# No. 1, January-February, 1933

**CAPTAIN HENRY J. REILLY, BATTERY COMMANDER OF LIGHT BATTERY F, FIFTH ARTILLERY**

# THE FIELD ARTILLERY JOURNAL

VOL. XXIII JANUARY-FEBRUARY, 1933 No. 1

## ROLLING ALONG WITH REILLY

BY A. R. GINSBURGH, Captain, F. A. (DOL)

I

"IF YOU had only one hitch to put into the Field Artillery and could pick your own time and your own outfit from among all those that ever served Uncle Sam, what would you take?"

Several years ago, an enlisted man stationed at Governors Island put this question to Bertram Follinsby, who then was closing his forty-sixth year of service with the army. For more than twenty-seven years, he had marched with the rolling caissons. For more than ten years, he had served as First Sergeant of Light Battery F of the Fifth Artillery. His choice came without hesitation.

"Give me back my hitch to Reilly's wagons between 1898 and 1902," he proudly voted.

And anyone familiar with the history of Reilly's Battery, as Light Battery F of the Fifth popularly was known, would find it rather difficult to challenge Follinsby's selection. Between 1898 and 1902, Reilly's Battery fulfilled every promise, even of the most enthusiastic recruiting sergeant.

Travel? From the plains of Kansas to the savannahs of Georgia and the everglades of Florida, across the Gulf of Mexico to Cuba, back to the mainland, hardly long enough to recover from tropical debilities, then off on a transcontinental trip to San Francisco, again in ships, away to the far off Philippine Islands, then once more to sea, to Japan, to China, then back to the United States, Reilly's soldiers saw the world.

Action? Behind the trenches around Santiago, in the rice patties of Luzon, along the dusty trails of China and on top of the walls of Peking, Reilly's gunners mixed their salvos.

Adventure? Galloping across enemy trenches, unlimbering in the face of desultory fire, going into action within 100 yards of the hostile lines, keeping up with the infantry despite flooded streams, washed out bridges and treacherous steep trails, harnessing

at sea before landing and hitching upon disembarking, Reilly's drivers delivered their guns.

Romance? New countries, strange peoples, foreign armies, glamorous surroundings, castles of gold and houses of silver—these redlegs verily lived the "Life O'Reilly."

Reilly's men were a wholesome crew, recruited all over the country. The backbone of the outfit consisted of the old-timers, the non-commissioned officers who had followed Light Battery F's fortunes through the Indian campaigns back almost to the Civil War. Reilly, a Civil War veteran himself, had come to the battery in 1868.

In those days, captains stayed with their outfits virtually for decades. Indelibly they left their imprints upon the character and morale of their batteries. Then, soldiers paid little or no attention to the letter and number designation of their batteries. It was alright on the morning report or on the muster roll to refer to an outfit as Battery "A" of the First or "B" of the Second, but once past the battery clerk or the sergeant major, the outfit and every man in it became identified with its battery commander. It was Reilly's Battery, or Grimes' Battery or Capron's Battery. Burgess, Summerall and McCloskey were Reilly's lieutenants. Follinsby was Reilly's first sergeant. Planco was Reilly's battery clerk. Reilly's non-coms, Reilly's horses, Reilly's guns, even Reilly's recruits had their distinguishing characteristics which bore the stamp and impression of Captain Henry J. Reilly.

On pass, by the tilt of their hats and the swagger of their gaits; on parade, by the polish of their guns and the sleek coats of their animals; in action, by their thorough reconnaissance, their march discipline and the speed and accuracy of their fire, Reilly's Battery always attracted attention.

"Better than any other battery in the campaign," after the capture of Peking, General Chaffee, in command of the American forces, officially referred to Reilly's Battery.

"I feel like taking off my hat whenever I see it," remarked General Linivitch, who commanded the Russian forces in the interallied campaign against the Boxers.

## II

Early spring of 1898 found the Battery at Fort Riley, Kansas,

Little did Captain Reilly or any of his men realize what the next four years had in store for them. Performing their daily garrison duties, drilling, marching, parading, taking a regular guard tour and the usual share of fatigue, Reilly's Battery was going through its normal peace time routine when the war drums rolled.

On March 14, the Battery received orders to move to Savannah. Two days later, it was on the way. On March 19, it reached Tybee Island. Immediately it was brought to full strength. The serious business of getting ready to take position on the firing line began in earnest. In no time, the recruits were whipped into shape. April found the Battery at Camp George H. Thomas, Chickamaugua Park. In May, the outfit reached Tampa.

Then followed a disagreeable lull. Men, animals and munitions glutted the streets and yards of the Florida ports, but nothing seemed to move. The army transport service still was in its infancy. Other outfits grew restless. Reilly's men did not get the chance to mope.

Every day the Battery followed a rigorous schedule of training. When the Battery finally cleared Tampa on the *Comanche* on the morning of July 3, it was ready to roll off its guns and take the field immediately upon disembarking. It was not disappointed.

Upon arrival at Daiquiri on July 10, it found orders to move to the front lines. Late the next afternoon it left Daiquiri, in the early evening passed through Siboney, early the next morning arrived at headquarters of the Fifth Army Corps, kept right on moving forward and at noon camped in rear of the trenches of Chaffee's brigade. Immediately the Battery dug in. Gun pits were built. Before daybreak, the pieces were in position ready for action.

But the guns never fired a shot. For all intents and purposes, the Battery had enjoyed a grand maneuver under actual war conditions and returned to camp. By the end of August, the outfit had returned to the United States. After a short delay at Montauk while horses and men recovered from the ravages of tropical disease, Captain Reilly led his men to Fort Hamilton for "permanent" station.

The sojourn at Fort Hamilton proved brief. The Philippine Islands were calling for Reilly's Battery by name. The seriousness

of the job ahead was obvious to the battery commander. He asked for the detail of three outstanding junior officers, all of them who since then have made history in the Field Artillery. The War Department granted his request. To Reilly's Battery came Lieutenants Louis R. Burgess, Charles P. Summerall and Manus McCloskey.

When the time came to take the train to San Francisco, Captain Reilly found that he was limited to 24 horses. Here was a full battery of 100 animals, many of them experienced in tropic campaign, with its lame and sick already weeded out, ready for action, but the ban of the limit to 24 never was raised. This restriction proved costly. Repeatedly during the Philippine and Chinese campaigns, Reilly missed his old draft animals. Time in training and conditioning would have been saved. The Battery would have avoided many hardships. By the time Reilly reached Manila, he had his doubts about getting even the 24 allowed him.

III

At San Francisco, the Battery was broken up. Horses and guns were placed on the *Leelanaw*. Men embarked on the *Newport*. Almost from the moment of sailing, both ships ran into difficulty. It took the *Newport* ten days to get to Honolulu. The strain on its machinery proved so great that it took five days to get it into shape to continue the voyage. Meanwhile, Reilly's men were enjoying their taste of the Hawaiian Islands.

On May 23, thirty-three days after sailing, the *Newport* landed in Manila. Men and baggage were taken off on cascoes. The Battery went into camp on the beach near the Quartermaster corral, but there were signs of neither horses nor guns.

No one, not even Reilly himself felt greater concern over the absence of the guns than General Lawton. He was ready for action but lacked guns to support his attack upon the insurgents. The *Leelanaw* still was far out at sea. It was late in starting out of San Francisco, stopped in Honolulu to rest the animals and 68 days after its scheduled departure, Noah's Ark, as the enlisted men dubbed the *Leelanaw*, drifted into the harbor of Manila.

On the very day of its arrival, General Lawton had drawn up his forces ready for an immediate attack upon the insurgent line south of Manila which extended from near Pateros to the bay near the Zapoti River. Every effort was made to hasten the landing.

But facilities for lightering the ship were poor. After much pulling and tugging, in which Reilly's artillerymen joined the native stevedores, guns and animals finally were cast ashore.

Obviously, Reilly did not have enough horses to bring the Battery into action, particularly since one of them had died on the way. No horse replacements were available. Reilly managed to get hold of twelve mules and the caissons went rolling along. With two mules as leaders and two horses as wheelers Reilly's six 3.2 guns marched off to take their part in the Philippine campaign. Adorned with red artillery saddle blankets and brass trimmed harness, the mules fell into line and soon Reilly's men were boasting that Reilly's mules were different—better than any in the service.

The south line proved merely a defensive sector. Three guns under Captain Reilly were placed at Haystack Knoll and the other three under Lieutenant Summerall, two miles away, at Telegraph Hill. Caissons were left behind. After bringing the pieces into position, one platoon was left at the guns. Horses and drivers returned to Manila. Platoons served tours of ten days each with the guns.

Reilly had visions of his Battery going stale and took steps to keep it in condition. Half way between the two camps, the Battery frequently assembled for a vigorous course of gunners' instructions. Every day, there was drill in the service of the piece. The terrain proved ideal for target practice. With live ammunition and with live targets Reilly's gunners and lieutenants received daily training in their duties.

Transportation problems arose to plague Reilly. Torrential rains had washed out the roads. The native bull carts failed. Only one escort wagon made up the total of his transportation facilities. Despite opposition at Fort Hamilton, he managed to retain this vehicle with his wagons. Drag ropes to haul out the wagon and carts were in daily use but battery drills continued.

The Battery began to function like a smooth well-oiled machine but never again in the Philippine campaign did it serve as a complete unit. From now on, it was the story of Burgess' platoon, Summerall's platoon, McCloskey's platoon and even Follinsby's platoon. At the battle of Putol Ridge, the first sergeant gave an excellent account of himself.

"First Sergeant Follinsby and his gun detachments deserve special commendation for bravery in deliberately serving a field piece on an open road 265 yards from an enemy who was protected by an embrasured work and armed with modern rifles," Captain Reilly advised the Adjutant General of the Second Brigade.

Follinsby's notable example proved the value of the training in the duties of the commissioned personnel that Reilly always gave his non-commissioned officers.

In September, 1899, Reilly's men began to show their wares in action. For the next five months, those who sang loudest in their praise were the doughboys they supported. At Imus, near Bacoor, at Calamba, at Binacayan, at Noveletta, near San Francisco de Malabon, at San Cristobal, at Lecheria, at Barrio Putol, at Santo Tomas, near Lipa, near Rosario and near San Pablo, Reilly's guns "volleyed and thundered." Now to the support of the 4th Infantry, then to the 21st, now to help the 39th, then the 14th, Reilly's redlegs drove their guns.

With the Fourteenth, Reilly's Battery had an especial strong and sentimental bond. Back in the Civil War, both outfits had fought at Antietam and Gettysburg. Now they were together in Luzon. Before returning to the United States, they were destined to play the vital role in the spectacular capture of the city of Peking.

## IV

The guerilla warfare of the Philippine Insurrection tested the caliber of the leaders of small units. Reilly and his platoon leaders more than met the requirements.

Tales of heroism, hardships and distinguished service abound in the chronicle of these skirmishes. Yet there never was a lull in action but that Reilly took his men out for sighting and aiming drills or for a special tour on the picket line. Under such training, battle action means merely the usual drill at a slightly more animated tempo. Officers and men ignore dangers. Here and there a casualty develops but the work goes on.

While the guns move along Dos Maunos Road an insurgent shot strikes Private Lievre, the wheel driver, in the knee, but without any commotion the piece is unlimbered and prepared for

action. In the battle along Binacayan Road, Lieutenant Burgess is severely wounded in the right leg. He has to be taken from the field. Sergeant Proctor moves forward in the saddle. The service of the guns continues uninterrupted. At Bacoor, under heavy fire from the insurgent lines, Captain Reilly calmly rides along the line and points out the targets to Lieutenant McCloskey. While bullets whiz around him. McCloskey reconnoiters the area, carefully plots the enemy positions, goes back to his guns and gives his commands.

The fire often gets too hot. It seems utter folly to expose one's self needlessly. The guns have to be withdrawn behind clumps of bamboo, loaded, quickly run out, aimed, fired and drawn back to cover. The men seem to enjoy the fight. The enemy fire persists. The gunner has trouble laying his piece. The target is obscured. McCloskey orders the gunner to step aside, rolls the gun forward, sets "shrapnel zero" and blazes away. From behind an embankment but 50 yards away, the natives scamper out.

Brigadier General F. D. Grant does not let the work of the platoon go unnoticed. "A section of the Fifth Artillery, under Captain Reilly rendered excellent service during the day in driving the insurgents out of their trenches," he officially reports.

At Cavite Viejo, on October 8, Reilly's center platoon, commanded by McCloskey, again distinguishes itself. McCloskey goes forward with one piece with the advance party of the vanguard. Sergeant Jay F. Proctor takes his place in the support with the second section. The line moves up about a mile to Bataminton. Enemy fire breaks out from front and both flanks. The leading piece gallops to the line occupied by the skirmishers, fires a few rounds, again advances at a gallop, again fires and keeps up with the fighting wave in the manner of infantry squad rushes. The advance stops. Here is a trench five feet deep, eight feet wide almost filled with water. Impassable rice fields and deep treacherous swamps cut off the flanks. While the guns fire, every available man works filling up the ditch. The Engineers, commanded by Captain Sibert lend a hand. Soon the pieces clear the obstacle.

The second line moves forward. Sergeant Proctor's men get their share of the enemy fire. But they are an invincible crew and nothing stops them. Even the horses are tough. Proctor's

mount is shot in the neck but he refuses to give up. The horse lives to take his part in the capture of Peking. McCloskey's horse is shot twice but recovers in three weeks.

Again Reilly's men win praise. "The work of the artillery, arduous in the extreme owing to the condition of the roads, may without exaggeration be characterized as brilliant. Under the leadership of their dashing officers, one or more sections were invariably placed in the firing line; in one instance (on the Buena Vista Road), when the troops were obliged to move forward in column, the leading piece marched with the point of the advance guard," reports General Schwan.

Summerall and his left platoon uphold the traditions of Reilly's Battery in other Luzon sectors. Not only 3.2's but Hotchkiss 1.65's and Vickers 2.95's are added to his artillery. From the front, the flanks and even from the rear come frantic appeals for support from Summerall's artillery. Always, he obliges.

Experiments in new armament go on right in the middle of the campaign. To Summerall's platoon come pieces of many calibers and various designs to try out on live targets. At Calamba, he gets a Sims-Dudely pneumatic gun. He fires at a range of 1300 yards. The first shell strikes within a few yards of the enemy trenches. A terrific report accompanies the nitro-glycerine charge. In terror the Filipinos run away. They escape to a nearby woods and watch the experiment. After a few rounds, they return to the trench and with great interest watch the target practice. They get into the game. At the flash of the gun they take to the woods. After the explosion they stand up and wait for the next shot. The Sims-Dudely, like many of its predecessors, goes back to Manila. Summerall sticks to his guns.

Summerall, too, has special transportation problems. The dump cart of the platoon which can hardly carry the ammunition for the Hotchkiss gun is loaded with rations as well. Grain is packed on the axle seats and hay on the limber chests. The heat is exhausting. Horses fall in harness. At Santa Cruz, for 36 hours at one time, there is no forage. Cocoa-nut leaves which they can hardly masticate suffice for the horses. Heavy rains soak through the roads. Diseases of the foot attack the animals. But Summerall's platoon never fails.

Bronzed by the tropic sun and toughened by the intensive campaigns

in the jungles and swamps of Luzon, Reilly's scattered platoons finally return to Manila in February, 1900, and the training as a battery unit is resumed. Disease has debilitated some of the men and weakened many of the horses. On the Exposition Grounds in comfortable brick buildings Captain Reilly has found suitable quarters for the men, but his efforts to improve the lot of the horses are not quite so successful.

In vain he tries to get the Quartermaster to build stables. The Battery constructs a framework over the picket line and stretches all the obtainable canvas over the top. The canvas resists neither rain nor heat. The ground proves soggy and many of the horses develop diseases of the foot. Finally Reilly places his guns on the open road, the only firm ground in the enclosure, stretches a picket line between the carriages and with the aid of vigorous grooming and plenty of exercise, most of the horses recover.

## V

Reilly and his men were adjusting themselves to their Filipino environment when the turbulent Pacific went on another rampage. This time, it was trouble in China. The Boxer Rebellion against the western powers called for an interallied intervention. Light Battery F of the Fifth Artillery was designated for service with the expedition.

Orders were received July 9. Reilly lacked both men and horses to make up a full strength war battery. From the infantry came a number of soldiers, who obviously had just finished a tour of duty behind guard house bars. From the artillery arrived 30 horses, many of them green and unaccustomed to harness. There was no time to drill the men nor train the horses. Both were to get experience in quick order on the fields and trails of China. To transport the Battery, the *Flintshire,* a horse transport, was made available on July 13.

During the night of July 14 the Battery, consisting of 3 officers, 146 enlisted men, 96 horses, 8 mules, six 3.2's, 9 caissons, 1 battery wagon and 3 escort wagons embarked. To the Battery were attached Assistant Surgeon H. S. Greenleaf and Contract Surgeon R. N. Winn. Lieutenant Burgess was on detached service in the Camarines at this time and was ordered to join but did not reach Manila in time to sail on the *Flintshire*. He followed on a later transport. Six mules and a light spring wagon

with a detachment also were left behind at Manila because of congestion on the *Flintshire*. On the morning of July 15, the transport sailed.

Hardly had the *Flintshire* cleared the breakwaters of Manila Bay when the hoodoo of the sea returned to annoy Reilly and his men. Cooking provisions were limited and but a few could be fed at a time. Neither officers nor enlisted men had accommodations on the ship. Gold Medal cots were put on deck but as soon as the ship began to toss, a number of the men fell out of their cots. The rest preferred to stretch out on deck. Steady sprays soon discouraged all rest on deck. Below deck other troubles were brewing.

On the way to Nagasaki, the coal in the bunkers caught fire from spontaneous combustion. For hours, large details from the Battery, most of them seasick, were kept busy stirring up the coal and keeping it wet. On July 21, Reilly reached Nagasaki. The burning Australian coal was dumped out of the bunkers and Japanese substituted.

The change took three days. Meanwhile, Reilly's men were getting first hand information about the customs and manners of their Japanese allies, who also were interested in the suppression of the Boxer Rebellion.

On July 24, the *Flintshire* started for Baku. Three days later, at anchorage, 18 miles from the Chinese port, Reilly's Odyssey ran into more difficulty. For lightering the transports, but three small draught boats had been obtained. One of them, a 70-ton steel barge had been grounded on the bar. Another of the same type and the smaller steamer *Pichili* were occupied in landing the Fourteenth Infantry and supplies from other ships. For three days, the *Flintshire* anchored and waited its turn.

Meanwhile, to facilitate the transfer of bulky articles from the *Flintshire* to the smaller boats, the Battery constructed large ramps. All the cargo that could be hoisted from below was raised on deck.

On July 31, came orders to transfer guns and carriages to the barge, horses and supplies to the steamer. The arrival of the message came simultaneously with a terrific gale. Reilly's men encountered great difficulty in lowering the guns to the barge. Reilly was anxious to bring the Battery ashore with the least

possible delay. Late into the night, Reilly's men worked. The gale grew worse. About nine o'clock at night, in pitch dark, the *Pichili,* with Captain Reilly, Lieutenant Summerall, a number of the men and all the horses aboard, was cast adrift.

Fear of ramming the *Pichili* prevented the *Flintshire* from going in pursuit. The *Pichili* lay at anchor and crossed the bar in the morning tide. Animals and cargo were landed at Tonku and she returned on the evening tide to pick up the rest of the Battery.

The barge was having more troubles even than the *Pichili*. Only by keeping astern of the *Flintshire*, was it saved from floundering. On the morning of August 1, a United States Navy tug undertook to tow it. After a few slight tugs the hawzers snapped. The barge with guns aboard started back toward Manila. Reilly's ingenious soldiers rigged up a sail. A customs service man, who knew the bar, was passing by on a launch when he noticed the plight of the men. He boarded and offered to steer it to Tonku. Under his able piloting, Reilly's guns and carriages were saved. Under its own sail the barge came into port.

There were other troubles. The ammunition of the Battery had been stored in a compartment between decks on the *Flintshire* and nailed up. Upon unloading it was found that a water pipe, passing through the compartment had burst and the water had injured the priming of many cartridges not packed in tin cases.

On August 2, the debarkation was completed. The Battery was ready to move on to Tientsin. The Russians who were operating the railroad could not understand the impatience of the Americans. They shrugged their shoulders, muttered a few "Nitchevos" and refused to push the Battery forward until August 3. Then for some reason they changed their minds.

The same night, Captain Reilly, Lieutenant McCloskey and the cannoneers boarded the cars with the guns, ammunition and supplies and proceeded to Tientsin. Early the next morning, Lieutenant Summerall with the drivers and animals followed. Before leaving Tonku, Summerall harnessed his horses. When he arrived, he found that the guns already had been unloaded. Carriages were hitched. The Battery lined up, reported. Drivers and cannoneers mounted. The bugle sounded. Reilly gave his

command and the Battery moved off. That night, they made camp in the foreign concession.

Noon. August 4, the interallied column, led by the British, started toward Peking. There followed in order the Fourteenth Infantry, Reilly's Battery, a Marine battalion and the Ninth Infantry. The column camped at Si-Koo. From this point, the Chinese intrenched line could be seen about two miles away. On the west bank of the Pei-Ho, the Chinese left flank rested on the river and their line extended to a lake and marshy country upon which their right rested. High roads led to the front of each flank from Si-Koo. On these roads and at intermediate points of their line, batteries were located.

Against this objective, with the Japanese in the lead, the Allies were to march the following morning. The Americans were to support their left, the British, their right.

The Allies made short work of the Chinese. Reilly's Battery was held in reserve. When the Chinese retreated, Summerall's platoon was ordered into action. With Reilly perched on a nearby house top observing fire, Summerall's guns dropped their shells in the retreating Chinese columns.

Step by step, the column moved closer to Peking. At every point of resistance Reilly's guns were mustered to aid in the advance. Sometimes all six guns fired at the same line. Often, each one of them had a separate and distinct target.

The Battery operated in open fields where the corn often stood higher than the guns. Observation at the guns was impossible. Officers jumped on the limber chests or climbed observation ladders to conduct the fire.

The August heat was intense. Many men were overcome. Horses were nearly exhausted. Cannoneers had to dismount and walk. All the men alternated as drivers. Often, there was a shortage of water, but Reilly's Battery never lost its place in the column.

## VI

Early on the morning of August 14, a messenger from General Chaffee arrived with orders to hurry the battery forward. In a few minutes, Reilly's guns were moving at a trot. Sharp turns and steep inclines, Reilly's drivers negotiated skillfully. To reach

**CHIEN-MEN GATE WHERE CAPTAIN REILLY WAS KILLED**

the high ground selected by General Chaffee with carriages, teams were doubled up. From here, the walls of Peking, two miles away, were visible.

On the right, the Japanese were heavily engaged. Overhead, bullets sputtered. Shells boomed. Reilly gave the command, "Action Front!" and his guns ranged on the large pagoda on the Tartar City walls near the Tung Pien gate. At a range of 3200 yards, Reilly's gunners poured 20 thorite shells into the pagoda.

As the Chinese fire slowed down, General Chaffee moved forward about a mile. Hardly had he reached his new command post when again he called for Reilly's guns. Two of them, under Lieutenant Summerall galloped forward and immediately took under fire a force of Chinese on the left. Soon, the other four guns followed.

At this time an officer of the Fourteenth Infantry reported that their advance had been stopped at the wall and asked for supporting fire to facilitate the attack. Reilly took Summerall's platoon and rushed forward. From the tower of the Sha-Huo gate, bullets sprayed horses and men. Reilly selected a position for his guns, unlimbered and opened fire. The Chinese fled from the gate.

