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**THE
FIELD ARTILLERY
JOURNAL**

EDITED BY

W. C. HOUGHTON

MAJOR, FIELD ARTILLERY, UNITED STATES ARMY

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Contents, May-June, 1923

The First American Shell	<i>Frontispiece</i>
The Boy Gunners of Lee	183
By Jennings C. Wise, Lt. Col., F.A., O.R.C.	
Firing from Photographs	190
By Lieutenant-Colonel D. F. Craig, F.A.	
The Sixth Field Artillery Song	199
By Major McMahon, 6th F.A. [Horse].	
Divisional Artillery Missions	200
By Major W. E. Burr, F.A.	
Motorized Artillery in the Field	219
By Captain John J. McCollister, F.A.	
High-Burst Ranging	224
By Major H. R. Odell, F.A.	
Artillery Fire, With and Without Observation	228
By Colonel Baron Von Weitershausen.	
Modern War and Machines	230
By General Debeney.	
Intercollegiate Polo	236
By Captain C. W. Yuill, Inf., A.D.C.	
Fort Sill in Wartime	239
By Captain E. Durette.	
The Seventh	246
By Colonel L. R. Holbrook (F. A.), G.S.C.	
Universal Cross-Country Cargo Vehicles	250
By "Train Commander."	
Current Field Artillery Notes	256
The Field Artillery Board.	
National Capital Horse Show.	
F. A. R. O. T. C. Pistol Tournament.	
New Jersey Reserves.	
The Colorado Endurance Ride of 1923.	
Polo.	
Ordnance.	
Just a Bum Bugler.	
Editorial Comment	268
Book Notices	269



THE FIRST AMERICAN SHELL
(From the Painting by Andrew T. Schwartz. Reproduced by Permission of the National Gallery of Art.)

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THE BOY GUNNERS OF LEE

BY JENNINGS C. WISE, LT.-COL., F.A., O.R.C.

WHEN we read of the tragedy of Europe that now claims so much of our attention we are prone to relegate the accounts of our own great war to a place of secondary interest. And yet, there were many heroic deeds among the youthful soldiers of 1861-1865, with which our people are wholly unfamiliar, that would have won the most coveted decorations in any of the present-day armies of Europe.

There has been enough written, perhaps, about the leaders and the battles of the War Between the States, but the interest of the American people in the individual heroism of American soldiers should never be allowed to flag. The writer proposes, in this article, to present only authenticated facts concerning one particular class of soldiers—the boy "gunners" of Lee's Army, about whom so little has been written.

Those of whom I shall write all wore upon their cuffs the scarlet facing of the artillery. They were no braver than the men of the other arms, for well I know that upon the breasts of all—infantry, cavalry, engineers and artillery alike—was worn "the red badge of courage." And yet, about the youthful artillerymen of the Army of Northern Virginia there was a glamour unknown in connection with those who served in other arms. In their spiritual composition there was an exalted note. In their courage there was a mixture of dash and conviction, loftier than the mere bravado of the *beau sabreur*, and in their make-up there seems to have been combined the stern solemnity of the roundhead and the reckless gayety of the cavalier. Boys in years and at heart, they met the responsibilities of full-grown men, and with the light-hearted spirit of their years, displayed those qualities of rugged tenacity which their heavy responsibilities demanded of them.

Their individualism was as notable as their courage and skill. Each battery, each battalion, was a clan, with tartan distinct, its chieftain known of all, and often men of the other arms, crouching by the roadside, rose to their feet to wave a spontaneous salute of recognition to a familiar "gunner" as, fearless and eager, he galloped at the head of his command into the thick of the fight. There was

THE FIELD ARTILLERY JOURNAL

a defiant note in the advancing rush and rumble of Lee's Artillery, which always called forth the welcoming cheers of his Infantry, for foot-soldier and cannoneer were one at heart, each cherishing the prowess of the other with mutual pride, and each with transcendent trust in the ability of the other. Among them, confidence, born of experience, wiped out at an early day the evils of caste jealousy. Let me repeat, Lee's "gunners" were no braver than his other troops, but about them there was a chivalric aspect, peculiar to their service, and so we find the names of these soldier lads better preserved in authentic records, as well as in the legends and military traditions of their people, than those of the juniors of the other arms.

Most illustrious of them all, though perhaps no more deserving of praise than others among his comrades, was John Pelham—the "Boy Major"—the good knight—the Gallahad of the Horse Artillery. Never was one better fitted by nature for the special service in which he engaged as the trusted companion and subordinate of the dashing Stuart, nor were two spirits ever more congenial than were those of these two romantic characters with their dancing plumes, their curvetting steeds, and their merry banjos. Theirs was the lilting air of exuberant youth which joyously rose above the solemn dirge of war. Both died in the saddle. The din of battle was their requiem.

An ideal companion in arms for Stuart, Pelham was a junior counterpart of his bold commander. There was something medieval, something impressively knightly about this lad. He seemed to belong to another age than that in which he lived—to the age of chivalry. Today his figure is preserved in the heroic tapestry of his comrade's memories; his name is the synonym of valor in the vocabulary of every Southern child.

There are few men who really enjoy a fight. Many men become hardened to the dangers of battle and lose all fear of death, but even they do not relish the business of fighting and are glad enough to escape the risks incident to the conflict of arms. Pelham was not only without fear, but actually enjoyed fighting, and anticipated his battles with the keenest pleasure. He was never happier than when actually sighting his guns and observing the effects of his own accurate aim.

The complete record of John Pelham had been preserved by his illustrious biographer, John Esten Cook. A cadet at West Point when the war commenced, and, resigning to join the Confederate Army, he was the only officer in the Army of Northern Virginia to receive from his immortal commander, Robert E. Lee, the epithet of "the gallant." Lee, Jackson, and Longstreet watched this youthful gunner from the heights of Fredericksburg, holding at bay an entire division with a single Napoleon gun. This exploit was also

THE BOY GUNNERS OF LEE

witnessed by two armies, and never before, perhaps, was a gunner so favored by the amphitheatrical stage upon which he played his part. One must visit the plains stretching along the south side of the Rappahannock in front of Hamilton's Crossing, to understand the influence which Pelham, single-handed, exerted upon the issue of the battle of December 13, 1862. This was but one of his many equally brilliant and daring exploits. Such were his deeds that even the stern Jackson exclaimed, "Oh! for another Pelham!"

While returning from a Court-martial in Culpeper in 1863, he rode to the sound of the guns at Kelleysville, and fell mortally wounded while engaging as a volunteer in a cavalry charge in which he had no official part. On this occasion his ardour for battle cost him his life. He was but twenty-four years of age when he died and yet, had participated in twice as many engagements as he had years to his credit.

There was another Confederate gunner known as "The Boy Major"—Joseph White Latimer, a graduate of the Virginia Military Institute, who died with the rank of Major at nineteen years of age, commanding five batteries at Gettysburg, where he received his mortal wound. Beginning his service in April 1861, as a cadet drill master of artillery at Camp Lee in Richmond, he served with marked gallantry with Jackson in the Valley, and on every important field up to the time of his death. Repeatedly individually mentioned in the reports of Jackson and Ewell, the latter referred to him as his "little Napoleon." When asked on his death-bed if he feared to die, he replied, "No, for my trust is in God." To his Chaplain, who sought to console him as his last hour approached, he said: "I base my hope of salvation not on good works, but on the merits of Jesus Christ alone." It is difficult for us in this prosaic day, to think of one so young, possessing such an exalted spirit, but it is that spirit which explains many of the most heroic deeds of war.

Robert Preston Chew, until but recently the senior surviving artillery officer of Lee's Army, attained the rank of Lieutenant-Colonel, and commanded the "Horse Artillery Corps" of the Army of Northern Virginia, when but twenty-one years of age. He was in every way a worthy successor to Pelham. His corps consisted in 1865 of five battalions and ten batteries. As a captain he organized in November, 1861, at the age of nineteen, the first Confederate horse battery at the instance of Colonel Turner Ashby, who commanded the cavalry of Jackson's Army. Chew, like Latimer, was a graduate of the Virginia Military Institute, and had been a pupil at that famous school of arms under Jackson, who gave them their training with the guns. It was Chew who originated and repeated many times the feat of moving in the front line with the cavalry while

THE FIELD ARTILLERY JOURNAL

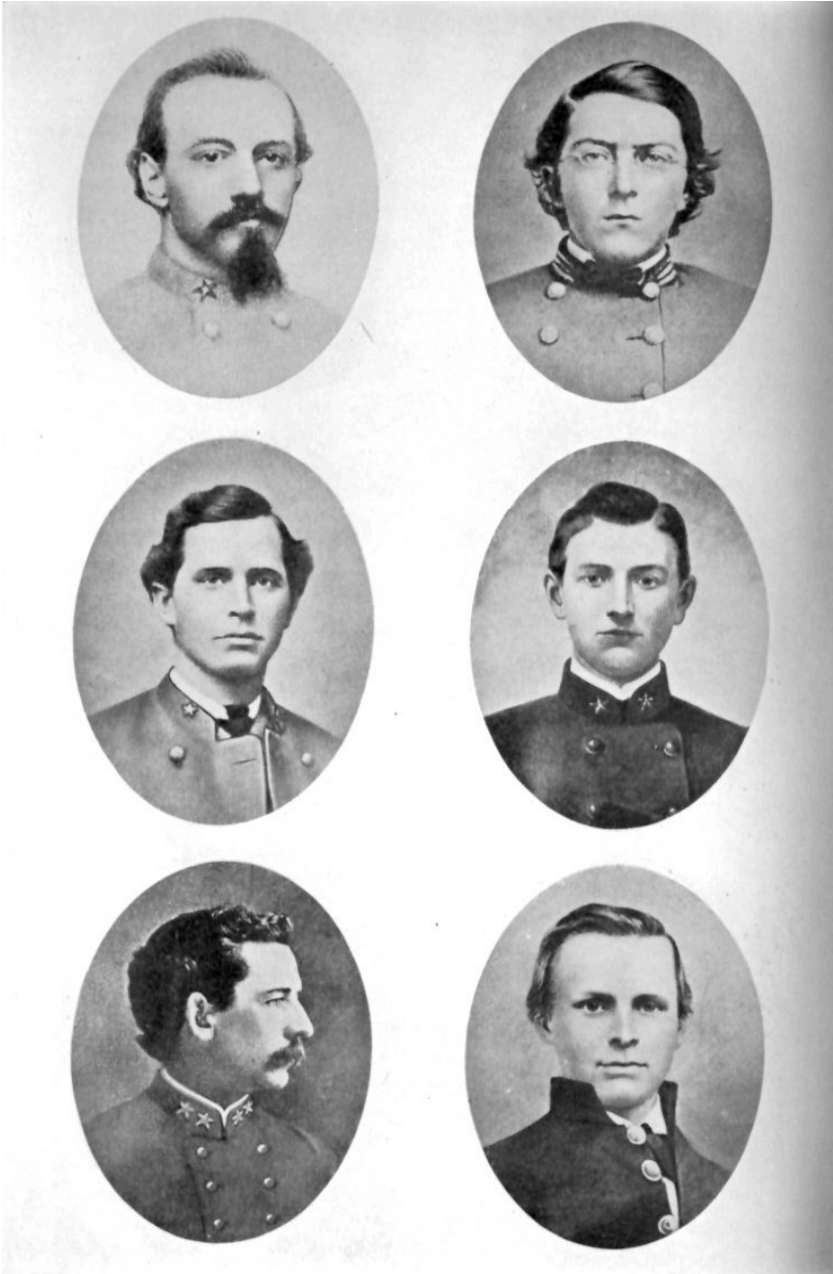
charging. Not even Ramsey's Horse Battery at Fuentes de Anoro, can be said to have performed such an unprecedented exploit.

After the death of Pelham, Colonel William Johnson Pegram, who fell at Five Forks, age twenty-two, was, perhaps, the best-known figure among the younger field officers of artillery in Lee's Army. In four years he had advanced from the grade of private to the rank of colonel by the sheer force of his skill and dauntless courage. Without previous military training of any kind, he might have commanded an infantry brigade before he fell. Three separate times he was recommended to be a brigadier. On every great battlefield in Virginia he was conspicuous for both skill and courage, and at all times for his girl-like modesty. Very near-sighted, Pegram frequently made personal reconnaissances almost up to the enemy's position, a custom which often elicited complaint from those who were called upon to accompany him. So well known had he become among all arms before the war had progressed very far, that the men in the trenches or on the march were often heard to exclaim: "There's going to be a fight, for here comes that damn little man with the 'specs'!"

On one occasion Pegram's adjutant reported to him that a certain battery commander temporarily attached to their battalion had shown little zest for the fray. "Sir," said Pegram to the unfortunate captain, "explain your conduct." Whereupon the officer explained that "he had a misery in his stomach." This has ever been a common ailment among untried soldiers, but Pegram had no patience with weakness of any kind. "I will treat you handsomely," Pegram replied. "Instead of having you cashiered, I will accept your commission now!" Thereafter there were no more complaints of stomach aches in Pegram's command. On another occasion, seeing the infantry falling back, Pegram, accompanied as usual by his adjutant, seized the colors from the color-bearer, and rode forward with them until the retreating men rallied and re-advanced to the assault. He was finally sacrificed to the stupidity of a division commander who sent him, in that spirit of blind obedience for which he was noted, to his death without a murmur from his firmly closed lips, but not until he had won the recorded plaudits of Hill and Jackson and Lee, and of all the lesser commanders under whom he served. Oh, what a record was that which he made in those closing weeks of his life! The name of Pegram was on every lip in that heroic army in which he served, and today appears on every page of the official history of the memorable siege of Petersburg. Throughout those days of strenuous service he was always accompanied by his equally gallant and youthful adjutant—Captain William Gordon McCabe. These two lads were far more to each other than commander



VIRGINIA IN 1864
By William L. Sheppard, Pvt., 2nd Co. Richmond Howitzer Battalion.



MAJOR JAMES BREATHED
 MAJOR JAMES WALTON THOMSON
 LIEU TENANT-COLONEL ROBERT-
 PRESTON CHEW

COLONEL WILLIAM JOHNSON PEGRAM
 MAJOR JOSEPH WHITE LATIMER
 MAJOR JOHN PELHAM

THE BOY GUNNERS OF LEE

and faithful assistant. They were comrades and brothers, inseparably bound to each other like Damon and Pythias. Pegram perished in the storm of battle with a smile upon his lips, his spirit passing to a better world, while his mangled body lay in the enfolding arms of McCabe. McCabe survived to write his comrade's epitaph in exalted prose and poetry, so tender that the pen with which he wrote seems to have been dipped in the tears of his own soul, never once reminding us that the deeds of his departed comrade were in part his own.

James Walton Thomson, killed at Sailor's Creek in April, 1865, was a fit companion in arms of Pelham, Chew, Latimer and Pegram. He was killed when but twenty-two years of age, while holding the rank of major in the Horse Artillery. He too performed innumerable heroic deeds. A graduate of the Virginia Military Institute, he entered Chew's original horse battery as lieutenant, succeeded Chew in command of that battery, and later led his battalion on many fields. At the time of his death his cannoneers, without guns, were serving as cavalry, and his wild daring on the field of battle on which he fell, actually inspired a poet among the admiring enemy to compose three exquisite verses which were captured with the author's fallen body. Said the celebrated Major James Breathed, as he gazed sadly upon Thomson's body where it lay beside those of his comrades—Dearing and Boston—all covered by a single blanket, suggestive of the pall that had fallen over their youthful lives, "with ten thousand such men as Jimmie Thomson, I could whip Grant's Army." This same remark is said to have been made of Breathed himself by General Lee and others, but certain it is that General Lee never made such a remark about any officer in his army.

