowledge of the proper technique of modern field artillery. France, England and Germany had made great progress toward developing most of their Regular and Reserve Officers along the lines of recognized progress in modern essentials of field artillery. America had a handful of field artillery officers, some few fortunate enough to have graduated from the School. She needed thousands!

The caretaking detachment, left in charge of the School Building when the School was disbanded, suddenly awoke one morning upon the receipt of a telegram from the Adjutant General to the effect that Fort Sill had been selected as the site of the Training School for the Field Artillery and that the school would be reopened soon.

In July, 1917, the school was reestablished, in tents. The first course actually began on July 15, 1917. Colonel William J. Snow, 4th Field Artillery, later to become Chief of Field Artillery, was made Commandant on July 27, 1917. With such a handicap, the average man in such a position would have had a tendency to "throw up his hands" and feel the situation to be hopeless. On a bare plateau, with a plant consisting of a small Trader's Store and a dust filled group of tents, he was charged with the training and development of sufficient officers to accomplish the organization of the Field Artillery in war! It was estimated that 1,200 officers would arrive for the first class.

But Colonel Snow was a man who could cope with the apparently impossible problem. He made a hurried trip to Washington, convinced the War Department of the soundness of his plans, and returned in ten days with three quarters of a million dollars to erect temporary buildings for the School. The contract was let without delay and with lightning rapidity enough buildings were thrown together to house the large stream of students which came and left at regular intervals until the Armistice.

The first war course was organized on October 1, 1917. The area was a bedlam. Temporary buildings were being raised overnight. Tents were moved frequently to make room for the foundation pilings of new buildings. The weather-beaten Trader's Store still held its supremacy, being used as the Administration Building and Library of the School. A pair of drab buildings nearby served as the mess, lecture hall and quarters of the detachment. Soon, across the street from the Trader's Store, arose the Administration Building, later known as Snow Hall, which provided good facilities for administration and rough but ample chart rooms. Snow Hall continued to be the main class room and office building until its destruction by fire in 1929.

It was fortunate for the Field Artillery that General Snow had had an immediate perception of his tremendous problem. Also, it was well that the War Department had concurred for, on November 11, 1918, the School had expanded to such an extent that the personnel consisted of the following:

Staff and Instructors	247
Field Artillery students	1,554
Air Service Cadets	419
Total	2,220

The average weekly output of the School during its peak was approximately 200 field artillery officers and 100 observers.

While the School area was growing into a group of temporary buildings to accommodate the training of the necessary field artillery officers and observers, Camp Doniphan had been located on the reservation southwest of the New Post and the building of it was well on the way. This camp was constructed for and used for the training of the 35th Division, National Guard. Later it was used as a field artillery brigade training center.

Post Field, a construction project for the Air Corps, was erected in 1917, being located east of the Meridian Highway and south of Fort Sill. It consisted of a series of one-storied, tar-paper covered shacks and temporary hangars.

During the World War, to the northeast of New Post, a temporary base hospital was built. To the west of New Post, along the road to Signal Mountain, other temporary buildings were constructed. Today, except for a few scattered buildings, there is practically nothing left to identify the era of 1917-1918.

On April 21, 1919, the old School of Fire was changed by a War Department order to the Field Artillery School. In 1919, the course at the School was changed to provide a general technical education for battery commanders only. At the same time, a basic course for newly commissioned officers was organized at Camp Taylor, Kentucky. Later, in 1921, a field officers' course was inaugurated at Camp Bragg, North Carolina.

As a result of the recommendations of the McGlachlin Board, in 1922 the Basic School at Camp Knox was discontinued and the basic course was combined with the course at Sill to make the Battery Officers' Course. Shortly after, the Field Officers' Course was moved from Camp Bragg to Fort Sill and established as the Advanced Course.

From 1920 to date the School has been seriously handicapped by the burning of many of the frame buildings constructed in 1917.

One large apartment burned in 1920. On April 30, 1925, fire destroyed two warehouses containing household effects belonging to many officers. These goods were stored due to the crowded conditions of the meager officers' quarters. This fire represented personal losses of hundreds of thousands of dollars.

On June 17th of the same year fire, from an undetermined cause, destroyed eight of the large apartment buildings in the school area assigned as quarters for student officers and instructors. This resulted in the students losing all quarters on the Post, necessitating their commuting from Lawton.

In 1926 ten different fires caused the loss of more buildings and the initiative of the School Staff was highly taxed to take care of the difficult situation. The three hundred or more students came in each year regardless of the cramped classrooms and the difficult living conditions.

On August 8, 1929, the crowning blow was struck when Snow Hall, the final standby for the existence of the School, burned to the ground. This reduced the instructional buildings to the Materiel Building, one old barrack building, a few scattered sheds and the Trader's Store. In spite of apparent defeat, in September, 1929, the School opened to another stream of students. Though instructed in the open, in temporary shelter and in the restricted space of the existing buildings, the 1929-1930 class graduated satisfactorily at the end of the school year.

Since 1929, as a result of remodeling an old frame barrack building into an Academic Building and two other frame buildings into headquarters and office buildings, the School has carried on and has improved its courses yearly in spite of the poor plant.

Fort Sill and the Field Artillery School have struggled along for years with a shortage of all types of buildings—quarters, barracks, stables, gun sheds, administration and school buildings. At last, after years of watchful waiting, funds have been allotted for a very comprehensive building program which is now under way.

In the next issue of THE FIELD ARTILLERY JOURNAL will be published a detailed account of this new construction and a plan of the Fort Sill and the Field Artillery School of the future.

Editor's Note: In this article liberal extracts have been made from a pamphlet entitled *Fort Sill,—A History,* by Master Sergeant Morris Swett, now, and for sometime past, Librarian, The Field Artillery School.

MAJOR GENERAL HENRY KNOX

BY S. H. P. PELL, DIRECTOR OF THE BULLETIN OF THE FORT TICONDEROGA MUSEUM

HENRY KNOX was born in Boston, Mass., July 25th, 1750. He came of Scotch Presbyterian stock and in 1762 was apprenticed to a firm of booksellers.

Several years before the outbreak of the Revolution an artillery company was organized in Boston known as The Train. Knox joined it in 1768. It was made up of young mechanics and shopkeepers of the South End of Boston and was commanded by Major Adino Paddock, an efficient drillmaster who soon brought his company to a high degree of efficiency. During the winter of 1766 a company of British artillery bound for Quebec was prevented by the weather from reaching its destination. It spent the winter in Boston and the officers fraternized with the officers of The Train, giving them much valuable instruction in the handling of guns.

The Train had three brass 3-pounders that had been cast in England from two old cannon sent over for the purpose by the General Court of Massachusetts. They bore the arms of the Province. When the Revolution broke out the guns were stored in the armory in West Street. General Thomas Gage, the British commander, had commenced seizing arms wherever he could find them, so placed a sentinel at the armory. Six young men, members of The Train, headed by Abraham Holbrook, a schoolmaster, took advantage of the temporary absence of the sentinel, removed the guns and hid them in Holbrook's schoolroom. Later they were carried by night out of Boston together with a fourth, acquired later, and did good work during the War, though one was captured by the British, and one lost or destroyed.

Knox, when he became Secretary of War, after the Revolulution, had two of them inscribed and they now repose in a chamber in the Bunker Hill Monument. The inscription on each reads, "This is one of four cannon, which constituted the whole train of field artillery possessed by the British Colonies of North America at the commencement of the War, on the 19th of April, 1775."

Plate courtesy of the Bulletin of the Fort Ticonderoga Museum

MAJOR GENERAL HENRY KNOX

In 1772 part of Paddock's company, The Train, organized a new company and called it The Boston Grenadiers Corps. It was commanded by Capt. Joseph Pierce. Henry Knox was First Lieutenant. On the 19th of April he succeeded in getting out of the city with his wife, who had quilted his sword in her cloak. He deposited Mrs. Knox with some friends in Worcester and immediately proceeded to Cambridge and offered his services to General Artemus Ward.

The siege of Boston commenced and he did good work in helping to lay out a system of fortifications menacing the city. Washington took command of the Continental Army on July 3rd, 1775, and on November 8th wrote to Congress recommending Henry Knox for a commission. His commission as Colonel of artillery

was dated November 7th, 1775, but before the commission reached him he had been ordered by Washington to proceed to Ticonderoga, select such cannon as he saw fit from the armament of that Fort, which had been captured by Ethan Allen on the tenth of May, and move them to Cambridge. His instructions from Washington read as follows:

"You are immediately to examine into the state of the artillery of this army, and take an account of the cannon, mortars, shells, lead and ammunition that are wanting. When you have done that you are to proceed in the most expeditious manner to New York, there to apply to the President of the Provincial Congress and learn of him whether Colonel Reed did anything or left any orders respecting these things, and get him to procure such of them as can possibly be had there. The President, if he can, will have them immediately sent hither; if he cannot, you must put them in a proper channel to be transported to this camp with despatch before you leave New York. After you have procured as many of these necessaries as you can there, you must go to Major General Schuyler and get the remainder from Ticonderoga, Crown Point or St. John; if it should be necessary, from Quebec, if in our hands. The want of them is so great that no trouble or expense must be spared to obtain them. I have wrote General Schuyler, he will give every necessary assistance, that they may be had and forwarded to this place with the utmost despatch. I have given you a warrant to the Paymaster General of the Continental Army for a thousand dollars, to defray the expense attending your journey and procuring these articles, an account of which you are to keep and render upon your return. Given under my hand at headquarters at Cambridge, this 16th day of November, Annoque Domini 1775.