The platoon then advanced to Tung Pien gate. It was open.

The narrow street inside the wall was packed with Russian troops. Outside, the ground was strewn with dead Russian bodies. Under cover of the brick and buildings along the street, the Russian troops were huddled. Two guns they pointed toward the walls of the Tartar City, but after Reilly's guns arrived hardly fired a shot.

Into the street Summerall drove his guns, but his path was blocked. Russian guns and carts cluttered the narrow thoroughfare. A Russian captain tried to discourage Summerall from advancing. He pointed out his own casualties of both men and animals. From the walls of the Tartar City one hundred yards away and through the crenalated parapet, the Chinese poured an incessant fire upon the unfortunate Russians.

Reilly's men moved the Russian guns by hand and squeezed in one of their own pieces. Immediately it opened fire. Reilly rode through an alley to the left of the narrow street and found an open space for both of Summerall's guns. He moved one piece forward and kept the other in action. The alley proved narrower than Reilly realized. The gun carriage started through an opening and jammed. Not to be outdone, Reilly's cannoneers tore down a side of the brick wall and pushed through the gun.

Now both guns were in action. They enfiladed the wall of the Tartar City. They demolished the parapet and sent fragments of brick along with the shells. The support of these two guns enabled the Americans to cross the Tang-Sang bridge. Summerall limbered up and followed behind the infantry when he was ordered back to resume firing against Chinese who took up their old position on the wall as soon as the guns moved off.

After the fire from the Tartar City wall by the Tung Pien gate had been subdued by Summerall's platoon, Captain Reilly led the rest of his guns across the Tang-Sang bridge into the Chinese city. About 400 yards from the Ha Ta gate, he left Lieutenant McCloskey with the center platoon to fire upon special targets assigned by General Chaffee. The general personally directed McCloskey to open up on the Ha Ta gate from which the Chinese were delivering rifle fire.

McCloskey's pieces were placed side by side in a narrow street and began to fire thorite and common shell into the three rows

of windows in the stone tower surmounting the gate. The gunners' work was excellent. Only one shot out of twenty failed to go through a window. The interior of the tower built of very old dry timbers went up in flames.

Led by General Chaffee in person, the Ninth Infantry supported by McCloskey's guns, marched up to the gate. Here two shells were fired to break through a portcullis. The gate remained firm. Upon raising the gate about eighteen inches, signs of still other gates loomed ahead. At this point, the platoon halted for the night.

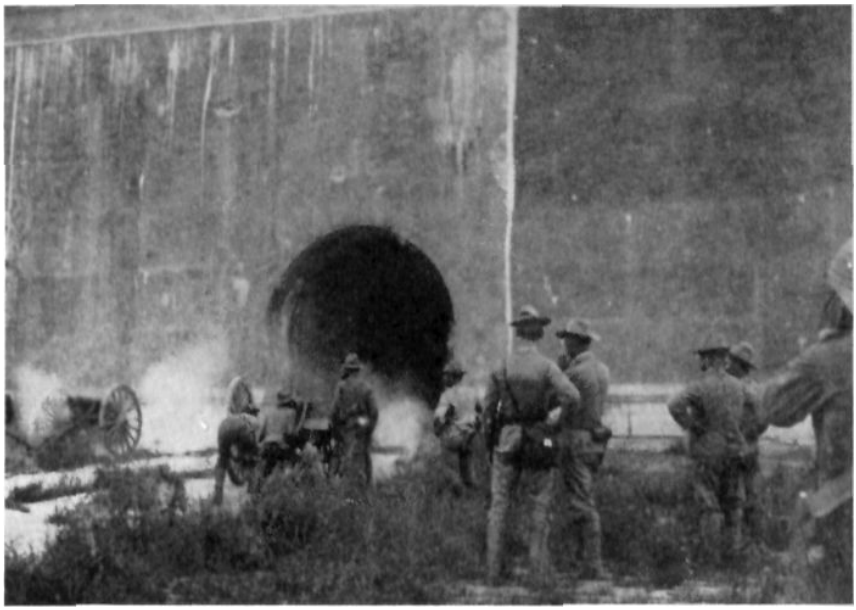
The next day, August 15, proved the most eventful and in one way the most tragic of the campaign. With the Fourteenth Infantry in the lead, followed by the Battery, the column marched through the Chien-Men gate of the Tartar City. Suddenly from the west, the Chinese opened a sharp fire.

Under cover of the south wall of the Imperial City, about 150 yards in front, Reilly placed Summerall's guns and caissons. The right platoon, commanded by Burgess, he placed on the north face of the pagoda commanding the Imperial City.

The center platoon was designated to fire from the top of the wall by the Chien-Men gate. The cannoneers prepared a long ramp leading up to the wall which had not been used for vehicles, for years and perhaps centuries. Ten horses were hitched to each piece. The cannoneers held the wheels. Soon both guns were on top of the wall pointing westward to the Shun Chin gate, a mile away. Openly exposed to rifle fire from the Chinese, Captain Reilly, Lieutenant McCloskey, First Sergeant Follinsby and the gun crews went about their duties with gun drill precision. They stopped the Chinese fire but they paid a heavy penalty.

As Captain Reilly was observing the effects of his fire, he was struck in the mouth by an enemy bullet and a few minutes later died in the arms of his first sergeant. The Spartan discipline of the Battery kept the men at their guns. The work of the Battery went on, but the loss was keenly felt.

"A braver soldier, a truer friend, never breathed than this admirable and lamented officer. He died by my side, touching me at the moment of the blow. He died without murmur or groan," reported L. W. T. Waller, Major, United States Marine Corps.



**LIEUTENANT SUMMERALL'S PLATOON OPENING THE DA-CHING GATE OF THE IMPERIAL CITY**

"A most efficient officer with an enviable record of faithful attention to duty throughout his career and of gallant and efficient service in Cuba and the Philippines," Secretary of War Root characterized Reilly in his annual report.

Shortly before his death, Reilly had given Summerall the orders to blow in the Da-Ching gate of the Imperial City. The gates were huge solid doors made of hard wood about eight inches thick. They were secured by beams of hard wood about nine inches thick. Both doors and beams were covered with thin sheet iron.

Summerall brought one of the guns to within ten feet of the gate, calmly walked out and with a piece of chalk carefully marked the exact location of the bar and then returned to "his post." One shell sufficed to cut through the door. Beyond, the beam exploded. Another shell severed the beam. The doors flew open. In rapid succession, the other gates gave way to Summerall's guns.

The fighting was over. A simple and impressive funeral ceremony was held for Captain Reilly in which all the allies took part.

Several days later a parade was held in the Forbidden City. The Battery sent a detachment. No officer was allowed to accompany it. Summerall rode with the staff in recognition of his leadership and the work of his platoon.

There was still some policing to be done and Reilly's Battery—his name remained so long as the outfit served in the Orient—performed its share of the work. The outfit had won quite a reputation among the allies and it frequently was called upon for demonstrations. The men enjoyed these contacts with soldiers of other armies. On Washington's birthday, the soldiers of the Battery gave a campfire with the British Royal Artillery as guests. Toasts to Queen Victoria and President McKinley were featured. On February 2, 1901, the Battery marched in a parade in honor of Queen Victoria's funeral.

On October 14, the Fourteenth Infantry left Peking for Manila. The Battery and the rest of the American troops escorted the regiment outside the Tung-Pien gate. Reilly's men fired a salute of 21 guns. The Fourteenth and the Battery had given each other most generous support throughout the campaigns in the Orient and had a wholesome respect and genuine affection for each other.

On May 16, the Battery started for home. On the 20th in Nagasaki, on the 25th in Manila, on June 6th to San Francisco and finally on June 29th through the Golden Gate, Light Battery F of the Fifth Artillery ended its adventures in the Orient.

While still in China its name was changed to "Tenth Battery of Field Artillery." Today, it is Battery C of the Third Field Artillery, stationed at Fort Benjamin Harrison, Indiana. But even now, more than 30 years after the death of its gallant captain, it is still Reilly's Battery and its record between 1898 and 1902 remains among the hallowed treasures of the traditions of the whole field artillery.

# FIELD ARTILLERY AND THE LOW-FLYING ATTACK

**BY MAJOR LOUIS E. HIBBS, Field Artillery**

THIS article is not intended to open a controversy—to grind any axes or plead any causes; it endeavors to be an impartial examination into a problem which confronts every Field Artilleryman: if not as a burning actuality in these times of peace—when our attention tends to wander off, not unaccountably, into clothing records, gunners' examinations, schools for bakers and cooks and many other kindred channels—at least with startling certainty as a prospect in any future major war. Much of what is contained herein is conjecture; much will be subject to individual differences of opinion, since much is individual opinion; and much will be conclusion reached through theory—not tested—and therefore inconclusive: much of what is written here, however, will afford food for thought and development and herein lies the justification for its writing. It is quite certain that in any future war, large or small, we are going to be attacked by low-flying aircraft: certain at least until we have developed an adequate defense against such attack, and it is with the broad phases of this subject that we herein will concern ourselves.

There are, generally speaking, two classes of air units which are intended for attack of ground troops, a class which operates at high, or moderately high, altitude and a class operating at extremely low altitude in a type of flight characteristically known as "hedge-hopping." This low flying class is known in our service as attack aviation; the individual plane, as the attack plane. It is with defense against this attack aviation that we of the Field Artillery are so vitally concerned.

We may expect to be protected by our own pursuit planes and by our organized anti-aircraft ground units against enemy aircraft operating at high, or moderately high, altitude; indeed such protection necessarily must be undertaken by other agencies, for we cannot expect to man the expensive and extensive means to protect ourselves against this type of aircraft and still be equipped for efficient performance of our battle mission. When, however, we examine the subject of protection against attack aviation we

find it is a different matter entirely, for the protection which can be afforded by the above agencies against the low flying aircraft, i. e., against attack aviation, is very meagre; it is quite apparent that we must provide our own protection in this case.

In immediate defense against this latter type of attack we may expect little help from our pursuit planes, for pursuit aviation seeks combat at higher elevations where it is better able to utilize its speed and maneuverability. This is particularly true of combat between attack aviation and pursuit, since pursuit, as a type, is generally the inferior in armament and needs to utilize in combat the superiority it otherwise possesses in order to make up for this inequality. In passing, it is interesting to note that in combat the probability of the pursuit type of plane's being the victor over the attack type of plane is at present subject to argument, the attack type finding not a few adherents to argue the possibility that it would be the superior. Of course, if this possibility should develop into fact the pursuit type as we know it will probably disappear in favor of the attack type; this, however, is outside of our discussion.

Against planes flying at very low altitudes the larger caliber guns of the anti-aircraft units are practically helpless, due to the possibility of endangering our own ground troops by fire, and due also to the short periods of time during which the planes may be expected to remain in view, appearing now here, and now there—dipping in and out of the folds of the ground. Present equipment for these guns does not contemplate their engaging such targets. We may expect some protection from the small caliber guns of the anti-aircraft units, but these again will be avoided by the enemy when their location is known to him and they will be little better off in action against him than our own small caliber weapons unless (which is not likely) they be placed in our own columns or positions, for in attack of ground troops the attack plane is most vulnerable to fire from the position of the target attacked, as will appear later. So, while we should be grateful for the presence and assistance of these small caliber anti-aircraft installations, we must not count upon them, for there is small probability of their being present in such numbers, or so fortuitously, as to be competent to take over, in its entirety, a responsibility

which concerns us so primarily and which we can be, and should be, equipped to handle.

The basic principles under which attack aviation operates against ground troops emphasize the characteristics of surprise action at low altitude, high speed, and a quick get-away. The attack plane seeks the concealment of terrain features until within short range of its target, flying at very low altitude, and attacks at high speed on a single sweep over its target, regaining concealment by terrain features as quickly as possible. Such surprise action heightens the moral effect of the attack upon ground troops and reduces the time available to them for taking cover or, by scattering, to reduce the effectiveness of fire from the plane. In addition, such tactics reduces the possibility of the plane's being shot down by the ground troops by reducing the time available to them for firing on the plane and because the high speed and low altitude of the plane increases its angular speed as viewed from the ground troops' defensive guns, thereby making the plane more difficult to hit.

The advantages resulting from operation according to these basic principles are so marked that we may expect no material departure from them until defensive measures are developed which may be so effective as to make such operation unprofitable: therefore our defensive measures against air attack should be designed to meet attacks so delivered.

The weapons to be employed by attack aviation will certainly include both machine guns and bombs and, possibly, chemical agents, though the latter, except smoke, are conceived to be more profitably suited to air formations other than the low flying attack. Smoke might find a use in obscuring the attacking planes from the ground in order to reduce the danger from fire of ground weapons. However, it has three aspects disadvantageous to the plane; for, it obscures the target, it may cause collision as between planes or between the plane and ground objects, and, since to be effective it should be placed prior to the attack, it reduces the surprise effect; for these reasons its use appears problematical.

One type of our present attack planes carries ten bombs. Of course the complement of bombs is susceptible of increase, but

since additional weight cuts down speed and maneuverability a balance will always be struck in such matters. There seems little probability that this number of bombs can be very materially increased without sacrificing maneuverability which can ill be spared; in any event the number of bombs carried will have little effect probably upon the tactics of attack aviation, so for purposes of discussion we may disregard it. The type of bomb to be carried does enter into our discussion since it affects the altitude from which the plane may drop them and thereby does affect the tactics of attack.

Generally speaking, in attack of columns on the road or troops in the open, the most effect from machine gun fire from the attack plane will be had when the plane is at very low altitude, for then the fire is the least plunging and, in addition, considerable effect is likely to be had from richochets. At the present time it is understood that developments are under way looking to the production of some type of bomb which will be delayed in either its action, such as a delay-fuzed bomb, or in its flight, such as one equipped with a parachute. This development is desired for the purpose of permitting the dropping of bombs from a plane at extremely low altitude and with safety to the plane, because the delayed operation of the bomb will permit the plane to pass beyond the danger range before the bomb detonates. Lack of such a bomb has in the past made it dangerous to the plane to drop bombs at the altitudes which are desirable for machine gun attack and has resulted in the practical necessity of refraining from dropping bombs as a combined attack taking place concurrently with the machine gun attack. This has made it necessary either to seek higher altitudes for the combined attack or for the attack plane to return, after completion of the machine gun attack, and execute its bombing attack at higher altitude. Either of these alternatives has been undesirable; the first reduces the effect of machine gun fire, the second sacrifices surprise effect and re-exposes the plane to fire.

The development of this bomb has not been carried to a conclusion, but successful accomplishment of the result may be confidently expected.

Present thought on attack planes equips them with from four to six (and possibly eight) fixed machine guns firing to the front

and at least two guns which may be fired at will to the sides and rear, a veritable arsenal! The fixed guns are mounted across the full wing spread of the plane and are so sighted as to sweep a broad path ahead of the plane. The fixed guns at present carry some 300 rounds of ammunition each; when this is exhausted it may not be replaced until the plane lands and is reserviced. With rates of fire of about 700 rounds per minute, the plane has about twenty-six seconds' continuous fire possible from its wing guns. This may seem to be a short period of fire, but it must be recalled that fire will be executed in bursts and that at the speeds with which the plane attacks, these groups of bursts will be of short duration, probably not exceeding five to ten seconds each. In the case of a plane flying 200 miles per hour, this amount of ammunition would permit the plane, if it so desired, to fire continuously while it swept a stretch of road about 2600 yards long.

Since the attack plane is most likely to come under fire of ground troops at short range, its greatest danger is from fire of small caliber guns. Of these weapons the commonest by far are those of the rifle calibers, approximately caliber .30. It is entirely possible that the vital portions of the plane will be armored to withstand this caliber—even perhaps the armor piercing bullet of this caliber. This addition of armor to the plane will surely be accepted reluctantly by air forces, for it will mean greatly increased weight, but it seems a probable development and it is mentioned here to point out the fact that we may have to go to increased velocities, or larger calibers, or both, in our small caliber anti-aircraft weapons.

Since speed is one of the major requirements of a plane suitable for attack aviation, it is quite certain that such planes will be capable of at least 200 miles per hour and our defensive plans should be based upon that figure as a minimum.

Let us pause for a moment and look at what the attack plane may be when we discover it roaring in on one of our columns:

It is a two-seater, single-motored plane, either biplane or monoplane, and is equipped with mufflers to cut down its motor roar. It carries armor which is proof against the caliber .30 bullet, protecting its vital points and its occupants from fire directed at the plane from the front, from below, and from the sides.

It has an armored shutter for protection of its air-cooled motor while under fire, or has a V-type motor, armor protected, with an armor shutter for periodic protection of its radiator. It carries ten bombs which it may release simultaneously, or in succession, or in any other desired manner. It mounts eight caliber .30 machine guns; two swivel mounted as a pair in the rear cockpit, two on the wing each side of the fuselage and halfway out to the wing tip, and two mounted in the landing gear below the reach of the tips of the propeller. These latter six machine guns are fixed guns and are so sighted as to place their cones of fire equally spaced over a front of sixty feet at about 200 yards in front of the plane. In direction the center of their pattern coincides with the center line of the plane. These fixed guns are controlled by aiming the plane, though a portion of them may be set to sweep the ground ahead of the plane even though the plane be flying a course parallel to the ground. There are two advantages sought from this last named arrangement: first, the plane when attacking a column can continue fire with its fixed guns even though it has levelled-off to drop its bombs; second, it affords additional safety to the plane, for if the plane is required to fly straight at its target, it presents itself during this short period of time as a practically stationary target to any machine guns which it is directly approaching. In this case, it is more easily hit than when it is flying parallel to the ground, for then it must be led by a machine gun even though the plane is going to pass directly above the gun.

* * * * * * *

As we have said before, attack aviation seeks to attack without warning, strike quickly, and be gone before it can be taken under fire. It relies upon its hedge-hopping flight to afford it immunity from attack by pursuit planes and large caliber anti-aircraft gun fire and to conceal the fact of its presence and its purpose from the target which it is planning to strike.

In wooded country attack planes will have little difficulty in concealing themselves from the view of their intended target, particularly if they have any prior knowledge of the terrain over which they are operating. Where the country is open and rolling, their task of concealment will be considerably more difficult, and, in

country which is not only open but which is also flat, such as is found in some of our central states, they will need to be very skillfully led to effect surprise on a vigilant enemy. Their task of effecting surprise on average terrain will not be as easy of accomplishment as casual mention of it may lead us to believe, but unless we are trained in vigilance it will be attained, probably much to our sorrow, and probably when we least expect it.

The attack planes will probably select the nearest cover to the target as the point from which to launch their attack unless, of course, this cover is so situated as to disclose their presence before advantage may be taken of it, or unless more advantage may result to the planes by reason of other considerations, such as attack with the sun behind their backs. Generally speaking, attacks will probably not be initiated from cover more distant than 500 yards, for greater distance exposes the plane for a longer time and at an initial range which is long for maximum effect from their machine guns. When cover close to the target exists, and other considerations do not mitigate against its use, the closest cover will probably be used. The utilization of the closest cover could, of course, be carried to an absurdity by selecting cover which is too close for effective attack; considerations of danger to the plane by reason of the length of time of exposure will always have to be balanced against those relating to effect upon the target.

As a general rule, it seems reasonable to suppose that the greatest danger to us will come from the direction of the closest cover and, when the sun is shining in the early part of the morning and the late part of the afternoon, from the direction of the sun, especially when cover which might easily be utilized lies in that direction.

In practically all cases the attack may be expected to pass directly over the target, for, while the machine gun attack will probably always initiate the action, it is upon bombs that the main reliance for effect will be placed.

The most profitable form of target for attack will be that which may be taken in enfilade. Such a target is best suited for attack by machine gun fire due to the elongated pattern of the gun, and is more easily hit by bombs because of the length of the target. We can count, almost surely, that when we are in a

position where enfilade attack is open to selection by the enemy, and other considerations are not of paramount importance, that he will so attack. Of course, where considerations of cover and protection to the plane are at variance with the considerations of target vulnerability, the plane will probably be governed in its actions by the former. That is to say, if, for instance, the only cover permitting surprise action exists on the flank of a column and the column may only be enfiladed by attack from other directions and from which no surprise may be effected, then the attack will probably not be made in enfilade. Or, taking another case, with the sun low in the heavens a battery which is just going into position will probably be attacked from the direction of the sun, regardless of whether the attack is in enfilade or not. It is pertinent here to point out that it is the direction of flight of the plane while attacking, with respect to the direction of the longer axis of the target, which determines whether or not the attack is in enfilade; not necessarily the position, with respect to the target, of the cover from behind which the plane first appears. For example, a column on a road, closely wooded on each side, may easily be attacked in enfilade though the cover is on the flanks, the plane merely coming in over the trees and turning up or down the column.

In enfilade attack, the length of target to be attacked by any one plane, or by a group of planes acting as a unit, will probably be limited to that which can be effectively covered by the bombs carried by the plane, dropped in succession. At the present time opinion seems to be fairly well centered upon a length of 400 yards as being the maximum length which is appropriate for such attack. In the attack of targets of smaller length it seems probable that only the number of bombs necessary for effective coverage will be dropped and the remainder conserved for subsequent use, unless the target is very concentrated and of a high order of importance with a high order of effect desired, in which case a more powerful concentration may be in order.

In attacking a column, a group of three planes will generally attack as a unit; the central plane attacking in enfilade over the column. The remaining two planes, slightly echeloned to the rear, will attack one on each side of the column, the effect from their

fire and bombs adjacent to, or overlapping, that of the central plane. This method, even though the column be long, is preferred to a method wherein each plane attacks a portion of the column with all three attacking simultaneously, or the alternative method of each one's attacking the same portion of the column in rapid succession. The latter form of attack of any target is not looked upon with favor because of the loss of the moral effect of surprise action and because of the danger to the planes which follow the leader, by reason of fire from the forewarned ground troops.

What we may expect in the nature of night attack is very much a matter of conjecture. At night there is the ever present danger to the plane from collision with his fellows or with ground objects, even on clear bright nights and in illumination provided by flares. This danger will undoubtedly act as a deterrent to attack and, while it will not prevent attack, it is probable that low-flying attack at night will give way to night attacks at greater altitude, in which case the use of machine guns against ground troops may be unprofitable and bombs alone will be used.

We must not be misled by these conjectures into an assumption that we will not be attacked at night; on the contrary it seems most probable that we will be and that these attacks will become more and more frequent as our daylight anti-aircraft defensive fires increase in efficiency. If we can make it costly to the enemy to attack by daylight, which is the time when we can best see his planes, he may be expected to make the bulk of his attacks at night—for then our difficulties will be greatly increased with respect to the fire of ground weapons because of the difficulty of seeing the plane—even though the efficiency of the attack be lessened because it is made at higher altitude in order to reduce the danger of collision. It also seems probable that except on clear bright nights the use of flares will be common, if not to light the target during attack, at least to disclose its position. This practice will reduce the surprise effect, but its moral effect will be high for it is a nerve-wracking experience to stand conspicuously in the spotlight of a flare and wait for a shower of bombs, especially when the plane is not visible and one stands little chance of even getting a shot at him!

Summing up, it sounds as though it were going to be pretty tough on the ground troops, but there are several things at least from which we may derive some comfort:

In the first place, planes cost money and they are costly to maintain and take time to manufacture; in all probability, therefore, we are not going to be attacked continually by swarms of planes for there are other, and possibly more profitable, uses for them.