"Jimmy" Thomson was one of the handsomest and most lovable lads in Lee's Army. He was constantly being cautioned by his comrades against the reckless exposure for which he was noted. Dearing and Boston were his particular friends. And then there was another—John C. Carpenter, captain of the "Alleghany Battery." "Johnnie" Carpenter was a classmate of Thomson's at the Institute. On one occasion, when the Confederate cavalry had fled, to save Thomson and the latter's guns from capture by Sheridan's Cavalry, he armed his own men with carbines and formed a line across the Valley Pike, losing his arm in the strange conflict which ensued. But what was an arm to "Johnnie" Carpenter if by losing it "Jimmie" Thomson had been saved!

Major James Breathed, just of age in 1861, was a Maryland doctor when he entered the army as a lieutenant in Pelham's famous battery, which was later commanded by him. This battery was soon converted into a horse battery, and was the second one to be

THE FIELD ARTILLERY JOURNAL

organized in Lee's Army. It bore the name of the "Stuart Horse Artillery," and served constantly with Stuart's Cavalry. In the battery were a number of Frenchmen from Talladega County, Alabama, whence came Pelham himself. The detachment formed by these gallant Creoles was known as the "French detachment," and on more than one occasion was known to have sung the Marseillaise while plying its heated guns.

Breathed distinguished himself on many fields as one who was the constant and respected companion of Stuart and Pelham and Chew and Thomson was likely to do, but of all his deeds of heroism his individual action at Spottsylvania Court House was the most remarkable. On this occasion Major Breathed's old battery, the "Stuart Horse Artillery," was retiring by piece before a dense mass of onrushing infantry. The four guns, though handled with great courage and skill by Captain Johnston, were unable to stay the enemy's advance, but Johnston, who had been badly shot, declined to withdraw his last piece and continued to fire with it alone. Finally, the lead and swing teams were shot down and the enemy was already crying for the surrender of the gun. At this juncture Breathed galloped up to the remaining gun, sprang from his mount, cut the traces of the disabled teams, and leaping into the driver's saddle, brought off the piece with the wheel team alone under the fire of point-blank musketry. This act actually brought forth the mingled cheers of the onlookers of both armies.

There were several striking instances that should be mentioned here, of officers of high rank serving the guns as cannoneers in action. When the Confederate infantry of D. H. Hill's Division was finally driven out of the "bloody lane" at Sharpsburg by Richardson's Federal Division, and fell back fighting across the fields and through the orchard in front of the Piper House, Miller's Battery of the Washington Artillery Battalion was sent to its support. The gunners were soon struck down, however, whereupon Longstreet's staff manned the guns and drove back the advancing enemy. So, too, at Fredericksburg, Longstreet directed Captain Osman Latrobe, of his staff, to take a Parrott gun of Maurin's Louisiana Battery from its pit and move forward with it to the enemy's extreme right, whence he might enfilade the line lying at the base of the hills. The attempt meant almost certain destruction as two Federal batteries had concentrated on Maurin's pits, and had hurled over two hundred shells upon them. But Latrobe was not to serve this gun alone, for Lieutenant Landry, Corporal Morel, and Privates Dernon Leblanc, Francis Perez, Claudius Linossier, Adolph Grilke, and Francis Babin, accompanied him. All five of the cannoneers fell after their third shot, while the two officers and the corporal continued the fire. The

THE BOY GUNNERS OF LEE

deed was seen by the men of both armies, and, like that of Pelham on the right, was cheered lustily by many throats.

A thing that has never occurred in war, before or since, was witnessed by many eyes at Sharpsburg. As the famous "Rockbridge Battery" dashed past the village on its way from Jackson's position on the extreme left to the support of Hill on the extreme right, a cannoneer was seen to raise himself to an erect posture on the limber and salute the commanding general. The general was Robert Edward Lee; the private was Robert Edward Lee, Jr., the former's son. And here we may remark that while the "kith" of Bonaparte bore the baton, the "kin" of Lee served with grimy hands upon the rammer staff.

The writer knows of but one instance where a field battery cut off by the enemy, circled in rear of the hostile army and managed to rejoin its own command. This was actually done by Battery "A" of Cutts' "Sumter (Georgia) Battalion" in the movement of Lee's Army from Spottsylvania to the North Anna. This battery was in the very rear of the rear guard when the movement commenced. Cut off from the main body by a large force of the enemy's infantry, Lieutenant Rees, in command, ordered the gallop, and dashing past the hostile troops with his guns, went into action in their rear, and then retired piece by piece. Moving by a long circuit to the west and south, he passed around the enemy's right at Little River and after two days and nights of ceaseless marching, during most of which time he was separated from his own army by the enemy, he reported with all his men and guns to his battalion commander.

Another heroic incident occurred in the "Sumter Battalion" at the North Anna. This battalion was under a heavy fire, and a shell which burst in one of the gun pits ignited the tow in one of the dismounted ammunition chests about which many men and caissons were gathered. The cry went up to seek safety, but Captain John R. Wingfield and Private Hemington sprang to the chest, opened it, and extinguished the threatening blaze with their bare hands, which were badly burned. On another occasion a caisson limber was set ablaze, and, while the flames were actually licking at the ammunition chest, a brave driver mounted to the lead saddle, and single-handed galloped the caisson into a nearby stream, and extinguished the blaze with his bucket. A very similar incident occurred at Petersburg, where on October 13, 1864, a Federal shell burst among the carelessly exposed ammunition of Flanner's North Carolina Battery of Haskell's Battalion, wounding six men and igniting the fuzes of a number of shells. Though himself wounded, Corporal Fulcher seized the shells and carrying them under fire to a nearby pool, hurled them into the water.

(To be continued)

FIRING FROM PHOTOGRAPHS

BY LIEUTENANT-COLONEL D. F. CRAIG, F.A.

IN any warfare in this country the artillery, especially that of the heavier types, is bound to be gravely handicapped by the lack of accurate maps. This problem was written in an attempt to overcome this handicap. It describes the attack of a corps against a defensive zone. The terrain was selected so that none of the targets assigned to the battalion of corps artillery in question could be seen from anywhere within the friendly lines, being hidden by the Dodge Hill—Hill 1305 ridge. The time required for the preparation of the airplane and firing charts was about two days, but in the operations of large units, at least this amount of time will be available.

An airplane photograph was taken of the entire corps zone of action from about 6000 yards behind the friendly lines to 10,000 yards beyond. In preparation for this photograph panels were displayed at various prominent points within the friendly lines, these points being located on the firing chart by traverse or triangulation. Having been so located, they were used in constructing the mosaic or photograph, by using the lines connecting them to orient at least a part of this mosaic. The panels used were forty feet square, it having been found that smaller ones would not be distinct enough on the photograph to serve the required purpose.

The firing chart of the battalion reconnaissance officer is shown with this article. The steps in the preparation of the chart were as follows: The battalion arrived in its area where the positions for the batteries, O.P.'s, etc., had been selected. The battalion reconnaissance officer noted that at O' was a triangulation station which could be seen from the vicinity of the guns and also that the location of this station was such that it was satisfactory as a point on the orienting line. The point P' was also noted by the reconnaissance officer as being one of the panels mentioned above and P, another one of the panels, could be seen from P'.

The reconnaissance officer set up his plane table at P' and placed thereon a gridded sheet. This grid is the one on which the accompanying chart is constructed, the scale being 1/20,000* and each side of the grid 1000 metres. The X and Y lines were given any convenient numbers. In this problem it was assumed that the topographical work was coördinated by the regiment and the numbering of the grid lines was prescribed by the regimental reconnaissance

* The maps and charts have all been reduced for reproduction with this article and are no longer to scale.

FIRING FROM PHOTOGRAPHS

officer. The battalion reconnaissance officer then declinated his board by placing his declinator on a Y line and centring the needle which placed Y north on the magnetic north of his compass. He then assumed the location of P' on his sheet. The assumed position of this point might have been anywhere on his sheet but care was taken that it was so placed that the work which followed would not be off the board.

Starting from P' the reconnaissance officer then located by traverse the points O, P, and P", and by triangulation the points O' and D. (This work is shown in broken and dotted lines on the chart.) If time permits, these triangles should be solved trigonometrically. D is a triangulation station within the hostile lines which could be seen from P and P" and which could also be identified on the photograph. The point O was a point on the orienting line O'O and from it the battery positions A and B were located by traverse.

This preliminary work outlined above is necessary for the accurate laying of the guns and it must all be done on the ground and none of it taken from the photograph. Targets alone should be taken from the photograph. (See note on chart "Result of Firing.")

The preparation of the photograph requires care and, above all, coöperation between the artillery and the Air Service. The airman does not, as a rule, understand exactly what the artilleryman wants until the two have worked together for some time, nor does the artilleryman appreciate the handicaps under which the airman labors until he has made something of a study of aerial photography.

The photograph used in this problem consists of some sixty-nine small pictures pieced together in the form of a mosaic, and it can be seen that a very slight twisting of one of these small pictures may cause a mistake in the computation of data for certain targets that will render the fire on these targets ineffective. In addition there is always distortion due to curvature of the earth, ground forms, side slip of plane, etc., not to mention errors in scale due to varying elevations, all of which help to make the problem a difficult one. The small photographs were taken from an elevation of 10,000 feet and the finished picture had a scale of approximately 1/10,000. A grid was drawn on this to give a means of communicating the location of targets between the airplane and the ground. The mosaic was then rephotographed and the scale reduced to about 1/20,000, which gave a more convenient size for work in the field.

In locating his targets the reconnaissance officer selected as a base for his triangulation the line P'D. This is shown on the photograph and also on the firing chart. For convenience the reconnaissance officer placed at each end of his base line a graduated arc,

THE FIELD ARTILLERY JOURNAL

the size of the arc and the graduations making no difference so long as the arcs on the chart and on the photograph are exactly alike and both have the same relative position to the base P'D.

As an example of the method of plotting targets, the airplane in Situation No. 4 sent the hectometric coördinates of a hostile battery. The target plots at T on the photograph. By reading the points on the arcs where the lines DT and PT cross, these lines are transferred to the chart and this intersection gives the location of the target on the chart. It is interesting to note that the plane did not adjust in this case, but the target was given to a battery and an area 200 by 200 yards covered. Four effective hits were gotten on this battery with an expenditure of thirty rounds.

The concentrations were fired on areas where it was assumed that activity was noticed on the photograph or where it was thought that enemy reserves would probably be formed. They were placed on the photograph and transferred to the chart in the same manner as T above. This was done by the regimental reconnaissance officer and sent down to the battalions by means of a tracing to fit over the firing charts.

The work of the battery reconnaissance officers was coördinated by the battalion. Each of them declinated his plane table with respect to that of the battalion reconnaissance officer by plotting the orienting line, setting up at O and orienting the table by sighting on O'. The needle was then centred and the position of the declinator recorded which declinated the board.

The guns were laid on the base line by means of the orienting line and the batteries adjusted on the base point BP. The range to the base point was so short in comparison with that to the targets and the necessary deflection shift so great that the registration, in all probability, was of very little help.

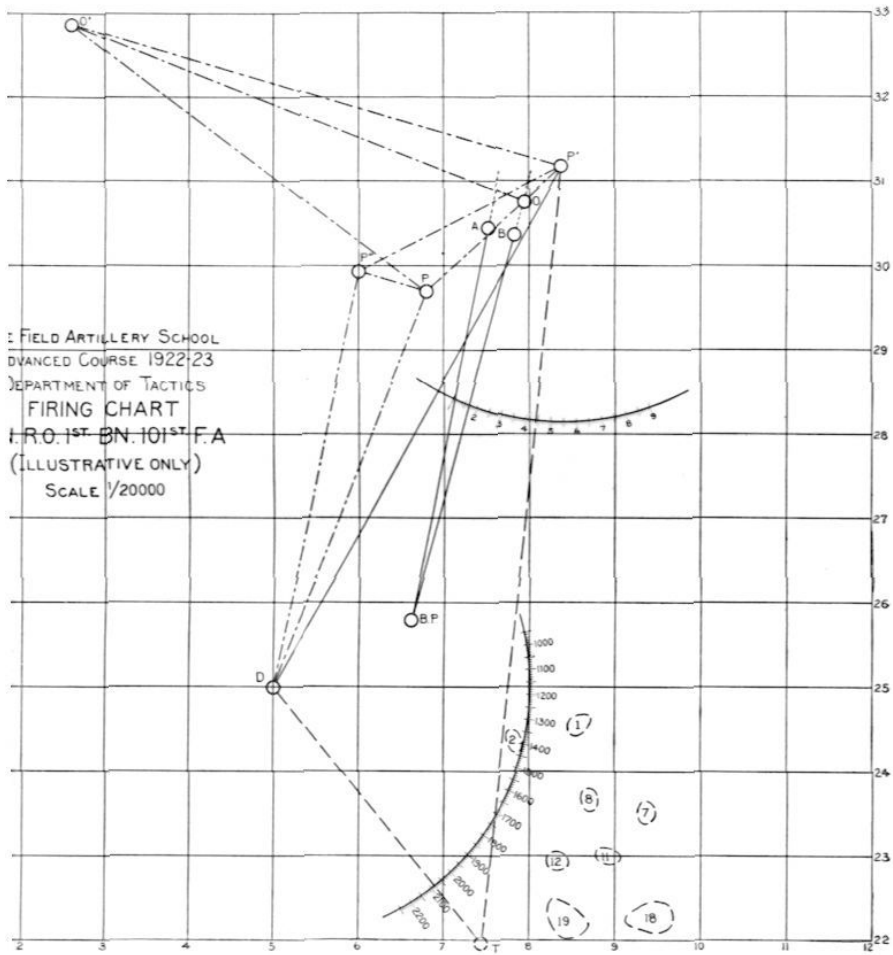
The results of the firing on the concentration areas are shown plotted on the chart marked "Result of Firing Concentrations." Considering the fact that the adjustment was of little value and that no meteorological bulletin could be obtained, the number of hits is considered very satisfactory. No better results could be expected, no matter how accurate the map used. The statement of the problem follows:

Battalion Corps Artillery (155-mm. howitzers) in the offensive.

Maps: Sketch of Fort Sill, old and too inaccurate for firing.

GENERAL SITUATION:

An east and west line through Chickasha (30 miles north of Fort Sill) is the boundary between two hostile states, Blue north and Red south.