G. Washington

Endeavor to procure what flints you can."

It is very probable that the idea of moving the cannon from Ticonderoga to Boston originated with Benedict Arnold, but it was Knox who submitted the plan to General Washington.

Today the run from Boston to Ticonderoga may be made by motor in six or seven hours, but Knox left Boston the 17th of November and reached New York the 25th, left there the 29th

and reached Ticonderoga in the late evening of the 5th of December. His diary shows that he made on an average of 40 miles a day on horseback, one day doing 56. It is interesting to note that on the night of the 4th of December he had reached the head of Lake George and shared a small cabin with a British officer, who had been captured by General Montgomery at St. John, November 3rd, and who was then on his way, under parole, to report to the American authorities at Lancaster, Penna. This young British officer was the unfortunate Major John André, afterwards hung as a spy. They were not to again meet for five years, when at André's trial in October, 1780, Brigadier-General Henry Knox sat on the court martial.

The 6th, 7th and 8th of December were spent in getting the cannon out of the Fort to the landing place at the foot of Lake George. They were loaded on a scow while Knox went ahead in a small boat, which he calls a "pettianger." The scow ran aground and they did not reach Sabbath Day Point until 9 o'clock in the evening. Knox and the crew went ashore and warmed themselves by a good fire and took up their quarters in a hut made by "civil" Indians who gave them roasted venison.

On December 17th he wrote to Washington from Fort George that he had made 42 exceedingly strong sleds and had procured 81 yoke of oxen to pull them and that the route would be to Kinderhook, then to Great Barrington and Springfield. It was not until January 4th, however, that the first brass 24-pounder reached Albany and even then one of the big guns broke through the ice in crossing the river. He succeeded in retrieving it, however. On the 24th of January the camp at Cambridge was reached by Knox, where he was welcomed with cheers and jubilation. Some of the guns were immediately mounted and in March the balance. General Ward and General Thomas with 400 oxen and 2,000 men drew the guns to Dorchester Heights, which commanded Boston, rendering that city no longer tenantable. The British, under General Howe, evacuated on the 17th of March.

Knox's whole route from Ticonderoga is interesting and has now been marked by the states of New York and Massachusetts with bronze tablets. The first of the tablets is in the courtyard at Ticonderoga and the last on Dorchester Heights. His route

was Fort Ticonderoga to Fort William Henry, to Albany, to Kinderhook and Claverack, where he crossed the border into Massachusetts, near the town of North Egremont, then to Great Barrington over the present Mohawk Trail and Jacob's Ladder through Otis to Glasgow, now called Blanford, to Russell, Springfield, Worcester to the camp at Cambridge. The list of artillery follows herewith:

Mortars and Cohorns

			Dim. of bore	Ft. and ins. of length	Weight	Total W'ht
Brass	2	Cohorns	5-7/10	1-4	150	300
	4	"	4-1/2	1-1	100	400
	1	Mortar	8-1/2	2-0	300	300
	1	"	7-1/2	2-0	300	300
Iron	1	"	6-1/2	1-10	600	600
	1	"	10	3-6	1,800	1,800
	1	"	10-1/4	3-6	1,800	1,800
	3	"	13	3 (aver.)	2,300	6,900
	14					

Howitzers

Iron	1		8	3-4	15.2.15	15.2.15
	1		8-1/2	3-4	15.2.15	15.2.15
	2					

Cannon

Brass	8	3 pounders	3-1/20	3-6	350	2,800
	3	6 "	3-7/10	4-6	600	1,800
	1	18 "	5-1/2	8-3	2,000	2,000
	1	24 "	5-11/12	5-6	16.3.18	1,800
Iron	6	6 "	3-7/10	9-7	2,500	15,000
	4	9 "	4-4/10	8-4	2,500	10,000
	10	12 "	4-3/4	9	2,800	28,000
	7-Dbl. fortif.	18 "	5-1/2	9	4,000	28,000
	3	18 "	5-1/2	11	5,000	15,000
	43					

Total weight 119,900 lbs.

Total Howitzers	2
Do. Cannon	43
Do. Mortars	14
	59

The regiment of artillery commanded by Knox was made up of twelve companies and when he took charge consisted of 635 men. This proved to be the nucleus and training corps for the whole artillery of the Continental Army.

Henry Knox served all through the Revolution. His regiment of artillery served in all the important engagements. At the capture

Plate courtesy of the Bulletin of the Fort Ticonderoga Museum

GENERAL KNOX AND CANNON ARRIVING AT CAMBRIDGE

of Fort Washington the artillery regiment lost about 100 men, almost twenty per cent.

He was made a Brigadier General in December following the victory of Trenton. In May, '77, he was planning the defense of the Hudson River with General Greene. In the Battle of Monmouth he again distinguished himself and in 1781 was complimented by Washington in his report to the President of Congress, for his skill and activity in providing and forwarding heavy cannon for the siege of Yorktown.

In 1783 when the Society of the Cincinnati was formed Washington was chosen as President and Knox as Secretary. In 1784 he retired to private life and took up his residence in Dorchester, Mass. On March 4th, 1785, Congress appointed Knox Secretary of War and fixed the salary at $2,450. He had much to do with the formation of the militia system of the country and was sole commissioner in the negotiations with the Creek Indians who held extensive territory claimed by Georgia and which was relinquished to that State. In December, 1794, he resigned as Secretary of War to take effect on the end of the month. While Secretary of War he had erected a large house for its time and place on the Waldo patent near Thomaston, Maine, which Mrs. Knox had inherited from her grandfather, General Waldo. He named the house Montpelier and retired to private life but was kept busy entertaining his old comrades and a steady stream of distinguished visitors.

He died on Saturday, October 25th, 1806. Of his twelve children but three survived their father.

COLONEL KNOX TO GENERAL SCHUYLER*

Fort George Dec. 17—1775

Sir

We have been so fortunate as to get the Mortars, Cannon, &c. safely over the Lake to this place. I have agreed with Capt. Palmer of Stillwater to get proper conveyances for them from hence to Springfield. We are apprehensive of a difficulty in crossing over at Albany for want of a proper Scow—I'm not well enough acquainted with the roads after we cross at the half

*From a manuscript in the Museum Library.

Moon to know whether it be practicable to keep on the east side of the river entirely to Kinkerhook—I expect Capt. Palmer up with the Teams on Thursday & hope to move as far as Saratoga if the Sleding continues as at present from thence we must wait for snow. . . . I had heard sir that you were gone to Philadelphia in consequence of which I wrote to Mr. Livingston at Albany for 500 fathom 3 Inch rope to fasten the Cannon on the Sleds.—It has not yet arriv'd. I beg Sir that you will please to give an Order for its being forwarded with the utmost expedition & I also take the liberty to request the favor of you to forward tho the inclos'd Letters by the most speedy Conveyance.

I am Sir with the
Utmost Respect Your most
Obedient Humble Servant
Henry Knox

Honble General Schuyler

THE WEIGHT OF GUN CARRIAGES

EFFECT OF LONG RANGE ON ARTILLERY DESIGN

BY E. C. GOEBERT*

THE progress of development of artillery has been extremely interesting from the inception of gun powder down to the present day. Beginning with the crude muzzle-loading cannon, man has applied his efforts toward constantly improving the ballistics and mechanical efficiency of the gun and carriage.

Consider the fundamental purpose of war. As far back as history will take us, and no doubt into the days of prehistoric men, war has been a physical conflict between men for the purpose of conquest, existence, liberty or adjustment of existing conditions believed to be detrimental to society or the civilization of the time. Success in winning a war requires superiority in the ability to destroy or disable the man power and material property of an adversary. In the days of wandering tribes the destruction of property meant little and consequently the destruction of man power was the deciding factor in winning wars. The conflict in those days was a hand-to-hand engagement with the law of the survival of the fittest deciding the outcome.

With the forward progress of civilization man began to accumulate material wealth. He came out of the caves and created places of abode, settling down on the land which he cleared and cultivated, formed communities, built towns and cities which in many instances have developed into centers of almost limitless property value. The destruction of material wealth because of its enormous value was thought by some military authorities to be an all important deciding factor in winning a war. However, the experiences of the World War made this hypothesis highly problematical. To illustrate: the Germans battered the eastern part of France into a "no man's land" and lost the war. The Allies on the other hand slowly and deliberately exerted their efforts to reduce the man power and morale of the Germans and won the war.

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*Chief of the Design Section, Aberdeen Proving Ground, Maryland. Captain, Ordnance Department, U. S. Army.