Secondly, after exhausting their bombs and ammunition in attack, it is necessary for planes to return to a base of operations and be reserviced. During these journeys, if they seek altitude the planes will be in danger from our own planes and from our anti-aircraft fire, and, above all, at night must land in illuminated landing fields, which will be, consequently, excellent targets for bombing attacks by our own planes. Here, indeed, is a potential shutting down of their night activity at the source which must not be overlooked.

Thirdly, in the daytime, attack planes may expect to be in continual danger from ground fire. Casual mention of "hedge-hopping" as the accepted method of concealing the attack from the target implies its routine practicability, but it is not going to be easily practicable for the planes, for it must be remembered that in operations involving any large number of troops, all roads throughout an area, or all folds in the ground, will probably be occupied by troops, and it will be difficult for planes seeking concealment from their selected target to avoid coming under fire of other units. There is a lesson in this statement which we will do well to record here before we overlook it: all low-flying enemy planes should be attacked wherever they appear unless orders to the contrary have been issued (such as might be necessary in order to avoid disclosure of movements at night, or location of important installations). Certainly, in daylight marches, all columns should endeavor to bring the enemy down whenever he is within range without regard to his actions or intentions. This introduces a problem of identification of our own planes, to avoid taking them under fire—failing a sure and instant means of identification, we might better keep them well off the tree tops than

allow the enemy to pass peacefully while we determine his nationality!

* * * * * * *

The foregoing discussion has been necessary in order that we may approach the second part of this article with an understanding of what our enemy is going to be, and how, when and where he may be expected to act.

There are three ways in which we may drive off the enemy's attack aviation, or escape the effect of its attacks:

The first is to conceal ourselves from him; a result which will unquestionably be sought to the limit of its capabilities. Unfortunately, moving on roads or across country, even the daylight concealment of foot troops from view of a low-flying plane is a difficult matter; when we come to the problem of concealment of vehicles it becomes well-nigh impossible. At night the concealment problem is not so difficult, but developments in illuminating flares are rapidly making it more so; certainly movement at night on roads which are suspected by the enemy will be difficult of accomplishment without his knowledge if he is determined upon its discovery.

The second way, avoiding the effect of the enemy's fire, is to so spread out our ground troops as to reduce the resulting casualties or, what is better, so as to make attack unprofitable by reason of the thin target presented. Such procedure, after discovery of the enemy's intended attack, is not practicable by reason of the time element, as will be shown later; if the future tactics of attack aviation develop into attacks at night rather than in the daytime, or if they develop into a serious threat against us without any effective counteroffensive measures being possible on our part, then we may find that our movements in the presence of hostile aviation must be made in a scattered formation and not confined to the roads. Such an eventuality seems far-fetched indeed, but is not beyond the realm of possibility, even though it would entail a great loss of mobility and maneuverability and great difficulty in maintaining control.

The third, and by far the most effective way of combating the enemy low-flying attack is to develop our anti-aircraft fire, or

other offensive means, so as to make this form of attack unprofitable to the enemy.

If we can bring down enough of the enemy's planes to make it a definite menace to him to come sweeping in over us at very low altitude, it may be expected to result in his abandoning the low-flying attack during daylight in favor of higher altitude where he must content himself with bombing, and where he is reasonably safe from the fire of small calibers. Driving him up into the air will result in: (a) reduction of his accuracy in bombing; (b) increased danger of attack of his planes by our own planes; (c) an opportunity for the employment of our larger caliber anti-aircraft guns against him; (d) loss to him of the surprise and moral effect of low-flying attack; (e) increased chances of our troops' not being discovered, thereby escaping attack.

Of these three* methods of combating the attack aviation, the first mentioned, that of concealment, is almost impossible; the second, that of presenting a thin target only, should be considered in the light of a last resort, for it entails making great sacrifices in mobility and control and accepting the lesser of two evils on account of the number of casualties we would otherwise suffer. (Of course, we will unquestionably utilize certain formations which partake of the "scattered target" type; what is referred to here as a last resort is the habitual departure from formations on roads and the movement of all troops across country on broad fronts.) The third method, that of driving the enemy up into the air, is the one to which we should look. It will undoubtedly require equipment which we do not now possess and probably intense study and development, with possible sacrifices in added weight and equipment. If, however, we must make sacrifices to obtain immunity from this type of attack then there is no alternative.

While we speak thus of immunity from this low-flying attack, we must take it with a grain of salt, for obviously there will arise tactical situations where the results obtained from such attack, even though the casualties in planes be large, will justify their

*A fourth method of combating the attack, i. e., that of utilizing armor for protection, is not discussed here for reasons of weight and impracticability, though its use does appear later in special forms.

being carried out. Such situations may, for example, arise in the need for delaying pursuit or retreat and will probably occur in such critical stages of actions. Our immunity to this form of attack, granting that we may secure it, will therefore only apply to the usual run of operations; even if there secured, it will be necessary for us to be continually vigilant in order to retain it.

* * * * * * *

Field artillery is most vulnerable to attack in its animals. The horse is a large target and is amazingly easily put out of action by shell fragments, especially when struck in the barrel; in addition he is extremely susceptible to being stampeded and readily injures himself when running blindly in a terrorized state. Thus we may say without fear of contradiction that the most vulnerable target which Field Artillery presents to the attack plane is a horse-drawn unit in column on the road; next in order of vulnerability are those formations or installations where the animals are grouped as a more or less concentrated target—horse-drawn batteries going into or out of action, horse-lines or limber positions exposed to attack, large groups of mounted men, etc. The crippling of the animals of a Field Artillery unit may be more effective, and a much more costly loss to us in battle efficiency, than an equal percentage of losses in personnel. This may sound like a cold blooded "cannon-fodder" statement but it is basically true: two men from a gun crew of nine may fire the piece and later even serve as drivers, but a gun team of one pair is inadequate to handle the carriage except in the easiest sort of going.

Here, by way of not glossing over an unwelcome truth, let us pause to note that in this matter of vulnerability of animals lies another cogent reason for adoption of motor transport for future artillery use. Truly, if "a battery seen is a battery lost" (and this saying implies "lost by reason of the enemy's artillery fire"), how much more applicable may it be to a horse-drawn unit caught in column on the road by a flight of attack planes? It requires little imagination to picture the result. Even supposing that no casualties result from the attack, there must certainly be a demoralizing disorganization which it will take many minutes to rectify—and who can fancy a situation where no casualties will have resulted

when all of our drivers, our mounted men, and our animals, have been completely exposed to the fire and to accident attendant upon the stampede of such teams as become terrified by the gun fire and bombs—both our own and the enemy's? (This is not a wildly imaginative picture conjured up for effect, such as appear in press and print devoted to sensationalism, but arises from a sad conviction of certainty supported by experience of fire far less potentially effective than we may expect from a flight of attack planes.) On the other hand we may armor the vital parts of motors, and, when attacked the personnel may seek what little cover they can take in the short time available to them.

To return to our discussion, we may place next in order of vulnerability of units, those which are motor-drawn, in the order; columns, and concentrated targets where personnel is also present. Batteries in position are considered to be of a low order of vulnerability when shelter has been provided for personnel. If attack by planes is a common procedure of the enemy small trenches to shelter personnel of the gun crews will appear as if by magic upon occupation of the position and without materially cutting down the efficiency of the fire of the battery. Once having provided pits to shelter personnel a battery in position cannot be classed as a very vulnerable target for attack.

* * * * * * *

What are the means which we are going to employ to make it so dangerous to the enemy that he will accept the disadvantages of higher altitude rather than risk the casualties which will result from his low-flying attack?

We know that danger of collision with obstacles is one of the things which would force him to abandon low altitude flight and if we could devise some means of presenting him with this possibility, such as towing small balloons over a column by means of steel wires, it would certainly be a deterrent to him. However, such a procedure might require very expensive equipment of a sort not now used, it would be very complicated in operation, and would be most troublesome during movement because of overhead obstacles such as trees and wires. This idea is mentioned here as

a possibility—not a probability; while it might find a use in a war of stabilization for protection of fixed installations, in the same manner as it was used in the protection of areas during the World War, it, and other similar devices, do not seem to warrant serious consideration until we have exhausted the possibilities of attack of the plane by fire from the ground. It will be noted that this latter form of protection extends its danger space to an altitude only limited by the effective range of the ground weapons, while an obstacle form of protection, at best, is of limited range both in direction and altitude, and is dependent upon accidents of fortune for definite material results.

There are two methods of attacking a plane by fire: first, by continuously firing at it during the time it remains within view; second, by putting up a barrage of fire through which the plane must pass. The latter of these two methods, while it offers possibilities of course, has so many apparent disadvantages that it appears not worthy of development unless, after thorough investigation and trial, the former method proves itself of little value.

Before entering upon the discussion of the characteristics of the weapon which we need, let us develop the time and space factors of the situation under which it will be employed.

The attack plane will come into view of our guns at ranges between 100 and 500 yards. It will attack and immediately seek the nearest cover, which, we may say, will lie not over 500 yards away. If it is attacking a concentrated target, these assumptions give 1000 yards as the maximum length of travel of the plane while it is susceptible of being fired upon by our guns. This distance, in the case of a target having length and being enfiladed, will be increased by the length so attacked, about 400 yards as a maximum. A plane flying at 200 miles per hour moves at a rate very close to 100 yards every second, so that the maximum time (under our assumptions) that the attack plane may be taken under fire by our ground weapons will vary from ten to fourteen seconds. This time estimate is given as the maximum; in the average case, where cover close to the target exists, the time will be cut materially and will probably average from six to ten seconds.

The extremely short time during which the attack plane will be

under fire arises from its high speed and its method of attack and is the governing factor which will control the design of the weapon for defense; its mount, its rate of fire and its system of fire control. Its caliber should be such as to assure effect upon vital parts of the plane when hits are obtained, and, since considerations of weight (of gun, mount, and ammunition), rate of fire, flexibility, and cost, are all adversely affected by large caliber, it should be kept to the minimum necessary for the purpose.

To digress a moment, this time element shows how useless will be any attempt to scatter a column, or even personnel, after the attack is perceived, in order to reduce the effectiveness of enemy fire. Machine gun fire may be expected to come from the plane as soon as it appears, and, even if it does not, the bombs will be dropped not later than five seconds thereafter; small progress toward scattering could be made by vehicles in this time, even where terrain conditions were favorable. The seeking of cover by personnel of a battery in position, when pits are immediately available, is a different matter and good advantage could probably be taken of them in the time available.

We may now lay down our primary and basic requirement—that our weapon should be capable of going into action with the least possible delay and should be capable of tracking the plane continuously throughout its all-too-short visible flight. It will do us little good to have a weapon with so little flexibility that it cannot be trained upon the plane and begin to fire in, say, less than two seconds, for we may many times be attacked by a plane which will be over our heads and dropping its bombs in a matter of three or four seconds after its initial appearance. The placing of fire upon the plane as early as possible during these first few seconds is of vital importance. It should be borne in mind that while the plane is approaching our weapons it probably will be constrained to fly a more or less straight course in order to place the fire of its machine guns upon us. During this period it is a much easier target to hit since its angular speed is low. The morale of our gunners may be expected to be better during this period than it will be later when the plane has dropped its bombs; besides, the target which the plane later presents will be more difficult to hit since it will be free to change direction, or altitude,

or both, during its departing flight. Achieving success in the requirement for flexibility in the weapon is more than a matter of its being possible to direct it at any point in the heavens: it is necessary that it be capable of being traversed and elevated rapidly to the direction of the plane from any position, without regard to the amount of movement necessary, and that it be capable of taking up the tracking of the plane at once and coincidentally with the opening of fire upon it; it must be capable of direct overhead fire; it must be capable of equally efficient performance regardless of any displacement from normal (by reason of slope of ground or unusual road conditions) of the base or carriage upon which it is mounted.

It will likewise do us little good to have a weapon which cannot track the plane continuously, for the time element makes it necessary for us to utilize the full time that the plane is within view in our endeavor to bring it down. This problem of continuous tracking which we will strike in these situations is one with which we are not generally familiar. Due to safety requirements for our peace time anti-aircraft machine gun training we have been accustomed, not to the type of target which we will encounter in the attack plane—with its high angular speed as viewed from the gun, its sudden appearance unheralded and at short range, and its passage directly overhead necessitating fire at continuously increasing elevations until the line of fire passes through the vertical with subsequently decreasing elevations—rather, we have been accustomed to fire at targets moving at slow speed across our front and at altitudes considerably greater than any we may look for in time of war. It is essential that any weapon which we develop be capable of this overhead type of tracking, for it must be remembered that the enemy will place reliance for effect chiefly upon his bombs and that his overhead flight, or very nearly overhead flight, is necessary in order for him to drop them upon us.

The second requirement of our weapon is that it be capable of extreme rapidity of fire for short bursts of, say fifteen seconds duration. The volume of fire delivered at a plane should be as great as practicable in order to secure a high rate of hits per minute; the rate of fire of our present water-cooled machine guns is

considered to be well below that which is desirable in this respect.

The third requirement of the weapon is that it be given such a fire control system that its cone of fire can be placed upon the plane quickly and held upon it while it is in view. Here is a requirement which is going to give us lots of trouble before we arrive at a suitable solution.

It seems desirable to consider seriously the matter of providing some armor protection against machine gun fire for the crew of the weapon, provided it is adapted to such a measure; the moral effect of such armor offers probabilities of increased efficiency to such an extent as to make it of sufficient importance, almost, to list armor as a requirement.

The requirements which we have laid down for flexibility and rate of fire, with the probability of a caliber in the nature of our small arms being sufficiently large, point to an automatic, or at least a semi-automatic weapon of rifle caliber or larger. The striking power of the weapon should be sufficient to be effective and must keep pace with such developments as take place in the armor carried by the plane. In any event, it seems highly improbable that plane armor capable of turning the armor piercing .30 caliber bullet will ever be employed due to weight considerations, though, of course, it is possible that we may be forced to larger calibers or higher velocities in order to secure greater effect from hits variant from the normal, which with the smaller caliber or lower velocity might not secure effect against such armor as is carried.

Fire recently conducted at aerial targets has demonstrated that the .30 caliber automatic rifle is capable of a higher percentage of hits against such targets than is the standard machine gun of the same caliber when the latter is fired from the many forms of tripod mounts which are in use at present. Data so far available on this subject should not be taken as conclusive as regards the comparative efficiency of the two weapons, for the capabilities of the machine gun have not been, by any means, exhausted, and there is good reason to believe that developments now in progress in this field will result in far greater efficiency than we have hitherto had from it. A large increase in efficiency of fire from the automatic rifle may not be as confidently expected, for its fire is not as susceptible of improvement by means of mechanical devices

as is the machine gun, but depends in great part for its successful delivery of fire upon its skillful handling by the individual. It is believed that lack of proper mounts has held down the efficiency of the machine gun in its adaptation to fire against targets of the attack plane type.

The automatic rifle, fired from the shoulder, is capable of a high order of flexibility for our purposes and answers in this respect one of our requirements by going into action quickly in any direction, speed in this regard being dependent only upon the skill of the individual handling the rifle. At first glance, when a single rifle is considered in comparison with the machine gun, it would appear that it is deficient in rate of fire; in using the automatic rifle however, a number of rifles are employed, which increases the number of rounds fired by a group although the rate of fire of each individual is low. Considering the number of men who could be armed with the automatic rifle for protection against attack planes, it seems that this weapon could well be considered as capable, also, of satisfying the requirement of a high volume of fire.

The automatic rifle has one inherent characteristic which might ultimately force us to discard it; this characteristic is that, being fired from the shoulder, there is a limit as to the recoil energy which can be satisfactorily withstood by the firer. If, and when, we are required to increase either our caliber, or our velocity, we may run into a greater recoil energy than the individual can absorb, or, in the lesser case, so great a recoil energy as to reduce to an inefficient level, either his rate of fire, or his accuracy, or both. Thus the automatic rifle has limitations which, in the event of our needing more striking power (and that is not by any means improbable), may result in its abandonment: until this eventuality becomes a fact however, the continued exploration of this weapon's capabilities is certainly desirable, even though, as was indicated above, the efficiency of the machine gun may be greatly enhanced by developments in the near future.

It has been indicated that for this special type of fire with which we are confronted we must develop a suitable fire control system that will meet the situation. With regard to the automatic rifle this need is not so imperative, for its past success in all

probability is due to the fact that it has been fired by the individual in much the same way as the duck hunter fires—with estimated leads learned from experience and with skill retained through practice; thus its basic fire control system exists in the individual. However, even for this weapon, mechanical aids might well be investigated, but if failure to increase its efficiency by that means results it still can function with promise. The need for a fire control system for the machine gun is a different matter and one which we should bend every effort toward solving.

The first solution which offers itself for the machine gun fire control system is the tracer bullet. Few of us have fired the tracer at a target which has been so flown as to simulate the flight of the attack plane, and, until this type of fire control is attempted at such a target, it is hard to understand the difficulties which are immediately encountered. These are due to certain characteristics of the tracer bullet and to certain conditions which arise in this particular firing problem; taken all together they cast serious doubt upon the suitability of tracer control for fire at this type of target.

Everyone who has seen tracers fired at a moving target is familiar with the optical illusion encountered, whereby it appears that the tracer, instead of keeping to its initial direction, curves off in a direction opposite to the direction of movement of the target. The reason for this optical illusion lies in the fact that the target, which is moving and which we are tracking with our eyes, is the object upon which we sense direction since our attention is focused upon it and it is generally silhouetted against a uniform background. The extent of the apparent curve of the tracer is thus dependent upon the angular rate of speed of the target as we view it. This curve of the tracer is familiar to us from firing at targets some 400 feet in the air and moving at about 100 miles per hour; even at this angular speed we have experienced the fire control difficulties which the illusion engenders. It seems extremely probable, when we increase the angular rate of speed to that which corresponds to a 200-mile per hour attack plane flying at an elevation of 40 to 100 feet and at very short range, that the resultant optical illusion will become so exaggerated that the tracers will appear to shoot off at a very sharp angle, increasing

greatly the difficulty of sensing the position of their trajectory with respect to the target. The tracer starts to burn in the bore of the gun and continues to do so for a much greater distance than any range at which we may fire at an attack plane; with the tracer appearing to move on a curve any sense of direction based upon viewing the tracer is extremely difficult due to the difficulty of sensing where the tracer was when at the range of the target; this difficulty is greatly increased by any increase in the extent of the apparent curve of the path of the tracer. It seems very probable that for this reason, if for none other, the tracer may prove entirely unsuitable.

During daylight the ease with which tracers may be seen depends greatly upon the character of the background against which they are fired. When the sun is shining, tracers fired into that half of the hemisphere which contains the sun are sometimes difficult to see, especially so when there is a mottled background of light clouds; the closer the line of fire approaches the direction of the sun the greater the difficulty becomes, until, when still well away from firing directly at the sun, the tracers become totally invisible. When we recall that the enemy may be counted upon to take advantage of the sun when selecting the direction from which he will attack, we find in this an additional reason to look with suspicion upon the tracer for our purposes until we have proved it for such.

One more thing about the tracer and we will pass on. Granting that they can be seen, utilization of the tracers requires the firing of several rounds, the observing of their position with respect to the target, the appreciation of this observation, subsequently effecting change in the direction of the tracer stream. Here, we are dependent for accuracy upon a mental operation based upon discerning with good judgment which of the visible tracers are those originating from the gun in question (in our situation there will probably always be more than one gun in operation), then the position of the tracers with respect to the target—both further complicated by the necessity for the gunner's keeping one step ahead of the target in regard to the matter of the ever-changing necessary lead. This places a heavy mental load upon any one man, especially when his mind is possibly already occupied

with the confusion of the moment. The performance of these mental operations under pressure at high speed may reasonably fall far short of efficiency.

If future tests should demonstrate that we should abandon the tracer as a control we will have to go to sights and it is here that we may find a solution. Several things peculiar to the probable operation of attack planes lend themselves to the use of sights.

The ranges at which we may expect to fire at these planes are such that for practical purposes we may disregard the drop of the bullet, i. e., we may regard the trajectory as being a straight line: a companion assumption possible under these conditions is that the velocity of the bullet remains constant. These simplify the problem at the very start and the errors introduced are practically negligible.

The top speed of the enemy's attack planes is going to be known within certain limits and it seems probable that the human equation will result in his pilots flying their planes at top speed in order to keep down the length of time that the plane is exposed to fire. This, with the preceding assumptions, and for initial trial at least, enables us to determine fairly well the amount of the actual linear lead necessary for any given conditions of flight.

If the enemy is going to seek concealment by hedge-hopping flight he will necessarily come upon us at low altitude and it will be usual for him to fly a more or less horizontal course, at least until he is beyond his target.

These assumptions as to the velocity and trajectory of the bullet, speed, and the range, make it an easy matter to construct a sight, for any given plane speed, which will automatically apply the necessary lead within some 600 yards and for all horizontal flight. It seems promising to give the gunner such a sight, relying upon the dispersion of the cone of fire to take care of minor inaccuracies which develop by reason of conditions not being the same as those for which the sight is built. Certain allowances may be made in the judgment of the gunner, as are obviously indicated by special conditions of the plane's flight, although it is entirely feasible to apply corrections mechanically by some member of the gun crew whose duty that is. Such a sight control would give the gunners one thing upon which to focus their attention,

instead of trying to think of several different things at once, and, in any event, it would insure at least that the cone of fire was somewhere near the target; an accidental hit is no less a hit by reason of its accidental nature.

This article might well go into a description and discussion of many mounts and methods but purposely refrains from doing so, its purpose being to present the general aspects of what is a subject having many ramifications, any one of which affords ample material for discussion (as witness our digression from the general into the specific in the case of the subjects of tracer control and sights).

* * * * * * *

In conclusion, our problem is to seek, by fire or other means, to drive the enemy up into the air where we not only reduce his effectiveness against us but we push him into the limelight where he is, or should be, attacked by our own planes and by our large caliber anti-aircraft guns. We must approach this problem with the realization that it is a serious one. Its solution will probably be found in equipment and methods which are a radical departure from those which have been used for the solution of other problems.

There should be no necessity to point out that this equipment and the methods of its employment probably will be unsuited to, and different from, those which are to be employed against higher altitude targets; emphasis must, however, be placed upon this fact for it is in danger of being constantly overlooked.

The effectiveness of such equipment and methods as are devised, should be proven by test and not by conjecture. These tests must embody the time element and the surprise element, for these are essntials in determining the requisite quality of flexibility. This matter of test is a problem of its own, for it will require the devising of a target which will simulate the action of the attack plane. It will do us no good to conduct firing tests against the type of target which we have been using habitually for training in the past, for outside of the fact that the target which we have been using is moving and in the air, it is totally

dissimilar in speed, altitude, and course flown, to that which the attack plane will present.

It should be noted that this need for a target is stated to be for test purposes; not for training purposes. As for the latter it seems reasonable, and also desirable, to conduct the major portion of our training with blank ammunition, the target being a plane or planes actually simulating attack, thereby affording them also, certain desirable training opportunities, and affording ourselves the necessary training, in fire discipline, of our animals, drivers, and other personnel. This would provide us, in addition, the opportunity for developing, under actual conditions, measures for reducing the casualties which may be incident to the varying situations under which attacks may be made upon us.

# BOOK REVIEWS

## The Nation at War

GENERAL PEYTON C. MARCH was Chief of Staff at the height of America's greatest war effort. When he returned from France in March, 1918, to take charge at the War Department the Allied cause was at the depth of desperation. Less than 300,000 Americans were in France, and German Victory appeared certain unless American help was accelerated. Eight months later 4,000,000 men were in the American Army and 2,000,000 were in France. The front was 400 miles beyond French ports available to the Americans; the United States lay 3,000 miles further away. Never before had so large an army operated so far from its home base. Therefore the deeds of Pershing's army are matched by the organized effort which made them possible. Of this effort General March was the military head, and its narration is, as he says, the "Great epic of a nation at war, without the glamour of the battlefield."