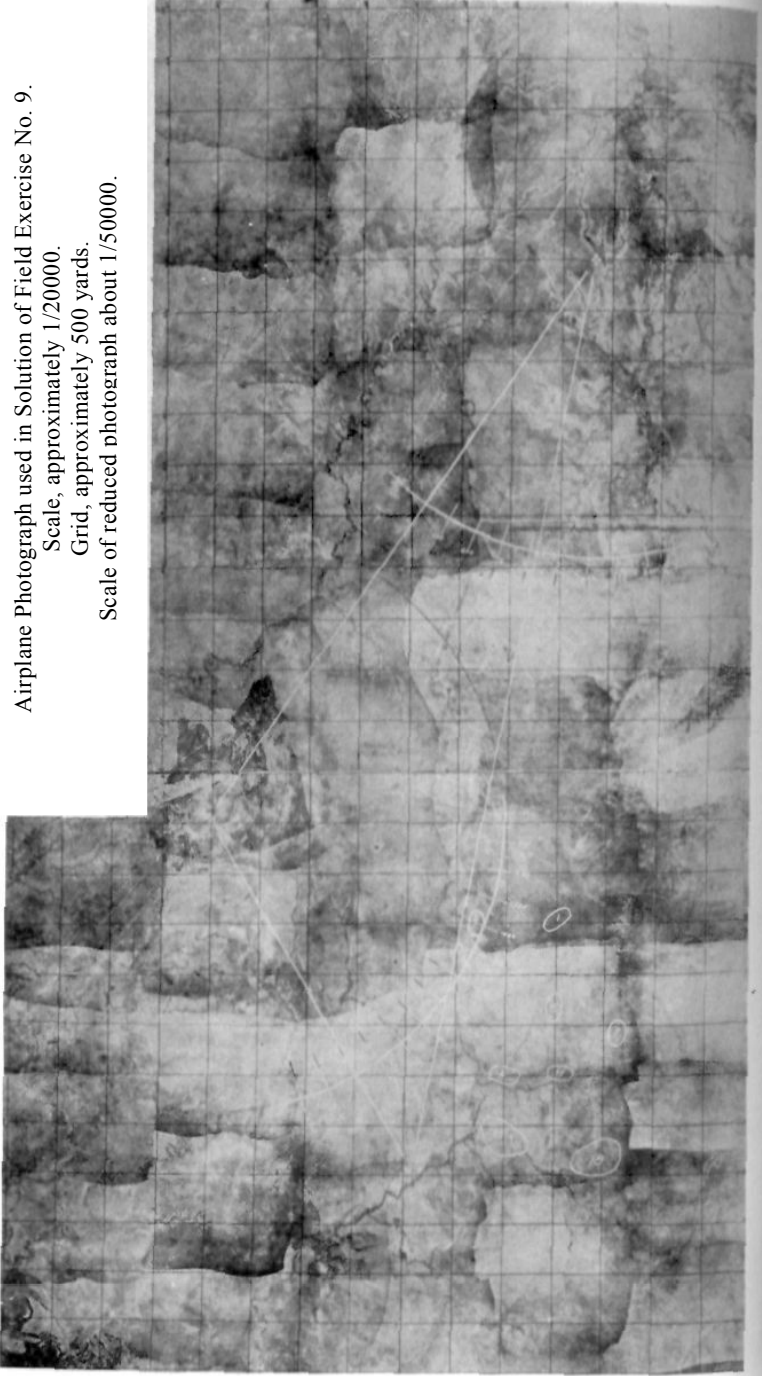


Airplane Photograph used in Solution of Field Exercise No. 9.

Scale, approximately 1/20000.

Grid, approximately 500 yards.

Scale of reduced photograph about 1/50000.



FIRING FROM PHOTOGRAPHS

A Blue force of considerable size invading Red territory has been stopped by the Reds, who have organized a defensive zone on a general east and west line through Fort Sill.

SPECIAL SITUATION (Blue):

On 15 April the I Corps (1st, 2d and 3d Divs.) occupies that part of the line from a point 1000 yards southeast of hill 1252—hill 1263—thence east to point on Nine Mile Creek 500 yards south of Sterling Gate.

The Corps Commander has received information to the effect that the Reds facing him have organized their position with the line of resistance of the delaying area through Dodge Hill—hill 1305—thence east. The line of resistance of the outpost is about 1000 yards in front of this line.

The line of resistance of the main battle position runs on a general east and west line through Arbuckle.

Between the delaying area and the main battle position are numerous organized strong points.

The II Corps occupies the line on the left of the I Corps, the III Corps on the right.

At 3:00 P.M. on this date the Corps Commander receives a warning order from the Army stating that a general offensive would take place at an early date, that the main effort of the Army would be made by the II Corps which was being reinforced for that purpose and that orders would follow.

The Corps Commander, I Corps, immediately calls a conference of his division commanders. At this conference, the Corps Staff being present, the Corps Commander formulates his plan. In this plan he attaches the 102d F. A. to the 2d Div., the 103d to the 3d Div., and holds the 101st and 105th F. A. for general corps support.

The Army Corps, division and brigade orders are all issued in the proper sequence.

The Battalion Commander 1st Battalion, 101st F. A., receives the regimental order for the attack at 4:30 P.M., 16 April. The regiment, having been in position for several days, the reconnaissance officers under the supervision of the regimental reconnaissance officer, have had ample time to prepare firing charts and to locate thereon numerous landmarks, targets, etc., by traverse and by triangulation.

The regimental AIO has also obtained an air photo of the enemy area for about ten thousand yards beyond the hostile front lines. This photo has been used to perfect the firing chart by transferring thereto the location of targets, roads, streams, etc., which cannot be seen from any OP within the Blue lines.

The regimental commander uses this chart in the preparation of his order.

THE FIELD ARTILLERY JOURNAL

The order follows:

Field Orders) 101st F.A.,
No. 17) Elgin Gate,
16 April 23, 3:30 P.M.

Maps: Sketch, Fort Sill, 1/62500
Firing Chart prepared by RO's.

1. (a) The enemy has organized a defensive zone with the main battle position on a general east and west line through ARBUCKLE.

The line of resistance of his delaying area runs through DODGE HILL—hill 1305—thence east.

Between the main battle position and the delaying area are numerous organized strong points.

The line of resistance of the hostile outpose line follows the general line BEEF CREEK to point directly north of DODGE HILL—thence east to point on NINE MILE CREEK 1500 yards south of STERLING GATE.

All lines have been strongly entrenched and fortified.

(b) Our Corps attacks at 6:00 A.M., 17 April 23, making its main effort in the centre.

Zone of action:

West boundary: Hill 1244—DODGE HILL—hill 1216 (all inc.).

East boundary: East boundary of FORT SILL RESERVATION.

Boundary between Divisions: 869000/1299400—head of WRATTAN CREEK—hill 1303.

Formation: 2d Div. on right, 3d Div. on left, 1st Div. in reserve.

Line of Departure: Present front line.

Rate of Advance: 100 yards in six minutes.

Preparation: The attack will be preceded by a 2 hour artillery preparation.

2. This regiment will support the attack of the 1 Corps by counter-battery, by successive concentrations and by special fires.

3. (a) 1st Bn.

Position: See Tracing A, attached.

Missions: See Tracing A, attached.

(b) 2d Bn.

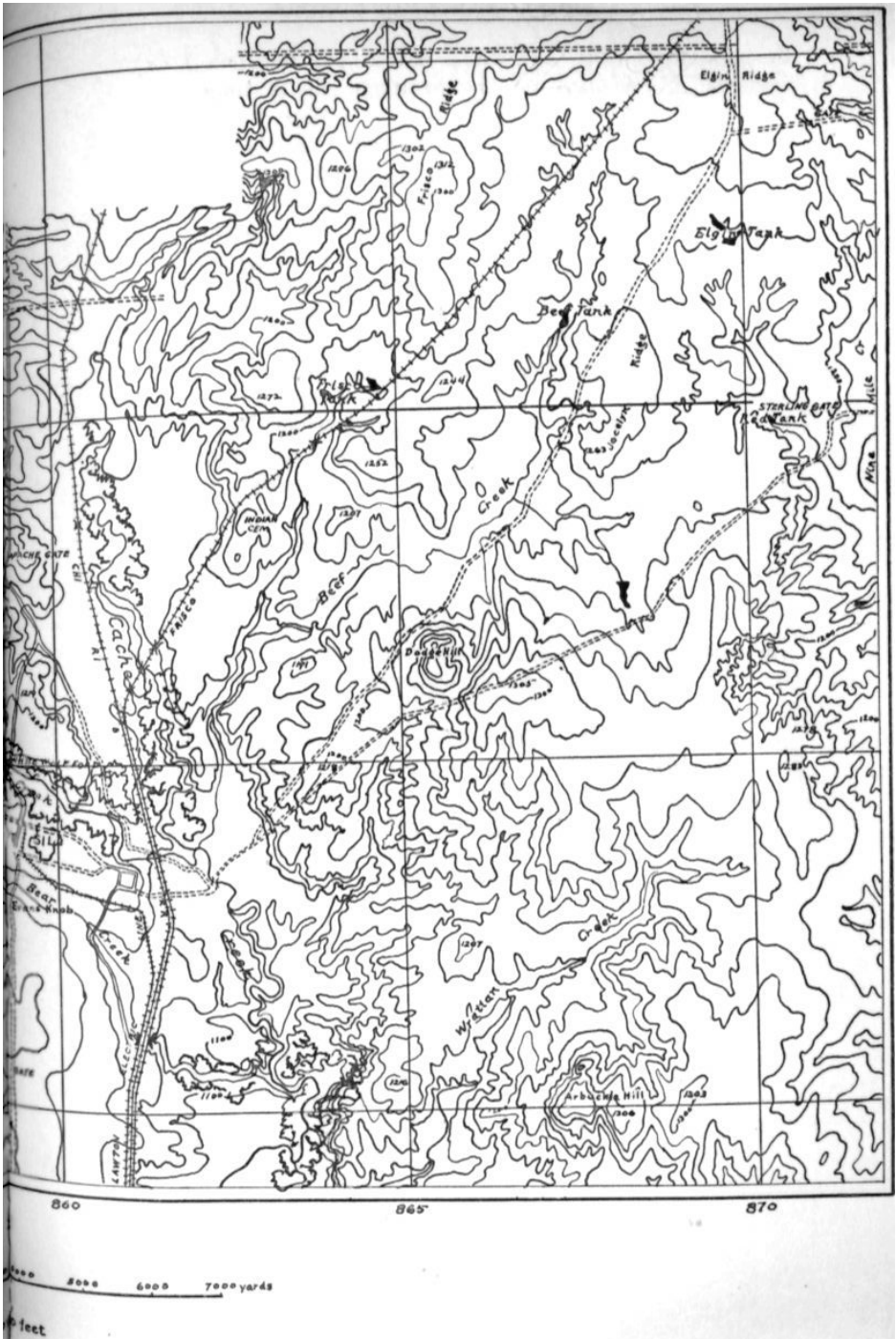
Position: See Tracing A, attached.

Missions: See Tracing A, attached.

(c) 3d Bn.

Position: See Tracing A, attached.

Missions: See Tracing A, attached.



FIRING FROM PHOTOGRAPHS

(x) Counter-battery: From 4:00 A.M. until 8:00 A.M. all guns of the regiment will be available for counter-battery calls.

Successive concentrations: Starting at 8:00 A.M. the regiment will support the attack by successive concentrations. The duration of all concentrations will be 15 minutes. Concentrations will be fired in the prescribed sequence (See Tracing A), except for Nos. 1 to 6, inclusive, which will be fired only on call from the infantry, the signal being a *RED* rocket.

Special fires: After 12:15 P.M. all batteries will be available for special fire on targets designated by airplane or by forward observers. One plane is assigned to each battalion for observation and adjustment of fire.

Circulation and reconnaissance: All movements of troops in preparation for the attack will be made under cover of darkness. Reconnaissance parties will be reduced to a minimum in personnel and will make every effort to avoid exposure.

Ammunition: Two days' fire at position.

Rate of fire: $\frac{1}{2}$ round per gun per minute.

Displacement: Battalions will be prepared for forward displacement after 1:00 P.M. Displacement in order 1st, 2d, 3d battalions.

4. (a) Am dump: RJ 400 yards north of ELGIN RIDGE.
- (b) Aid Sta: Near road west of ELGIN TANK.
- (c) F Tn: Serv. Battery remains in present position.
5. (a) Plan Sig. Com: See Tracing A, attached.
- (b) Ax Sig Com: See Tracing A, attached.
- (c) CP: Near gate north of ELGIN RIDGE.

L
Col.

Append

Tracing A

Distribution:

CG 101st FA Brig

CO 1st Bn

CO 2d Bn

CO Hq Btry

CO Serv Btry

Staff

War Diary

File

C.O. 3d Bn.

THE FIELD ARTILLERY JOURNAL

NOTE: 1. For purpose of this problem the day of fire for the 155-mm. howitzer is taken as 25 rounds.

NOTE: 2. For purpose of this problem the 155-mm. howitzer battalion has been issued a set, radio, type SCR 77 A, as additional equipment.

NOTE: 3. To be issued to students at 9:00 A.M., 14 April 23.

SITUATION NO. 1

Given to Bn CO by Umpire No. 1 at 10:30 A.M.

You have received information from the regimental commander that the advance of our infantry has been much slower than anticipated and he has instructed you to fire the concentrations scheduled for 8:00 A.M. at 11:00 A.M.

(The time until 11:00 A.M. is available for adjustment and correction of data.)

SOLUTION:

Directs BCs to adjust on base point and correct data. Orders concentrations fired beginning at 11:00 A.M.

SITUATION NO. 2

Red Rocket Fired from Jocelyn Ridge at 11:13 A.M.

SOLUTION:

Directs batteries to fire concentrations Nos. 1 and 2.

BCs should fire these concentrations without orders from the Bn CO if they see the rocket.

SITUATION NO. 3

Given to Battalion Message Centre by Umpire No. 6 at 11:50 A.M.

U. S. Army Field Message

Time filed	No.	Sent by	Time	Received by	Time	Check
11:45 A.M.	10	A B	11:46 A.M.	C D	11:50 A.M.	

These spaces for signal operators only.

From: C O 101st F. A.

At: ELGIN GATE.

Date: 17 April 23. Hour 11:45 A.M. No. 4

To: CO 1st Bn 101st F. A.

How sent

M C Messenger.

Our infantry has captured the enemy line running east and west through DODGE HILL and is preparing to continue its advance.

Send an observer forward to establish a forward OP at DODGE HILL. Connection will be made with him through the regimental axis by the regimental signal detail.

L
Colonel.

FIRING FROM PHOTOGRAPHS

SOLUTION:

Sends Ln O forward to establish forward OP. Should send two or three scouts and a telephone operator with him. Gives AIO and P & TO information contained in message.

SITUATION NO. 4

Radio Message from Airplane at 12:15 P.M.

"Battery at (8262) firing on our infantry. Will adjust if you desire. Request first fire be battery volley."

SOLUTION:

Bn CO directs one battery to fire with airplane adjustment. Location of hostile battery on firing chart is determined by Bn RO and given to BC. B C figures data, lays guns, and fires volley. Thereafter, airplane adjusts fire in normal manner.

SITUATION NO. 5

Given to Artillery Observer by Umpire No. 7 at Dodge Hill at 12:30 P.M.

You have arrived at Dodge Hill and have been met by the CO 5th Inf. who points out an enemy battery which is causing his regiment serious losses. He requests that this battery be neutralized and tells you that you may use his 77 A set if needed to communicate with your battalion.

SOLUTION:

Gets in touch with battalion using 77 A set. Requests assignment of battery for fire on target. Conducts fire.

SITUATION NO. 6

Dropped Message from Airplane at 1:00 P.M.

U. S. Army Field Message

Time	filed.	No.	Sent by	Time	Received by	Time	Check.
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These spaces for signal operators only.

From: Air Observer.

At:

How sent

Date 17 April 23 Hour 12:40 P.M. No. _____

To: C O 1st Bn 101st F A

Enemy battery located as shown on attached photo. Will adjust fire if you wish. Request first fire be battery volley.

D
Lieut. A S

THE FIELD ARTILLERY JOURNAL

SOLUTION:

Bn CO directs one battery to fire with airplane adjustment. Location of hostile battery on firing chart is determined by Bn RO and given to BC. B C figures data, lays gun, and fires volley. Thereafter, airplane adjusts fire in normal manner.

SITUATION NO. 7

Radio Telephone Message from Airplane at 1:20 P.M.

Enemy battery at (coördinate) firing on our troops. Will adjust fire if you wish. Request first fire be battery volley.

SOLUTION:

Bn CO directs one battery to fire with airplane adjustment. Location of hostile battery on firing chart is determined by Bn RO and given to BC. B C figures data, lays guns, and fires volley. Thereafter, airplane adjusts fire in normal manner.

SITUATION NO. 8

Given to Battalion Message Centre by Umpire No. 6 at 1:15 P.M.

U. S. Army Field Message

Time filed	No.	Sent by	Time	Received by	Time	Check
1:05 P.M.	25	A B	1:07 P.M.	C D	1:15 P.M.	

This space for signal operators only.

From: C O 101st F A

At: ELGIN GATE

How sent

Date: 17 April 23. Hour 1:05 P.M. No. 18 _____

To: CO 1st Bn 101st FA.