Recognizing that property destruction has some proportional value in winning a war, its effect has been imposed upon the development of artillery and along with the harassing effect of such fire is no doubt the reason for the development of weapons of long range. The artillery of early history had short range and was fired against visible targets. As the weapons were improved the range was gradually increased and in the World War the principal weapons, the Allies' 75mm gun and the Germans' 77mm gun, had ranges between 9,000 and 10,000 yards. With the increase of range except under most favorable conditions, the direct observation of the burst of the projectile is practically impossible so that fire must be conducted against invisible targets by the use of maps and highly developed fire-control instruments.

The value of long range in direct fire in the destruction of property is no doubt great but, on the other hand, its effect upon the all important destruction of man power is exceedingly low. It has been estimated that in the World War it took an average of 800 rounds of artillery ammunition to produce one casualty! On the basis of the 75mm gun allowing that the average life of the gun tube under the condition of fire experienced in the World War was approximately 5,000 rounds, eight casualties resulted for every gun tube worn out. This would tend to indicate that even with the ranges used in the World War the results obtained in man power destruction were not of a high order.

Since the World War a concerted effort has been made to further increase the range in practically all weapons and as a result the designers, by taking advantage of the development of better grades of material and new processes of manufacture have produced weapons which, when considered merely as machines, are developed to a very high mechanical efficiency.

Having accomplished this engineering feat the question arises have we not materially reduced the overall efficiency of the weapon as an instrument of destruction of enemy man power especially if in future wars the artillery takes advantage of this range to remain further behind the front line of an engagement?

Further let us consider with interest the advantages gained

and the disadvantages resulting by this increase of range. Listing the advantages:

First, the increased range has made possible a deeper penetration of the enemy lines with artillery fire.

Second, the selection of positions in which to emplace the carriages has been greatly enlarged.

Third, for the same depth of penetration the path of ammunition supply may under certain conditions be shortened by a maximum of the difference between the larger range and the World War range.

The disadvantages may be listed as follows:

First, the weight of the units has been increased and correspondingly the mobility decreased.

Second, observation when taking advantage of the increased range has been made more difficult with a resulting probable increase of ammunition expenditure to accomplish a mission.

Third, the muzzle velocity of the weapons has been increased and, therefore, the life of the gun tube in rounds reduced.

Fourth, the powder charge necessary for the long range has been increased and, therefore, the cost of each round fired increased.

Fifth, the development of longer and more costly systems of communication from observation point to gun position to make possible proper control of fire at the long range has resulted.

Sixth, the effectiveness of the gun shell at short and intermediate ranges has been lessened by decreasing the angle of fall at these ranges to overcome which two charges, a normal and a super, have been introduced; thus adding to the always important matter: the complications of ammunition supply.

Weighing the disadvantages against the advantages one cannot help but wonder: has constructive progress really been made in this intense drive for longer ranges? Has not the mechanical efficiency of our weapons been increased at the sacrifice of the real efficiency? Would it not have been better for the ordnance engineer to have used the higher grades of material and improved methods of manufacture to produce a real balanced design based upon the ranges of the World War?

The comparative table (below) of the principal characteristics

of the 75mm gun and carriage M187 M1 and the 75mm howitzer and carriage T1 (of recent date) gives much food for thought.

In addition to the advantages shown by the tabulation, the 75mm howitzer carriage T1 design includes features not found in the 75mm gun carriage M1897 M1; such as, commercial disk wheels carrying pneumatic tires and mounted on hubs containing antifriction bearings and spring suspension. These added features make possible road and cross-country travel at speeds way beyond the old horse-drawn units with less resultant injury to the vital parts of the carriage from shocks encountered in the travel.

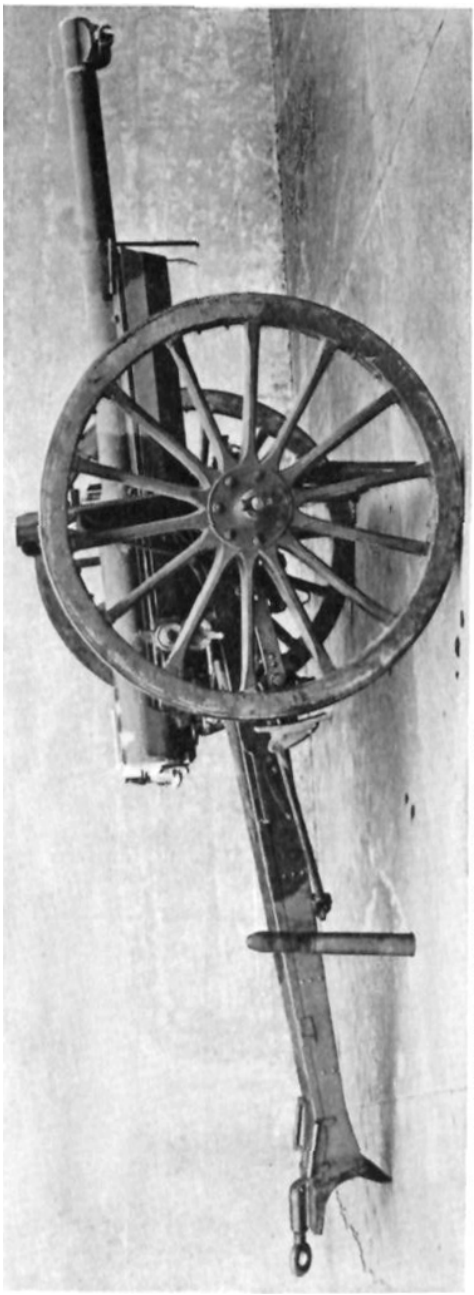
The 155mm gun illustrates another example of what could be accomplished. The G. P. F. weighed in traveling position 29,400 lbs. and at 35° elevation had a range of 17,400 yards. After the World War a 155mm gun tube capable of producing a 26,000 yard range was designed and manufactured. This gun has been mounted on a modern carriage at a total weight in traveling position of approximately 30,500 pounds.

On the basis of comparison with the 75mm units it would in all probability be possible to produce a unit with the same range at the G. P. F.; namely, 17,400 yards within a weight limit of from

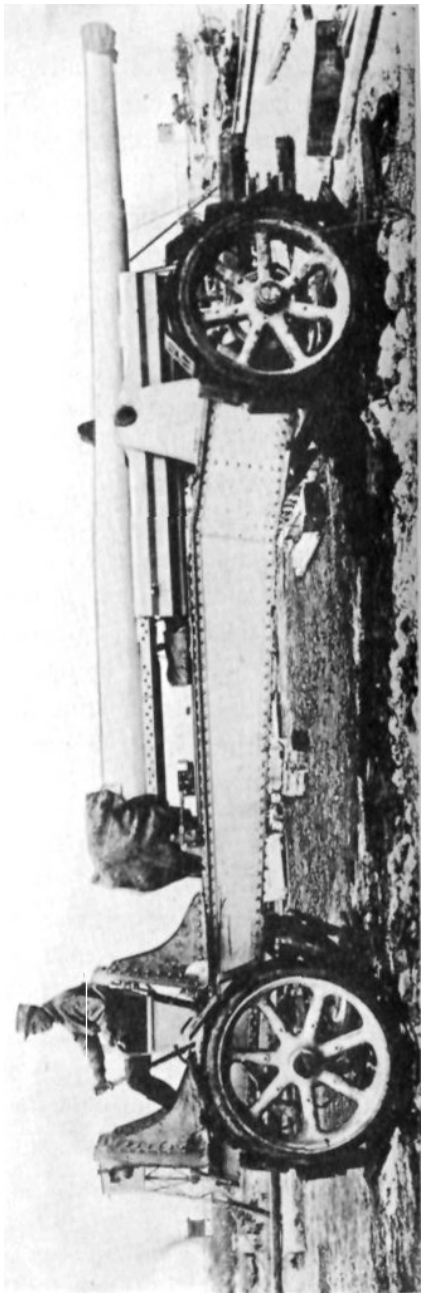
TABLE

	75mm Gun and Carriage M1897 M1	75mm Howitzer and Carriage, T1
Weight of projectile (shell)	12.75	15
Muzzle velocity (ft. per sec.)	1,850 Super	1250
Maximum range (yds.)	6,930	9200
Maximum range with trail buried (yds.)	9,200	
Maximum elevation (degrees)	19	45
Elevation with trail buried (degrees)	45	
Total traverse (degrees)	6	45
Weight of unit (lbs.)	2,657	1880
Overall length, traveling position (inches)	173	156
Overall length firing position	173	125
Overall height in traveling position at zero elevation (inches)	53	42
Overall height in firing position at zero elevation (inches)	55	36
Overall width (inches)	70	67.5