General March has compressed into one volume a report of his work as Chief of Staff. General Pershing's reminiscences occupy two volumes, and Frederick Palmer, Mr. Baker's official biographer, also has written two volumes. Thus, inevitably, the March reminiscences are more condensed and compelled by compression of space to greater generalization. It is interesting to examine the Pershing and Baker books in the light of General March's indictments of the A. E. F. commander.

"The Nation at War" is published by Doubleday, Doran and Company and costs $3.00. A discount of 10 per cent will be made to members of the U. S. Field Artillery Association who purchase it through the Association.

EXTRACT FROM *The New York Times* BOOK REVIEW

**The Personal Memoirs of Joffre, Field Marshal of the French Army**

LEADER of the French army during the most exciting and dangerous part of the war, faced with stupidity and incompetence on every side. "Papa" Joffre performed a miracle when he stemmed the German tide. Here is his own statement of his experience—completely different from all other war memoirs in the frankness, the honesty and the completeness with which it is written.

Joffre minces no words and uses no subterfuges. He says what he thinks of the hopeless inefficiency of the French generals in the early days of the war. When he describes the failure of the British to cooperate in the effort to hold the constantly advancing Germans, he quotes verbatim conversations. Time and again he inveighs against the needless waste of arms, the criminal slaughter of men, which marked almost every Allied operation.

The story is as thrilling as it is frank. The Germans are advancing, the supply of ammunition is reduced to 400 rounds per gun, the production of the arsenals is hopelessly inadequate. What is to be done? Only a Joffre could have solved the problem. Again, the Fifth Army Corps is in an important position during a crucial battle. The Corps Commander—"abandoning all sense of duty to his men"—commits suicide. Joffre manages to snatch victory out of almost certain defeat.

Reading this work is a tensely exciting experience. One feels constantly that the fate of Europe is in the hands of a single man. But that man proves adequate. And the struggle settles into the weary trench warfare which ends finally in German defeat.

These two volumes are history. And their format is worthy of comment. Bound in fine blue cloth stamped in art gold, beautifully printed, with numerous illustrations and maps, and boxed, the set is a bargain at $6.00. The book is published by Harper and Brothers. A reduction of 10 per cent will be made to members of the U. S. Field Artillery Association who purchase it through the Association.

# GERMAN MEDIEVAL ARTILLERY

**THROUGH THE COURTESY OF COLONEL ROBERT R. McCORMICK, THE CHICAGO TRIBUNE**

GERMAN artillery looks back on a history of 600 years. Aix la Chapelle, the free city of Nuremberg, is the first to boast of cannon in its old parchments. They were heavy iron contraptions, kept in arsenals near the fortified walls of the cities.

The cannon were placed in charge of the "Buechsenmeister" or master gunner. There were no trained gun crews and gun teams, men and horses being hired when the occasion demanded it. Old German records have it that in times of war the master gunner was never to leave his guns, neither by day nor by night, and that he never was to get drunk.

At first, the city owned guns were used for defence purposes only. Later, enterprising gunners had cannon built and rented them out to customers for the duration of a campaign or a siege, princes and free towns alike making use of these military tradesmen. The first cannon to acquire nationwide fame in Germany was the "faule Grethe" or "lazy Daisy"—a clumsy and primitive piece of ordnance which served well the Margraves of Brandenburg and helped establish the power of the Hohenzollern dynasty.

When the Hohenzollern Prince Frederick I ascended the Prussian throne in 1415, Prussia was terrorized by a handful of robber barons, the real masters of the country. Sitting securely behind the mighty walls and buttresses of their proud castles, they would descend on the peaceful merchants trading their wares through the country, slay the traders and carry the booty back to their impregnable bulwarks. All trade and peaceful intercourse was paralyzed until "faule Grethe" battered in the walls of the robber castles and forced the unruly barons to surrender.

Maximilian I was the first German Emperor to further the development of artillery in Germany. He placed an export embargo on all material necessary for the manufacture of guns. The cannon were placed on wheeled gun carriages. In 1509, when the Emperor fought against the city of Venice, 108 pieces of ordnance were brought into action. Albrecht Duerer, the great German painter of the Renaissance, was attracted by this new military

engineering and, like his contemporary, Leonardo da Vinci, tried his hand at constructing cannon.

For the next hundred and fifty years German artillery made little progress. German guns and gunners were greatly inferior to the comparatively well equipped and well trained field artillery force Gustavus Adolphus, the Swedish King, employed in the Thirty Years' War.

To the Great Elector, Prussia's greatest ruler in the 17th Century, goes the credit of giving new impetus to this long neglected branch of the service. Himself a trained gunner, able to load, train, and discharge a gun like any artilleryman in his service, he saw to the formation of a reliable artillery officers' corps. This had not existed before as a permanent institution, infantry officers being ordered to take charge of the guns in case of emergency. Instead of hiring horses to draw the guns, as was the habit in all other countries at that time, he equipped his cannon with gun teams. "The 'Great Elector' completely changed artillery tactics heretofore in use," says Colonel O. Neuschler in his book, "Prussian Artillery." "Instead of placing the cannon before the infantry to prepare the way for the advancing infantrymen, in the rigid and approved fashion of the day, he placed his guns preferably on hills, making full use of any advantages the battle field offered."

Under his successor, Frederick I, the first King of Prussia, the youngest branch of the service was placed on an equal footing with its sister arms, the infantry and cavalry. The King's own brother, Margrave Philip of Brandenburg, was appointed Inspector General of Artillery, to give this equality visible expression. The regulations for the artillery service issued by the Margrave in 1704 reveal that the gunners, officers as well as the rank and file, were regular soldiers of the King, no mere hirelings. The regulations read:

"Every gunner must take the oath of allegiance before entering the service.

"Nobody may be enrolled in the artillery service unless he has sworn not to quit the Sovereign's service without his permission."

A special clause, pledging the gunners to secrecy, is added: "No gunner is allowed to pass on any knowledge gathered in the service without the King's permission."

Under the rule of Frederick I of Prussia artillery was a very

fashionable arm of the service. The splendor loving King equipped his gunners with brilliant uniforms. The officers wore goldbraided scarlet tunics, with blue lapels; bright yellow vests and pants; laced and frilled white shirts; and to crown it all a powdered wig and a goldbraided cocked hat.

Frederick William I, Prussia's Spartan "soldier" King, had little taste for fancy uniforms. He quickly did away with them. Instead, he used his funds to increase the efficiency of the Prussian artillery. He standardized gun calibers to simplify and cheapen the manufacture of cannon, making only 3, 6, 12 and 24 pounders. Once a year, for a fortnight, the entire artillery park was drawn together for target shooting. Drill, drill, and again drill. When he died in 1740, he left to his son, Frederick the Great, a crack force of 72,000 men, the best drilled and equipped army in the world. Among them were a thousand gunners. In the Prussian arsenals lay several thousand pieces of up-to-date ordnance.

In the epic fight Frederick the Great waged against a host of enemies, against the Austrian and Russian Empires, against France and numerous German princes who sided with his foes, the well trained gunner force his father left him played an important role. The force was greatly increased in the course of the King's numerous campaigns. When he died in 1786 the Prussian artillery force numbered 10,000 men and 6,000 pieces of ordnance.

The King personally issued numerous orders laying down the tactics to be pursued by his gunners in battle. For instance, the King ordered his artillerymen to lay the main stress on hitting the enemy's infantry and cavalry, and to avoid concentrating their fire on the enemy's artillery.

For the small cannon, 3 and 6 pounders, attached to the infantry, the King issued the following orders: "The guns are to march into battle ahead of the infantry. Five hundred paces away from the enemy, the gunners are to dismount, and advance on foot, pushing their guns before them. An incessant fire is to be kept up while advancing, the last 300 paces with grape shot. The firing with grape shot is to be continued at closest range, until the infantry catches up, breaks through the artillery line and storms the enemy's position."

After Frederick the Great's death the Prussian army rested thoroughly on its laurels until roused by the defeat in the Napoleonic wars. In the years following the rout of the Prussian army at Jena and Auerstaedt in 1806 the Prussian forces were thoroughly reorganized. Prince August of Prussia was appointed Inspector General of Artillery. Artillery was given new social prestige when one of its regiments was called to serve the King directly as Guard Artillery Regiment. Hitherto this honor was conferred only on cavalry and infantry. The Prussian gunners were trained and drilled according to the new artillery tactics introduced by the former artillery officer of Napoleon. When the Prussian nation rose against the Napoleonic yoke in 1813 the Prussian forces were able to put 34 batteries into the field.

After Napoleon's defeat the Prussian artillery force numbered 23,000 men. It now became tradition for Prussian Princes to take charge of Prussia's artillery. Prince August was succeeded by Prince Adalbert of Prussia as Inspector General of Artillery and Prince Karl of Prussia succeeded Prince Adalbert. In the early sixties the smooth bore cannon were replaced by rifled guns.

In the Franco-German war of 1870-71 the German forces put 1,718 guns in the field. In the course of the campaign the entire Prussian field artillery fired only 357,237 rounds, a strikingly low figure compared to the masses of munition fired on a single day in the World War.

Emperor William II, now exiled in Doorn, took great pains to further the efficiency of artillery. Under his rule the Krupp Company developed into one of the world's leading cannon foundries. The Emperor himself was a large shareholder of Krupp stock.

Curiously enough, the Emperor failed to make artillery a fashionable arm from a social point of view. With the single exception of the four Guard Field Artillery Regiments stationed in Potsdam and Berlin the young noblemen of the country flocked to the cavalry and foot regiments rather than become gunner officers.

The outstanding achievement of German artillery in the World War was the "dicke Bertha" which hurled its missils into the French capital from March to October, 1918, over a distance of 75 miles. General Ludendorff, in his book "Kriegserinnerungen," refers to the gun as a "marvelous product of technical skill and

science." Fourteen years after the end of the World War the military authorities in Germany are still trying to keep the technical details of the gun a secret.

The treaty of Versailles permits the German army 288 field guns and a few heavy stationary guns on the Eastern frontier. Despite these stringent restrictions Germany may have a surprise in store for the world in the field of naval gun construction. Though strict secrecy is maintained by the military authorities it is believed that the heavy guns mounting Germany's vestpocket-battleships—3 of these ships are now under construction—will represent a marked progress in gun construction. It is said that these 11-inch guns—each ship will mount 6 of them, 3 forward and 3 aft—will have a much longer range than any other gun of the same caliber. The firing speed will be 4 rounds per minute which corresponds to the firing speed of 8-inch guns in other navies.

# THE UNITED STATES FIELD ARTILLERY ASSOCIATION

IN accordance with the call of the Executive Council, the twenty-second annual meeting of the U. S. Field Artillery Association was held at the Army and Navy Club in Washington, at 4:30 P. M. on December 14, 1932, with Colonel Charles D. Herron, Field Artillery, senior member of the Executive Council, present, in the chair, acting for Major General Harry G. Bishop, President of the Association, who was sick in Walter Reed General Hospital. The Secretary-Treasurer read the call for the meeting, which he stated had been sent by mail to every active member of the Association. He reported that a quorum for the transaction of business was present in person or by written proxy.

The Secretary-Treasurer presented and read his annual report and financial statements, appended hereto and made a part of these minutes.

The President had previously appointed a committee consisting of Lieutenant Colonel Frank K. Ross, F. A., and Captain Harry B. Allen, F. A., to audit the financial statements of the Treasurer. The Secretary-Treasurer then read the report of the committee which stated that the auditing had been performed and the financial statements had been found to be correct. A motion was then made, seconded, and adopted, approving the report of the committee.

The chair stated that there was one vacancy in the Executive Council to be filled from the Regular Army. The vacancy was caused by the expiration of the term of office of Lieutenant Colonel Thomas D. Osborne.

Lieutenant Colonel Thomas D. Osborne was re-elected to fill the vacancy, the Secretary being directed to cast the unanimous ballot for him.

The Secretary was directed to write a letter to Major General Harry G. Bishop, President of the U. S. Field Artillery Association, expressing the regrets of the Association that he has been so ill and its deep gratification over his continued improvement.

The Secretary was also directed to write a letter to Major John

M. Eager, former Editor of the U. S. FIELD ARTILLERY JOURNAL, expressing the appreciation of the Association for his work in building up and maintaining a JOURNAL of outstanding excellence.

## ANNUAL REPORT OF THE SECRETARY-TREASURER

For Year Ending November 30, 1932

| | | |
|---|---|---|
| Assets—November 30, 1931: | | |
| Balance, checking account | $3,066.67 | |
| Savings account | 3,060.00 | |
| Securities on hand | 23,000.00 | $29,126.67 |
| Assets—November 30, 1932: | | |
| Balance, checking account | 2,833.09 | |
| Savings account | 3,152.47 | |
| Securities on hand | 23,000.00 | 28,985.56 |
| | | —$141.11 |

A detailed statement of the receipts and expenditures during the last fiscal year is as follows:

RECEIPTS

| | | |
|---|---|---|
| Membership dues and subscriptions | $ 6,158.78 | |
| Interest on checking account | 29.16 | |
| Interest on securities | 933.75 | |
| Interest on savings account | 92.47 | |
| Books, magazines and binders | 559.47 | |
| Miscellaneous | 20.00 | |
| | $7,793.63 | |
| Cash on hand, November 30, 1931 | 6,126.67 | $13,920.30 |

EXPENDITURES

| | | |
|---|---|---|
| Printing and mailing Field Artillery Journal | $ 3,770.07 | |
| Office supplies | 122.09 | |
| Postage, express and telegrams | 151.95 | |
| Rent and telephone | 514.49 | |
| Services | 1,560.00 | |
| Authors, engravers, photographers | 1,157.46 | |
| Books, magazines and binders | 301.48 | |
| Insurance | 11.00 | |
| Trophy | 25.00 | |
| Horse Show donation | 20.00 | |
| Miscellaneous: copyright, refund, collection charges, etc. | 301.20 | |
| | 7,934.74 | |
| Cash on hand November 30, 1932 | 5,985.56 | $13,920.30 |

| | |
|---|---|
| Total receipts for the year ending November 30, 1932, were | $7,793.63 |
| Total expenditures for the year ending November 30, 1932, were or a loss of | 7,934.74 |
| | $141.11 |

Outstanding obligations and amounts receivable are approximately the same as on November 30, 1931. The only outstanding obligation of any importance is the printer's bill for the November-December, 1932, number of the JOURNAL, which had not been received. The same obligation was also outstanding on November 30, 1931. Considerable amounts are receivable consisting of dues to the Association.

As regards membership, the depression has taken its toll. There has been a decrease of 26 Regular Army members and a decrease of 138 from the National Guard and Reserves. At the same time there has been an increase of 50 from public libraries, colleges, business firms, etc. The total paying dues and subscriptions has decreased from 2,360 to 2,246, or a loss of 114.

While the difference in the assets for 1931 and 1932 shows a loss during this year of $141.11, it must be remembered that during 1931 there was received from advertising in the JOURNAL a sum of $1,329.64 and that interest on securities amounted to $1,361.97; while during the year 1932 no advertising was carried due to Congressional action and that the interest on securities fell to $933.75 (of which $165.00 had to be refunded, leaving a net income from securities of $768.75) or a loss in receipts on these two items alone of $1,757.86.

Of the $23,000 in securities $10,500, or more than 45 per cent, are not paying interest at the present time.

At the meeting of the Executive Council on May 27, 1932, the incoming secretary was directed to make a study of the possibilities of reducing expenditures of the Association by changing the format of the JOURNAL by reducing it in size, and to present his estimate at the next Council meeting. The above study was made and it was found that by changing the cover from the present enamel to granite, by changing the paper from the present bulking book to 60-pound English finish and by stapling rather than sewing the pages that a reduction of approximately 40 per cent could be made in the printing bill without changing the shape or size of the JOURNAL. The above changes were authorized at an informal meeting of the Executive Council. Future numbers of the JOURNAL will be made up in accordance with the above study.

Rent has been reduced $60.00 per year beginning with December

1, 1932. In view of the above economies which become effective on December 1, 1932, there is no cause to be alarmed over the financial status of the Association because of its net loss during the year of $141.11.

The importance to the Association of increasing its membership among Field Artillerymen of the Regular Army, National Guard and Organized Reserve, is obvious. The more members we get the better we are accomplishing our mission of disseminating professional knowledge. The help of our present members in interesting prospective members is most important. A few personal words will do more than many letters from the Secretary.

DEAN HUDNUTT, *Major, Field Artillery, U. S. Army,*
Secretary-Treasurer.

After an informal discussion of the affairs of the Association and the policies of THE FIELD ARTILLERY JOURNAL, the meeting adjourned at 5:30 P. M.

# THE START OF THE MEUSE-ARGONNE CAMPAIGN

**BY COLONEL CONRAD H. LANZA, Field Artillery**

THE repulse on July 15th, 1918, of the attack along the Marne and in Champagne, was the turning point in the long series of victories which had been uniformly with Germany during the first half of the year. This Allied success was followed a few days later with another more decisive one at Soissons. During August new battles were won.

These battles led Marshal Foch, the Allied Commander in Chief, to adopt a strategic plan for ending the war. Instead of separate attacks with limited, or even unlimited, objectives, he decided on a series of offensives. In a note to Field Marshal Haig, on August 25th, he stated:

"Your affairs progress very well; I can only admire the resolute manner in which you follow the enemy without allowing him any rest, while constantly extending the zone of your action. It is this continuous extension of the offensive, *supported from the rear,** and strongly pushed forward on well chosen objectives, without preoccupation as to alignment, nor to too close liaison, which will give you the best results, as you thoroughly understand. It is unnecessary to advise you, that the Armies of General Petain, are about to follow the same line of action."

General Petain commanded the French armies in France, and at this date the American First Army as attached. Marshal Foch's plan was similar to those for General Grant's 1864 campaign, and the German campaign of 1915 in Poland. It consisted of attacking on converging lines, at numerous places, with constant fighting and no rest to the enemy. Such a strategic plan offers the possibility of reducing the enemy to complete exhaustion, with immense losses. The steady stream of American divisions arriving in France assured the superiority of strength required by a plan of this kind.

In furtherance of this plan the French Tenth Army attacked on August 30th in central France, and preparations went forward for the American First Army to reduce the St. Mihiel salient

*Italics by Marshal Foch.

about September 10th to 12th. Regarding the latter operation, Marshal Foch now thought that the original idea to drive a wedge northeast towards Metz and Briey would no longer give the best results. Better, he thought, to initiate an offensive west of Verdun, with the right along the Meuse River, and advance northwest towards Mèziéres. This was to be accompanied by an attack eastwards from the English Channel. These two converging efforts were to be connected by intermediate attacks, well chosen as to time, place and objective. The Marshal believed that the operations he contemplated would, if carried out, result in driving the enemy out of France before winter.

During the morning of August 30th Marshal Foch visited General Petain, and verbally explained to him his new intentions. The Marshal then proceeded to Ligny-en-Barrois, headquarters of the American First Army, and suggested to General Pershing the desirability of curtailing the St. Mihiel operation, in order to start, at an early a date as possible, an attack west of Verdun, towards Mèziéres, and to be carried out:

| *On the* | *By the* |
|---|---|
| Right: | French Second Army, reenforced by American divisions advancing between the Meuse and the Argonne. |
| Center: | American First Army, advancing along the Aisne. |
| Left: | French Fourth Army, advancing in Champagne. |

General Pershing was not favorably impressed with the new strategic plan to attack west of Verdun, especially when it was suggested that he give up the St. Mihiel offensive, or reduce this to a minor operation. Marshal Foch had foreseen that General Pershing would object, and had prepared for this a written outline of his plan, which he left, asking General Pershing to study it carefully and advise him later as to whether he did not agree with him. General Pershing promised to do this, but objected emphatically to having American divisions taken from his command for French armies.

The study was completed by morning. In his reply General Pershing stated that he desired to complete the St. Mihiel operation, after which he proposed that the American forces be grouped

on the Vosges front, with a view to an advance north and northeast towards Metz. He added:

"However, as Commander in Chief of the Allies, it is to you to decide on the strategy of operations, and I am ready to accept your decision . . . .

"If you decide to use American forces to attack in the direction of Mèziéres, I accept that decision, although it will complicate my system of supply and care of sick and wounded, but I insist formally, that an American army be employed as a whole, either east or west of the Argonne, and not 4 or 5 divisions here, and 6 or 7 there."

The reason for fearing complication in services and supplies in or near the Argonne was, that American General Headquarters had been employed in preparing for an attack in the direction of Metz, to be started from the Moselle area, or east thereof. This offensive was expected to occur in the spring of 1919, when the American Armies in France would be completely organized and equipped. To advance in the autumn of 1918 at right angles to the direction planned, and from a base west of that intended, meant the abandonment of plans laboriously prepared, and a complete new orientation.

After sending his letter, Pershing went to see General Petain, at Nettancourt, to talk over the new plan. General Pershing suggested organizing the American First Army with two corps, each of three divisions. Leaving the area east of the Argonne to the French Second Army, he proposed to advance astride the Aisne. Petain explained that this would be difficult, pointing out on the map that the geography of the region was not favorable, as there were numerous ridges perpendicular to the line of operations which would each afford an excellent defensive position for the enemy. He suggested an advance between the Meuse and the Argonne as a better solution. Petain was sympathetic, and finally agreed that an advance northeast towards Metz would be desirable.

On September 2nd, Marshal Foch had Generals Pershing and Petain report at his headquarters at Bombon. After some discussion it was decided that the American First Army would retain its present front from the Moselle around the St. Mihiel salient, which it would reduce without delay, and that it would then extend

its front west as far as the Argonne, inclusive, relieving the French Second Army. It would attack, with 12 to 14 American divisions, between September 20th and 25th, from the Meuse to the Argonne. This attack was to be supported on its left by the French Fourth Army. The objective was to be northwest towards Mèziéres. Marshal Foch rejected the idea of an advance on Metz, as this would be, in relation to his other armies, an operation on divergent lines, whereas his plan of campaign was based on advances on converging lines. In this decision Foch's plan was accepted, while Pershing gained his point of having all possible American forces left under his command.

The relief of the French Second Army involved moving out west of the Meuse two corps, containing eight divisions. With army troops, this amounted to about 200,000 men. To replace these about 600,000 men, with 600 batteries of artillery, trains, 93,000 animals, etc., had to be moved in. Twenty-four ammunition depots, field hospitals, command posts, and other services had to be established. As this had to be all concealed from enemy observation, it was a gigantic task. It was agreed that the French XVII Corps, which held Verdun and vicinity, would remain in line, and would be transferred to the American First Army. The French Second Army, under General Hirschauer, was charged with preparatory arrangements, to be completed in about three weeks.