Our infantry captured the DODGE HILL—hill 1305 line at 12:30 P.M. Since that time advance has been at the rate of 100 yards in 4 minutes.

Displacement of regiment begins 2:00 P.M. New position your battalion vicinity large tank about 3000 yards east of DODGE HILL.

L
Col.

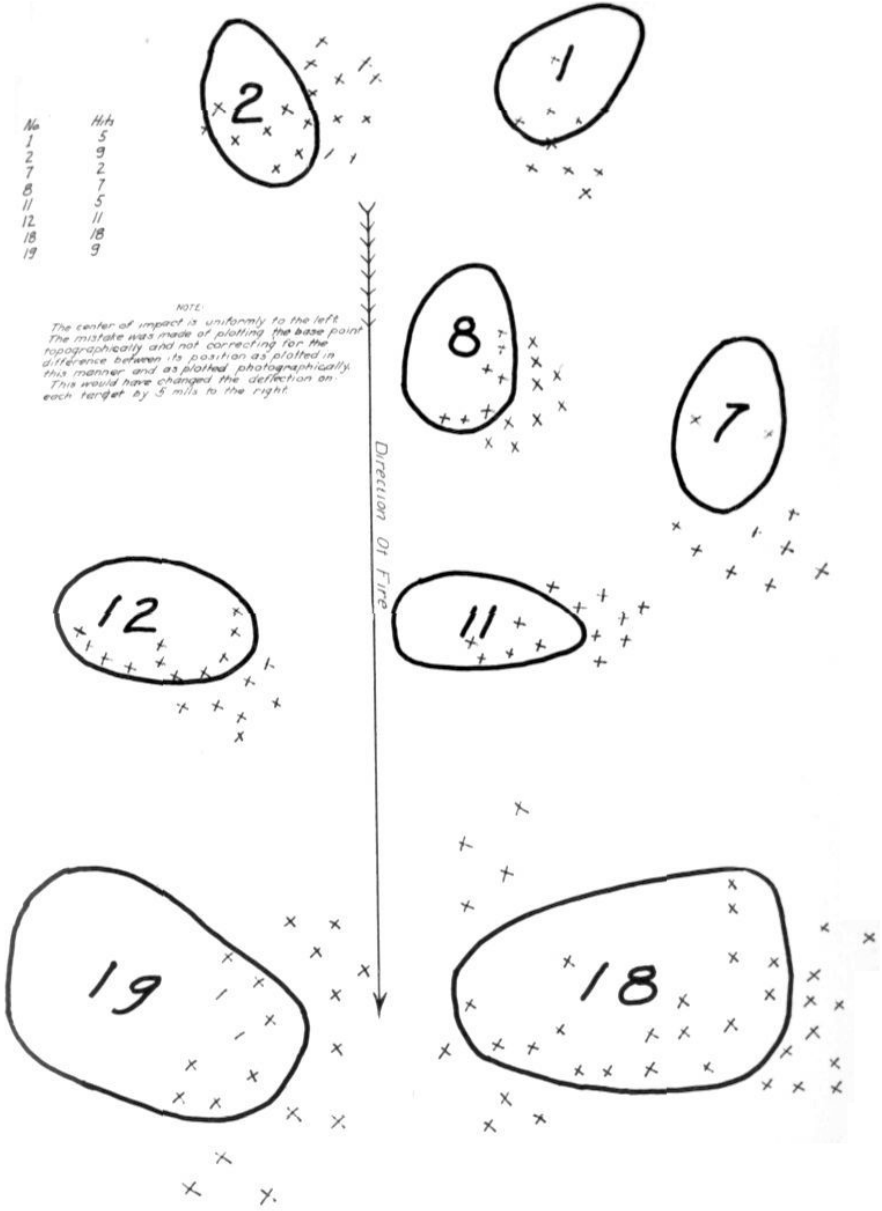
SOLUTION:

Bn CO directs Executive to bring battalion forward to new position. Move to start at 2:00 P.M.

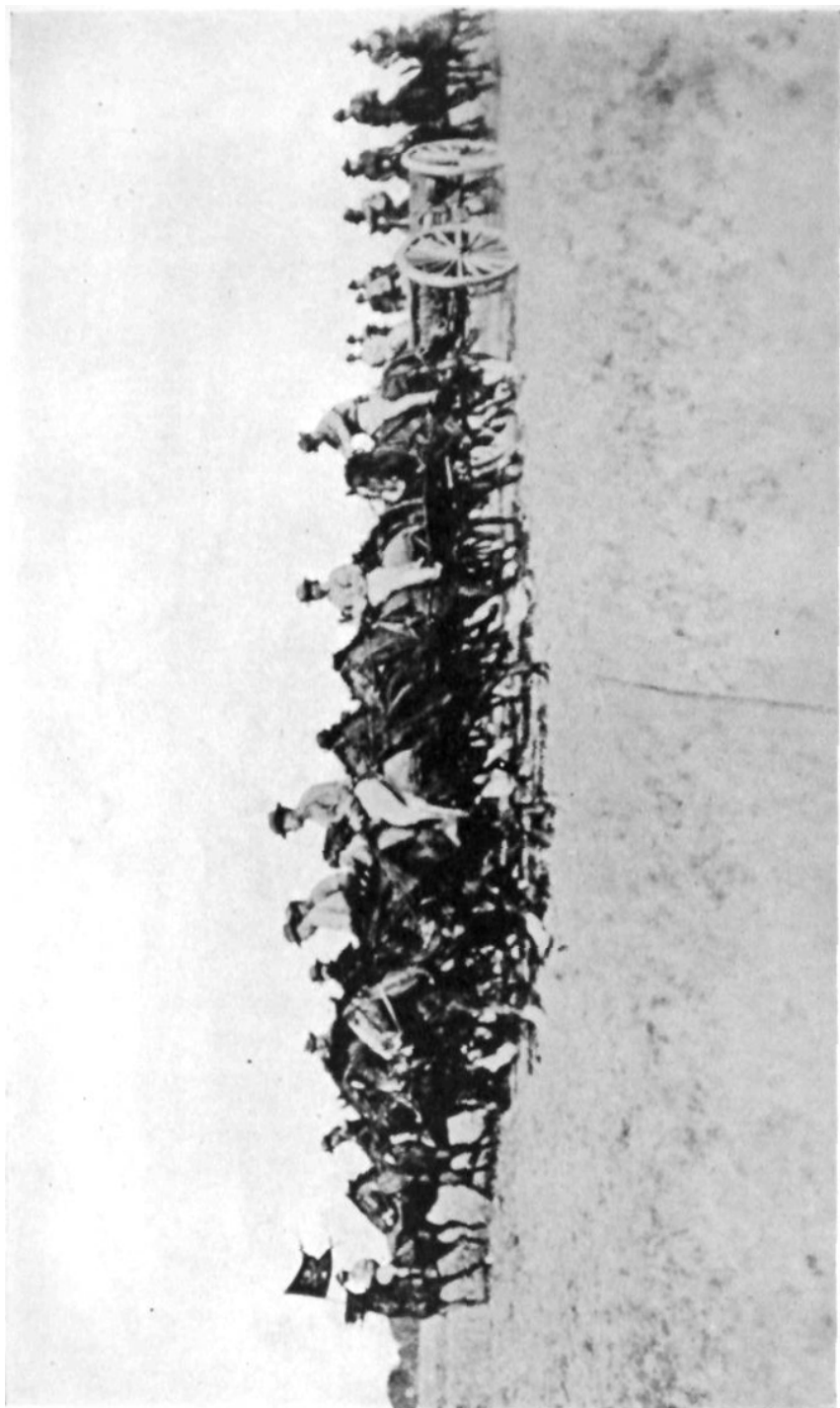
Goes forward on reconnaissance, taking remainder of party with him.

No	Hts
1	5
2	9
7	2
8	7
11	5
12	11
18	18
19	9

NOTE:
 The center of impact is uniformly to the left.
 The mistake was made of plotting the base point
 topographically and not correcting for the
 difference between its position as plotted in
 this manner and as plotted photographically.
 This would have changed the deflection on
 each target by 5 mils to the right.



RESULT OF FIRING CONCENTRATIONS



A BATTERY OF THE 6TH F. A. [HORSE]

THE SIXTH FIELD ARTILLERY SONG

BY MAJOR McMAHON, 6TH F.A. [HORSE]

(MAJOR JOHN E. McMAHON WAS LATER MAJOR GENERAL AND COMMANDED THE 5TH DIVISION AT ST. MIHIEL. THIS SONG WAS WRITTEN WHEN THE SIXTH WAS AT FORT RILEY, KANSAS, BEFORE THE BORDER TROUBLES)

We're only a "rookie" regiment, we've yet our spurs to win,
But when the country gives the word, we are ready to start in;
And when from Maine to Oregon the call to battle runs,
You can bet your stack 'twill be answered back by the thunder of our guns.

Chorus

Oh! The booming of our guns is heard in front with the Cavalry screen
And the scarlet of our guidons on the skirmish line is seen:
We storm redoubts with doughboys, our repertoire is large,
For when our ammunition's gone, we limber up and charge.

The wagon soldier jolts his bones a-riding on a chest.
As a matter of course we straddle a horse and gallop with the best,
The yellow man, the brown man, the black man or the white,
Can call on the Sixth Artillery, if he's anxious for a fight.

We hit the road at break of day, we march till set of sun,
And when the hike is ended, our work has just begun.
We groom the horses, clean the guns, and polish the harness up,
And then about 9:30 P.M., on government straight we sup.

I don't care where the regiment goes, I've got three years to do,
A-wandering round the universe, from Cuba to Cebu.
If it's work all night or march or fight, it's all the same to me,
For that's the way we look at things in the Sixth Artillery.

DIVISIONAL ARTILLERY MISSIONS

BY MAJOR W. E. BURR, F. A.

SECOND PRIZE ESSAY

THERE are many texts dealing with the various problems and duties of field artillery. Their subject matter is voluminous and, in most cases, complete, but their range is limited almost entirely to organization and the technical details connected with the service of the matériel.

This article has been prepared in an effort to discuss in a logical manner the general tactical problems or missions which are liable to confront the artillery of an infantry division. The classification is made on the assumption that all actions are susceptible of being divided broadly into various classes or types, and, hence, that the rôle that the field artillery will play will depend entirely on the type of action involved. In other words, that different situations require different treatment.

No serious attempt has been made in this paper to divide the missions among the artillery units within the division, or to dictate how the individual fire problems are to be solved. In some instances lines of action are indicated, but solely to clarify or magnify the mission itself.

1.

From a broad military point of view all actions may be classified as either offensive or defensive. There may be times when such special terms as "trench warfare," or "stabilized situations," are used to describe the special situation involved, but when examined from a strategical or even tactical point of view a situation can always be classed as either offensive or defensive.

Strictly speaking, it may be said that field artillery always acts on the offensive, since it operates by attacking the enemy with its fire. A better way to put it, would be to state that its spirit is always offensive. Its general mission in the division is to support and protect the infantry. Hence it must conform to an offensive or defensive rôle undertaken by the infantry.

2.

Offensive actions are of two types, with, or without infantry action. The former is a far greater subject than the latter, but for the divisional artillery there are great possibilities in the latter. Even though no manœuvre takes place, much can be accomplished offensively by an offensive spirit displayed by the artillery. There

DIVISIONAL ARTILLERY MISSIONS

are situations when it is desired to wear the enemy down by methods of attrition. Such an offensive rôle falls almost entirely to the field artillery.

With this situation in view, namely, the assuming of what may be termed a passive offensive, we find for the divisional artillery the following specific missions:

- a.* Fires of harassment.
- b.* Fires of neutralization and interdiction.
- c.* Fires of deception.
- d.* Fires of destruction.

Taken as a whole the above types of fire require an orderly and logical manipulation. They should be worked out on a systematic basis as far as their distribution and control is concerned, but they should avoid disclosing the system to the enemy. There should be order in disorder.

Harassing fire has for its general effect the breaking down of the morale of the enemy. It should interrupt and render uncomfortable his existence. It should descend upon him where and when he least expects or desires it. While it may not produce visible or material damage to any great degree, however, if carried out persistently along these lines its effect is insidious, and is generally indicated in a crisis by unsteady or unreliable troops. In this connection the use of gas has become increasingly important.

To render innocuous the defences of the enemy is the purpose of neutralizing fire. From an offensive point of view, batteries, machine-gun nests, trench mortars, etc., which have been neutralized are as much a loss to the enemy for the time being, as if they had been destroyed. However, neutralization of enemy defences must be regarded as a step of less severity than destruction of enemy defences. It is brought into play, as a rule, when it is impossible or inadvisable to use destructive schemes. Such factors as the ammunition supply, the artillery available, or the time element, control the choice of the two methods.

Interdiction fire is a mild type of neutralizing fire. It diminishes or neutralizes the strength of the hostile scheme of defence, by endeavoring to forbid circulation. It should be used in connection with neutralization fire.

In general, for both neutralization and interdiction fire, the same apparent lack of system as far as the enemy's comprehension is concerned must be planned for, as in harassing fire. In other words, the hostile forces must be kept in as much doubt as possible as to what to expect. But to achieve proper results, a systematic scheme based on reliable knowledge or information of the objectives to be taken under fire, is of greater importance than in harassing fire.

THE FIELD ARTILLERY JOURNAL

Systematic accuracy and distribution of missions is sought for, rather than systematic efforts at an apparent lack of system as demanded by harassing fire.

Fires of destruction differ from the above described missions in that they contemplate material damage to the enemy. Their scope is practically unlimited, from hostile front line defences to batteries, ammunition dumps, and sensitive points well in the rear. They are always to be preferred, time and ammunition permitting, to the less severe methods such as neutralizing or interdiction fire. The tendency in the future should be to expedite destructive fires, but at the same time to retard ammunition consumption. Destructive fires of long duration permit the enemy greater possibilities of escape and retaliation.

Fires of deception, the last classification in the group indicated above, have a much wider scope than those discussed so far. They include any fire or grouping of fires that is intended to deceive the enemy. Such occasions as the desirability of leading the enemy to believe an assault is imminent, or creating a diversion at a point or points other than the real area of attack indicate the object of this type of fire. With this purpose in view, it is easily seen how they may be constituted or varied so as to deceive. In addition to the three types just mentioned, they might include the use of barrages, gas or shell concentrations and smoke screens. In other words, individual or separate types of fire are grouped together in a serious scheme for the broader mission of deception.

In the discussion of the missions enumerated above, no reference has been made to the corps artillery. A strict definition of divisional artillery missions might develop opinions as to the appropriateness of certain of these missions for the division guns. It is admitted that there is room for argument, but it is thought that, first, there is no strict dividing line as yet between the missions of these two artillery commands, and, secondly, such being the case, this apparent lack of distinction or omission is wise. The primary duty of corps artillery is to give added assistance to the divisional infantry. To perform this it fills out and completes the missions undertaken by the divisional artillery. The liaison between the two, therefore, should be close, and when this is achieved it will be found that the demands of many situations force the overlapping of their rôles. A wise command would encourage such relations.

It will be noted, also, that counter-battery fire has not been given a separate classification. In the past counter-battery fire has included any fire against a hostile battery or batteries. Therefore it is thought that in a classification made upon the basis of the specific missions to be performed, this special type of fire will be

DIVISIONAL ARTILLERY MISSIONS

found to be included in several of the types just enumerated. In other words, counter-battery fire may be considered as harassing, neutralizing, or destructive, depending entirely upon the specific object to be achieved, and therefore upon the manner in which it is to be delivered.

In considering as a whole this question of offensive fire when no movement of troops is contemplated, it is desired to stress several fundamental ideas. First, the means permitting, there is no more successful policy in warfare than in taking and holding the initiative. Modern warfare undoubtedly in the future will include many so-called stabilized periods. When these periods occur, the commander who causes or permits his troops to display, even though stationary, an offensive spirit will still hold some of the advantages of the initiative. Secondly, such stationary offensives, if well planned, and properly executed, will cause serious material damage and loss to the enemy. And, lastly, the resultant effect of such a policy on morale, both friendly and hostile, an effect indefinable in exact terms, will be of incalculable value.