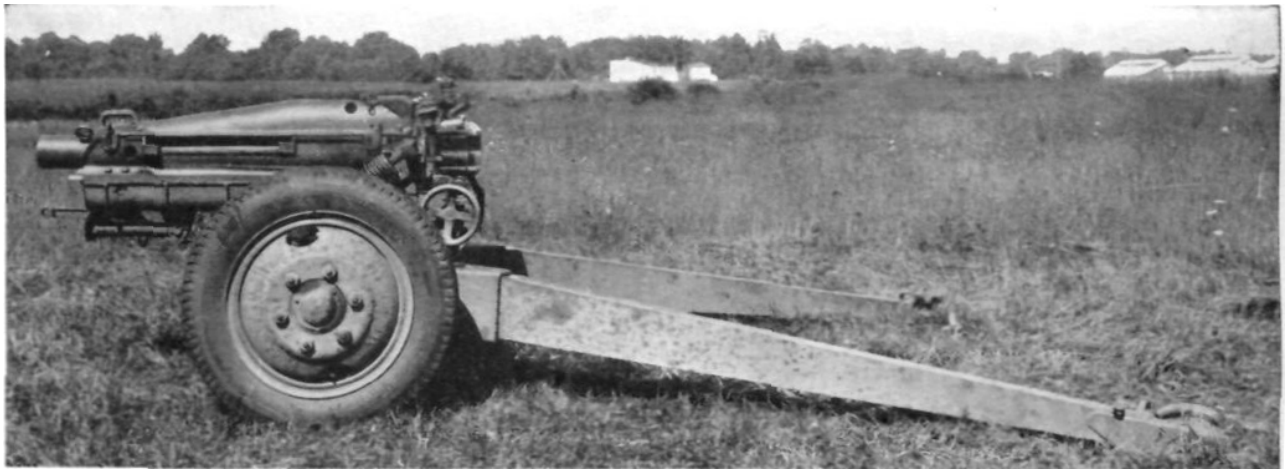
21,000 to 22,000 pounds including all modern improvements found in the 155mm gun 8-inch howitzer carriage T2 with a saving in weight of between 7,000 and 8,000 pounds.



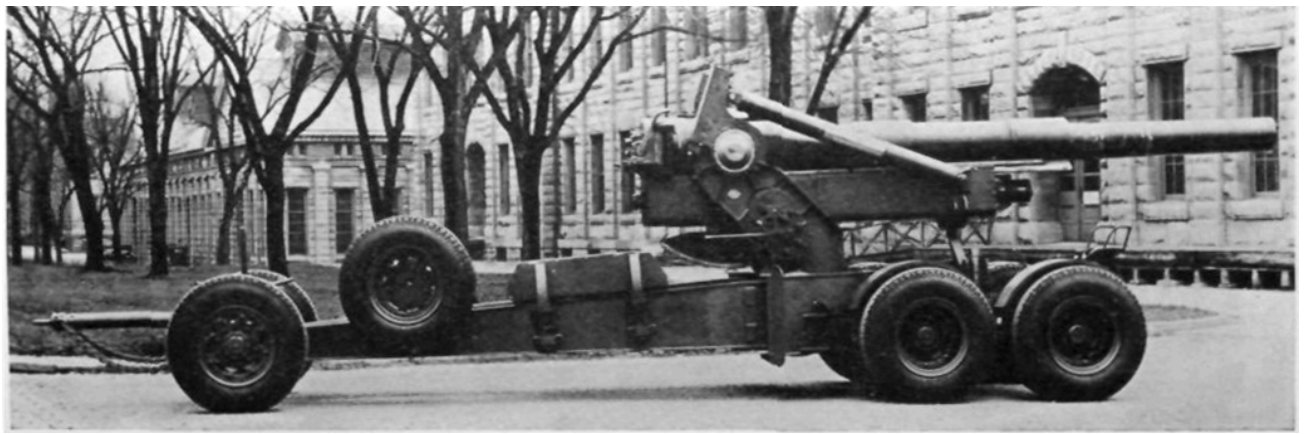
THE OLD: THE 75-MM GUN (FRENCH), MOD, 1897, WEIGHT 2,657 LBS.; MAXIMUM RANGE 6,930 YDS.



THE OLD: THE 155-MM G. P. F. WEIGHT 29,400 LBS.; RANGE AT 35° ELEVATION 17,400 YDS.



THE NEW: THE 75-MM HOWITZER T1, WEIGHT 1,880 LBS.; MAXIMUM RANGE 9,200 YDS.



THE NEW: THE 155-MM GUN CARRIAGE T2, WEIGHT 30,500 LBS.; RANGE 26,000 YDS.

Assuming for the sake of discussion that the long ranges in artillery weapons are obtainable only at an excessive sacrifice of such elements as mobility, life of the gun tube and ease of observation of fire, the suitable types of weapons will be considered classified or grouped in the following range limits: 1st, 8,000 to 10,000 yds.; 2nd, 10,000 to 12,000 yds.; 3rd, 12,000 to 15,000 yds.; 4th, 15,000 to 20,000 yds.

In the 8,000-10,000 yard limits could be placed the 75-mm. howitzer with its 9,200 yard range. This weapon would be extremely mobile and produce the high-angle fire found to be most effective against personnel. It should, therefore, be the principal division weapon. No flat trajectory gun would be placed in this group since gun fire when absolutely necessary could be obtained from the gun selected for the 10,000 to 12,000 yard group.

For the 10,000-12,000 yard group there should be selected both a gun and a howitzer. In the interest of ammunition production and supply it would be advantageous to have both these weapons of the same caliber; however, since the missions of the two are entirely distinct and since, after all, the ultimate purpose is to secure the weapon most suitable for the mission it would seem advisable to place in this group a 75mm gun and a 105mm howitzer.

The shell for the 75mm gun could be identical with the 75mm howitzer shell and this gun could be used as the secondary division weapon. The 12,000 to 15,000 yard group could contain the 155mm howitzer and a gun of approximately 105mm caliber and in the fourth or 15,000 to 20,000 yard range could be fitted the 155mm gun and an 8-inch howitzer. These classifications seem to cover the needs.

To obtain ranges beyond 20,000 yards when necessary special Army weapons could be relied upon; such as, the 26,000 yard 155mm gun, 8-inch gun and the 9.2's.

Considering now the weapons selected above with respect to weight, the 75mm howitzer can be built to weigh 1,800 pounds in firing position. With a reasonable amount of traverse, say 60°, it is believed that an efficient modern 75mm gun carriage could be designed within the limits of 3,000 pounds bearing in mind that the range would not exceed 12,000 yards, a 105mm

howitzer for about 3,400 pounds; a 105mm gun 4,500 pounds; a 155mm howitzer 10,000 pounds; the 155mm gun 22,000 pounds and the 8-inch howitzer for 29,500 pounds.

In conclusion it is desired to state that this article expresses, according to the personal views of the writer and not the official opinion of the Ordnance Department, the problem of artillery weapons from the viewpoint of the designer. There may be ample reason why the range limits expressed are not sufficient for the artilleryman's use and that the extreme ranges sought since the World War are absolutely essential. Should this be the case, however, with the persistent demands for increased features of carriages; such as wide traverse, high road speed, etc., the field artillery must adjust its demands to a point where increased weights will be acceptable, since the designers have exhausted every available resource to keep the weight to an absolute minimum and still obtain stability and wear life in gun carriages. The question is one of importance.

OFFICERS ASSIGNED TO REGULAR ARMY F. A. UNITS (As of October 1, 1933)

1ST FIELD ARTILLERY BRIGADE HEADQUARTERS (FORT HOYLE, MD.)

Brigadier General E. D. Scott
Major J. L. Devers
Major J. M. Eager
Captain R. L. Joyner
1st Lt. E. B. Gjelsteen (ADC)

6TH FIELD ARTILLERY (FORT HOYLE, MD.)

Colonel L. L. Lawson
Major H. H. Fuller
Lt. Col. S. Miles
Major D. E. Cain

CAPTAINS:
- H. P. Gantt
- J. H. Fye
- G. G. Heiner
- V. R. Woodruff
- W. H. Quarterman
- P. J. Atkinson
- S. T. Wallis
- C. C. Brown
- E. C. Ewert
- J. H. Keatinge
- J. Mesick
- L. S. Arnold
- A. M. Gruenther
- D. F. Healy, Jr.
- T. B. Hedekin
- F. C. Holbrook
- R. T. Tompkins
- W. E. Shallene
- W. E. Paschall
- O. W. van den Berg
- T. C. Wood
- J. H. Baumann

FIRST LIEUTENANTS:
- C. D. Daniel
- N. H. Smith
- M. H. Burckes
- R. E. O'Connor
- J. L. McKinnon

SECOND LIEUTENANTS:
- G. M. Wertz, Jr.
- C. F. McNair
- A. A. Greene
- W. Menoher
- R. Hackett
- W. W. Dick, Jr.
- J. H. Weber
- D. N. Sundt

7TH FIELD ARTILLERY, LESS 2ND BATTALION (FORT ETHAN ALLEN, VT.)