The enemy to be attacked occupied with five divisions a front of about 28 kilometers. Including all troops, the Germans appear to have had not over 75,000 men in this sector. The front line was for observation; the second line, through Apremont, Montfaucon and Sivry, was the main line of defense, for which about two thirds of their infantry, around 24,000 men, were available. This line was roughly 6,000 meters from the front held. The remainder of the German infantry was distributed through the advance zone. The artillery, between 400 and 500 guns, was similarly deployed. A third line of defense, prepared but not manned, extended through Grandpré, Romagne and Brieulles; and a fourth line, laid out, but neither prepared nor manned, through the Bois de Barricourt. The lines, except the front one, generally ran along ridges, which commanded the foreground. At the season of the

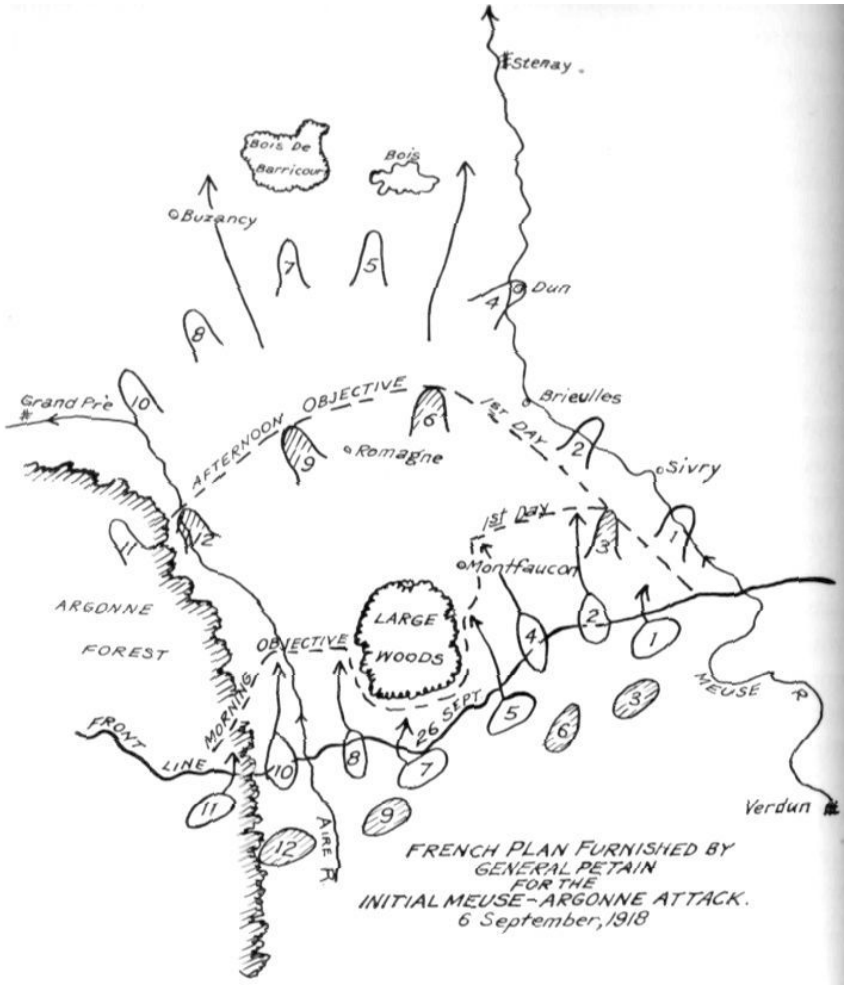
year when the campaign was to start rain and mists were common; consequently visibility would be probably poor, and often non-existent.

On September 6th, General Petain sent to the First Army a plan for its attack. It provided two groups of two corps each. Each corps was to have two divisions in line, and one in reserve. One group was to attack east of Montfaucon, inclusive; the other, down the Aire valley. Covered by an artillery preparation to be fired at night, the front line was to attack early in the morning, advancing 6 to 7 kilometers to pierce the main line of defense. In the afternoon of the same day, the reserve divisions, supported by tanks and any artillery available, was to pass through the front and, the two groups uniting, advance another 6 or 7 kilometers through the enemy's third line, expected to be undefended except for defeated elements falling back. The next morning the original front line was to pass forward, becoming a front line again, and advance to the enemy's fourth line. Subsequent advances in the same manner were to be continued until the vicinity of Mèziéres was reached. The plan provided for complete defeat of the enemy by the second day, and mostly on the first day. Great secrecy was prescribed; all preliminary movements were to be by night; artillery registrations were prohibited.

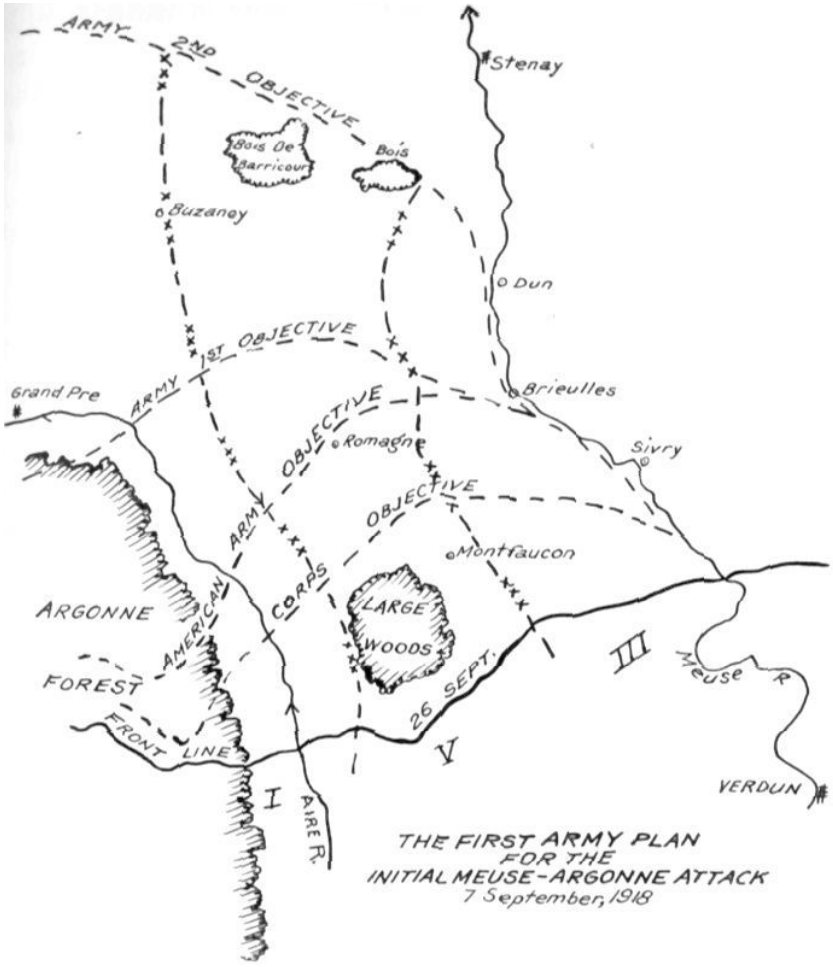
The First Army issued its instructions on the 7th. It complied with General Petain's views as to the artillery preparation, limited to a maximum of 4 to 5 hours. As part of its mission it was to neutralize hostile artillery on the flanks, so as to prevent the advance from receiving enfilade fire. Blinding observation posts, and cutting gaps in wire* throughout the advance zone, and in the east half of the main line of resistance were given as additional tasks. A straight advance was substituted for the French leap-frog plan, with three corps with three divisions each *in line*. This change was made as it was believed that the French plan was too complicated for some of the divisions to be engaged, which had had but little, or no experience in battle. One division *in reserve* was provided for each corps. The date of attack was announced as probably September 22nd.

---

*St. Mihiel had not yet been fought, and how to pass through enemy wire was a matter of serious concern at this date.




When the artillery staff of the First Army started their plans, they knew nothing of what has been explained here. They were simply told to prepare for "Operation B," to involve 12 divisions, on D day, at X locality, against Y forces. Questions as to how much time was available, what were the enemy forces, and where was the terrain, were answered by the reply, that no information could be given out, as these matters were SECRET. The artillery reported that their plans were based primarily on the enemy and the terrain, and that they could not intelligently prepare a plan




without knowing about this. After waiting one day, the needed information was supplied.

On September 8th, General Buat, of General Petain's staff, sent an estimate of artillery required for the Meuse-Argonne attack. A list of artillery, with accompanying air forces, which the French would furnish was enclosed. According to a letter sent on the same day by General Petain to Marshal Foch, the French artillery estimate was arrived at by averaging the amount used in recent offensives, both French and German. Much of the artillery

for the Americans was to come from the St. Mihiel front as soon as that operation was over. For the majority of batteries to be transferred, this was expected to be on the evening of D day, September 12th, and they were ordered to be ready to march on that night. General Buat's estimate, together with the artillery in sight on this date, as probably available, was:

| Character | French Estimate Guns | Probably Available Guns |
|---|---|---|
| Light | 720 | 804 |
| Heavy | 720 | 724 |
| Very heavy | 100 | 37 |
| Total | 1540 | 1565 |

There was a possibility that there would be time to transfer about 400 additional French guns, of light and medium caliber, from the St. Mihiel front, in addition to those shown as probably available.

On September 9th, the III Corps headquarters, Major General R. L. Bullard, reported, and was assigned to station, under the French Second Army, to the east sector of the Meuse-Argonne front. The corps was not told about the proposed attack. After the St. Mihiel attack was over it was intended to take the I Corps, Major General Hunter Liggett, and the V Corps, Major General George H. Cameron, out of line, and move them to the new front to take the left and center of the attack group. On the 10th General Pershing sent his plan of attack to General Petain for approval.

On the 11th General Petain informed the French Second Army of its mission of reforming the front. It was made responsible for information and security measures until relieved by the American First Army. The Second Army started at once on its new task. It was advised by the American Army as to the desired order of battle, and as troops became available, they placed them accordingly. The front, held by French troops on the left, and the American 33rd Division on the right, was to be left unchanged until the last moment, so that the enemy might observe no changes should he capture prisoners or deserters. All movements in and out were by night, and the only artillery fire authorized, was the

small amount of daily fire customary for tranquil sectors, restricted absolutely to batteries already in line.

The battle of St. Mihiel was fought on the 12th, and completed on the 13th. Reorganization of the front was made immediately, and troops relieved to be made available for the Meuse-Argonne campaign. Marches to the capacity of the road and railroad net were started, troops being billeted by day in towns, or in woods. Separate roads were allotted to foot troops and horses, and motorized units. Fires, and lights, outside of buildings were prohibited. Notwithstanding the fatigue involved in constant night matching on crowded unlighted roads, and the discomfort of occupying woods, whose sanitary condition was anything but desirable, the troops followed orders closely. One Field Artillery brigade commander marched by day, because he thought it was too misty for the enemy to observe his march. He was right as to this, they did not observe it, but General Pershing did, as he happened to be traveling on the same road just as the brigade came along. The commander in chief did not approve of the explanation for a violation of orders. This brigade commander's career ended right there. As this event became noised about, it led to a tightening of discipline, and the enormous mass of troops was moved in, without the enemy discovering anything, other than that important troop movements were taking place. The Germans failed to locate a single new battery position out of the hundreds brought in.

On the 16th the First Army issued Battle Instructions to the corps acquainting them with their missions under the plan of the 7th. Each of the nine divisions in line was to be reenforced by one regiment of French 75mm portée artillery of nine batteries. Each of the three corps and the army was to have three regiments of heavy artillery, and the army about 40 railroad guns in addition. Tanks were to be equally divided between corps. The main missions were:

| | |
|---|---|
| I (left) Corps: | Reduce the Argonne forest, by flanking from the east, by advancing down the Aire valley. |
| V (center) Corps: | Seize Montfaucon. |
| III (right) Corps: | Turn Montfaucon, by advancing beyond it to the east. |

The instructions provided for an advance to the enemy's third

line through Romagne, by afternoon of the first day. The artillery preparation was to last five hours.

On the 17th, Corps commanders were advised that the placing of troops in line was under control of the French Second Army, to whom they would report directly; but that they would also consult the Chief of Artillery of the American First Army in order to insure timely and proper placement of troops and services. They reported as ordered to the Chief of Artillery, and were advised as to the probable date of attack, the general idea of the artillery preparation and subsequent supporting fires. Exposure to hostile observation by artillery reconnaissance parties was warned against. The selection of battery positions was made by the French Second Army, and allotted by them to corps and divisions. On this day the First Army decided to allot the tanks, so as to give the V Corps eight battalions, the I Corps three battalions, and the III Corps none.

The army artillery plan was issued on the 19th. In general it followed the principles which had worked well at St. Mihiel, an initial 15 minutes of intense fire on lines of communications and command posts, followed by neutralization fire for a length of time to be determined later. To insure coordination of fire along the front, the infantry were to maintain time tables, corrected to date, at the proper artillery headquarters. Portée artillery was to be far forward, to fire deep into enemy territory, and to cover the advance of horse drawn units, to be emplaced in their rear. Artillery commanders were ordered to arrange for their own observation. As the battle plan contemplated a large advance on the first day, 155mm GPF brigades were warned to have batteries ready to move forward close behind the infantry. It being possible that infantry might be held up in some places, all calls from the infantry for fire were ordered to be promptly complied with. The night of the 22nd-23rd was designated for placing guns in position, except those which would be exposed to hostile view, which were not to be emplaced until the last moment.

The artillery now available and its distribution was as follows:

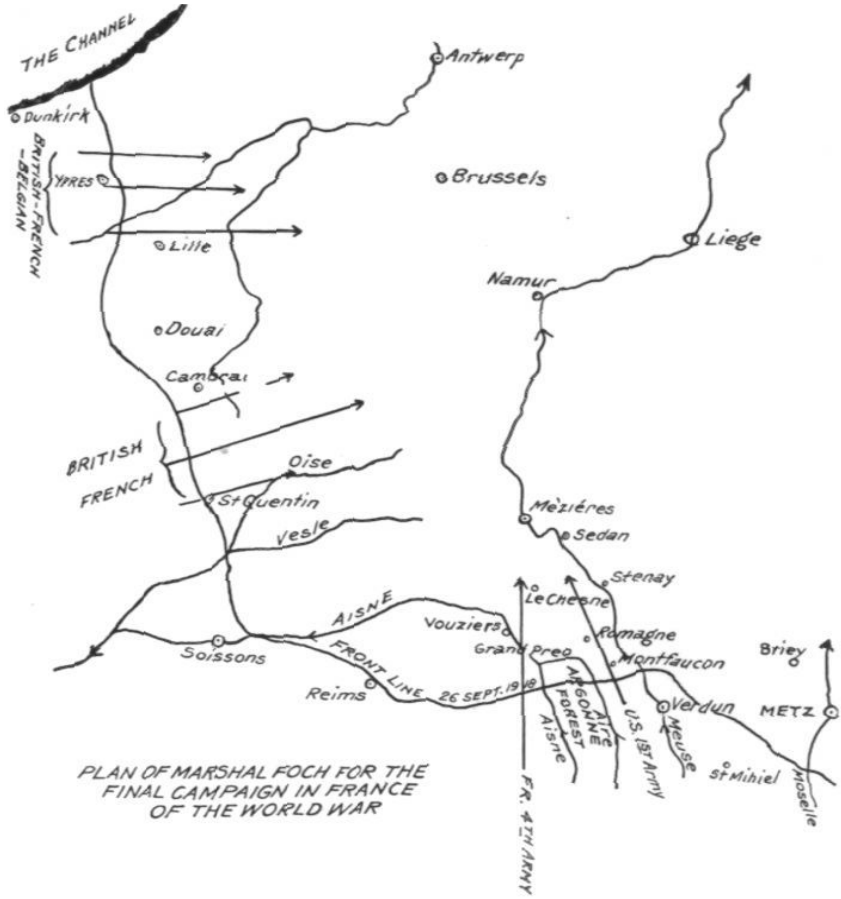
| | TMs | 75mm | Heavy | Very Hvy. | AAC | Total | % |
|---|---|---|---|---|---|---|---|
| Army Artillery..... | ___ | 12 | 281 | 101 | 18 | 412 | 10.29 |
| I Corps..... | 132 | 336 | 300 | ….. | ….. | 768 | 19.19 |
| V Corps ..... | 102 | 312 | 318 | 8 | ….. | 740 | 18.49 |
| III Corps ..... | 131 | 348 | 312 | ….. | ….. | 791 | 19.77 |
| Total, battle front..... | 365 | 1008 | 1211 | 109 | 18 | 2711 | 67.74 |
| Defensive front, Meuse to Moselle . | 138 | 468 | 646 | 14 | 25 | 1291 | 32.26 |
| Grand Total ..... | 503 | 1476 | 1857 | 123 | 43 | 4002 | 100.00 |

For the battle front there were 96.8 guns per kilometer. The United States furnished 2,021 guns or 50.5 per cent; the French, 1,981 guns, or 49.5 per cent. France furnished the chiefs of artillery for the I and V Corps, all the ammunition, six squadrons of airplanes for the heavy artillery, and several balloons. The planes were attached to regiments in the same manner as Medical detachments, and were at the immediate disposition of regimental commanders for observation. This was standard French practice.

The 281 guns in the army artillery were mainly 155mm GPFs. They were intended to furnish a mass of fire, which the army commander could employ to intervene in the battle, to assist such units as he might desire. These guns had a range sufficient to cover not only the front of the corps in which they were located, but also the greater part of the front of the adjacent corps. It was therefore possible, if they were under the orders of a single artillery commander, to secure concentrations of fire of very formidable extent on selected parts of the front, within the time required to telephone orders, and compute firing data. The very heavy artillery included the railroad artillery, and was for bombardment purposes on important targets such as Montfaucon and very distant towns. These targets were to be interdicted in accordance with General Petain's directions.

The entire force of artillery in this battle was equivalent to over 55 brigades, organized according to American Tables of Organization. It was the largest assembly of artillery that had ever been under control of one American commander in battle, and the largest ever operating under one plan, under one chief of artillery.

On September 20th, Marshal Foch visited General Pershing, and more fully explained his plan for the coming campaign. The Marshal had in view four main offensives:




a. The attack by the American First Army and the French Fourth Army, jointly, toward Mèziéres-Sedan, to cut the railroad line, east and west, through those cities.
b. A British-French attack, on the line St. Quentin-Cambrai.
c. A British-French-Belgian attack, directed east from Ypres and vicinity.
d. Liaison attacks, in between, to keep the enemy busy and prevent him from sending troops or materiel elsewhere.

General Petain now ordered the Mèziéres-Sedan attack for the morning of September 26th. The First Army field order was also issued on the 20th. Except that the rate of advance of the infantry was fixed at 100 meters in 4 minutes, the plan of attack

was not changed. The length of the artillery preparation was not stated. Neither did the Army Artillery field order issued on the 21st, determine this point.

On the 22nd, Generals Pershing and Petain met at the latter's headquarters at Nettancourt and discussed cooperation with the French Fourth Army and artillery preparations. The French Fourth Army desired a six hour preparation, which was approved by General Petain. General Pershing asked that the preparation be as short as possible, suggesting one like that on the south front of St. Mihiel, which had been a four hour preparation. He declined to agree at this time as to any artillery preparation other than to accept General Petain's request that the Americans at least undertake interdiction of enemy rear areas and that some artillery preparation be fired by that part of the American army forces east of the Meuse to the Moselle, so that the enemy would not at once recognize the limits of the attack about to be launched. It was also understood that authority would be given to those batteries of divisional artillery which were to fire in the rolling barrage, to each register one gun before the battle.

An agreement was arrived at that the attack of the First Army would comprise the following steps:

a. An advance of about 10 miles to a line through the north edge of the Argonne; to be obtained by two wedges driven respectively by the I Corps down the Aire valley, and by the III Corps east of Montfaucon. After passing the latter place, the wedges to close on each other, and advance to the line Romagne-Cunel.
b. A subsequent advance to the line Stenay-le Chesne.
c. A clearing of the high ground east of the Meuse. It was foreseen that if this was left in possession of the Germans, they would enfilade the advance west of the river, where the ground was lower.

The French generals took this occasion to invite attention to what they considered a too rigid control of traffic by the Americans. It was true that the Military Police were strict. So much so that they prevented battery commanders from visiting their own guns, seized and carried off cars whose occupants had temporarily left them, prevented laying or repairing telephone lines, all of which made the installation of artillery particularly difficult.

Efforts were well meant, but there was justification in stating that restrictions on traffic were sometimes carried too far.

The relief of the French Second Army by the American First Army took place on the 22nd. The American 33rd Division on the east, and French units on the west part of the front were left undisturbed, until the night before the attack. With this exception the front was in full activity in locating enormous bodies of troops and materiel involved in moving in and out of the area. A French Cavalry Division was brought up in rear of the I Corps, to be ready to push forward through the gap expected to be made, and pursue the enemy. Tanks on hand amounted to 189, all of French make; of these 141 were manned by Americans.

General Petain ordered the infantry assault to start between 5.30 and 6.00 A. M. He directed an artillery preparation for the French Fourth Army, a false preparation on the St. Mihiel front, interdiction fire on enemy rear areas and then added:

"The American Army will attack without any preparation, as requested by it."

This was not exactly what General Pershing had said. He had postponed his decision as to the artillery preparation, but had not rejected it. On the 23rd, instructions were issued to the heavy artillery to prepare fire to be delivered during the battle, against the east edge of the Argonne, to protect the I Corps from enfilade fire from their left flank. From the apparent strength of the positions as determined from map and photographic studies it appeared that heavy artillery could profitably be used for this purpose. The army artillery undertook this mission, leaving the I Corps artillery free to support the direct advance.

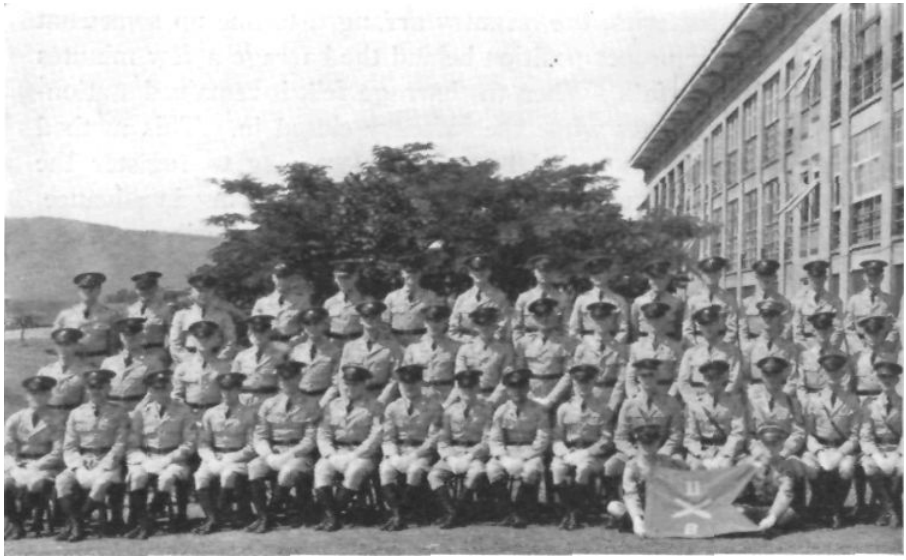
An Army Artillery order was issued on the 24th, fixing the length of the artillery preparation. H hour being 5.30 A. M., September 26th, a preparation by 25 per cent of the army artillery was to start at 11.30 P. M., the 25th, simultaneously with the preparation of the French Fourth Army on the left, together with a false preparation by more than 300 batteries of the First Army between the Meuse and the Moselle. The first part of the preparation was exclusive of counter-battery fire, which was to be in addition, and to the extent necessary to meet the enemy's reply to our fire. It was feared that the hostile artillery might, by placing

persistent gas on our front line, seriously interfere with the initial advance. At 2.30 A. M. all batteries were to engage in the artillery preparation, according to the plan announced and published on the 19th, covering a general program of neutralization fire.