3.

Turning to the second type of offensive actions, that which includes movement of the infantry, we find the rôle of artillery steadily increasing in importance. From an artillery viewpoint, or any other, the last war proved that infantry cannot advance successfully in actions of any size against well-armed troops, without artillery protection.

Since the rôle of the artillery in this case is absolutely subsidiary to that of the infantry, the differentiating of the artillery missions is made according to the rôles undertaken by the foot troops. These rôles or actions may be classed as follows:

- a. Raids.
 1. Minor.
 2. Major.
- b. Attacks with limited objectives.
 1. Within the initial range of the artillery.
 2. Beyond initial range of the artillery.
- c. Attacks with unlimited objectives.
- d. Advance guard or pursuit actions.

The general difference between major and minor raids lies in their object rather than in their execution. Minor raids seek to acquire information alone. They consist of incursions into the enemy lines by the infantry for the purpose of testing the hostile defences, examining the works and capturing prisoners. The raiding parties invariably withdraw to their own lines upon the completion of the operation. Major raids have for their purpose the

THE FIELD ARTILLERY JOURNAL

seizing of ground, the securing of information being a secondary consideration. They can be considered as local attacks from an infantry point of view, but as regards their execution by the artillery they are closely allied to minor raids.

The program of the artillery for a raid may include the following:

- a.* Preparation.
- b.* Neutralization and interdiction fire.
- c.* Rolling barrage.
- d.* Standing or box barrage.
- e.* Protective fire for the withdrawal or occupation.

The question of preparatory fire is one which is open to discussion. Circumstances alone control it. The strength of the enemy defences may require a preparation to assure the advance of the infantry. On the other hand, the surprise element desired may cause the preparation to be abandoned. Factors to be considered in the decision are the strength and depth of wire, nature of the enemy positions, defensive scheme of the enemy, alertness of hostile troops, and retaliatory power of the enemy.

Neutralization and interdiction fire should be included in any preparatory fire schedule. They also play an important part in the raid proper, their object being to prevent the enemy supporting the raided sector, and to diminish or eliminate the retaliation.

The rolling barrage plays the main rôle in the operation. It has two purposes, to beat down the hostile small arm and automatic weapon fire, and to serve as an advancing guide for the raiding troops. By smothering the small arm and automatic weapon fire, the rolling barrage not only secures the advancing forces against disorganizing losses, but prevents the possibility of effective counterattack measures being taken by the enemy. The main artillery strength must therefore be employed in the barrage.

The sector or territory to be raided having been occupied by the raiding forces, the rolling barrage halts, and becomes a standing or box barrage. Its purpose is to protect the raid while the object of the raid is being achieved. In a minor raid, information being the object, prisoners, documents, etc., are sought for, followed by the organization for the withdrawal; in a major raid, the organization of the captured territory takes place. Ordinarily this fire is drawn well around on the flanks of the raiding forces, to prevent the pinching out of the raiding party by hostile counter-attacks. Hence the designation of box barrage.

Protective fire for the withdrawal involved in a minor raid may consist of the reversal of the rolling barrage, or the continuation of the standing barrage. In a major raid it involves the continuation

DIVISIONAL ARTILLERY MISSIONS

of the box barrage and the arrangements necessary to strengthen it upon an emergency. At this point it passes into the type of fire known as the ordinary protective or normal barrage which will be described later.

Taken as a whole, raids include many of the problems of the larger and more comprehensive attacks. To be effective they must be organized with all the available strength. The best opinion of the day rather inclines towards short, powerful operations rather than those with a long preparation.

The divisional artillery finds its most exacting rôle in the problems of the general attack. To insure the advance of the infantry is its duty. To perform this, its fire must include many missions. The enemy defences must be made subject to penetration, the hostile small arm and automatic weapon fire must be kept down, the enemy forces pinned to their cover, the hostile artillery fire neutralized or destroyed, circulation and concentration, and hence reinforcements for the enemy, interdicted, observing posts blinded, command posts rendered untenable, and, in general, the hostile scheme of defence voided.

To classify logically these important missions of the artillery, attacks have been divided into two groups, namely, with limited objectives, or with unlimited objectives. The former, from an artillery point of view, can be divided again; those within the initial range of the artillery, and those beyond the initial range.

When those within the initial range are considered, the problems are much the same as those of major raids, but considerably magnified. The main difference, as a rule, arises from the fact that in the instance now considered the artillery will eventually have to be displaced, whereas in raids no displacement generally occurs.

The successive steps of this type of attack may be listed as follows:

- a. Preparation.
- b. Interdiction, harassing, and destructive fire.
Deceptive fire.
Rolling barrage, or concentrations.
- c. Standing barrage, or protective fire.
- d. Readjustment of artillery.

As in the case of raids, in considering the necessity for preparatory fire before an attack, the factor of surprise *versus* defensive strength has to be considered. An additional element of great importance, in the particular circumstances now discussed, is the retaliation the enemy may attempt if a preparation is fired. In attacks of any strength at all, for some hours previous to the zero hour, the forward area of the attacking forces will be congested with the

THE FIELD ARTILLERY JOURNAL

troops involved in the attack proper. Upon the beginning of a serious preparation, an enemy with a well-planned scheme of defence will immediately subject this forward area to a severe bombardment. As a result, the attacking forces run the grave risk of incalculable losses and a resulting confusion. It is believed, therefore, that before the surprise element can be discarded the local situation as to the strength and organization of the enemy must be given the most serious consideration. As a rule the divisional artillery, while it may not be permitted to decide the question as to whether there shall be a preparation or not, still its advice will be sought, and a well-formed opinion will carry great weight.

Any preparation ordered should include the following:

- a.* Neutralization and destruction of hostile artillery.
- b.* Neutralization and destruction of strong points.
- c.* Interdiction of communications.
- d.* Concentrations on assembly points or areas.
- e.* Destruction of defences covering approaches.
- f.* Destruction, neutralization, and blinding of command and observation posts.
- g.* Destruction of important works, such as redoubts, emplacements, railroads, etc.
- h.* Destruction of ammunition dumps, etc., etc.

Preparations may vary from a length of a few hours to those of several days' duration. The most advanced tendencies incline towards short violent preparations as compared to those of the longer type. Preparations may be simulated for deceptive purposes. When used in this rôle no effort should be spared to make them convincing to the enemy.

As a general rule a division serving in a corps will be supported by corps artillery in addition to its own. When such is the case, the missions for harassing, interdiction and destructive fire will fall quite generally to the corps artillery. The division, in general, though, indicates the scope of these missions, if it is well informed. However, a division being a self-supporting combat unit, is subject to the liability of separate actions as such, in which case the mission just enumerated will fall to the divisional artillery. Actually the missions will be a continuation of the preparation if undertaken, and will include the specific requirements detailed above for a preparation. The bombardment must be in depth and provide for systematic and timely lengthening of ranges.

Deceptive fires, as indicated previously, should consist of combinations of various types of fire. When used in connection with diversions they are of great value. Well-planned destructive shoots,

DIVISIONAL ARTILLERY MISSIONS

gas attacks, simulated rolling barrages, and smoke screens ordinarily form the foundation of most deceptive efforts.

The steps indicated so far cover the attack up to the moment of the zero hour. The instant the infantry moves out the main purpose of the artillery is to facilitate and make possible its advance. The best thought of the day considers the rolling barrage the most effective means available, provided sufficient guns are present. Advancing concentrations on hostile strong points are considered preferable by some to a weak barrage. Rolling barrages not only form a protective curtain for the infantry, beat down the hostile small arm and automatic weapon fire, and force the defence to cover, but they provide a well-nigh indispensable guide for the advancing forces. This factor should be considered when it is desired to substitute concentrations for the rolling barrage.

Rolling barrages should include howitzers as well as field guns. Their greater explosive effect make it necessary that they fire at somewhat longer ranges than the lighter guns. Their effect is powerful, though, and their systematic inclusion in a barrage adds considerable power to the attack. If possible, a superimposed arrangement of batteries or battalions in a barrage should be made, in order to lessen the possibility of holes occurring in the barrage due to individual guns or batteries being put out of action for various reasons. A small proportion of smoke-shell and shrapnel added to this rolling curtain of fire increases its effectiveness.

There is some discussion as to whether a barrage once started should, or can be, halted before it completes its schedule. Checks in an attack may leave certain sections of the advancing lines far behind the barrage. A barrage halted for this reason may nullify any advance being made at another section of the line. A part of a barrage checked and brought back to a particular point may be effective at that point, but is difficult to recommence, and is dangerous to the far advanced forces when it takes up its course again. Hence it is believed that unless the attacking forces sustain a general check along the whole front of their attack, or unless a general cessation of the attack is directed, a barrage once started should be permitted to run its course. Modern improvements in communication in the future may facilitate the partial checking of a barrage and its continuation again, but its control in this manner must be based upon the swift and reliable supply of information. For the present it is believed that this need could be cared for by proper liaison with any corps artillery available. Upon the receipt of information by the divisional artillery as to a partial check received in an attack, if proper arrangements had been made in advance with the corps artillery, it should be a fairly simple matter to switch the

THE FIELD ARTILLERY JOURNAL

necessary corps artillery fire from their distant missions in order to clear up a local check.

Infantry attaining its objectives ordinarily must not only organize its positions for defence, but must reorganize itself. It is therefore especially vulnerable to counter-attacks at this stage of the combat. Logically it is the most appropriate time for the enemy from his point of view to undertake a counter-attack. Therefore upon the cessation of the rolling barrage the artillery must put down a stationary curtain of fire or standing barrage. The length of time for its continuation will depend upon the local circumstances, but, usually, decreasing gradually in intensity, it is not continued much beyond two or three hours. By that time the infantry should have reorganized itself and consolidated its positions sufficiently in order to be able to make a strong stand against any counterattack. From this point on the usual normal barrage methods come into play.

Any serious attack, even though it can be covered by the artillery from its initial positions, will require the forward movement of the artillery when the attack has been completed. Exceptions to this are liable to be very rare. In this readjustment of the guns, an echeloning scheme should be followed. Any other practice would be disastrous in its possibilities in the event of a counter-attack during its progress. During the echeloning forward complete protection of the front must be provided for by the prompt re-distribution of protective missions among the units in place. The readjustment completed the final distribution of missions, for the normal protection must take place immediately. Artillery without missions might just as well be out of action.

It has been the custom, in order to take care of special and unforeseen missions which are liable to occur during an advance, to designate certain units of the divisional artillery in advance for what is termed fugitive target fire. These units are supposed to receive their missions as the emergencies arise. To fulfill these they are usually diverted from their places in the barrage. In the future, it is thought that if corps artillery be present, the best practice will be to divert these missions to the corps and not to permit the withdrawal of barrage fire for this purpose.

Another method of handling emergencies arising in attacks which demand artillery fire, has been to designate artillery to accompany the infantry in its advance. In the past a very small degree of success has been achieved by the guns or batteries detailed on such missions. Their vulnerability has been too great. The principle is believed to be sound, but it is thought that the results due to poor execution and unsuitable matériel have been poor. It is believed that the self-propelled

DIVISIONAL ARTILLERY MISSIONS

mount with protection against automatic weapon fire will solve this problem in the future. There is no better scheme for preventing partial checks in an advance than the proper handling of the accompanying gun mission. In this connection it may be stated that in the future the lines of demarcation between tanks and artillery are going to be difficult of definition.

In considering attacks the objectives of which are beyond the initial range of the divisional artillery, the general procedure for the artillery remains the same up to the moment of the forward movement by the infantry. The most important factors added are the decisions necessary for the designation of, and the instructions for, the units which will have to pick up the barrage from advanced positions. In this connection some differences of opinion will be found. There is one school of thought which holds that not only should the artillery units which must move to the advanced positions, usually in hostile territory, to pick up a barrage, be designated in advance and held in readiness if necessary but that this forward movement should be made according to prearranged time-tables. Opposed to this, is the view that the advance should be ordered only after the favorable development of the primary stages of the infantry advance, and only by the direction of the divisional artillery chief. If the unexpected was not so universally present in combat, it is believed that the time-table school might carry greater weight. But since combat developments cannot be accurately foretold, and since such prearranged systems will usually emanate from headquarters higher than the division and hence be cumbersome and of dangerous delay in revocation, it is believed that the forward movement of the artillery must be left subject to the successful primary advance of the divisional infantry. Examples of both schools of thought may be found in the conduct of artillery operations in the recent war, but it is believed that investigation will prove that due to the emergencies unexpectedly arising in practically every case no time-table was ever carried out accurately. As a matter of fact, it is believed that if the motives underlying the adoption of such methods were disclosed, it will be found that their adoption was decided upon in the belief that otherwise the divisional artillery chiefs would fail to get their guns forward properly—in other words, that they were incapable of handling the situation themselves. No sound principle should be based upon such an assumption.

Therefore, remembering that the history of military combat proves that its successful conduct is made up of examples of success achieved, not by following definitely prearranged schemes, but by the application of general principles to specific situations, it is believed that this time-table principle is basically wrong.

THE FIELD ARTILLERY JOURNAL

Other points to be cared for in the initial decisions regarding the movement forward of the artillery include the routes of march, localities for the advanced positions, and ammunition to be transported. The barrage to be picked up should, if possible, be as dense as the initial fire. Factors governing this requirement are the routes available, condition of terrain and amount of ammunition necessary to be transported.

The infantry advance having commenced, the development of the situation with respect to the artillery depends solely upon the receipt or non-receipt of unfavorable information as to the progress of the attack. This being lacking, the instructions regarding the occupation of the advanced positions must be put into effect, considerable leeway in the time element being allowed. At no other time in active combat is a reliable communication and liaison system of more importance.

In general the scheme followed under the conditions outlined above, will be to advance one or more battalions to advanced positions as soon as it appears that the infantry has received no initial check, these battalions being held in readiness for this movement. The remaining artillery available for the advance is then leapfrogged forward upon the completion of its share in the initial barrage, and may or may not pick up the barrage depending entirely upon the depth of the attack. To provide for artillery protection in depth, a series of echeloned positions should be occupied in the various advances made, and at the same time the maximum fire power at all times assured. At no time should the infantry be without the availability, if not the actual fire, of its artillery.

Needless to say, the artillery commander during the whole forward movement of the infantry must be supplied with or secure all possible information as to the progress of the attack. Any failure in the attack either as a whole or in part, will require, as a rule, a complete readjustment of the specific artillery missions. And when the element of artillery units on the march moving into a repulse is added, the situation will require decisive decisions. As a rule, properly trained organizations caught in such a situation should be able, by reason of their reconnaissance methods, to not only safeguard themselves, but to be of immediate assistance to the adjacent infantry units. But the complete readjustment of such situations cannot be left for long in subordinate hands, and the artillery commander who is competent to size up such crises most quickly will uniformly be able to provide the maximum support to the infantry. In this connection the value of assured artillery support due to an echelonment of artillery positions is of the greatest importance.

The final artillery positions for completing the barrage having been occupied, the missions for the artillery become the same as

DIVISIONAL ARTILLERY MISSIONS

in an attack the objectives of which are within the initial artillery ranges, namely the standing barrage and readjustment necessary for normal protection.

Reconsidering, then, this type of attack, the great problem is found in the decisions necessary to regulate the carrying on of the barrage. The decisions in question involve the proper initial distribution of units, the proper arrangements necessary to insure the timely advance and occupation of positions, and the proper supply of ammunition.