Colonel J. F. Barnes
Major Howard Eager
Lt. Col. G. W. DeArmond
Major A. J. Betcher

CAPTAINS:
- J. Hunt
- J. M. Sanderson
- F. H. Timmerman
- E. S. Van Benschoten
- D. J. Sabini
- M. C. Shea
- R. L. Greene
- V. Oleson
- J. C. Campbell
- S. P. Collins
- F. W. Watrous
- J. B. Rasbach
- H. F. Conrey
- W. J. Eyerly
- C. S. Follansbee
- L. E. Jacoby
- L. H. Ham

FIRST LIEUTENANTS:
- A. E. Smith
- R. S. Marr
- K. L. Johnson
- D. J. Oyster
- A. J. Hastings

SECOND LIEUTENANTS:
- J. A. Cain, Jr.
- H. F. Bigelow
- D. P. Armstrong
- I. R. Schimmelpfennig
- J. D. Armitage

SECOND LIEUTENANTS:

S. Sawicki
Todd H. Slade
F. P. Miller
F. E. Fellows
R. Park, Jr.
G. C. Lothrop

2ND BATTALION, 7TH FIELD ARTILLERY
(MADISON BARRACKS, NEW YORK)

CAPTAINS:

N. C. Manley
W. B. Walters
W. F. Kernan
M. L. Young
W. C. Brigham
J. T. B. Bissell
R. F. Hallock
G. A. Grayeb
S. B. Bonner
C. G. Nelson

FIRST LIEUTENANTS:

W. W. Webster
L. B. Bixby
K. S. Sweany
L. R. Wingfield
H. K. Palmer, Jr.

SECOND LIEUTENANTS:

W. M. Tisdale
N. L. Head
W. H. Richardson, Jr.
R. G. Speiser
C. A. Piddock
W. R. Goodrich
N. M. Wallace
F. J. Carson, Jr.

5TH FIELD ARTILLERY, LESS 2ND BATTALION
(MADISON BARRACKS, NEW YORK)

Colonel R. W. Briggs
Major A. C. Sullivan
Lt. Col. W. S. Sturgill
Major E. Yeager
Major W. M. Tenney

CAPTAINS:

J. C. Butner
A. Brill
B. Moore
H. E. Tisdale
R. A. Knight
R. T. Finn
T. B. Whitted, Jr.
H. C. Dayton
T. E. Meyer
G. J. Deutermann
J. E. Perman

FIRST LIEUTENANTS:

R. T. J. Higgins
D. Q. Harris
K. N. Decker
C. A. Horne
J. T. Loome
R. B. Hart

SECOND LIEUTENANT:

E. B. Thayer

2ND BATTALION, 5TH FIELD ARTILLERY (FORT BRAGG, N. C.)

Major F. E. Royse

CAPTAINS:

J. S. Mallory
J. Nash
J. G. Coxetter
H. L. Berry
W. E. Corkill
C. E. Margrave
T. E. DeShazo
W. D. Webb, Jr.
C. S. Whitmore
S. S. Koszewski
S. M. Bevans

FIRST LIEUTENANTS:

B. D. Hayford
C. O. Wiselogel
A. B. Devereaux

2ND FIELD ARTILLERY BRIGADE HEADQUARTERS
(FORT SAM HOUSTON, TEXAS)

Brigadier General Francis Le J. Parker
Lt. Col. R. H. Lewis
Major E. B. Edwards

CAPTAINS:
J. F. Roehm
D. C. Schmahl
FIRST LIEUTENANTS:
W. H. Hill
G. E. Burritt
R. O. Smith
SECOND LIEUTENANTS:
E. A. Walker
J. F. Greco

12TH FIELD ARTILLERY

Colonel J. H. Bryson
Major C. Porterfield, Jr.
Lt. Col. F. T. Cruse
Major T. R. Kerschner
Major J. H. Tate

CAPTAINS:
J. J. Atkinson
E. A. O'Hair
A. M. Post
J. M. DeWeese
J. A. Smith, Jr.
R. B. Shaw
M. M. Montgomery
C. R. Hall
W. W. Dixon
C. R. Toy
FIRST LIEUTENANTS:
E. H. Lastayo
T. A. Jenning, Jr.
W. D. McNair
J. H. Hinds
G. D. Pence
A. N. Williams
SECOND LIEUTENANTS:
G. K. Cusack
S. Smellow
L. V. Hightower
E. L. Thompson
I. W. Jackson
A. M. Haynes
R. S. Carter
G. W. Seaward
C. W. McConnell
M. M. Magee
W. H. Isbell, Jr.
J. P. Daley
R. Q. Brown
J. W. M. Read
J. F. Stroker
C. A. Schrader
W. P. Goodwin

15TH FIELD ARTILLERY

Lt. Col. R. McT. Pennell
Major A. M. Harper

CAPTAINS:
H. F. Schoonover
N. E. McCluer
E. R. Block
C. H. Brammell
J. W. Loef
C. A. White
FIRST LIEUTENANTS:
E. M. Edmonson
R. P. Huff
S. Edwards
SECOND LIEUTENANTS:
J. A. Barclay, Jr.
O. C. Troxel, Jr.
L. W. Cather
E. H. Eddy
J. N. Raker
R. L. Cradell
D. C. Little
D. E. Beach

17TH FIELD ARTILLERY, LESS 3RD BATTALION (FORT BRAGG, N. C.)

Colonel E. R. W. McCabe
Lt. Col. M. Magruder
Lt. Col. T. G. Gottschalk
Major S. G. Brady
Major A. R. Ives

OFFICERS ASSIGNED TO REGULAR ARMY

CAPTAINS:
A. R. Reeves
F. Camm
A. L. Campbell
W. W. Murphey
J. McDowell
F. E. Kauffman
L. M. Haynes
J. F. Hepner
V. A. Dash
A. S. Quintard
L. McHale

FIRST LIEUTENANTS:
A. S. Bennet
F. W. Crary
W. L. Carr
W. E. Watters
P. H. Enslow
B. Furuholm
F. G. McGill
J. P. Kennedy, Jr.
L. L. Hittle
R. Condon
W. R. Grove
W. D. Williams
W. J. Klepinger
M. B. Stokes
T. E. Binford
P. H. Ringsdorf
E. A. Niblack
W. F. Millice
E. A. Banning
J. H. Workman
S. F. Little
R. C. White

3RD BATTALION, 17TH FIELD ARTILLERY (FORT DES MOINES, IOWA)

Major W. J. Jones

CAPTAINS:
J. C Patterson
R. Garey
H. J. Crigger
G. W. Vaughn
E. M. Link
E. C. Ringer
R. T. Beurket

FIRST LIEUTENANTS:
F. H. Canlett
C. L. Booth
G. B. Kraft
A. Bratton
L. M. Rouch

3RD FIELD ARTILLERY BRIGADE HEADQUARTERS (FORT LEWIS, WASHINGTON)

Brigadier General Henry W. Butner
Major W. F. Winton

THIRD AMMUNITION TRAIN (FORT SILL, OKLAHOMA)

Captain M. C. Wilson
Captain C. H. Mitchell
1st Lt. D. P. Poteet

10TH FIELD ARTILLERY (FORT LEWIS, WASHINGTON)

Colonel F. W. Clark
Major R. D. Johnson
Major C. H. Hayes
Major S. F. Clark

CAPTAINS:
J. G. White
W. W. Crawford
M. M. Potter
P. W. Allison
R. C. Hirsch
J. E. Ray
J. J. France
M. J. Rockwell
A. C. Gale
A. L. Warren
M. B. Patton
M. B. Barragan

FIRST LIEUTENANTS:
F. R. Brisack
R. C. Hendley
E. C. Norman
C. W. Stratton
H. F. Molloy
H. C. Raymond
P. Sather
E. McGinley
F. W. Lee

SECOND LIEUTENANTS:
- E. S. Berry
- J. W. Cave
- H. M. Peyton
- J. W. Park
- H. W. Riley
- J. B. Heyburn
- F. Q. Goodell
- H. B. Packard
- R. H. Harrison
- C. W. Raymond
- P. H. Lash, 2d
- F. A. Hansen
- D. E. Jones
- R. W. Fletter
- J. R. Messersmith

1ST BATTALION, 18TH FIELD ARTILLERY (FORT SILL, OKLAHOMA)

Major H. D. Jay

CAPTAINS:
- O. N. Schjerven
- J. A. Wallace
- H. Kernan
- W. W. Belcher
- A. P. Kitson
- D. T. Boisseau

FIRST LIEUTENANTS:
- P. R. M. Miller
- V. F. Burger
- G. E. Wrockloff
- O. L. McDaniel
- R. J. Reid
- F. A. Granholm
- R. F. McEldowney
- J. R. Lindsay, Jr.
- J. F. Bird
- H. F. Handy
- J. Meade
- I. Schindler
- F. H. Sinclair

SECOND LIEUTENANTS:
- R. J. Handy
- C. M. Matthews

2ND BATTALION, 18TH FIELD ARTILLERY (FORT RILEY, KANSAS, AND FORT SNELLING, MINNESOTA)

Major W. H. Cureton

CAPTAINS:
- W. S. Bryant
- W. F. Pride
- R. H. Slider
- S. M. Smith
- T. E. Buechler

FIRST LIEUTENANTS:
- H. Crawford
- E. V. Williamson
- C. W. Land
- C. C. Blakeney
- W. A. Walker
- C. H. Day
- J. T. Dawson

SECOND LIEUTENANTS:
- C. H. Gunderson
- M. S. Davis
- H. H. Hunt
- T. W. C. Carrithers
- R. G. Crandell
- R. I. Pride

76TH FIELD ARTILLERY, LESS 2ND BATTALION (FORT FRANCIS E. WARREN, WYOMING)