Although authorized to register light batteries firing in the rolling barrage, the V Corps forbade it, and the other corps availed themselves but sparingly of this permission. Instead of registering barrage batteries, the infantry arranged to line up somewhat in rear of their proper position behind the barrage a few minutes before it was to fall. When the barrage fell, it remained stationary for five minutes while the infantry closed in. This method took less time than would have been necessary to register the guns, avoided alarming the enemy by unusual firing in advance, avoided possible discovery of location of the batteries, and absolutely insured the infantry against possible losses through errors in firing data. This method became standard practice.

On the 25th, General Pershing personally visited the Corps headquarters and assured himself that all was proceeding in accordance with plans. They were, and without further orders, the great battle of the Meuse-Argonne, destined to last uninterruptedly for five weeks, instead of two days, was launched.

# THE 1932 KNOX



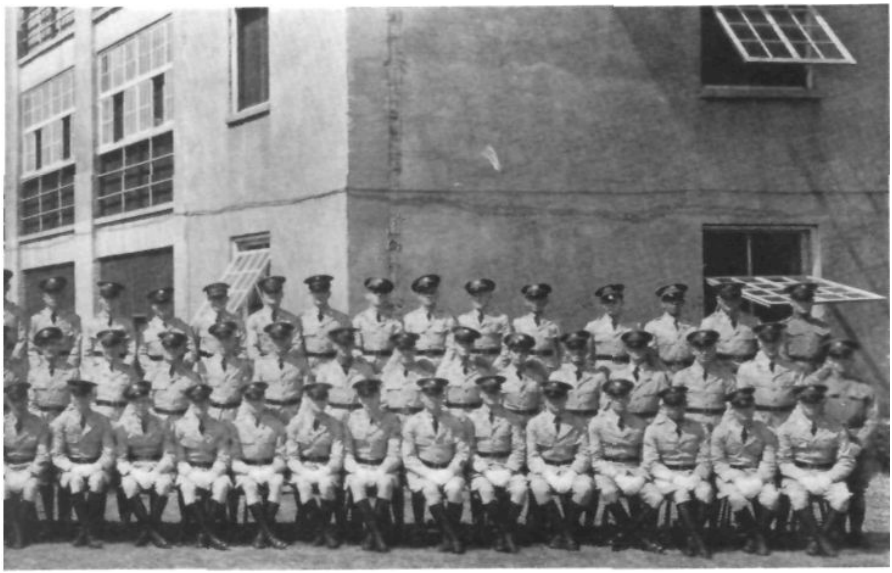
**BATTERY "B"**

THE Chief of Field Artillery, Major General H. G. Bishop, has announced that the Knox Trophy for the year 1932 has been won by Battery B, 11th Field Artillery, stationed at Schofield Barracks, T. H., Captain William R. Philp, commanding.

The Knox Trophy is presented annually by the Society of the Sons of the Revolution in the Commonwealth of Massachusetts to that battery of the Regular Army Field Artillery which has the highest rating in efficiency—this rating to be based on firing efficiency, tactical mobility, proficiency in the use of Field Artillery means of communications, and on interior economy.

The batteries selected to represent the commands of which they form a part and to take the competitive test for the Knox Trophy were:

# TROPHY BATTERY



**11th FIELD ARTILLERY**

1st Corps Area—Fort Ethan Allen, Vermont—Battery B, 7th Field Artillery.
2nd Corps Area—Madison Barracks, New York—Battery A, 5th Field Artillery.
3rd Corps Area—Fort Hoyle, Maryland—Battery A, 6th Field Artillery.
3rd Corps Area—Fort Myer, Virginia—Battery A, 16th Field Artillery.
4th Corps Area—Fort Bragg, N. C.—Battery C, 17th Field Artillery.
4th Corps Area—(Infantry School)—Fort Benning, Georgia—Battery A, 83rd Field Artillery.
5th Corps Area—Fort Benjamin Harrison, Ind.—Battery A, 3rd Field Artillery.
6th Corps Area—Fort Sheridan, Illinois—Battery E, 3rd Field Artillery.
7th Corps Area—Fort Des Moines, Iowa—Battery F, 18th Field Artillery.
8th Corps Area—Fort Bliss, Texas—Battery B, 82nd Field Artillery.
8th Corps Area—Fort Sam Houston, Texas—Battery F, 12th Field Artillery.
8th Corps Area—(The Field Artillery School)—Fort Sill, Oklahoma—Battery D, 1st Field Artillery.
8th Corps Area—Fort F. E. Warren, Wyoming—Battery C, 76th Field Artillery.
9th Corps Area—Fort Lewis, Washington—Battery A, 9th Field Artillery.
9th Corps Area—Pres. of Monterey, Calif.—Battery E, 76th Field Artillery.
Hawaiian Department—Schofield Barracks, T. H.—Btry. B, 11th Field Artillery.
Panama Canal Department—Fort Davis, C. Z.—Battery C, 2nd Field Artillery.

**SERGEANT CLARENCE SCOTT, HQ. BTRY., 1ST F. A., WINNER OF 1932 KNOX MEDAL**

**CAPTAIN WILLIAM R. PHILP AND OFFICERS OF BTRY. B, 11TH F. A., WHICH WON THE 1932 KNOX TROPHY**

The Knox Medal, awarded by the same Society for excellence as an enlisted student at the Field Artillery School, was won this year by Sergeant Clarence Scott, Headquarters Battery, 1st Field Artillery, Fort Sill, Oklahoma. Sergeant Scott has spent all of his service in the First Field Artillery with the exception of one year in the Signal Corps, back in 1920. Major General Harry G. Bishop, Chief of Field Artillery, in his letter announcing the honor, extended his hearty congratulations to Sergeant Scott on his excellent record both at the Field Artillery School and in the service since completion of the course.

Brigadier General William M. Cruikshank, Commandant of the School, will personally present the Knox Medal to Sergeant Scott at a formal ceremony when the medal is received from the donors which is expected to be the latter part of January or the first part of February, 1933.

## THE 1932 KNOX TROPHY BATTERY

### REMARKS FROM THE WINNING BATTERY COMMANDER

The success of Battery "B" 11th Field Artillery, was due in a large measure to the former Battery Commander, Captain John P. Crehan, who had commanded the battery for almost three years prior to May 1, 1932, when I took command. While we put in some "good licks" after May 1, Captain Crehan, by many months' hard work, had given his battery the most thorough fundamental training, without which the Knox Trophy will never be won.

According to the records, no howitzer battery has won the test prior to this year. Battery "B" is therefore justly proud of its achievement and especially so as the howitzer batteries here function under a local table of organization which gives us practically the same number of men as a light battery. As we have fourteen tractors to seven in a light battery and habitually need more cannoneers for the proper functioning of the firing battery, it is necessary that we put greater effort into the training and have luck with us in order to beat a good light battery.

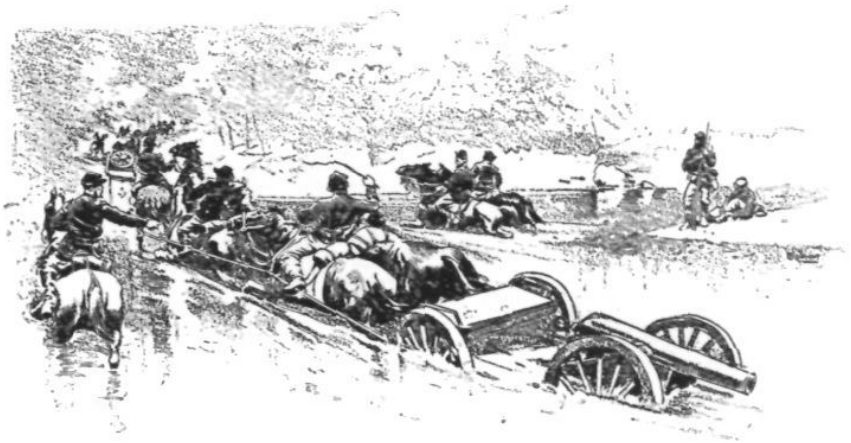
In my opinion, the preparation for the Knox Trophy Test is a distinct advantage to a battery. There is nothing in the requirements of the test that a well trained battery should not be able to perform with practically a perfect score. The test represents what might well be considered as the proper standards for any battery. These standards are ordinarily difficult to attain owing to the heavy special duty and fatigue which seems to be ever with us. It is only with some incentive, as the Knox Trophy Test, which adds to the interest of the men and leads them to work on their own time, that any battery can reach really satisfactory standards.

Battery "B" has been fortunate in having a fine staff of Lieutenants and an excellent First Sergeant. The Signal Sergeant, Instrument Sergeant, Motor Sergeant, Chiefs of Sections and

Range Finder Corporal deserve special credit for their good work.

The battery assignments were as follows:

1st Lieut. O. W. Martin, Battery Executive.
1st Lieut. R. C. Ross, Reconnaissance Officer.
2nd Lieut. Barksdale Hamlett, Motor Officer.
2nd Lieut. J. C. Hayden, Assistant Executive.
1st Sergeant S. Falat, First Sergeant.
Staff Sergeant D'Augustino, Signal Sergeant.
Sergeant Steed, Instrument Sergeant.
Sergeant Seals, Motor Sergeant.
Corporal McKean, Range Finder.
Sergeant Jusinski, Chief of 1st Section.
Sergeant Cardiel, Chief of 2nd Section.
Sergeant Novy, Chief of 3rd Section.
Corporal Hill, Chief of 4th Section.



# FRENCH ARTILLERY DOCTRINE

**(Fifth Installment)**

(The following is a digest by Major John S. Wood, F. A., of the course in artillery given at the Ecole de Guerre under the direction of Colonel de la Porte du Theil. Major Wood was a student there in 1929-1931.—EDITOR.)

## PART III

## ARTILLERY IN THE DEFENSIVE

### FOREWORD

DEFENSIVE combat is based on the employment of fire and the utilization of organized positions. Hence, in determining the use to be made of artillery in the defensive, it appears logical to study first the maneuver of its fire and then to consider the influence this exerts on the commander's choice of positions.

In the offensive, the possibilities of an attack depend in a major degree on the artillery available, since infantry alone can not furnish the required fire power. In the defensive, however, the situation is entirely different—infantry fire becomes the predominant factor, owing to the invincible stopping power of automatic weapons.

Nevertheless, such weapons can not be left at the mercy of undisturbed fire from enemy artillery. Also, they have certain definite limitations. Their flat trajectory may prevent concentrations of fire in many parts of the terrain, their limited penetrating power renders them ineffective against troops under cover, and their short range allows the enemy too great freedom in making his preparations for the attack. Hence, counterbattery, reinforcement of the infantry barrage, counterpreparation, and long range fire are the missions which require the employment of artillery in defensive combat. In addition, it constitutes in the hands of the commander a powerful instrument of maneuver, capable under certain conditions of scattering and crushing the enemy advance.

Undoubtedly, any position may be defended for a time by infantry alone, but for victorious resistance artillery must be present. Moreover, as shown at Verdun, long continued defensive action requires artillery strength comparable to that of the attacker.

### SECTION I—MANEUVER OF FIRE

In defensive combat, a commander first chooses a battle position on which he prepares to resist with his entire force. Consequently

the artillery problem involved has to do mainly with fire in defense of the battle position. Every piece must be ready to join in this mission.

The artillery action required may be either a counterpreparation to break up the dispositions for the attack or defensive barrages to shatter the enemy assault lines. Plans are made for both systems of fire.

### COUNTERPREPARATION

A counterpreparation can be certain of effect only when the enemy dispositions are definitely known. Evidently this is never the case, hence the system of fire must be planned *a priori*. The term *a priori*, however, does not mean haphazard. It implies reason. Although the exact intentions of the enemy are usually unknown, nevertheless the terrain offers a solid basis of hypothesis as to his probable action.

Originating from widely dispersed sources and applied usually on terrain invisible to observers, counterpreparation fire must be carefully prepared. This includes precise designation of objectives, judicious assignment of missions, accurately calculated corrections of the moment, and provision for simultaneous action. All this requires time, and allowance for it must be made in the commander's plans.

To defend is not to submit tamely to whatever maneuver the attacker is pleased to adopt. The will of the defender must be made manifest by his maneuver of fire.

Such fire is applied first on the zones favorable to the enemy's advance toward the critical regions of the defense. Mass effects are sought, capable of causing considerable losses and of acting powerfully on the enemy morale.

For certainty of effect, a favorable moment must be chosen, and the fire must cover an area sufficient to include all occupied points—an extent of surface far beyond the possibilities of the means ordinarily at hand. For effective action against unsheltered personnel it is necessary to fire in a very few minutes:

100 to 150 rounds of 75 per hectare* (10,000 sq. meters)
50 to 80 rounds of 155 per hectare
80 to 120 rounds of 105 per hectare.

At a rate of 4 rounds per minute, a battery of 75 or 105 will fire

*About 2.5 acres.

80 rounds in 5 minutes and cover about one hectare. A battery of 155, at a rate of one round per minute, will fire 20 rounds and cover half a hectare. The rates may be increased for fires of short duration. On this basis, a battalion can cover 3 to 5 hectares in a little less than ten minutes, using about one-fourth of a unit of fire. Likewise, a division artillery (3 battalions of 75, 2 battalions of 155) can cover only about 25 hectares at one time. Even with an equal amount of reinforcing artillery and the aid of the corps, it will be difficult for a division to fire effectively on more than 50 hectares—and 50 hectares are only the equivalent of an area 700 meters square.

These figures merit reflection. The areas mentioned are far short of those that should be covered in a simultaneous counterpreparation along the whole front. This would require much more artillery than the defender can ordinarily muster. In this connection, it is well to remember that the situations of the war were very special and the procedure followed there can not be applied blindly in all cases. For example, the 1st Army in Picardy and the 4th Army in Champagne in the spring and summer of 1918 had about one battalion of artillery per 450 meters of front—fifteen battalions per division front of 7 kilometers. With such amounts of artillery a general counterpreparation was possible. With the normal amount of only a third as many guns, the fire would be scattered and ineffective.

Losses are too often considered as equal in value wherever produced. The loss of a few men per section in each assault company along the front has far less effect, however, than the annihilation of one or two complete battalions, even though the numbers are equal. In the first case, the attack suffers little; in the second, a gap has been created in the assault lines. This is why counterpreparation is a special affair, requiring the concentration of all the artillery on limited zones—hence the necessity for successive fire actions and for a judicious choice of objectives by the higher command.

There can be no thought of initially parcelling out the artillery among the executants with the idea of regrouping its fire later when time allows. Time does not allow—concentration is required immediately. The first essential for the higher commander is the maneuver of fire of his entire artillery. Placing

artillery at the disposal of sub-sector commanders to meet sudden emergencies comes later.

*To think of dispersing the artillery is to think of defcat; to adopt measures which require such dispersion is to court disaster*.

However, a just appreciation of the situation is essential. Counterpreparation is not merely a matter of laying out a number of equal rectangles on which all guns are to be concentrated successively. After considering his forces and his scheme of maneuver, the higher commander designates the regions for counterpreparation. The artillery commander then plans the fire so that the critical areas will be adequately covered. The resulting fire-actions—each based on a certain hypothesis (for example, the protection of a particular center of resistance)—applied simultaneously, and reinforced by indirect machine gun fire when possible, are capable of producing terrifying effects over an extensive zone.

Ordinarily on a division front, two or three separate counterpreparations are planned, each one comprising all division artillery and reinforcing corps artillery available. Certain light batteries must be left out to answer sudden calls for fire, for one never knows at what moment the counterpreparation must be broken off and the defensive barrages begun. On larger fronts with more artillery, two such counterpreparations may sometimes be put down simultaneously.

The decision as to the proper moment for releasing a counterpreparation is a grave one. If released too soon, the defensive arrangements are revealed; if too late, the enemy has crossed the danger zone. The decision is too important to be delegated to commanders of units smaller than the division. In the celebrated defense of General Gouraud's IVth Army east of Rheims in 1918, the army commander himself made the decision, but ordinarily it is left to corps or division commanders.

The difficulty as to choice of objectives and choice of time for commencing fire is even more marked in open warfare than in stabilized situations, for the dispositions and intentions of the enemy are more obscure. Counterpreparation in open warfare consists of partial fire actions, more localized, but utilizing as before the mass of the artillery. Rapid maneuver must be sought by

means of a complete system of observation and communication. The concentrations are prepared and numbered for rapid designation. They are then applied successively as the enemy advances, under strict control of the higher commanders.

In any situation, counterpreparation is a part of the commander's maneuver. Its value depends strictly on his information and his decision. With it he is able to intervene early and powerfully in combat; and, from the beginning, he must reserve the possibility of engaging his entire artillery in such action.

#### DEFENSIVE BARRAGES

Evidently counterpreparation alone can not be relied on to break up an attack. The general characteristic of all defensive operations is the establishment of a system of deep and powerful fire in front of and within the main position—a net work of fire which will sooner or later stop the enemy even though it may be broken down in spots. In this, infantry fire has the predominant role.

The artillery, however, must play its part, reinforcing infantry fire at critical points and covering portions of the terrain which infantry weapons can not reach. In general, its action takes the form of standing barrages.

For standing barrages, the regulations require a density of two rounds of 75 per minute per 15 meters of front. One battery, firing at a rate of 8 rounds per gun per minute, can cover only about 200 meters of front. The nine light batteries of the division are assigned a total of not more than 2 kilometers of standing barrage missions.

A front of 200 meters may also be assigned to each 155 howitzer battery; but it must be remembered that howitzer fire can not be put down closer to the front lines than 500 meters and that the barrage is not impenetrable, since the cadence of fire can not be more than 1 round per gun per minute. The 155 is more often used to render untenable the woods and hollows in front of the position.

At this stage, the crisis has arrived. There is no further question of finesse, of successive actions here and there. The attack must be stopped at any cost all along the line. Hence the scheme of defense must provide for prompt and powerful fire, capable of

being applied in any circumstances on a simple signal from the front line infantry.

The division commander, in this crisis, must leave the direction of the close defense to his infantry sub-sector commanders. Accordingly, he makes arrangements to place the fire of his entire artillery at the disposal of the infantry. The regimental commanders indicate the points where artillery fire is needed, making their wishes known through the commander of their supporting groupment of artillery.

The artillery barrage plan for the division is drawn up by the division artillery commander in accordance with the requests of the infantry. He fixes the scheme of fire according to the ammunition available.

Ordinarily, the heavy artillery is left on the last objective of the counterpreparation; while the light artillery places its barrages as close in as safety allows, firing at a very rapid rate for two or three minutes. These barrage fires of 75 are usually followed by several minutes of raking fire, extending to the limits of the zones covered by the 155s in order to reach enemy troops caught between the two fires.

It must be realized that the standing barrages are not delivered instantaneously. One or two minutes intervene between the signal from the infantry and the delivery of fire from the 75s in direct support. Five or six minutes are often needed for the light batteries in general support which are laid on missions outside the sector concerned. Heavy batteries require ten minutes, at least, for any considerable shift, which explains why they are left to fire in the direction of their last counterpreparation missions if possible.

#### DEFENSIVE FIRES WITHIN THE BATTLE POSITION

In order that the fight may be continued throughout the depth of the battle position, arrangements must be made for a system of fires to cover the principal centers of resistance along the regimental reserve line. These fires are released on the order of infantry regimental commanders, the details being handled by the commander of the artillery groupment in direct support.

#### FIRE IN DEFENSE OF THE OUTPOST POSITION

The mission of the outpost determines the nature of the artillery supporting fire. Outpost forces either defend to the last or fall

back as the enemy gains contact. In a defense mission, the position comprises strong points, grouped in centers of resistance and covered by contact groups in front. In case the mission is one of surveillance, there is no echelon of resistance, and plans are made for withdrawal of the covering groups as the enemy advances.

The nature of the surveillance mission must not be misunderstood. For the infantry engaged both missions imply fighting, even though the surveillance mission comprises a withdrawal when the enemy has reached certain points designated in advance by the division commanders: and fighting infantry requires artillery support, particularly when a delicate maneuver is involved. Also, the artillery will be able to inflict greater losses on an advancing enemy if it is ready to profit immediately from the information furnished by the outpost. For these reasons, certain batteries are designated for the support of surveillance groups.

In the other case, when the outpost resists to the last, what is to be the nature of the artillery support? Are we to organize another system of counterpreparation and barrage fires ahead of the outpost position? Evidently not. The defender can not afford to dissipate his strength by engaging battle on two positions. *The artillery engaged in firing ahead of the outpost is always limited, and the commander must fix the exact amount in his orders*. Counterpreparation and a complete system of barrages are out of the question. The fire will comprise more or less dense box barrages around the strong points, numbered concentrations on certain approaches which are sheltered from machine gun fire, and concentrations to block pursuit if any withdrawals are ordered. This conception may run counter to that imposed by many memories of the war; but it must be remembered that the doctrine of the inviolability of the front lines was then in vogue, and that the outpost position was in fact the true position of resistance.

A series of concentrations may also be provided between the outpost and the main position, particularly when intermediate strong points are organized to break up the enemy advance and to force it into certain channels. The amount of artillery used is determined by the scheme of maneuver and is definitely prescribed. Evidently a system of this sort requires minute preparation and a communication net capable of withstanding the enemy bombardment.

**OBSERVED FIRE**

The systematic fires just considered offer the advantage of immediate artillery action, by day or night, on a simple signal from the infantry; but they strike blindly and they consume a quantity of ammunition often out of all proportion with the enemy forces under fire. Provision must be made for observed fire against any enemy elements that show themselves. The defensive battle of July 15, 1918, well illustrated the necessity for such fire and the results to be obtained in stabilized situation. Obviously, it is even more essential in open warfare.*

The artillery, from top to bottom, must seize every opportunity for observation. The tendency to overlook its importance—a heritage from the stabilized situations of the war—must be combatted, and the battery and battalion commanders must be allowed wider initiative in order to secure its benefits. The high command, also, must make observation, infantry as well as artillery, one of its chief concerns. Actually, one of the main factors in the choice of a battle position is the possibility of obtaining and protecting artillery observation within the lines selected.

Of course, the initiative given artillery commanders in fire of this nature can not be allowed to commit the entire artillery to action unless the higher commander so desires. He must decide and announce the limiting line within which observed bodies of the enemy will be attacked and the amount of artillery to be so used.

**LONG RANGE FIRE**

The French artillery regulations, based on the experiences of the war, do not attach much importance to long range defensive fire. Undoubtedly, it had little place in the stabilized defensive battles of the war, and in such situations the close employment of artillery in covering the battle position is perhaps the best use that can be made of it. However, as the war has receded, consideration of open warfare situations has brought about a change in thought. The enemy should be struck as quickly and as powerfully as possible. Why, then, should the action begin at one or

*Report of the 3d Division (Vicinity of Rheims): "Daylight, 5:15. Visibility good. Objectives: infantry columns, convoys; batteries. Method of fire from daylight on; volley fire observed."

Report of the 43rd Division (Vicinity of Tahure): "Until 7.00 A. M., execution of prearranged fire. After this time, concentrations of division and reinforcing corps artillery were fired against objectives signalled by ground and air observers."

two thousand meters when the guns can fire effectively at ten thousand? The present doctrine is thus stated by the inspector general of artillery: "As soon as the arrangements for close defense barrages have been completed, the commander seeks to strike as deeply as possible within the enemy lines. To reserve the artillery for close defense only is a mistake. Every important objective signaled by the aviation should be attacked by artillery as soon as the enemy comes within effective range."

Certain questions at once arise. Are the results expected of sufficient importance to warrant an outlay of ammunition in distant combat? If so, what proportion of the available ammunition is to be so expended?