In discussing further the various possible developments of the various types of attacks, we arrive next at that type the objectives of which are unlimited. At this point much room for discussion will be found, not so much from a strictly artillery point of view as rather from a broad tactical standpoint. Without attempting to enter into the argument, it can be stated safely that the best opinion of the day seems to incline towards the viewpoint that formal attacks with unlimited objectives are unsound when attempted in great strength against an enemy of strength and good defensive organization. Accordingly, it is deduced that attacks of this type, being possible only against a weak or disorganized enemy, are in reality advance guard or pursuit actions. Accepting this reasoning, then, the measures pertaining to the artillery under such circumstances will be discussed subsequently under those headings.

In general, though, should an attack of such a nature and in great strength against an enemy well organized, be decided upon, the rôle of the artillery will conform in general to the missions laid down for attacks of limited objectives. The main problem will be to provide by echelonment forward a continuous rolling barrage or curtain of concentrations. The factor of greatest importance will be found in the matter of ammunition supply necessary to keep up a strong fire in a penetration of an indefinite length. Circumstances at the time will alone control such matters. As in any other similar situation the general problem of the artillery commander will consist of providing a scheme which will allow constantly of the maximum artillery support. Undoubtedly such a scheme would require every available gun to be either firing or on the move to a firing position, once the attack had moved forward.

Advance guard, or pursuit actions as they may be termed, result either from attacks forcing the hostile forces to a withdrawal, or from the refusal of an enemy to be brought to bay.

In both cases the artillery missions become the same, and as in all cases, covering the movement of troops in combat, conform to the action or needs of the infantry.

When the hostile force or forces will not or cannot be brought

THE FIELD ARTILLERY JOURNAL

to bay, and it is desired to keep contact with or engage the enemy, the general formations adopted by the combined arms follow the principles laid down for advance guards. Safe contact with the enemy, and of such strength as will prevent if possible his making a successful stand are the objects in view. Therefore, within the division, due to the emergencies liable to occur, decentralization of command takes place, resulting in the formation of an advance guard command and a main body.

To perform properly its mission in these circumstances a division of the artillery must occur along similar lines. The advance guard commander must be furnished with a suitable artillery strength proportional to the strength and task of his whole command. This artillery must be grouped under an artillery officer and be at the complete disposal of the advance guard commander. The remaining artillery, of course, functions as usual with the main body under the control of the divisional artillery commander.

No specific orders could be laid down for such situations. The artillery commander with the advance guard becomes the artillery advisor for its commander and, to render the maximum aid, should follow the principles already indicated as necessary for supplying continuous protection. The basic principle remains, as always, to be able to furnish fire when directed to do so. In cases of obstinate hostile withdrawals continuous "leap-frogging" will have to be resorted to. Echelonment in depth will provide the necessary element of safety. When the enemy does not stand, more movement and less fire will occur, but even then the artillery movement should as far as possible be by echelons. No excuse can ever cover an inability of the artillery to deliver fire when called for.

In summing up the subject of attacks and advances coördination within the division has been assumed, but before the question is dropped the matter of coördination of artillery fire between divisions must be touched upon. A divisional artillery commander before distributing the missions of his own command must check his plan not only against the corps artillery plan, but against those of the adjacent divisional artillery. Divisional barrages which are not hooked up or adjusted as to rates of advances may play havoc with a general attack. It is a corps function to plan such coördination, but it is the function of the divisional artillery commander to assure the operation of such plans.

4.

Opposed to the offensive type of action is that of the defensive. The main subdivisions of the latter are two, the passive defence and the active defence. Unlike the offensive, when on the defensive the initiative, broadly speaking, rests with the enemy. Therefore we find

DIVISIONAL ARTILLERY MISSIONS

that the matter of taking either an active or passive defence is not a matter of choice, but one of circumstance, since no able commander acts on the defensive unless forced to by circumstances.

As is found in the matter of offensive actions, the strict detail of artillery missions on the defensive must conform to the infantry situation or problems. When the defence is passive it is assumed that no general or serious hostile infantry action occurs, but that the enemy adopts an offensive spirit, particularly as regards his artillery and auxiliary services, a situation which in general is handled as a passive offence as outlined in the first part of this paper. An active defence is considered as that necessary to oppose a hostile assault or attack in strength.

To combat a passive offence is a difficult but uncomplicated task for the divisional artillery. The methods used include the exact missions as described previously for the passive offence. To recapitulate, they are:

- a.* Harassing fire.
- b.* Neutralization and interdiction fire.
- c.* Deceptive fire.
- d.* Destructive fire.
- e.* Normal or defensive barrage.

In the situation under discussion, though, while the methods remain the same with the exception of the normal barrage which will be discussed, the general purpose to be achieved is considerably different, and the missions require careful selection. When assuming a passive offensive the general purpose is to discomfort the enemy, whereas when engaged in a passive defence the idea is to prevent the enemy from discomforting in one way or another one's own forces.

Emphasis must be placed on fires of neutralization, interdiction and destruction, not to mention the normal barrage. The artillery fire of the enemy will be strong, therefore artillery missions must consist primarily of fire schedules which will beat down the fire of the enemy and prevent losses to the friendly troops.

No passive defence can be expected to be successful unless handled systematically. It should be understood that targets become more difficult to locate as the art of war advances, and that no freehand discharging of artillery projectiles will smother hostile fire in the future. A commander to be able to dispose of his artillery fire on intelligent and productive missions must have at his service the supply of active and accurate information. To describe the sources of such information is beyond the scope of this article, but to emphasize the importance of the proper functioning of the Artillery

THE FIELD ARTILLERY JOURNAL

Information Service is not believed to be amiss. Only in the case of a hostile attack will its *raison d'etre* be more important.

In addition to the fires previously described one important artillery mission now crops up which has not been discussed hitherto, namely the normal or protective barrage. It is the primary artillery defence for the infantry and is organized to act automatically. It is the artillery's normal, local and basic mission when not engaged in more important directions. It is the infantry's protection against local actions such as raids, assaulting parties or local alarms, and is so used except as to be described for the active defence. Mechanically, it is the curtain of fire to be put down immediately in front of the infantry units by the artillery units responsible for their protection.

As a whole, the general mission of the divisional artillery when forced to a passive defence will consist in the systematic distribution of minor missions whose effect shall be to lessen, nullify or silence the hostile efforts. The methods to be employed will ordinarily suggest themselves, and have been catalogued above.

When hostile forces advance to the attack, the most critical situations as regards the defending forces are then liable to occur. The problem of the offence and defence is much like the struggle between the ship's armor plate and the naval gun. One is always striving to outdo the other. Present-day opinion regards the elastic defence organized in depth as the proper means for checking general attacks, or as a matter of fact, any type of attack. The general scheme consists of the organization of the ground into several zones in the following order from front to rear:

- a. Outpost zone.
- b. Battle zone.
- c. Artillery zone.
- d. Reserve zone.

The enemy advancing to the attack is met first with direct and cross-fire from defensive areas organized as small redoubts in the outpost zone. These outposts hold their ground at all costs. Upon penetration into the battle zone, strong defensive areas organized in great depth are met with and the main combat is expected to ensue. It is expected to check the enemy in this zone. In the event of a failure to hold the enemy in the battle zone, the subsequent resistance offered occurs either in the artillery zone or the reserve zone, preferably in the former if possible. However, at this stage of the defence, the combat usually has reached such a development that prearranged schemes dictating the specific points or areas of resistance cannot be expected to be accurately carried out. Circumstances alone will control the areas in the zone of combat where the commander will

DIVISIONAL ARTILLERY MISSIONS

throw in his reserves once the battle zone has been penetrated successfully. At points where heavy attacks are expected reserve troops will hold completely organized areas as described above in rear of the artillery zone of the holding troops. An enemy will have to force himself through two complete defensive systems to overcome an opponent organized in this manner. It is evident that the general idea of the defence, then, is to bring the enemy to a gradual halt, never allowing a break-through by reason of concentrating all resistance along one line.

The artillery's part in such a defensive scheme can be divided, first, into two parts, a defence in the original positions, and a defence when a withdrawal of guns is directed.

In considering the first part, we find the following stages:

- a.* Counter-offensive preparation.
- b.* Defensive barrage for outpost zone.
- c.* Rear shifts upon enemy penetration to or within the battle zone.

The counter-offensive preparation includes all fire put down previous to the forward movement by the hostile forces to the attack. It has for its object the prevention if possible of the attack, or, failing in this, to render it as innocuous as possible. To secure this result it is prearranged with great care, and includes fire on the following points or areas:

- a.* Troop assembly or rendezvous points.
- b.* Trench intersections.
- c.* Avenues of approach.
- d.* Routes of circulation.
- e.* Front line trenches.
- f.* Hostile batteries.
- g.* Strong points.
- h.* Command and observation posts.
- i.* Areas of possible tank concentrations. Etc., etc.

To be effective it must be put down several hours previous to the jump-off of the hostile troops, hence an extra premium is put on the alertness of the defence. When an attack is imminent the counter-offensive preparation is ordered sometimes for several periods previous to the occurrence of the actual attack. As a rule most attacks will occur before noon. Several nights are sometimes necessary to an enemy to collect his assaulting troops in his forward area. Also a defender, lacking the information as to the specific time for the assault intended, should use the counter-offensive preparation on all suspected nights.

Actually, when put into operation the counter-offensive preparation

THE FIELD ARTILLERY JOURNAL

commences or expends its maximum effort at the start in the rear areas of the enemy, and moves forward gradually as the probable time for the suspected attack approaches, so that at the zero hour it shall be covering the jump-off areas and barrage batteries.

Here again is found the difficulty of distinction between divisional and corps artillery missions. As a rule, though, the corps guns take the longer ranges and hostile artillery, while the divisional guns cover the hostile troop assemblies and debouching areas.

The first probable crisis is liable to occur in the shifting of the fire from the counter-offensive preparation to the defensive barrage in front of the outpost positions. There is no difficulty connected with the actual firing of this normal or defensive barrage, but the moment for its instigation is liable to be difficult to select, as the counter-offensive preparation should continue up to the moment of the actual moving forward to the attack by the enemy, and, as a consequence of the very real fog of battle now produced either mechanically or naturally, this actual time when the enemy makes his jump-off is very difficult to determine. A counter-offensive preparation shifted to the normal barrage too soon makes it considerably simpler for the enemy to leave his positions for the initial assault; on the other hand, a defensive barrage put down too late is valueless to a large extent. Therefore the most careful organization for directing the shift must be in force.

The actual mechanics of the defensive barrage depend largely upon the defensive scheme adopted. It may vary from a solid curtain in front of the outpost position, to a series of concentrations in front of and between the defensive areas, or be a combination of both. Ordinarily, since no withdrawal is to be permitted from the outpost zone, the combination scheme is believed to be the most efficacious, as it obviates rearward shifts while the enemy is engaged in this zone. With the defensive barrage maintained as a solid curtain in front of this zone, the moment the enemy breaks through it, he is unhampered by artillery fire until the rearward shifts, always an uncertain and cumbersome problem to handle, are put into force.

If the outpost zone is overwhelmed or successfully penetrated in force, a second crisis occurs, and for the artillery consists of the shifts of fire necessary to bring the protection back to the defensive areas in the battle zone. As is the case in shifting from the counter-offensive preparation, the details should be prearranged, the missions assigned, and the means of effecting the shifts swift and assured. Modern improvements in the wireless seem to indicate a more assured degree of success in this connection for the future.

In specifying the missions in this shift to protect the battle zone, the principle of concentrations covering and forbidding the passage

DIVISIONAL ARTILLERY MISSIONS

of hostile troops between the defensive areas or redoubts seems to be the most logical. With an organization in depth in force a defensive curtain of fire would not be sufficient. Successive rearward shifts for the concentrations should be assured. Their carrying into effect undoubtedly would be difficult, but experience has indicated that they are possible. An enemy should always be covered by artillery fire until he takes the artillery positions themselves.

Reconsidering, then, the question of the defence up to this point we find that the basic principle upon which the artillery acts is to so place its fire that no matter in what direction the enemy may proceed, he meets with artillery fire, and that no matter what defensive area he is able to attack, he finds it protected by artillery, until he captures the artillery itself. Mechanically, the fulfilling of missions by rearward shifts must be cared for.

If the battle zone is overcome or successfully penetrated, the second stage of the artillery part in the defence occurs. Two situations are possible. If the commander has strong reserves and supporting artillery in reserve positions, he may offer resistance in his own artillery zone intending to check the enemy either there or in the reserve zone, in which case the artillery in the artillery zone must generally hold its positions and make a close defence of its guns. The artillery combat then becomes a matter of local missions handled by the unit commanders according to the local situations, and fought under the principles of close combat.

On the other hand, if the commander has no reserves in his rear and must withdraw to prevent a break-through, his decision should be made while the combat is still localized in the battle zone, otherwise the artillery is liable to be unable to extricate itself. No commander should be caught unprepared for a withdrawal. His points or areas for resistance should be selected in advance, and a scheme prepared to allow of their defence while the general withdrawal is put into effect. The artillery mission in a plan of withdrawal must allow for the protection of such defensive areas, and at the same time permit artillery units to be displaced to the rear for the further protection of the movement. A method of echelonment to the rear should be assured. As in an advance, the maximum fire power at all times should be sought for.

At this stage of the combat four situations are liable to develop, *viz.*:

- a. The enemy may overwhelm the withdrawal, in which case the combat develops into local close defence problems for the individual artillery units.

THE FIELD ARTILLERY JOURNAL

- b.* The withdrawal may continue successfully but be closely pressed by the enemy, in which case the artillery continues its rearward echelonment providing the maximum fire protection possible for the defending areas.
- c.* The withdrawing forces may make a stand, in which case the artillery assumes its normal defensive functions.
- d.* Or, the withdrawing forces may disengage themselves, in which case the situation becomes that of a rear-guard problem.

As in the problem of advance guard situations, a general division of the command takes place, and artillery is passed to the command of the rear guard commander. Its missions consist of fire protection, basically for the main body of course, but specifically to cover the rear-guard action. Occupation of successive positions of considerable depth by echelons should be the principle to be followed.

Summing up the whole question of the defence as it concerns the artillery, alertness appears as the prime necessity. Troops in an advance may still advance often in spite of their artillery's negligence or inefficiency, but troops on the defensive are, as a rule, not in possession of the initiative, and hence to be adaptable to the emergencies arising require the support of alert artillery. Artillery failing of support to the infantry in a defensive action, not only abrogates its right to exist, but eventually becomes a burden to the other arms.

And thus, in conclusion, with reference to all artillery missions, the basic purpose of artillery should be to make existence easier for the troops it supports. To do this, not only must the artillery be able to fire its guns scientifically, but, unlike the ideal batter in a base-ball game, it must be able to "put them where they are" and not where "they ain't."



MOTORIZED ARTILLERY IN THE FIELD

BY CAPTAIN JOHN J. McCOLLISTER, F.A.

THE ability of motorized artillery in large units to march and get through was given a very thorough test on the 30-mile night march made by the 11th Field Artillery Brigade on March 23-24, 1923. The organizations constituting the Brigade were the 8th Field Artillery (75-mm. Br.), the 11th Field Artillery (155-mm. howitzers), the 13th Field Artillery (75-mm. Br.), the 11th Ammunition Train and Brigade Headquarters Battery. All the organizations of the Brigade were completely motorized.

The first stage of the Brigade problem was non-tactical. It consisted of organizing the march column and marching the Brigade from parks at Schofield Barracks, Hawaii, along the paved highway to the vicinity of the village of Waipahu, fourteen miles, by road south of Schofield Barracks.

At Waipahu the special tactical situation to be solved was taken up. The Brigade was assumed to have been operating in the vicinity of Waipahu. It received an order from the Division Commander to proceed to Schofield Barracks on the direct dirt road to support an attack by the Division against an enemy operating on the Artillery Range just north of Schofield Barracks. The Division order reached the Brigade Commander at Waipahu at 12:20 A.M.