Colonel C. R. Norton
Major J. D. Key
Lt. Col. A. L. P. Sands
Major F. B. Inglis

CAPTAINS:
- H. W. Turner
- C. G. Holmes
- J. G. Cook
- C. F. Murray
- J. M. Hamilton
- J. C. Cook
- C. W. Bonham
- B. M. James
- H. B Dawson

FIRST LIEUTENANTS:
- J. E. Adkins, Jr.
- R. D. Waring
- H. L. Love
- P. R. Covey
- R. C. Lawes
- R. C. Cameron
- R. J. West

SECOND LIEUTENANTS:
- A. V. Dishman
- C. R. Murray
- D. L. Hine
- J. B. Rankin
- G. E. Dietz
- G. L. Roberson

2ND BATTALION, 76TH FIELD ARTILLERY
(PRESIDIO OF MONTEREY, CALIFORNIA)

Lt. Col. J. P. Marley

CAPTAINS:
- R. S. Perrin
- G. O. Kurtz
- R. W. Yates
- T. E. T. Haley
- D. S. McConnaughy
- W. M. Wiener

FIRST LIEUTENANTS:
- M. Pierson
- F. S. Kirkpatrick
- T. E. Lewis
- F. F. Carpenter
- E. J. Roxbury
- J. F. Collins

SECOND LIEUTENANTS:
- T. W. Parker
- C. R. McBride
- E. S. Hartshorn, Jr.
- B. Thielen
- C. E. Hughes
- R. W. Meals
- R. Totten
- G. S. Speidel, Jr.
- G. W. Power
- H. S. Sundt
- R. Wentworth
- J. F. Ammerman
- M. Tague
- J. G. Shinkle

THIRTEENTH FIELD ARTILLERY BRIGADE HEADQUARTERS
(FORT BRAGG, NORTH CAROLINA)

Brigadier General Manus McCloskey
Major J. B. Anderson
Major C. M. Busbee
Captain W. L. Kluss
First Lieutenant J. M. Whistler

BATTERY "A", 1ST OBSERVATION BATTALION
(FORT BRAGG, NORTH CAROLINA)

Captain F. M. Crist

FIRST LIEUTENANTS:
- J. M. Works
- H. W. Kruger
- E. T. Owen
- A. F. Freund

SECOND LIEUTENANT:
- F. H. Chaffee

1ST FIELD ARTILLERY (FORT SILL, OKLAHOMA)

Colonel R. C. Foy
Lt. Col. C. S. Blakely
Major H. R. O'Dell
Lt. Col. J. L. Collins
Major O. E. Beezley
Major R. G. Barkalow

CAPTAINS:
- J. H. Carricker
- H. J. Gaffey
- W. C. Goessling
- B. C. Anderson
- H. H. F. Gossett
- M. C. Walton, Jr.
- W. A. Ray
- L. H. Frasier
- E. R. Roberts

CAPTAINS:
- G. L. Danforth
- C. M. Lucas
- R. D. Terrell
- J. W. MacKelvie
- R. H. Dixon
- E. Y. Argo
- H. C. Harrison, Jr.
- W. Hayford, 3d
- I. L. Kitts
- T. C. Harry

FIRST LIEUTENANTS:
- N. J. Eckert
- P. L. Martin
- D. S. Babcock
- W. W. Scott
- R. L. Taylor
- J. A. Cella
- W. N. Gillmore
- S. H. Fisher
- C. L. Taylor
- E. L. Strohbehn
- E. V. Holmes
- W. H. Kennett
- M. F. Stober
- T. M. Watlington, Jr.
- J. M. Burdge, Jr.
- L. J. Stewart
- G. E. Mitchell
- S. C. Lombard
- E. C. Burkart
- B. F. Luebberman
- F. Dorn
- G. L. Holsinger
- L. J. Greeley
- H. C. Fowler
- J. Massaro
- J. B. Horton
- R. M. Montague
- C. E. Berg
- F. J. Hierholzer
- J. R. Wheaton
- F. J. Brown
- C. R. Hutchison
- L. E. Heyduck
- H. C. Larter, Jr.
- R. P. Turner
- S. A. Beckley

1ST BATTALION, 3RD FIELD ARTILLERY
(FORT BENJAMIN HARRISON, INDIANA)

Major J. K. Boles

CAPTAINS:
- H. F. Searight
- W. D. Davis
- C. M. Thirlkeld
- W. B. Leitch
- C. D. Parmalee
- A. L. Shreve

FIRST LIEUTENANTS:
- E. M. Quigley
- R. S. McClennaghan
- R. P. Hollis
- E. A. Routheau
- M. Faulhaber
- C. S. Berrien

SECOND LIEUTENANTS:
- W. W. Sisson
- F. D. Atkinson
- J. J. Davis
- R. F. Bowers
- J. E. Godwin
- J. K. Wilson, Jr.
- R. B. Franklin
- J. W. Ferris
- T. J. Edgar
- H. A. Hughes
- C. P. Westpheling
- A. W. Blair
- F. G. Hall
- J. K. Bryan
- P. R. Walters
- R. P. Thompson

2ND BATTALION, 3RD FIELD ARTILLERY (FORT SHERIDAN, ILLINOIS)

Lt. Col. O. L. Brunzell

CAPTAINS:
- O. M. Marshburn
- A. M. Goldman
- P. P. Rodes
- C. B. Cole
- M. A. Dawson
- J. P. Crehan

FIRST LIEUTENANTS:
A. Vepsala
C. E. Hixon
S. E. Stancisko
J. Hinton
D. V. Johnson
S. F. Yeo
SECOND LIEUTENANTS:
R. C. Cooper
F. H. Tapping
R. A. Hewitt
J. C. McCauley
W. A. Downing, Jr.
S. E. Otto
W. R. Gallup
A. R. Hercz
F. W. Ellery
C. L. Williams, Jr.
T. S. Pollock
H. C. Plapp

2ND BATTALION, 4TH FIELD ARTILLERY
(FORT BRAGG, NORTH CAROLINA)

Lt. Col. J. R. Brabson

CAPTAINS:
R. L. Gervais
R. L. Allen, Jr.
E. S. Brewster, Jr.
R. T. Adams
R. H. Knapp
FIRST LIEUTENANTS:
H. E. Sanderson, Jr.
J. J. Deery
G. P. Harrison
E. L. Andrews
S. V. Hasbrouck
W. H. DeLange
SECOND LIEUTENANTS:
A. P. O'Meara
H. C. Porter
C. A. Clark, Jr.
H. J. Versace
E. C. Shinkle
D. E. Means
W. P. Whelihan
J. P. Pearson, Jr.
E. J. Greco

1ST BATTALION, 9TH FIELD ARTILLERY (FORT LEWIS, WASHINGTON)

Major B. Frankenberger

CAPTAINS:
J. R. Williams
A. E. Billing
K. K. Jones
W. J. Egan
FIRST LIEUTENANTS:
H. Cort
W. H. Bertsch, Jr.
C. J. Kanaga
H. J. Harper
J. G. Anding
L. M. Johnson
F. B. Porter
E. H. Barr
L. R. Woods, Jr.

1ST BATTALION, 16TH FIELD ARTILLERY (FORT MYER, VIRGINIA)

Lt. Col. C. P. George

CAPTAINS:
H. W. Blakeley
W. R. Frost
W. H. Colbern
D. O. Hickey
H. P. Brotherton
P. G. Tenney
G. D. Shea
G. B. Barth
FIRST LIEUTENANTS:
L. B. Downing
A. T. McCone
D. G. Erskine
J. L. Chamberlain, Jr.
W. H. Barksdale, Jr.
E. S. Molitor
R. W. Mayo
SECOND LIEUTENANTS:
A. G. Stone
W. H. Hoover
A. Graham
F. I. Pohl

SECOND LIEUTENANTS:
- R. C. Moore
- A. Watson, 2d
- A. Hero, 3d
- J. T. Honeycutt
- B. D. Jones
- N. C. James
- H. King

2ND BATTALION, 16TH FIELD ARTILLERY
(FORT BRAGG, NORTH CAROLINA)

Lt. Col. L. J. McNair

CAPTAINS:
- D. L. Crane
- J. L. McIlhenney
- C. W. Glover
- S. White
- M. Ross

FIRST LIEUTENANTS:
- L. C. Friedersdorff
- C. Cavellie, Jr.
- G. M. Williamson, Jr.
- M. H. Lucas

SECOND LIEUTENANTS:
- A. R. Fitch
- M. Moses
- F. R. Redden
- J. C. Street
- H. K. Whalen
- H. G. Sparrow
- C. F. Buck, Jr.
- M. O. Perry
- J. A. Berry, Jr.
- S. W. Horner, 2d
- J. A. Meeks
- W. J. Given, Jr.
- W. F. Ryan

1ST BATTALION, 82ND FIELD ARTILLERY (FORT BLISS, TEXAS)

Lt. Col. L. C. Sparks

Major R. C. Rutherford

CAPTAINS:
- A. F. Doran
- L. J. Whitlock
- H. B. Hester
- S. C. Hilton
- W. B. Weston
- E. A. Hyde
- F. B. Lyle