These questions once decided by the commander, the number of guns to be used and the limiting line for beginning fire must be determined. The limit may be the line of surveillance of the outpost, which often corresponds with the maximum range of the light artillery emplaced to cover the main line of resistance. In most cases, however, certain batteries of 75 and 105 may be pushed forward temporarily in rear of the outpost, thus rendering the march of the enemy more difficult and causing premature deployment of his artillery. During this period of the operation the amount of circulation behind the enemy lines will not ordinarily justify a use of harassing fire beyond certain surprise concentrations on points known to be occupied.

As the enemy advances within the zone of combat of the outpost, the artillery emplaced in rear of the main line of resistance comes into play. The amounts of artillery in action depend largely on the possibilities of observation, particularly air observation. Complete interdiction is rarely possible, and the artillery action is ordinarily limited to more or less dense concentrations of harassing fire.

When the outpost position has been reduced and the real attack commences, defensive counterbattery action plays a part which is stressed entirely too little in the regulations. This is undoubtedly due to the fact that counterbattery is assigned exclusively to the corps heavy artillery, and this artillery is too weak organically to undertake any serious action along the entire defensive front occupied by the corps. The present doctrine recognizes the necessity

for corps control of counterbattery, but it does not conclude that only the corps heavy artillery should be assigned to this mission. There is just one artillery and one maneuver of fire, not several separate categories. The commander must decide whether the maneuver of fire is to include counterbattery. If so, he must assign sufficient artillery to this part of the mission, utilizing whatever portion of the division artilleries he deems necessary. In this connection, it is interesting to note that the German postwar regulations attach much importance to defensive counterbattery action.

Effective long range fire is impossible without adequate air observation. The cavalry groups operating in advance of the outpost lines may locate suitable artillery objectives and of course, should be in radio communication with certain advance batteries. However, fire in answer to such calls must be adjusted by high bursts, and too great importance can not be attached to it. For effective action, the cavalry signal must bring air observation into play. Until this moment, only the previously scheduled general air reconnaissance have been made, but the situation now requires special flights for the benefit of the artillery.

The possibilities of long range fire are limited definitely by the number of airplane flights allotted to the artillery, just as they are by the amounts of ammunition allotted. The commander must provide for the artillery requirements in this respect if he wishes to obtain effective results from his long range action.

(*To be continued*)

# TYPE PROBLEMS

## Lateral Precision, Small t

(Paragraph 86-b, Page 131. T. R. 430-85)

*Target Description:* Base Point. *Mission:* Registration. *Materiel:* French 75mm gun, Model 1897. *Visibility*: Excellent. *Wind direction*: Left to right. *Initial data obtained*: Prismatic compass and rangefinder. B. C. on the left. R=3.2, r=3.0, T=270 mils, c=4.5, s=9, F=3 (Firing Tables 75—B—2), s/c=2, r/R=.9.

*Initial commands*: No. 1 Adjust, Compass 5000, Shell Mark I, Fuze long, No. 1 One Round, Quadrant 93.

| *Commands* | *Elevation* | *Deviation* | *Range* | *Deflection* | *Remarks* |
|---|---|---|---|---|---|
| | 93 | 40 L | ? | | 40×.9=36 |
| R 36 | 93 | 13 R | + | | r/R=36/53=2/3=.7<br>13×.7=L 9 to get on line<br>6×2=L 12 to stay on line. |
| L 21 | 87 | 3 L | + | | |
| | 81 | 3 R | ? | | This command should have been L 8, 81.<br>3×.7=2, R 2 to get on line, L 12 to stay on was too much. Should have been L 10. So L 10 to stay on line. |
| L 3 | 81 | 3 R | ? | | Command should have been L 2. |
| L 3 | 81 | Line | – | | Command should have been L 1. (½ indicated shift). 3 L×.7=2 L 2 L+L 3+L 3=8 L 8/2=4 |
| R 4 | 84 | 3 L | + | | 3 L×.7=2 L<br>2 L+R 4=R 2÷2=L 1. |
| L 1, 3 rds. | 83 | 1 L | + | ? | |
| | | 2 L | + | ? | |
| | | Line | + | + | |
| L 2, 2 rds. | 81 | 2 R | – | ? | |
| | | 5 R | – | ? | |
| 3 rds. | 82 | | | | |

SUMMARY: Error in initial data: Deflection 29 mils: Range 250 yds. or 8.6 per cent. Time not taken. Ammunition expended 12 rounds. Classification satisfactory. General comments: Deflection not well handled. The last command of "3 rds., 82" is correct, fire for effect being continued in half groups of three rounds until the deflection is correct.

# Axial Precision

(Paragraph 81, Page 112, T. R. 430-85)

*Target Description:* Machine gun emplacement. *Mission*: Destruction. *Materiel*: American 75mm gun, Model 1920. *Visibility*: Good. *Wind*: None. *Initial data obtained*: Deflection measured with B. C. Telescope. Range estimated. Fork=4 mils.

*Initial commands*: No. 2 Adjust. Base Deflection Right 180, Shell E-1, Normal charge, Fuze delay, No. 2 One Round, Quadrant 90.

| *Commands* | | *Elevation* | *Sensing* | *Remarks* |
|---|---|---|---|---|
| | | 90 | Lost | |
| | | 82 | Lost | |
| | | 74 | Lost | |
| L 25 | | 74 | – | |
| L 15 | | 82 | – | With estimated range this should have been a 4 fork jump. |
| | | 90 | – | |
| R 5 | | 98 | + | |
| | | 94 | + | |
| | 3 rds | 92 | + | |
| | | | + | |
| | | | + | |
| L 1, | 2 rds | 90 | + | |
| | | | – | Fork=4. All six rounds are assumed to have been fired at 91. 4 overs, 2 shorts 2/12×4=.7, 91–.7=90.3. |
| | 6 rds | 90.3 | Cease firing | |

SUMMARY: Error in initial data: Deflection 36 mils. Time not taken. Ammunition expended 13 rounds. Classification: Satisfactory. General Comments: When a shot is lost it is advisable to change some element of the data, preferably the one most likely to be in error, rather than to risk losing another shot in the same place. However, when after the third "Lost" the officer firing decided to try to find his shots by making a deflection change, he should have gone back to 90 mils elevation, having no reason as yet on which to change his original estimation.

# Axial Precision

(Paragraph 81, Page 112, T. R. 430-85)

*Target Description*: Enemy gun, the crew of which had been driven off by the previous bracket adjustment. *Mission*: Destruction. *Materiel*: American 3-inch gun Model 1903, equipped with sub-calibre tubes. *Visibility*: Good. *Initial data obtained*: From previous problem.

T=90 mils. BC on left. F= 14 (taken as 14 by student, actually 15).

*Initial commands*: No. 2 Adjust. Base Deflection Right 160, Shell 37mm, No. 2 One Round, Quadrant 250.

| *Commands* | | *Elevation* | *Sensing* | *Remarks* |
|---|---|---|---|---|
| | | 250 | + | |
| L 5 | | 236 | + | One fork jump because of excellence of initial data. |
| L 3 | | 222 | – | |
| R 2, 3 rds. | | 229 | – | |
| | | | – | |
| | | | – | |
| | 2 rds. | 236 | – | F=13. All six rounds are assumed to have been fired at 232.5. |
| | | | + | 4 shorts, 2 overs 2/12×13=2.2. 232.5+2.2=234.7. |
| | 6 rds. | 234.7 | Cease firing | |

SUMMARY: Error in initial data: Deflection 6 mils; Range 130 yards or 3.6 per cent. Time not taken. Ammunition expended 8 rounds. Classification: Satisfactory. General comments: An excellent problem. Although this was an axial set-up, small deflection changes were necessary to keep the shots on the line (T=90 mils).

# FIELD ARTILLERY OFFICERS (REGULAR ARMY) ON DUTIES OTHER THAN WITH TROOPS (AS OF DECEMBER 1, 1932)

**Note: The list of officers assigned to Regular Army Field Artillery Units (as of September 1, 1932) was published in the September-October, 1932, number of The Field Artillery Journal.**

OFFICERS ON DUTY, OFFICE CHIEF OF FIELD ARTILLERY

Major General H. G. Bishop
Lieut. Col. R. M. Danford
Lieut. Col. T. D. Osborne

MAJORS:
- F. K. Ross
- E. P. Parker, Jr.
- J. H. Wallace
- J. M. Swing
- Dean Hudnutt
- B. H. Perry

CAPTAINS:
- H. B. Allen
- A. F. Kibler
- W. C. Dunckel

ON DUTY WITH PORTO RICAN HURRICANE RELIEF COMMISSION

Major Howard Eager

OFFICERS ON DUTY WITH FIELD ARTILLERY BOARD

Col. Augustine McIntyre
Lieut. Col. Maxwell Murray

MAJORS:
- F. C. Wallace
- J. J. Waterman
- L. E. Hibbs
- C. C. Bank
- A. C. Fitzhugh

CAPTAIN:
- B. A. Day

LIAISON OFFICERS

Maj. A. W. Waldron, with Ordnance at Aberdeen 1st Lieut. C. H. Mitchell, Signal Corps School

FIELD ARTILLERY SCHOOL, STAFF AND FACULTY

Lieut. Col. L. J. McNair
Lieut. Col. R. E. D. Hoyle

MAJORS:

- S. L. Irwin
- R. C. Batson
- G. S. Gay
- L. R. Dougherty
- W. W. Hess
- W. F. Maher
- S. Bacon
- J. F. Barnes
- C. A. Baehr
- G. D. Wahl
- W. R. Woodward
- A. C. Stanford
- T. T. Handy
- O. Ward
- R. W. Barker
- J. E. Lewis
- J. A. Hoag
- R. F. Hyatt

CAPTAINS:

J. F. Brittingham
S. F. Dunn
J. M. Lentz
H. Harding
Boniface Campbell
J. C. Adams
L. L. Boggs
J. G. Watkins
C. C. Parks

FIRST LIEUTENANTS:

A. L. Shreve
E. W. Searby
G. F. Wooley, Jr.
H. E. Kessinger
R. M. Wicks
M. K. Kurtz
G. V. Keyser
M. V. Gannon
M. W. Daniel
J. M. Willems

INSTRUCTORS, OTHER SERVICE SCHOOLS

Major I. T. Wyche, Cavalry School
Major A. V. Arnold, Infantry School
Major V. E. Prichard, Air Corps Tactical School

ADVANCED COURSE, 1932-1933, FIELD ARTILLERY SCHOOL

Major Percy G. Black

CAPTAINS:

G. H. Dosher
S. D. Bedinger
C. W. Bonham
T. C. Harry
V. A. Dash
L. E. Babcock
C. A. White
A. L. Warren
M. L. McCreary
D. T. Boisseau
R. Hirsch
L. H. Frasier
E. A. Hyde
E. R. Block
G. H. Stuts
J. McDowall
M. V. Patton
J. E. Ray
A. E. Billing
H. C. Harrison, Jr.
H. N. Lockwood
J. B. Matlack
J. P. Crehan
F. B. Lyle
L. L. Partlow
A. C. Donovan
C. N. Thirlkeld
R. A. Carter
C. E. Sargent
W. Hayford, III
L. T. McMahon
I. L. Kitts
L. V. Harris

FIRST LIEUTENANTS:

C. H. Day
C. S. Berrien
E. C. Ringer
R. M. Montague
E. L. Strohbehn
C. E. Berg
C. H. Swartz
S. F. Little
F. W. Lee
L. L. Lesser

## FIELD ARTILLERY OFFICERS ON DUTIES OTHER THAN WITH TROOPS

### ADVANCED HORSEMANSHIP COURSE, 1932-1933, FIELD ARTILLERY SCHOOL

FIRST LIEUTENANTS:

G. J. Reid
J. Meade
L.R. Wingfield
H. F. Handy
L. S. Griffing
M. H. Lucas

### ADVANCED MOTORS COURSE, 1932-1933, FIELD ARTILLERY SCHOOL

Captain W. E. Corkill

FIRST LIEUTENANTS:

N. Catalan (P. S.)
E. V. Holmes
J. A. Sullivan
F. J. Hierholzer
W. H. Kennett

### BATTERY OFFICERS' COURSE, 1932-1933, FIELD ARTILLERY SCHOOL

FIRST LIEUTENANTS:

O. L. McDaniel
A. Martelino (P. S.)
C. J. Barrett, Jr.
M. D. Taylor
B. M. Bryan, Jr.
R. E. Chandler
F. T. Dodd
L. F. Young
R. M. Osborne
R. W. Mayo
J. R. Wheaton
C. O. Wiselogel
S. F. Yeo
H. C. Larter, Jr.

SECOND LIEUTENANTS:

F. I. Brown
T. M. Watlington, Jr.
R. Condon
E. G. Farrand
M. F. Stober
C. R. Hutchinson
J. M. Burdge, Jr.
F. A. Granholm
A. N. Williams, Jr.
J. F. Collins
F. H. Sinclair
H. S. Isaacson
A. E. Solem
M. D. Masters
L. H. Ham
R. C. White
J. Ganahl, Jr.
J. M. Moore
R. I. Pride
C. M. Matthews
R. J. Handy
F. Q. Goodell
G. B. Coverdale
E. V. Thayer
F. G. Stritzinger
D. C. McNair
F. H. Chaffee
D. P. Armstrong
C. H. Jark
D. F. Brown
F. M. Steadman

### STUDENTS IN OTHER SERVICE SCHOOLS AND CIVILIAN INSTITUTIONS, 1932-1933

### AIR CORPS TACTICAL SCHOOL

Major C. B. King
Major R. M. Bathurst

### ADVANCED EQUITATION, CAVALRY SCHOOL

1st Lieut. J. T. Dawson
1st Lieut. T. E. Lewis

SIGNAL CORPS SCHOOL

1st Lieut. S. P. Collins
2nd Lieut. S. V. Barnard

INFANTRY SCHOOL

Captain Pierre Mallett
1st Lieut. P. W. Thompson

ITALIAN CAVALRY SCHOOL

1st Lieut. G. E. Mitchell, Jr.

POLISH CAVALRY SCHOOL

Captain W. H. Colbern

PURDUE UNIVERSITY

1st Lieut. M. Buckley, Jr.
1st Lieut. H. L. Love

UNIVERSITY OF PENNSYLVANIA

1st Lieut. A. F. Freund

OXFORD UNIVERSITY

2nd Lieut. I. R. Schimmelpfennig
2nd Lieut. R. D. Black, Jr.

QUARTERMASTER CORPS MOTOR TRANSPORT SCHOOL

1st Lieut. A. B. Devereaux
1st Lieut. T. B. Whitted, Jr.

ALLIANCE FRANCAISE AND THE SORBONNE, PARIS, FRANCE

1st Lieut. W. R. Hensey
2nd Lieut. P. H. Draper
2nd Lieut. T. J. Sands

COMMAND AND GENERAL STAFF SCHOOL, STAFF AND FACULTY

LIEUT. COLONELS:

H. W. Huntley
E. P. King, Jr.
R. J. Talbot, Jr.

MAJORS:

W. H. Cureton
A. C. McBride
V. Meyer
Philip Hayes
F. A. Doniat
J. E. Sloan

FIRST LIEUTENANT:

E. A. Bixby

COMMAND AND GENERAL STAFF SCHOOL, STUDENTS, 1931-1933

MAJORS:

H. E. Miner
M. A. S. Ming
J. J. Bethurum Williams
P. T. Vance
C. E. Hurdis
A. M. Gurney
R. W. Beasley
G. S. Beurket

## FIELD ARTILLERY OFFICERS ON DUTIES OTHER THAN WITH TROOPS

CAPTAINS:

J. Kennedy
R. T. Guthrie
R. W. Yates
R. E. Dupuy
J. D. Matthews
L. B. Hershey
L. J. Fortier
E. C. Ewert
T. E. Buechler
J. T. B. Bissell
E. H. Almquist

### COMMAND AND GENERAL STAFF SCHOOL, STUDENTS, 1932-1934

Major J. A. Stewart

CAPTAINS:

B. M. Sawbridge
L. H. Bixby
W. C. Lattimore
C. C. Alexander
S. McLeod
W. A. Campbell
J. P. Ratay
E. H. Brooks
W. H. Maris
G. P. Hays
R. V. Maraist
R. C. Montgomery
M. R. Cox
A. R. Wilson
R. W. Hasbrouck
L. M. Riley

### ARMY WAR COLLEGE, STAFF AND FACULTY

COLONELS:
W. D. Smith
W. H. Peek

LIEUT. COLONELS:
F. W. Honeycutt
F. M. Barrows

MAJORS:

J. W. Anderson
H. E. Maguire
C. M. Busbee

### ARMY WAR COLLEGE, STUDENTS, 1932-1933

LIEUT. COLONELS:
W. R. Henry
W. H. Dodds, Jr.

MAJORS:

C. Brewer
B. R. Peyton
G. A. Pollin
F. B. Prickett
C. G. Helmick
J. L. Devers
J. B. Wogan
F. T. Armstrong

### ARMY INDUSTRIAL COLLEGE, STUDENTS, 1932-1933

Major Ralph Hospital
Captain C. R. Toy

### NAVAL WAR COLLEGE, STUDENT, 1932-1933

Major Marshal Magruder

### OFFICERS ON DUTY AT THE UNITED STATES MILITARY ACADEMY

MAJORS:

P. V. Kane
J. S. Tate
J. M. Devine

CAPTAINS:

A. E. Fox
H. A. Cooney
M. A. Cowles
L. V. Warner

FIRST LIEUTENANTS:

R. T. Bennison
F. W. Farrell
H. B. Enderton
A. L. Keyes
J. A. Samouce
A. R. Taylor
W. A. Samouce
W. R. Pierce
H. W. Holt
R. R. Raymond, Jr.
M. McClure
M. P. Echols
H. M. Jones
G. S. Price
J. F. Uncles
P. W. Brown
L. E. Matthewson
J. W. Clyburn
J. J. Burns
J. R. Burrill
W. E. Shallene
E. C. Gillette
E. O. Lee
C. P. Nicholas
W. P. Ennis, Jr.
H. J. John
W. D. Brown
W. H. Bartlett
G. DeGraaf
H. D. Kehm
R. G. Gard
J. M. Lewis
R. K. McMaster
H. M. Roper
C. L. Dasher
J. J. Fiske

SECOND LIEUTENANT:

D. W. Traub

OFFICERS ON R. O. T. C. DUTY

HARVARD:
Col. O. L. Spaulding
MAJORS:
H. C. Jones
A. A. White
1st Lt. C. D. Palmer

YALE:
Major W. C. Houghton
Major R. W. Hocker
1st Lieut. A. Svihra
1st Lieut. W. A. Wedemeyer

PRINCETON:
Lieut. Col. R. S. Parrott
Major R. P. Shugg
Captain G. P. Seneff
1st Lieut. W. T. O'Reilly
1st Lieut. A. E. Kastner
1st Lieut. T. F. Keefe
1st Lieut. E. B. Ely

V. M. I.:
Major J. Magruder
1st Lieut. F. J. Tate
1st Lieut. S. R. Hurt
1st Lieut. W. E. Waters

CHICAGO:
Major T. J. J. Christian
1st Lieut. N. F. Galbraith
1st Lieut. A. B. Price

INDIANAPOLIS HIGH SCHOOL:

JOPLIN HIGH SCHOOL:
1st Lieut. E. A. Elwood

LEAVENWORTH HIGH SCHOOL:
Captain W. W. Woodbridge

MEMPHIS CITY HIGH SCHOOL:
Captain G. H. Cushman, Jr.

MONTGOMERY HIGH SCHOOL:
Captain P. C. Fleming

MARION INSTITUTE:
Captain L. A. DesPland, Jr.

NEW YORK MILITARY ACADEMY:
1st Lieut. E. L. Johnson

FIELD ARTILLERY OFFICERS ON DUTIES OTHER THAN WITH TROOPS

ILLINOIS:
Maj. W. McCleave
CAPTAINS:
L. A. Daugherty
R. L. Dalferes
P. H. Weiland
E. Busch
1st Lieut. R. P. Clay

IOWA A. AND M.:
Lieut. Col. P. W. Booker
Major R. M. Wightman
1st Lieut. C. A. Pyle
1st Lieut. T. O. Foreman
1st Lieut. F. M. Day
1st Lieut. J. H. Lewis

MISSOURI:
Lieut. Col. M. G. Randol
Captain M. C. Calhoun
Captain W. A. Beiderlinden
1st Lieut. W. B. Avera

OKLAHOMA:
Major H. J. Malony
Captain J. J. Waters, Jr.
Captain L. H. Caruthers
Captain G. R. Hayman
Captain H. C. Demuth
1st Lieut. I. D. Yeaton
1st Lieut. J. V. Collier
1st Lieut. G. P. Privett

CORNELL:
Major C. S. Ferrin
Captain S. E. Bullock
Captain W. H. E. Holmes
1st Lieut. L. W. Bassett
1st Lieut. J. R. Culleton
1st Lieut. E. O. Hopkins

ALABAMA POLYTECHNIC INST.:
Major G. H. Franke
Captain E. S. Ott
Captain W. A. Metts
1st Lieut. H. L. Watts, Jr.
1st Lieut. T. S. Gunby
1st Lieut. W. C. Huggins
1st Lieut. J. V. Phelps

OHIO STATE UNIVERSITY:
Major C. I. McClure
Captain H. E. Camp
1st Lieut. J. B. Murphy
1st Lieut. E. T. Williams
1st Lieut. J. A. McFarland
1st Lieut. G. D. Adamson

R. E. LEE INST. HIGH SCHOOL:
Captain C. C. Knight

ST. JOSEPH, MO., HIGH SCHOOL:
Captain D. M. Hoagland

COLORADO A. & M.:
Major Y. D. Vesely
Captain L. M. Skerry
1st Lieut. E. J. Roxbury
1st Lieut. P. B. Herrick

TEXAS A. & M.:
Major S. R. Hopkins
Captain C. S. Richards
1st Lieut. J. V. Carroll
1st Lieut. J. J. Binns

STANFORD:
Lieut. Col. D. C. Cubbison
Major E. C. Williams
Captain R. A. Gordan
Captain S. F. Miller

UTAH:
Major J. A. Gillespie
Captain M. L. Craig
Captain P. C. Boylan
Captain C. F. Murray
Captain R. C. Snyder

OREGON:
Major F. W. Bowley
Captain N. J. McMahon
1st Lieut. G. A. A. Jones
1st Lieut. F. A. Garrecht

FLORIDA:
Major D. A. Connor
Captain E. T. Barco
Captain J. P. Donnovin
1st Lieut. J. F. Williams
1st Lieut. R. K. Quekemeyer

LOUISIANA STATE UNIVERSITY:
Captain L. M. Jones

CULVER MILITARY ACADEMY:
Major J. S. Wood

CHATTANOOGA HIGH SCHOOL:
Lt. Col. B. Lyerly

CHICAGO HIGH SCHOOL:
Captain E. C. Fleming

COUNCIL BLUFFS HIGH SCHOOL:
Major J. O. Hoskins

DAVENPORT HIGH SCHOOL:
Captain Lewis E. Reigner

DETROIT HIGH SCHOOL:
1st Lieut. C. B. Leinbach

FISHBURNE MILITARY ACADEMY:
1st Lieut. E. V. Kerr

PURDUE UNIVERSITY:
Major J. E. McMahon
Major L. H. Hanley
Captain C. Pickett
Captain J. A. Steere
Captain O. C. McIntyre
Captain C. W. Mays
Captain A. S. Miller
FIRST LIEUTENANTS:
J. P. Barney, Jr.
H. A. Doherty
C. M. Hallam
C. C. Duell
R. C. Singer

GARY HIGH SCHOOL:
Captain F. H. Hollingsworth
LONG BEACH POLYTECHNIC HIGH SCHOOL:
Captain J. C. Hughes
SALT LAKE CITY HIGH SCHOOL;
Captain G. B. Haddock
SANTA BARBARA HIGH SCHOOL:
Captain C. A. Beaucond
WALLA WALLA HIGH SCHOOL:
Captain E. A. Ericson

## OFFICERS ON DUTY WITH THE NATIONAL GUARD

MILITIA BUREAU:
Major J. A. Pickering
Major G. H. McCoy
FIRST CORPS AREA:
Lt. Col. H. E. Marr
Major H. S. Struble
Major C. W. Gallaher
Major L. W. Hasslock
Major E. A. Zundel
Major W. E. Jenkins
Captain T. F. Hickey
Captain B. M. Fitch
Captain Wm. Michener
1st Lieut. C. E. Pease
SECOND CORPS AREA:
Major F. Heard
Major W. A. Raborg
Major J. G. Burr
Major C. B. McCormick
Major W. D. Mangan
Major W. Clarke
Major S. D. Downs
Major E. H. Hicks
Captain A. P. Moore
Captain W. H. McNaught
THIRD CORPS AREA:
Lt. Col. F. Thorp, Jr.
Major J. N. Hauser
Major W. A. Pendleton
Major M. H. Taulbee
Captain D. S. Doggett
Captain A. M. Sheets
Captain R. A. Knight
Captain L. E. Savage
Captain J. L. Gammell
1st Lt. C. N. McFarland
1st Lt. W. C. Price, Jr.