Orders in detail as to the mission of the Brigade reached the Brigade Commander at the point 615 (4 miles up the road to Schofield) at 2:00 A.M. The Brigade orders to the Regimental Commanders assigning positions and missions were communicated to them at this point just after 2:00 A.M. Firing positions were ordered occupied before 8:00 A.M. (For the route of march see the road sketch.)

As stated above, paved road was found between Schofield Barracks and Waipahu, a distance of 14 miles. There were two deep and wide gulches with heavy grades. Dirt road led from Waipahu to the position—partially improved, rocky in places, and crossing numerous small gulches. This distance was 14 miles. The weather was clear and dry until 5:00 A.M. when a light rain set in lasting until 8:00 A.M.

Several special conditions affected the efficiency of the Brigade: (a) There were about 600 Recruits with less than four months service. (b) There were many drivers who had had very limited experience

THE FIELD ARTILLERY JOURNAL

and who had had no night training. This condition was largely due to the chronic shortage of gasoline for training. (c) Insufficient gasoline was issued to assure all vehicles having an adequate supply. This shortage was due to the small allotment available for the Brigade. (d) The Motor Matériel was in only fair operating condition due to partially trained men, and a shortage of essential parts; moreover the motor matériel of the Brigade to a large extent saw service during the war and was more or less unserviceable when issued to the Brigade two years ago. Many of the vehicles saw service in France.

The Brigade was divided into three columns, first of which, in order of march was the speed column. This consisted of all speed vehicles except those needed to supervise and repair trucks and tractors. Second came the tractor column including all the tractors of the Brigade. Third and last came the truck column made up of all the trucks. Each column was organized as a separate command on the march and had sections corresponding to the various units of the Brigade.

The speed column consisting of 12 Dodge cars, 32 reconnaissance cars and 90 motorcycles, cleared Schofield Barracks at 9:00 P.M. and arrived at Waipahu at 10:15 P.M. where it stopped until 12:30 A.M. At 12:30 A.M. the tactical problem began and the return march to Schofield Barracks over the dirt road was commenced. The speed column reached point 615 at 1:20 A.M.

Orders assigning positions and missions were given by the Brigade Commander at this point after which the speed column proceeded to Schofield Barracks as a unit arriving at Military Police Barracks two miles in rear of the position at 3:45 A.M. Regimental sections were released at this point and the reconnaissance of positions was made by organization commanders.

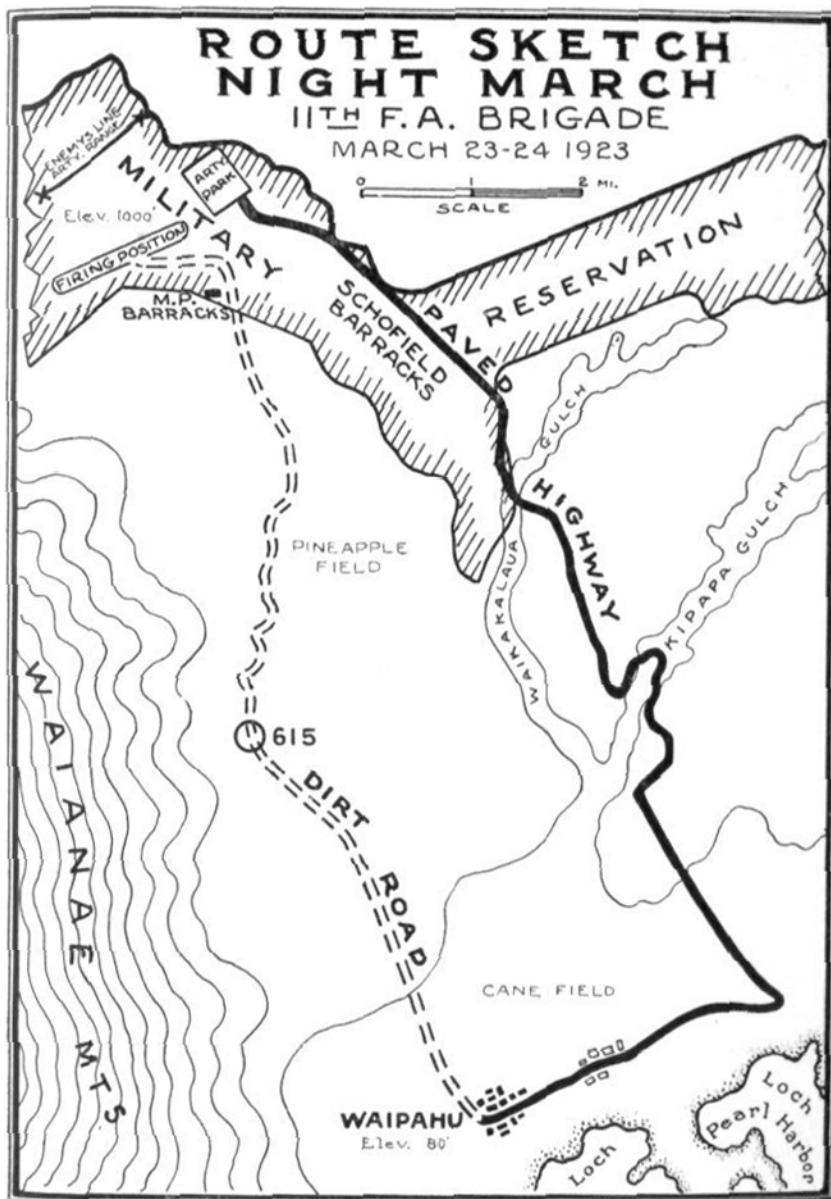
The tractor column consisting of 152 tractors with their loads, followed the speed column on the main highway. The head of the column left Schofield Barracks at 9:00 P.M., immediately after the speed column had cleared. The head of the column reached Waipahu at 1:30 A.M., point 615 at 3:20 A.M. and Military Police Barracks at Schofield at 5:45 A.M., having covered 24 miles in 8¾ hours. The rate of march was 2.9 miles per hour which includes the stop of 30 minutes for midnight lunch at Waipahu. The prescribed rate of march was 3 miles per hour.

The truck column, consisting of 171 trucks, left Schofield Barracks at 12:20 A.M. and arrived back at Schofield Barracks at 9:00 A.M., having made several long halts on account of overtaking the tractor column. The truck column had orders not to pass the tractors.

ROUTE SKETCH NIGHT MARCH

11TH F.A. BRIGADE

MARCH 23-24 1923





AT SATURDAY INSPECTION IN HAWAII



HAWAIIAN ROAD SCENE

MOTORIZED ARTILLERY IN THE FIELD

VEHICLES WHICH TOOK PART IN MARCH

Motor Vehicles

Type	Brig. Hq.	11th Am. Tr.	8th F. A.	11th F. A.	13th F. A.	Total
Dodge 5-Pass.....	..	1	5	6	5	17
Dodge Lt. Repair.....	..	1	10	10	8	29
Motorcycles.....	1	2	37	33	39	112
Reconnaissance Cars.....	1	..	9	10	12	32
G.M.C. Trucks.....	2	..	6	3	8	19
F.W.D. Trucks.....	3	34	36	49	30	152
Tractors.....	..	..	44	66	42	152
White Staff Cars.....	..	..	..	1	..	1
G.M.C. Ambulances (From Ambulance Co.)	..	1	2	2	2	7

Total Motor Vehicles, 521

TRAILERS

	Brig. Hq.	11th Am. Tr.	8th F. A.	11th F. A.	13th F. A.	Total
Guns (75mm Br.).....	24	..	24	48
Howitzers (155 mm).....	24	..	24
Caissons (all Field).....	66	54	66	186
Reel Carts.....	9	10	10	29
M.G. Trailers.....	6	6	6	18
Tank Trailers (Gasoline).....	1	..	1
Kitchens.....	..	1	9	11	9	29
Trailers, R. C.	9	10	10	29
Water Trailers.....	..	1	10	10	10	31

Total Vehicles 394

Total motor and others = 915 vehicles

THE FIELD ARTILLERY JOURNAL

GASOLINE CONSUMPTION

Miles per gallon

	Brig. Hq.	11th Am. Tr.	8th F. A.	11th F. A.	13th F. A.	Average for Brig.
Dodge, 5-Pass.....	....	12	7.3	10.8	10.9	10.2
Dodge Lt. Repair.....	....	8	....	....	8.6	8.3
Motorcycles.....	17	15	11.4	21.3	14.1	15.7
Reconnaissance Cars.....	6.4	....	2.9	5.4	4.7	4.8
G.M.C. Trucks.....	2.8	....	3.7	....	4.8	3.7
F.W.D. Trucks.....	1.5	2.5	2.0	2.0	2.3	2.0
Tractors.....	....	....	1.0	1.1	1.3	1.1
Total Gasoline Used.....	107	587	2147	2889	1935	

Total gasoline used by Brigade = 7665 gallons

The consumption of gasoline exceeded estimates. The following general causes may have led to excessive consumption: (1) Inexperienced drivers; (2) road congestion resulting in considerable idling; (3) poorly adjusted carburetors; (4) dirty gasoline. It is believed that the average gasoline consumption by the Brigade for each type of vehicle is about what is to be expected under field conditions.

Only 14 serious causes of motor trouble developed counting all types of vehicles. This is 26 per cent. of the total number of vehicles on the march. Numerous minor troubles occurred which were repaired on the road in time to enable the vehicles to accompany the column. A number of vehicles were left on the road due to shortage of gasoline. The principal causes of motor trouble are shown below:

Dodge (5-Pass) None.

Dodge (Lt. Repair) None.

Reconnaissance Cars—1 gasoline leak.

Trucks:

1 cylinder head out. Numerous gasoline stoppages.

1 ignition trouble.

1 gasoline leak.

1 gasoline line broken.

3 radiators damaged.

1 pump shaft broken.

Tractors:

1 overheated due to broken oil line.

3 gasoline lines broken.

MOTORIZED ARTILLERY IN THE FIELD

- 2 tracks thrown.
- 1 gear shaft broken.
- 2 magnetos out of adjustment.
- 2 brake linings overheated.
- 3 cylinder head gaskets blown.
- 1 broken crank case.

Motorcycles:

- 3 carburetors out of adjustment.
- 1 magneto out of adjustment.
- 1 drive sprocket pulled off.
- 1 chain broken.

A considerable part of the motor troubles were due to improvised repairs made at various times before the march, when necessary repair parts and materials were not available. This is particularly true of gasoline line trouble and blown gaskets.

The road discipline was generally good, but many cases developed when absolute compliance with orders in regard to keeping all traffic and men well to the right would have prevented minor mix-ups. Stalled vehicles interfered to a considerable extent with traffic, because frequently vehicles in the rear, coming to a stalled vehicle, would halt thinking they were closed up. Altogether an appreciable amount of time was wasted due to this cause.

In general the organization worked satisfactorily. The road column covered ten miles when in march and was an impressive and inspiring sight, particularly to an artilleryman familiar with the personnel element as well as with the vast diversity and complication of the matériel on the road. As a test of motorized matériel it was of great value. The motorized performance will be improved when training enables both officers and men to better understand their responsibilities.

The minor shortcomings in traffic control indicated the desirability of further and more extensive tests to secure more light upon this point along with the other and manifold problems.

One of the most interesting phases of the march was the reaction of the officers to the possibilities of the march. In general those who had a fixed purpose of bringing all of their vehicles through succeeded. A motorized organization runs as much on the will power, determination, and ingenuity of its commander as it does on gasoline. Both are essential.

HIGH BURST RANGING

BY MAJOR H. R. ODELL, F.A.

IN the January-February number of the FIELD ARTILLERY JOURNAL appeared an article by Major H. E. Miner, F. A., describing briefly several methods of High Burst Ranging, and commenting on their relative merits. His conclusion is that none of the methods in use at present are sufficiently accurate and simple of application for general use by Artillery Units.

The texts heretofore used in this instruction at the Field Artillery School have been the following: "Flash, Sound, and High Burst Ranging," prepared by the Coast Artillery Board, September, 1920, and "Provisional Instruction on High Burst Ranging by Tangent Reticule Method," translated from the French, February, 1918. Both of these pamphlets make a difficult problem of a comparatively simple one. The illustrative examples used are based on matériel and ammunition no longer in use in our service, making the application to our own matériel difficult. Neither pamphlet gives a clear and concise statement of the problem before plunging into a multiplicity of detail.

The text used this year was prepared and published at the Field Artillery School, and while it involves no new principles, it has been adapted to our present matériel, and it is believed, states the problem in such a way that it can be readily understood and applied. In preparing the section on the Tangent Reticule Method, reference was had to "Conferences on Artillery Firing," by Colonel Treguier, French Army, published in 1921.

No exceptions are taken to Major Miner's comments on the Approximate Trajectory, and Telemetric Methods; but it is believed that the False Site and Tangent Reticule Methods are worthy of further consideration. In the case of the False Site Method, the principal criticism is that systematic errors in the time of burning of the fuzes will be confused with errors in site and range, so that the final data will be incorrect. This difficulty can be readily overcome.

For example: In a referring adjustment we lay all the instruments with the cross hairs on a single trial burst. Suppose that in the subsequent referring series of six rounds the centre of burst as read by the observer near the guns is 5 mils *above* this point. The flank observers will also get centres above their horizontal cross hairs, and short of the first burst. From their readings the B.C. will plot on his chart the projection of the centre of the burst on the plane of site of

HIGH BURST RANGING

the target, taking the projection of the trial burst as the centre of his chart. This plotted point "M" will in this case be short of the centre of the chart.

In resuming the fire with a different lot of shrapnel or with different atmospheric conditions, it is possible that the time of burning will be longer (systematic error), and the bursts consequently lower. Suppose this is the case, and that in the first series of two or more rounds, the observer near the guns gets a centre of burst 5 mils *below* the horizontal line. The B.C. has merely to raise his corrector, using column 9, Table B of the Range Tables, or by simply bracketing the corrector, until the observer near the guns observes a centre 5 mils *above*, as it was in the referring fire. Then from the horizontal readings of the flank observers, a point "M'," the projection of this new centre is plotted on his chart, and the necessary range change is made to bring "M'" to "M." We then have the new trajectory passing through the reference point, and can commence fire for effect.

In the case of an original adjustment, the instruments are laid by topographical computation on a point directly above the target. The elevation of the guns is computed by taking the map range and position correction for the target, plus an arbitrary False Site sufficient to raise the trajectory from the target to the point R upon which the instruments are laid. A series of shots is fired. From the readings of the flank observers an intersection "M" is plotted on the chart (which has its centre at the target). Suppose the observer near the guns has observed a centre of burst 10 mils *below* the horizontal cross hair. Now if we make the necessary range correction to bring the plotted point "M," to T (the centre of the chart), and lower the trajectory by the amount of the False Site "S" diminished by the 10 mils that we are already below the Reference Point, the trajectory will pass through the target.

The main criticism of the Tangent Reticule Method are: That it requires the use of special instruments; that several charts or tables are needed for *each type* of gun and ammunition; and that the method is not sufficiently accurate.

No Tangent Reticule instruments have as yet been issued to organizations. It would be quite easy to modify our present B.C. instrument by the addition of parallel scratches and an index on the rotating reticule, so that it could be used for this purpose. It is suggested, however, that the use of the Tangent Reticule Method be confined to the Corps Observation Battalion, and that they be equipped with the French Instrument. The False Site Method is better adapted to use by batteries.

The only charts and tables required for any gun and ammunition

THE FIELD ARTILLERY JOURNAL

are the following: The Firing Chart, constructed for the target fired on; a small chart for use in performing the preliminary operations, which chart is the same for all types of gun; and the Range Tables.