FIRST LIEUTENANTS:
- W. W. Ford
- E. J. McGaw
- R. G. Miller
- G. B. McReynolds
- L. R. Garrison
- R. A. Ellsworth

SECOND LIEUTENANTS:
- J. J. McFarland
- D. A. Herman
- A. H. Hogan
- D. Parker, Jr.
- W. O. Darby
- M. L. Fisher
- W. Taylor, Jr.
- P. E. LaDue
- J. R. Brindley
- G. T. Powers, 3d

1ST BATTALION, 83RD FIELD ARTILLERY (FORT BENNING, GEORGIA)

Major C. A. Selleck

CAPTAINS:
- J. G. Brackenridge
- R. G. Mangum
- W. L. Bevan
- L. S. Partridge
- P. Mallett

FIRST LIEUTENANTS:
- G. B. McConnell
- C. H. Studebaker
- G. H. McManus, Jr.
- A. L. Cobb
- G. D. Vanture
- P. Thompson, Jr.
- W. A. D. Thomas
- W. C. Lucas
- L. B. Ely

FIRST LIEUTENANTS:
J. P. Barney, Jr.
L. S. Griffing
M. Craig, Jr.
G. D. Crosby
SECOND LIEUTENANTS:
J. J. Heriot
R. A. Ports
J. R. Beishline
W. A. Harris
R. B. Neely
W. E. Grubbs
C. E. N. Howard, Jr.
D. F. Walker
G. Chapman
J. M. Royal, Jr.

24TH FIELD ARTILLERY (PHILIPPINE DEPARTMENT)

Colonel U. Birnie, Jr.
Major H. L. McBride
Lt. Col. D. C. McDonald
Major J. C. Wyeth

CAPTAINS:
M. H. Doty
H. W. Tarkington
W. C. Green
L. M. Kilgarif
A. M. Sheets
G. J. Downing
J. P. Eckert
I. L. Foster
R. B. Willis
E. A. Henn
M. L. McCreary
S. F. Reyes (PS)
F. V. Segundo (PS)
V. Z. Gomez (PS)
A. D. Garcia (PS)
A. Martelino (PS)
J. L. Graves
C. F. Burback
J. P. Woodbridge
V. H. Connor
J. D. Balmer
G. M. Lindsay
M. S. Sulit (PS)
N. Catalan (PS)
G. F. Wooley, Jr.
FIRST LIEUTENANTS:
S. L. Cowles
R. M. Cannon
H. P. Storke
R. D. Powell
G. R. Carpenter
D. Larr
SECOND LIEUTENANTS:
H. E. Brooks
J. Q. Brett
B. C. Patrick
A. C. Goodwin, Jr.
F. G. Terry
G. C. Duehring
R. L. Carmichael, Jr.
W. H. Allen, Jr.

11TH FIELD ARTILLERY BRIGADE HEADQUARTERS
(HAWAIIAN DEPARTMENT)

Brigadier General James B. Gowen
1st Lt. A. C. McAuliffe (ADC)

(Officers not yet assigned to units herewith)

Major O. M. Moore
Captain J. H. Ball
Captain R. A. Carter
1st Lt. S. V. Krauthoff
1st Lt. W. C. Stout
1st Lt. E. Parmly, 3d
1st Lt. W. R. Schaefer
Captain F. G. Chaddock
Captain C. Pickett
Captain F. H. Gaston
1st Lt. L. Vocke
1st Lt. L. F. Young
1st Lt. A. R. S. Barden
2d Lt. D. F. Brown

Assigned to 11th F. A. Brigade Headquarters

Captain H. M. Findlay
Captain E. T. Hayes
1st Lt. W. L. Coughlin

8TH FIELD ARTILLERY

Colonel W. K. Moore
Major J. Keliher
CAPTAINS:
M. A. Stuart
R. J. Sothern
E. H. Brown
L. F. Kosch
T. C. McCormick
R. H. Bacon
P. A. Reichle
A. E. King
A. B. Wade
H. M. Schwarze
P. C. Boylan
FIRST LIEUTENANTS:
C. E. Hart
A. Bliss
W. G. Bennett
H. Y. Grubbs
F. A. March, 3d
A. R. Sewall
J. O. Taylor

Major F. B. Jordan
Major H. G. Fitz
H. E. Baker
B. P. Heiser
F. H. Morse
H. D. Baker
S. A. Dickson
B. A. Holtzworth
SECOND LIEUTENANTS:
R. E. Chandler
D. M. Perkins
R. W. Timothy
C. I. Hutton
R. H. Booth
R. S. Pratt, Jr.
J. G. Harding
E. H. McLemore
C. C. Smith, Jr.
W. E. Johns
L. H. Wyman
F. M. Steadman

11TH FIELD ARTILLERY

Colonel E. Swift, Jr.
Major P. L. Thurber
CAPTAINS:
F. H. Boucher
C. E. Boyle
C. R. Lehner
E. F. Kollmer
W. R. Philp
G. R. Middleton
T. R. Willson
C. D. Calley
L. A. Daugherty
FIRST LIEUTENANTS:
G. C. Benson
P. A. Berkey
J. B. Clearwater
R. C. Conder
W. C. Stanton

Lt. Col. E. W. Wildrick
Major R. B. McBride, Jr.
W. W. Whelchel
R. H. Donaldson
N. C. Cureton
O. W. Martin
S. Y. McGiffert
R. C. Ross
R. M. Osborne
SECOND LIEUTENANTS:
V. B. Barnes
P. Clark, Jr.
B. Hamlett
T. J. Counihan
S. L. Morrow
J. C. Hayden

13TH FIELD ARTILLERY

Colonel R. S. Pratt
Major M. C. Heyser
CAPTAINS:
H. R. Hanson
J. R. Sheetz
J. W. Faulconer, Jr.
J. E. Bush

Lt. Col. W. Bryden
Major P. G. Black
Z. E. Lawhon
M. E. Scott
P. E. Shea
W. N. White
J. R. Young

OFFICERS ASSIGNED TO REGULAR ARMY

FIRST LIEUTENANTS:
- J. L. Lewis
- V. R. Smith
- J. L. Hardin
- J. G. Howard
- J. K. Gibson
- T. Calhoun, Jr.
- M. P. Chadwick
- D. Dunford
- R. L. Mabie
- C. G. Blakeney
- J. C. Strickler
- L. E. Snell
- C. W. Cowles

SECOND LIEUTENANTS:
- D. R. French
- W. P. Connally
- J. L. Beynon
- K. H. Ewbank
- J. R. Pitman, Jr.
- W. J. Thompson
- R. E. Hatton
- J. H. Rothschild
- F. A. Lightfoot
- R. W. Goldsmith
- J. P. Hannigan

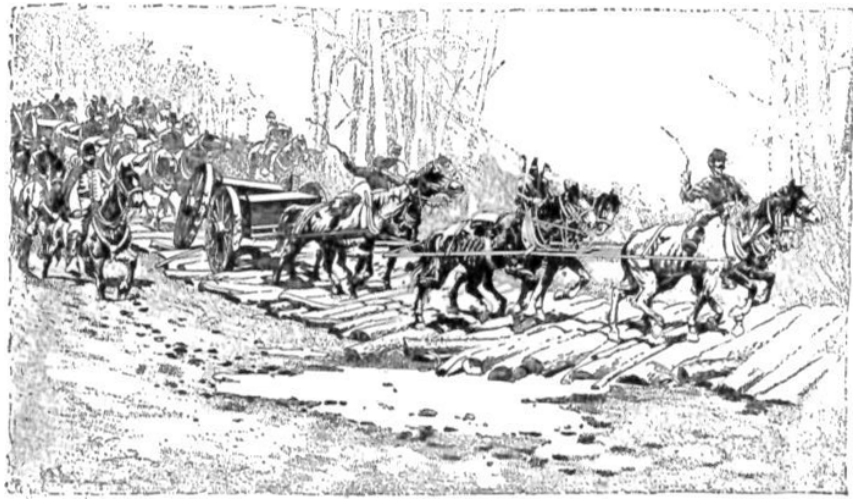
2D FIELD ARTILLERY (CANAL ZONE)

Lt. Col. E. L. Gruber

CAPTAINS:
- D. L. Ruffner
- G. H. Duff
- S. G. Fairchild
- W. M. Wright, Jr.
- L. E. Babcock
- F. J. Achatz
- C. P. Summerall, Jr.
- F. S. Gardner
- J. E. Slack
- J. W. Black
- C. R. Carlson
- J. M. Callicut
- R. C. Partridge
- C. A. Pyle

FIRST LIEUTENANTS:
- G. R. Scithers
- E. F. Hammond
- T. McGregor

SECOND LIEUTENANT:
- F. S. Stritzinger, 4th



TYPE PROBLEMS

Percussion Bracket Lateral

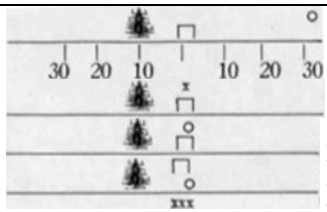
Target Description: Enemy infantry in vicinity of terrain feature. *Mission*: To neutralize. *Initial data obtained*; Plotted, Range finder and BC telescope. *Matériel*: French 75mm guns, M1897. Guns to right rear of OP. T=200 mils, r=2.5, R=4.9, r/R=½, s=20/4.8=4. *Initial Commands*: Base Deflection Left 110, On No. 2 Close 3, Site plus 10, Shell Mark 1, Fuze Long, No. 2, 1 Round.