FIFTH CORPS AREA:
Major N. N. Polk
Major H. C. Bowman
Major O. I. Gates
Captain B. B. Lattimore
Captain W. S. Evans
1st Lieut. T. D. Moore
SIXTH CORPS AREA:
Colonel W. K. Moore
Major J. H. Milam
Major R. G. Hunter
Major S. Knopf
Major G. E. Arneman
Captain L. A. Kurtz
Captain J. A. Chase
Captain J. F. Roehm
1st Lieut. J. Gross
SEVENTH CORPS AREA:
Major H. H. Ristine
Major S. L. Kiser
Captain D. C. Schmahl
Captain A. P. Rhett
Captain M. S. Creusere
Captain T. N. Tiernan
Captain J. J. Turner
1st Lt. O. Ellis
1st Lt. H. G. Elliot, Jr.
EIGHTH CORPS AREA:
Major H. B. Parker
Major H. S. Clarkson
Major R. C. Rutherford
Captain W. E. Kneass
Captain J. C. Dolan
Captain A. B. Hicklin
Captain A. H. Lee
Captain L. E. Boren
Captain A. Brumage
Captain E. F. Hart

## FIELD ARTILLERY OFFICERS ON DUTIES OTHER THAN WITH TROOPS

FOURTH CORPS AREA:

Lt. Col. B. M. Bailey
Major T. W. Wrenn
Major F. C. Mellon
Major N. P. Morrow
Major H. C. Vanderveer
Major D. A. Craig
Major C. Bassich
Major L. A. Craig
Major H. Parkhurst
Captain R. Campbell
Captain D. G. Trenholm
1st Lieut. C. P. Jones

NINTH CORPS AREA:

Colonel D. W. Hand
Lt. Col. W. C. Potter
Major J. J. McCollister
Major C. E. Ide
Major Wm. Alexander
Major B. L. Carroll
Captain E. M. Graves
Captain R. H. Crosby
Captain I. B. Warner
Captain W. C. Carlan

## OFFICERS ON DUTY WITH THE ORGANIZED RESERVES

Col. A. F. Brewster, 9th Corps Area
Major R. T. Heard, Haverhill, Mass.
Capt. W. F. Kernan, Providence, R. I.
Capt. V. L. Knadler, Portland, Me.
Capt. S. Wotkyns, Pittsfield, Mass.
1st Lieut. W. A. Enos, Worcester, Mass.
Capt. M. M. Pharr, Boston, Mass.
1st Lieut. L. V. Chaplin, Manchester, N. H.
1st Lieut. M. F. Wakefield, New Haven, Conn.
Col. F. E. Hopkins, New York, N. Y.
Col. C. H. Lanza, Syracuse, N. Y.
Lt. Col. J. R. Davis, New York, N. Y.
Capt. G. R. Rede, Albany, N. Y.
Maj. J. B. Hunt, Elizabeth, N. J.
Capt. O. F. Marston, New York, N. Y.
Lt. Col. J. A. Rogers, Newark, N. J.
Lt. Col. E. M. Watson, New York, N. Y.
Capt. R. O. Montgomery, New York, N. Y.
Maj. J. M. Garrett, Jr., New York, N. Y.
Maj. C. M. Tuteur, East Orange, N. J.
Capt. L. O. Field, New York, N. Y.
Col. A. J. Greer, Buffalo, N. Y.
Maj. J. Andrews, Philadelphia, Pa.
Maj. J. M. McDowell, Washington, D. C.
Lt. Col. W. H. Shepherd, Richmond, Va.
Capt. R. B. Warren, Pittsburgh, Pa.
Col. C. R. Day, Philadelphia, Pa.
Col. W. H. Smith, Baltimore, Md.
Maj. F. A. Prince, Pittsburgh, Pa.
Col. H. L. Landers, Pittsburgh, Pa.
Maj. R. M. Milam, Philadelphia, Pa.
Capt. R. C. Mallonce, Harrisburg, Pa.
Capt. G. P. Winton, Nashville, Tenn.
Col. F. C. Doyle, Savannah, Ga.
Capt. D. B. Floyd, Raleigh, N. C.
1st Lt. H. E. Sowell, Birmingham, Ala.
1st Lt. R. T. Strode, Jackson, Miss.
Capt. G. E. Cook, Augusta, Ga.

1st Lt. M. G. Smith, Columbia, S. C.
Col. A. U. Faulkner, Ft. Bragg, N. C.
Maj. F. H. Gallup, Charlotte, N. C.
Maj. J. A. Sheridan, Macon, Ga.
Maj. S. McGehee, Shreveport, La.
Col. L. S. Ryan, Cincinnati, Ohio
Maj. R. B. McBride, Jr., Indianapolis, Ind.
1st Lt. E. M. Taylor, Columbus, Ohio
Capt. L. M. Hanna, Lafayette, Ind.
1st Lt. E. H. Metzger, Dayton, Ohio
1st Lt. J. H. Leusley, Ft. Wayne, Ind.
1st Lt. G. D. Vanture, Cincinnati, Ohio
Maj. A. Smith, Huntington, W. Va.
Maj. A. J. Zerbee, Cincinnati, Ohio
1st Lt. C. R. Gildart, Louisville, Ky.
Maj. K. C. Greenwald, Akron, Ohio
Col. J. P. Barney, Columbus, Ohio
Maj. E. D. Ferguson, Cleveland, Ohio
Capt. P. Winlock, Chicago, Ill.
Lt. Col. W. S. Wood, Chicago, Ill.
Capt. G. J. Downing, Chicago, Ill.
1st Lt. S. L. Mains, Jr., Milwaukee, Wis.
Capt. F. A. Metcalf, Springfield, Ill.
Capt. D. B. Rogers, Detroit, Mich.
Col. T. E. Merrill, Milwaukee, Wis.
Maj. C. K. Rhinehart, Chicago, Ill.
Maj. R. V. K. Harris, Warsaw, Wis.
Capt. B. L. Davis, Detroit, Mich.
Lt. Col. O. A. Dickinson, Wichita, Kans.
Lt. Col. W. F. Morrison, Sioux City, Iowa
Capt. J. R. Young, Sioux City, Iowa
Maj. J. M. Jenkins, Ft. Omaha, Nebr.
1st Lt. J. Y. LeGette, St. Joseph, Mo.
Maj. J. O. Daly, Kansas City, Mo.
Capt. I. D. Offer, Minneapolis, Minn.
1st Lt. R. M. Costigan, Des Moines, Iowa
1st Lt. G. Heninger, Little Rock, Ark.
Maj. H. W. O. Kinnard, St. Paul, Minn.
Capt. S. G. Fairchild, St. Louis, Mo.
Capt. H. C. Brenizer, Muscatine, Iowa
Capt. J. M. Reynolds, Denver, Colo.
Maj. D. G. Page, San Antonio, Texas
Capt. H. M. Schwarze, Ardmore, Okla.
Capt. S. J. Cutler, Dallas, Texas
1st Lt. N. W. Jones, Okmulgee, Okla.
Capt. F. S. Conaty, Phoenix, Ariz.
Maj. T. R. Miller, Waco, Texas
Maj. C. H. Tate, Fort Worth, Texas
Lt. Col. G. W. DeArmond, Seattle, Wash.
Maj. A. C. Searle, Portland, Ore.
Lt. Col. J. R. Starkey, Oakland, Calif.
Col. F. S. Bowen, San Francisco, Calif.
1st Lt. R. B. Hood, Portland, Ore.

## FIELD ARTILLERY OFFICERS ON DUTIES OTHER THAN WITH TROOPS

Capt. W. G. Dockum, Ogden, Utah
Lt. Col. W. D. Geary, Salt Lake City, Utah
Capt. S. L. Bertschey, Los Angeles, Calif.
Maj. H. A. Schwarz, San Francisco, Calif.
Maj. H. Templeton, Los Angeles, Calif.
Maj. E. T. Spencer, Los Angeles, Calif.

### OFFICERS ON DUTY WITH THE GENERAL STAFF (WAR DEPARTMENT)

LIEUTENANT COLONELS:
J. P. Marley
P. V. Kieffer
L. P. Collins
H. D. Higley
R. G. Kirkwood

MAJORS:
H. H. Fuller
L. E. Jones
L. R. Cole
C. D. Daly
I. Spalding
J. E. Hatch
J. P. Lucas

### (WITH TROOPS)

Lt. Col. R. H. Lewis, Hq. 2d Div.
Col. G. P. Tyner, Hq. 8th C. A.
Lt. Col. J. N. Greely, Hq. Haw. Div.
Maj. J. S. Winslow, Hq. P. C. Dept.
Maj. M. Proctor, Hq. 2d Div.
Col. C. M. Bundel, Hq. 3d C. A.
Maj. S. E. Reinhart, Hq. Haw. Div.
Lt. Col. N. B. Rehkopf, Hq. 3d C. A.
Maj. W. Spence, 1st Cav. Div.
Col. E. H. DeArmond, Hq. 2d C. A.
Lt. Col. F. A. Ruggles, Hq. 6th C. A.
Maj. R. M. Howell, Hq. 4th C. A.
Col. W. H. Burt, Hq. 6th C. A.
Col. W. P. Ennis, Hq. 1st C. A.
Lt. Col. G. H. Paine, Hq. Haw. Dept.
Maj. E. R. VanDeusen, Ft. Hamilton, N. Y.
Maj. W. E. Burr, Hq. Haw. Div.
Lt. Col. W. F. Sharp, Hq. 3d C. A.
Lt. Col. J. E. Mort, Hq. 5th C. A.
Maj. A. C. Sandeford, Hq. 2d C. A.
Maj. E. C. Hanford, Hq. 5th C. A.
Maj. R. E. Lee, Hq. 1st C. A.
Col. R. H. McMaster, Hq. 7th C. A.
Col. E. R. Coppock, Hq. 8th C. A.

### DUTY WITH GENERAL STAFF WITH TROOPS

Col. J. H. Bryson, Hq. 8th C. A.
Capt. A. W. Shutter, Hq. Haw. Dept.
Maj J. M. Fray, Hq. 7th C. A.

### DUTY WITH WAR DEPARTMENT GENERAL STAFF

Captain A. R. Ginsburgh

### MILITARY ATTACHES

Lt. Col. C. Parker, England
Maj. A. R. Harris, Costa Rica
Maj. J. A. Crane, Turkey
Capt. F. D. Sharp, Argentina
Maj. R. C. F. Goetz, Belgium
Col. E. R. W. McCabe, Italy
Maj. J. A. Lester, France

### AIDES DE CAMP

Capt. L. Dessez, to Major Gen. W. D. Connor
1st Lt. J. F. Sturman, to Brig. Gen. A. Hamilton
1st Lt. R. Sears, to Brig. Gen. G. H. Jamerson
1st Lt. G. S. Smith, to Maj. Gen. Frank Parker
1st Lt. B. L. Pearce, to Maj. Gen. S. Heintzelman
1st Lt. E. McGinley, to Brig. Gen. P. A. Wolf

1st Lt. H. P. Adams, to Brig. Gen. H. Dorey
1st Lt. R. O. Smith, to Brig. Gen. S. D. Rockenbach
2nd Lt. J. C. Oakes, to Brig. Gen. H. B. Fiske
2nd Lt. J. S. Nesbitt, to Brig. Gen. H. W. Butler
1st Lt. A. T. Leonard, to Brig. Gen. H. J. Brees
1st Lt. M. Craig, Jr., to Brig. Gen. C. King
1st Lt. E. L. Sibert, to Major Gen. P. Brown
1st Lt. H. M. Cole, to Brig. Gen. W. E. Cole
1st Lt. W. R. Grove, Jr., to Maj. Gen. E. B. Winans
1st Lt. W. B. Palmer, to Maj. Gen. A. J. Bowley
1st Lt. H. W. Kiefer, to Brig. Gen. L. R. Holbrook
2nd Lt. H. W. Wilkinson, to Brig. Gen. M. L. Walker
1st Lt. E. B. Gjeltseen, to Brig. Gen. Scott
1st Lt. G. D. Crosby, to Maj. Gen. E. L. King
Capt. W. M. Wiener, to Maj. Gen. B. H. Wells
1st Lt. A. C. McAuliffe, to Brig. Gen. J. B. Gowen
2nd Lt. J. Hagood, Jr., to Maj. Gen. J. Hagood
1st Lt. B. Evans, to Brig. Gen. W. M. Cruikshank
1st Lt. E. C. Meriwether, to Brig. Gen. W. M. Cruikshank
1st Lt. J. S. Winn, Jr., to Maj. Gen. M. Craig
1st Lt. W. D. McNair, to Brig. Gen. G. H. Estes

PUBLIC BUILDINGS AND GROUNDS, WASHINGTON, D. C.

Captain D. O. Hickey

UNITED STATES DISCIPLINARY BARRACKS

Capt. F. L. Thompson 1st Lt. F. O. Wood

OFFICE CHIEF OF STAFF

Colonel C. D. Herron

OFFICE ASSISTANT SECRETARY OF WAR

Major W. R. Gruber
Captain F. C. Jedlicka

OFFICERS DETAILED TO OTHER ARMS

AIR CORPS:
SECOND LIEUTENANTS:

D. F. Callahan, Jr.
A. J. McVea
H. D. Williams
W. J. Bell
J. E. Barr
C. W. Carlmark
C. F. Densford
J. E. Smart
W. W. Bowman
H. C. Gibner, Jr.
J. B. Zimmerman
H. H. Geoffrey
F. L. Howard
J. F. Thompson, Jr.
L. B. Hillsinger
J. P. McConnell
W. P. Goodwin
D. E. Beach
R. J. Stecker
C. A. Schrader
H. P. Huglin
G. D. Campbell, Jr.
W. R. Huber
D. H. Kennedy
E. G. Simonsen
W. E. Kraus

## FIELD ARTILLERY OFFICERS ON DUTIES OTHER THAN WITH TROOPS

ORDNANCE DEPARTMENT:

1ST LIEUTENANTS:
- D. J. Crawford
- H. J. D. Meyer
- R. H. Coombs
- R. K. Haskell

2ND LIEUTENANTS:
- J. D. Billingsley
- J. H. Hinrichs
- N. E. Poinier
- W. J. Latimer, Jr.
- G. D. Garton
- E. C. Reber
- J. S. Neary

QUARTERMASTER CORPS:
- Lt. Col. T. J. Johnson
- Lt. Col. B. F. Miller
- Major A. S. Harrington

CAPTAINS:
- H. Feldman
- R. C. Moore
- G. A. Greaves
- H. R. Evans
- W. Hitzfeldt

1ST LIEUTENANTS:
- L. E. W. Lepper
- W. A. Walker
- O. R. Marriott
- H. M. Manderbach
- H. L. Ingham
- A. P. Barnes

2ND LIEUTENANTS:
- D. R. Neil
- L. T. Heath
- J. E. Gill

### JUDGE ADVOCATE GENERAL'S DEPARTMENT

Captain D. O'Keefe

1st Lt. F. H. Vanderwerker

### ADJUTANT GENERAL'S DEPARTMENT

Captain W. S. Roberson

### FINANCE DEPARTMENT

1st Lt. C. K. McAlister

### INSPECTOR GENERAL'S DEPARTMENT

Col. R. W. Briggs
Col. W. S. Browning
Lt. Col. J. G. Tyndall
Lt. Col. G. R. Allin
Lt. Col. K. S. Perkins
Lt. Col. J. T. Kennedy
Lt. Col. J. W. Downer
Major L. J. Ahern
Major H. Erlenkotter

### STUDENTS, ORIENTAL LANGUAGES

Capt. M. W. Pettigrew
1st Lt. F. P. Munson
1st Lt. B. A. Tormey
1st Lt. R. G. Duff

### RECRUITING

Col. W. C. Webb
Capt. R. J. Canine
1st Lt. H. L. Kersh
Major R. H. Lewis
Capt. E. Herendeen
1st Lt. W. P. Blair

### AMERICAN BATTLE MONUMENTS COMMISSION

1st Lt. T. North

### SAN FRANCISCO GENERAL DEPOT

Lt. Col. G. E. Nelson

# FIELD ARTILLERY NOTES

**Saint Barbara, Patron Saint of Artillery**

The picture of Saint Barbara appearing on the first page of this number of the JOURNAL is a miniature reproduction of the picture published with an article entitled "Saint Barbara" in the November-December, 1920, FIELD ARTILLERY JOURNAL. The legend of Saint Barbara was introduced from the East, about the same time with that of Saint Catherine. She is the armed Pallas or Bellona of the antique mythology, reproduced under the aspect of a christian martyr. As protectress against thunder and lightning, gunpowder, firearms and sudden death, the effigy of Saint Barbara was a frequent ornament on shields, armor and particularly on great guns and field pieces.

**Ultra-High Frequency Radio Set**

The Field Artillery Board has completed its test of the ultra-high frequency radio set. This set, it will be remembered, is a small, light weight equipment which can be carried and operated by a single man. It operates on a wave length of about five meters and can transmit either voice or telegraphy.

The result of the test indicates that this type of radio equipment has considerable promise for intra-battery and liaison uses. While the particular model tested did not have sufficient range under all conditions, it was found that by increasing the wave length of the set to about eight meters, a reliable range of about five miles could be obtained.

As a result of this test the Signal Corps has initiated action to procure improved sets of this type for further test by the Field Artillery Board.

**Battery D, 17th Field Artillery en Route to Fort Ethan Allen, Vt.**

Battery D, 17th Field Artillery from Fort Bragg, N. C., which has recently been equipped with light trucks, is on its way to Fort Ethan Allen, Vermont. The battery has favorably completed those portions of its test which could be carried out at its home station. It has therefore been ordered to Fort Ethan Allen to conduct operations over a terrain covered with ice and snow. The battery left Fort Bragg on January 3 and arrived at Fort Myer,

Virginia, on January 4 having in the meantime staged a demonstration for the Marines at Quantico, Virginia. The battery was scheduled to arrive at Fort Ethan Allen on January 10 by way of Frankford Arsenal, West Point and Watervliet Arsenal, New York. However owing to an outbreak of influenza in the personnel of the battery it will not be able to carry out the above schedule. The column consists of:

5 station wagons (Fords).

5 Ford "A" trucks with subtransmission.

5 Ford "A" trucks, standard.

1 Ford 6-wheel ((A", 2 or 4 wheel drive with subtransmission.

1 Chevrolet truck 6 wheel, 4 wheel drive towing a Martin-Perry 75mm gun.

1 Ford "A" 4 wheel, 4 wheel drive.

1 Ford "B" 6 wheel, 2 wheel drive.

One of the Ford standard trucks has been transformed into a rolling kitchen in the sense that it carries a No. 5 Army Range which is bolted to the truck but insulated therefrom. The fuel is coal. Cooking is performed while moving on the road and fifteen minutes after the battery is halted food is served. A strap iron rack has been devised which holds the boilers from slipping on the stove when the truck is travelling. Lieutenant Colonel Maxwell Murray and Major Louis Hibbs are accompanying the battery.

**National Guard and Reserve Officers' Graduation**

Twenty-two National Guard and Field Artillery Reserve Officers from sixteen different states completed a three months' course of intensive instruction at the Field Artillery School, Fort Sill, Oklahoma, on December 10 and their graduation exercises were held on that date in the Officers' Club. The course taken by these officers contained 487 hours of instruction embracing the tactics and technique of field artillery to include the battery in the battalion. Included therein was a total of 229 hours under the department of gunnery where, after a comprehensive theoretical course, about 80 hours were devoted to actual service practice.

The final week of instruction was featured by two all-day exercises so designed as to give the students a chance to put into practice what they had been taught in the class room.

The officers who graduated were:

Captain Alfred H. Anderson, 53d F. A. Brigade, Pennsylvania National Guard.
Captain Thomas M. Calvert, 178th F. A., Mississippi National Guard.
Captain George T. Gunston, 143d F. A., California National Guard.
Captain Hayward K. Kelley, Field Artillery Reserve, Ohio.
Captain Kent E. Lawrence, 135th F. A., Ohio National Guard.
Captain Rollin E. Oliver, 66th F. A. Brigade, Washington National Guard.
Captain Mortimer J. Propps, 112th F. A., New Jersey National Guard.
Captain Francis J. Reichmann, 70th F. A. Brigade, Oklahoma National Guard.
1st Lieutenant Daniel J. Boger, 113th F. A., North Carolina Natoinal Guard.
1st Lieutenant Paul M. Burge, 132d F. A., Texas National Guard.
1st Lieutenant Robert C. Burns, Field Artillery Reserve, Missouri.
1st Lieutenant Willis T. Ellis, Field Artillery Reserve, Texas.
1st Lieutenant James S. Malsbary, Field Artillery Reserve, Indiana.
1st Lieutenant George L. Neblett, Field Artillery Reserve, Oklahoma.
1st Lieutenant Raymond A. Ramage, Field Artillery Reserve, Indiana.
1st Lieutenant Reed H. Richards, 145th F. A., Utah National Guard.
1st Lieutenant Seth B. Robinson, Field Artillery Reserve, Massachusetts.
1st Lieutenant Glen W. Trindal, 120th F. A., Wisconsin National Guard.
1st Lieutenant Robert Waldo, 104 F. A., New York National Guard.
1st Lieutenant William F. Wulf, 52d F. A. Brigade, New York National Guard.
1st Lieutenant Lester O. Yarian, Field Artillery Reserve, Indiana.
2nd Lieutenant George R. Farren, 102d F. A., Massachusetts National Guard.

**War Commander of 131st Field Artillery Honored**

Brigadier General and Mrs. Claude V. Birkhead were honored with a reception and dance by the Officers of the Regular Army, National Guard, and Organized Reserve Corps, on the evening of November 18th, at the Officers Club at Fort Sam Houston, Texas.

The event was in recognition of the high attainments of General Birkhead manifested by his election as President of the National Guard Association of the United States.

Invitations were extended by Major General E. B. Winans, Commanding General of the 8th Corps Area, in behalf of the Committee, to officers and their ladies and friends of the three components residing in the vicinity of San Antonio.