Commands	*Range*	*Rd. No.*	*Deviations noted*	*Sensings* *Range*	*Deflection*	*Remarks*
	4900	1	45 Right	?		
Left 25	4900	2	8 Left	over		Right 4 to get burst on line. Left 8 to stay on.
Left 5, BR	4700	3		short	over	For effect, open 5 mils from present sheaf.
		4		over		
		5		short		
		6		?		
Left 10, on No. 1, Open 5, B 1 Rd.	4800					Improve deflection if necessary. Fire through zone 4800-4600.

Comments: Errors in initial data, Deflection 40 mils, Range 200 yards. Time to announcement of initial range, 1 minute, 50 seconds. Ammunition expended, 7 rounds. Classification—satisfactory. General comments: Partially converging sheaf facilitates adjustment when target offset is small.

Axial Time Bracket

Target Description: OP in vicinity of tree on low ridge. *Mission*: *To neutralize, Initial data obtained*: Estimated. *Matériel*: French 75mm guns, M1897. Battery 1400 yards in rear of OP. r=3000 (est.), R=4400, r/R=2/3. *Initial Commands*: Base Deflection Left 180, On No. 2 Close 4, Site 0, Corrector 35, No. 2, 1 Round.

Commands	*Range*	*Sensings*	*Remarks*
	4400		30 × 2/3 = 20
Left 20, Down 5	4400		
Up 3	4000		Effect over, Appears close to adjusting point. Open 33/4 = 8 for effect.
BR	3800		
Up 5, On No. 2 Open 8, B 1 rd	4000		

Comments: Errors in initial data: Deflection 30 mils; Range, 500 yards. Time to first range, 50 seconds. Total time of problem, 2 minutes, 15 seconds. Classificaiton—Satisfactory.

Lateral Precision

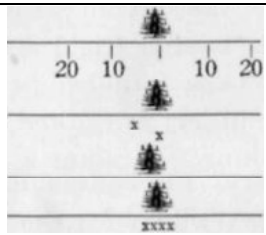
Target Description: Base point. *Mission*: To register, and determine a K. *Initial data obtained*: Estimated. Survey work to locate the base point and guns accurately is proceeding during the adjustment. *Matériel*: French 75mm guns, M1897. Guns to right rear of OP. r=3.2, R=4.5, T=220, s=22/4.5=5, c=6, s/c=.8 r/R=.7, Fork=6, Shift per fork=.8×6=5 mils. *Initial Commands*: Battery Adjust, Compass 3170, Shell Mark I, Fuze Long, No. 1, 1 Round.

		Rd.		*Sensings*		
Commands	*Elev.*	*No.*	*Dev.*	*Range*	*Deflection*	*Remarks*
	160	1	60 R	?		60 × .7 = 42
Left 42	160	2	4 L	short		Right (.7 × 4) + Right (4 × 5) = Right 23.
Right 23	184	3	6 R	short		Left (.7 × 6) + Right (20 – 4) = Right 12.
Right 12	208	4	3 L	over		$\frac{.7 \times (6R + 3L) + R12}{2} = L7$
Left 7	196	5	2 R	short		
Right 4	202	6	2 R	short		
Right 2, 3 rds	205	7	1 R	short		
		8	2 R	short		
		9	line	short	short	
Right 2, 2 rds	208	10	5 R	short		
		11	line	over	over	Fired at 206.5. Fork=9 206.5+(2/12×9)=208.

Left 1, On No. 1
Adjust sheaf parallel,
Corrector 35, 5000.
Record Base Deflection.
Adjusted elevation = 208.0 mils.
Map data for target shows map range 5180 yds.
Site = plus 6.0 mils.
Adjusted elevation less site = 202.0 mils.
Adjusted range = 5086 yds.
K = 5086/5180 = .982, or minus 18 yds. per M.
Comments: Errors in initial data, deflection 7 mils. Range, 700 yards. Ammunition expended, 11 rounds. Classification: Satisfactory.

Axial Percussion Bracket

Target Description: Machine guns in vicinity of bush. *Mission*: To neutralize. *Matériel*: French 75mm guns, M1897. *Initial Data obtained*: Estimated. *Initial Commands*: Compass 1600, On No. 2 Close 5, Site 0, Shell Mark I, Fuze Long, No. 2, 1 Round.

Commands	*Range*	*Deviations* < 30 R >	*Sensings*	*Remarks*
	4000		?	
Left 30	4000		–	
Right 5	4400		+	For effect, interval between bursts should be 33/4.2 = 8 mils.
BR	4200			Sheaf is 9 mils wide, 3 mil interval.
On No. 2 Open				
5 B 1 Rd, zone	4400			Open 8 – 3 = 5 mils. Start at 4400, as only one sensing there.
	4200			

FIELD ARTILLERY NOTES

All-Purpose Battery

Battery B, 17th Field Artillery, commanded by Captain A. R. Reeves and Major C. C. Bank of the Field Artillery Board, were ordered to Aberdeen Proving Ground in September for duty in test of the battery of 75mm guns T2E1 (All-Purpose). This battery included the fire control equipment for anti-aircraft as well as terrestrial fire, and complete motor vehicle equipment including six wheel, six wheel drive trucks as prime movers and cargo vehicles. After certain modifications found necessary in the Proving Ground test of the guns this battery will return to Fort Bragg for test by the Field Artillery Board.

Test Equipment Assigned to the 6th Field Artillery

There have been assigned to the 1st Battalion, 6th Field Artillery, Fort Hoyle, four 75mm guns M1897 M1E10 and four 75mm guns M1897 M1E12 for comparative test. These represent two types of high speed adapters, designed and manufacutred by the Martin Parry Corporation and by the Ordnance Department respectively. This battalion was equipped throughout last August with light trucks and station wagons and despite the additional duties connected with the C. C. C. and special work in relief of unemployment has been conducting interesting tests and exercises with the new equipment.

Comments on Truck-Drawn 75mm F. A. for the National Guard

Many letters are now being received by the Office of the Chief of Field Artillery concerning the recent transformation from horse-drawn to truck-drawn divisional Field Artillery of the National Guard. This change has been found to be very satisfactory. An extract of a letter on this subject is quoted herewith:

> "We think that we can show you some greatly improved National Guard Field Artillery. I'm completely sold on truck-drawn 75mm divisional Field Artillery for the National Guard. While I know little yet about its tactical mobility, yet its strategic mobility enables us to concentrate most of it in a single

camp (Jackson, S. C.) and to group the officers for special training in a miniature Fort Sill that we have organized to improve target practice. As a matter of economy truck-drawn Field Artillery is the only thing for the Guard."

Artillerymen Win Army and Navy Journal Medals

From each Corps Area the outstanding C. C. C. Company was selected and the winner in each Corps Area announced. Of these winners three were commanded by Field Artillery officers as shown below: Fifth Corps Area—Company No. 1538, Pineville, W. Va., Captain Charles W. Mays, F. A., U. S. A., Commander, Captain John P. West, F. A. Res., 1st Lt. Clinton S. Berrien, 3rd F. A., U. S. A. Sixth Corps Area—Company No. 647, Camp Smith Lake, Hayward, Wisconsin, Captain John P. Crehan, 3rd F. A., U. S. A., Commander, Captain Robert W. Fisher, Cav. Res. Seventh Corps Area—Company No. 1776, Lake Andes, S. D., Captain Herman J. Crigger, 17th F. A., U. S. A., Commander.

Colonel Erlenkotter Dies at Walter Reed General Hospital

The death of Lieutenant Colonel Herman Erlenkotter, Field Artillery, Inspector General's Department, which occurred at Walter Reed General Hospital, Washington, D. C., August 30, 1933, is announced with deep regret.

Lieutenant Colonel Erlenkotter was born in New Jersey, January 18, 1885. He is a graduate of the U. S. M. A., 1909; G. S. C. Eligible List; G. S. C. 30th June '25 to 23rd June '28; Graduate: Army War College 1925, C. and G. S. School 1923, Mounted Service School, First Year Course, 1915; M. E. Stevens Institute of Technology, N. J., 1905.

During the World War he served as Major and Lieutenant Colonel of Field Artillery. His attention to duty, conscientiousness and loyalty to the service were his outstanding characteristics. In the death of Lieutenant Colonel Erlenkotter, the Army loses an officer whose experience, command, administrative ability and professional attainments were unusually valuable to the service.

THE LIGHT PRIME MOVER T9, SIX WHEEL, SIX WHEEL DRIVE MARMON HERRING. TON TRUCK, EQUIPPED WITH HIPKINS TRACTION DEVICES, TOWING THE 155MM HOWITZER THROUGH THE MUD COURSE AT ABERDEEN PROVING GROUND.

Time Shell

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