As to the accuracy of either method we can best judge by result of trial. Recently the following tests have been made at the Field Artillery School:

Problem No. 1, Fired by instructors, March 31st.—A False Site original adjustment on a target at range of about 6000 yards gave an adjusted elevation of 271 mils. Fire for effect with this data yielded both shorts and overs, with the Centre of Impact less than one probable error short. Deflection correct.

Problem No. 2, Fired by instructors, March 31st.—A Tangent Reticule original adjustment on the same target as No. 1 above, but fired entirely without reference to it, gave an adjusted elevation of 273 mils. Fire for effect with this data yielded an almost equal number of shorts and overs. Deflection correct.

Problem No. 3, Fired by student officer, April 24th.—A False Site, original adjustment on a target at slightly under 6000 yards gave an adjusted elevation of 253 mils. Fire for effect at this elevation was mostly over. The elevation was reduced $\frac{1}{2}$ fork and several bracketing salvos were obtained. Deflection correct.

Problem No. 4, Fired by student officer, April 24th-26th.—A False Site referring adjustment was made April 24th on a target at about 6000 yards. On April 26th the same officer resumed the fire. He obtained an adjusted elevation of 246 mils. A salvo for effect at this elevation was all short. The elevation was increased $\frac{1}{2}$ fork and a mixed over obtained. Deflection correct.

Problem No. 5, Fired by student officer, April 24th-26th.—A Tangent Reticule referring adjustment was made April 24th, on a target at about 6500 yards. On April 26th the same officer resumed the fire. He obtained an adjusted elevation of 304 mils. Fire for effect at this elevation was observed bracketing by Range Party. Deflection correct.

Problem No. 6, Fired by student officer, April 26th.—A Tangent Reticule original adjustment on a target a little less than 6000 yards gave an adjusted elevation of 264 mils. Fire for effect at this elevation was all over. Reduced elevation $\frac{1}{2}$ fork and obtained a mixed over. Centre of impact about one probable error over. Deflection correct.

Problem No. 7, Fired by student officer, April 26th.—A False Site original adjustment on a target at about 6000 yards gave an adjusted elevation of 248 mils. Fire for effect at this elevation yielded about an equal proportion of shorts and overs. Deflection correct.

HIGH BURST RANGING

Problem No. 8, Fired by student officer, April 25th-27th.—A False Site referring adjustment was made on April 25th. On April 27th the same officer resumed the fire and obtained an adjusted elevation of 246 mils. Fired for effect at this elevation and the range party plotted the C.I. 85 yards short. Fired again at 250 ($\frac{1}{2}$ fork up) and obtained C.I. 33 yards short. Fired at 255 and obtained C.I. 30 yards over.

Problem No. 9, Fired by student officer, April 25th-27th.—A Tangent Reticule referring adjustment was made on April 25th. The same officer resuming fire on April 27th, obtained an adjusted elevation of 299 mils. Fire for effect all short. Increased elevation one fork and obtained 2 shorts, 1 over and 1 target hit. An error was made in plotting this problem.

Problem No. 10, Fired by student officer, April 27th.—A False Site original adjustment gave an adjusted elevation of 248 mils. Several salvos at this elevation showed a centre of impact 13 yards over. Deflection correct.

It will be observed that in six problems out of ten, the adjusted elevation yielded both shorts and over, while in only two problems was it necessary to cover a zone one fork short and over to include the target.

It is not contemplated to attempt precision fire with either method, but by using zone fire over a zone $\frac{1}{2}$ fork short and over, the probability of getting effect seems quite high.

Of the two methods, the False Site is believed to be the more practical for use by Battery Commanders, as it involves no very difficult computations, and may be applied with the matériel at hand. For use by the Corps Observation Battalion in adjusting long range artillery, the Tangent Reticule Method will be more accurate.



ARTILLERY FIRE, WITH AND WITHOUT OBSERVATION

BY COLONEL BARON VON WEITERSHAUSEN
IN MILITÄR WOCHENBLATT FOR MARCH 1, 1923;
TRANSLATED BY COLONEL OLIVER L. SPAULDING, JR., F.A.

ALTHOUGH two communications on this subject have already appeared in this paper, I venture to offer another, based upon my experience as regimental commander and divisional chief of artillery.

To direct effectively the fire of a large number of batteries in attack, on a modern "empty" battlefield, is no easy task. It cannot be solved by a mere order of a superior commander, to cover with fire a specific area of the enemy's territory. One has as a rule so little information, at the outset, of the enemy's dispositions, that such orders lead inevitably to throwing away ammunition that no supply system can replace.

Although we got brilliant results with unobserved fire in 1918, we must remember that this fire was based upon very careful reconnaissance before the attack. It was not, in fact, unobserved fire at all—only the observation was not of the usual kind. Good prospects of effect were assured beforehand; and even in open warfare we must have this assurance. The fear that there will not be time to find enough good observation stations is unfounded. General Rohne is right when he says, "first the observation station, then the gun position."

The problem of finding observation stations is simplified by organization of temporary group commands in the artillery, and by attaching parts of it to infantry units. Simultaneous deployment of the artillery, and a single fire order, have become impossible. In attack, I habitually formed the batteries at my disposal into groups of mixed calibres, from the field gun to the 21-cm. howitzer. These groups I attached to the infantry regiments in whose tactical spheres they were to act, retaining one or more under my direct orders, for use wherever the division commander wanted additional power.

The division commander can fix only in general terms the task of the artillery, its position and the amount of fire; the rest is for the artillery commander. The commanders of artillery attached to the infantry will of course send their observers and liaison officers into the front lines, and so they should know as much about the movements of the enemy as the infantry commanders. This furnishes the foundation for fire direction. Each shot may not be observed, but a specific observed zone is held under fire. The first fire order for the groups held at the disposal of the artillery commander was habitually given by the map, as indicated by the division; but

ARTILLERY FIRE, WITH AND WITHOUT OBSERVATION

it was the duty of the batteries to send out observers and to establish connection with the infantry at once, so as to make observed fire possible.

I have never found this extraordinarily difficult. As a rule, on the offensive, the first task is to fire upon the enemy's infantry with all the artillery, and to cover the roads and villages that seem most important. The enemy's artillery is concealed, and one cannot seriously undertake to combat it. After the fight has begun, observation from the air or from favorably placed ground stations will gradually gain information which will justify firing upon hostile batteries, but it is criminal waste of ammunition to fire over the whole landscape on the chance of finding them. Allowance having been made for the weather and for the peculiarities of the guns, a general observation of the target area may be sufficient; only in the case of moving targets is it necessary to observe each individual shot.

At first sight it may seem that this splitting into groups will interfere with control of fire. This is not the case. By means of fire orders the artillery commander can always concentrate the fire of all groups on the desired points. To establish a system of observation and fire direction quickly, however, the information and communication system must operate smoothly. This necessitates good special details in the batteries and higher units.

Allotments of ammunition must be made by the artillery commander. This calls for some little technical knowledge as to the powers of the various calibres.

One cannot count upon getting a perfect rolling barrage on a divisional front. Instead, each group working with an infantry unit should aid the advance by successive concentrations. I have often done this, as regimental commander. It is then the business of the artillery commander to work his remaining groups in harmony with them. In modern combat there is plenty of time for everything.

Gas may be used along with explosive shell, even in attack, without danger to our own infantry.

On the shell-shrapnel question I cannot agree with General Rohne. The shrapnel is a good projectile, but far inferior to shell in general utility, by reason of the difficulty of adjusting height of burst. This adjustment depends upon the quality of the fuze and the skill of the battery commander, both of which deteriorate in a long war. Even in peace, it has been my observation that many battery commanders cannot handle this adjustment. Theoretically, one gets a larger percentage of hits on silhouette targets with shrapnel; but not effective hits on war targets, for the shrapnel bullet has not sufficient power. Incidentally, all war experience indicates that the moral effect of the bursting shell is by no means negligible.

MODERN WAR AND MACHINES

BY GENERAL DEBENEY

Second Installment*

TRANSLATED FROM AN ARTICLE APPEARING IN LA REVUE DE LA SEMAINE OF FEBRUARY 10, 1922

"If you wish peace, prepare for war," is an old adage. But it is for the war of machines that we must prepare today, a preparation which means nothing less than organizing that immense arsenal, the entire country, on the one hand, and utilizing the entire population for the defence on the other hand.

It is no longer a question of merely calling to arms a certain part of the population such as the men from twenty to thirty years of age as we did in 1914. We must anticipate the mobilization of all the activities in the country, of all the material resources and of all individuals according to their occupations. It will be necessary to add to the mobilization of troops with which we are already familiar an industrial mobilization to supply, repair and increase the armament of war, an economic mobilization to assure the continued functioning of the country as well as the army, a mobilization of administrations of all kinds to conduct the regular government of the nation during war time, and finally a mobilization of our North Africa and our other colonies which have proved themselves to be integral parts of France. Thus we shall be assured of a proper functioning of the nation at war, an indispensable condition if we are to make use of our national resources at maximum efficiency.

As it is of the utmost importance that all these simultaneous mobilizations be effected calmly and quickly, the preparations should be very thorough and foreseen in every detail. The necessity is not only one of technic but also of morale. No one can forget the inspiring spectacle of our mobilization in 1914. The impression of power and confidence which it gave out is certainly one of the elements which enabled the army to stand without weakening the reverses that came at the beginning of the campaign and enabled the country to await calmly the turning of the tide at the Marne. The experience of 1914 proves that we can organize a general mobilization of the nation in as thoroughly efficient a manner as possible. It is no less certain that we shall be able to repeat this success on one condition only—and that condition is indispensable—that our mobilization be protected, that is, that we have a covering force.

The problem of the covering force is intimately related with that

* The first installment appeared in our January-February number. The translation is by Captain Paul C. Harper, F.A.

MODERN WAR AND MACHINES

of the preparation itself. The transition from peace footing to war footing is always a delicate operation and especially so when the organization is so large and complex. The general mobilization of the country, such as is required by the war of machines, will take a long and critical period during which the covering will be a vital question whose solution is one of the first duties of our military institutions. The covering is truly a question of principle.

This principle, so obvious to us, is far from being so well understood by other countries. Its denial, or simply a misconception of it, is at the bottom of all the controversies over the reduction of armies that have taken place at London as well as Washington and other places. It is generally admitted that each country has the right to prepare for its defence according to the exigencies of the situation and its own political customs. Most people are willing to classify these exigencies under the head of the domestic politics of the country and to refrain from passing judgment on them. But as the required covering for mobilization differs in different countries some people think that they can bring questions of foreign politics into the matter and accuse us of imperialism. This belief is sincere, we think, and the grounds for it are very simple. People only understand what they see and experience themselves and the viewpoint of each of the allies is fixed by one particular case, its own, which is entirely different from that of its friend, especially when the friend is not an immediate neighbor.

In the case of a nation like the United States which is separated from possible adversaries by oceans several thousand miles wide and which has moreover a powerful navy in reserve to block the avenues of access to her coasts, a delay of entire months can be counted on for general mobilization. Her covering is completely assured by the ocean and her navy. It is almost useless for her to have a standing army.

England is separated from the continent by seas controlled by her powerful navy and her danger is no more immediate than that of America. However, the narrower bodies of water are not the obstacles that oceans are and some new invention might neutralize them momentarily since aviation has so greatly widened its field of action. Therefore, although not in months, England can still count on a delay in weeks which will permit her to get on a war footing. Powerful as it is, her navy is an insufficient covering force in itself, so a permanent army is a necessity to her. It can be a modest one, nevertheless, a regular army without universal service.

Italy has a frontier protected by high mountains, but this is a very precarious defence. Roads and paths across the mountains and aviation is developing more every day. Italy can count on a delay

THE FIELD ARTILLERY JOURNAL

of days only and cannot content herself with a regular army to cover her mobilization.

And then consider France. Where are the oceans, the seas or even the mountains that will procure her the time indispensable for putting herself in a state of defence? She lies in immediate contact with her traditional enemy. The delays at her disposition must be counted in hours, not days. What, then, is the covering force on which France must rely?

An alliance? Actually alliances are not adequate protection. At the very first they discourage aggression by threatening dire consequences of any violence done and later they bring relief in the shape of powerful fleets and armies. God knows, alliances are valuable! But the fact remains that the preventive power of a threat is a problematical support and what we have got to have is protection on the day, even on the hour, and not on the morrow. That protection we alone can supply by means of a strong army and navy.

Belgium is in the same situation as France. Like her neighbor she has no natural protection and through bitter experience she has learned the brutal lesson of the value of treaties as a protection. She has not hesitated to rebuild her traditional institutions and make her own protection, in the shape of a permanent army, behind the cover of which she can pass from a peace to a war footing.

For nations in as exposed positions as France and Belgium the element of protection is intertwined with the time element, and we have a greater appreciation of the importance of the time element than anyone else. Several times during the war we had occasion to calculate very closely the delays necessary to complete the military preparations of other allied nations, to equip them for modern war and get them into the battle line. We can well remember how, as interested spectators, we counted the days and we knew what time was worth.

The reasons that compel France to maintain a strong permanent army are the necessity for furnishing the cadres for a general mobilization of the country and the necessity for protecting this tremendous operation. This army must necessarily be large because when time is lacking the two duties are inseparable. If the covering force is inadequate the enemy's troops, aviation and navy will arrive in the midst of our mobilization and all our preparations will have been for nothing. If the preparation does not include in time of peace all those organizations which it will be necessary to place quickly on a war footing, all the human, economic, industrial and agricultural resources of the nation, the accomplishment will take too long and the covering force will be crushed before the mobilization becomes effective.

MODERN WAR AND MACHINES

It is the essence of the war of machines to unite the organs of protection with the organs of the general mobilization. The advantage is sometimes discussed of having a regular army equipped with a very formidable armament under the protection of which it would be possible to organize a *levy en masse*. Aside from the fact that an army such as this would cost too much for the maintenance of its effectives alone, to keep up its matériel in step with the constant progress of industry would be ruinous to the nation and otherwise there would be the risk of its being caught by war with an antiquated armament. Behind the imposing facade of such a system there would be a great probability that the machinery for raising the *levy en masse* would rust and that the preparation would gradually become a paper preparation. Moreover, experience has shown this to be true. In 1867 Marshal Niel organized the national guard behind a regular army, but we know that the regular army was crushed before the guard had time to pass from paper to reality and the spectacle ended in tragedy. Between the covering force and the machinery of mobilization there must be more than a close liaison, there must be an identity of nature which will permit a constant interchange of elements so that normal life can continue, so that the regular pulse of the army will control the efforts of the nation and so that the progress of the nation can supplement the efforts of the army.

The army of universal service is an army capable of furnishing at the same time the machinery for a general mobilization of the country and a covering force as well. It has certain active elements, thoroughly trained in time of peace, which can absorb and coördinate all the forces of the nation in their particular capacities so as to make certain an orderly and efficient mobilization. It is possible that a regular army might furnish as solid protection, but it would encounter greater difficulties, to say the least, in making secure behind it the general mobilization of the country. It is possible that a militia army might be able to manage the organization of the country in a satisfactory manner, but it would certainly be incapable of protecting itself also at the same time. The army of universal service alone is capable of solving all the problems of organization imposed by the war of machines.

To say to Frenchmen that universal service is the modern form of an army is to make them understand in one word the solution of the problem and, at the same time, assure them that there is nothing to fear from the war of machines, terrifying as it appears to be, because no other country, except perhaps Germany, has the principle of universal service more in its blood than France. During the fifty years that the institution has existed it has permeated our customs

THE FIELD ARTILLERY JOURNAL

and habits to an extent which we do not realize. A superficial view reduces military service to the presence of citizens in barracks for one, two or three years and later to encampments of a month or a week. In reality the service has many other obligations which have become so customary that they are not perceived but they will have the effect of making easy the general mobilization necessitated by modern war.

Every French citizen makes a declaration and registers for possible requisition any property he may have such as a pure bred horse or a pedigreed percheron, all wagons and carts and all automobiles and trucks. This obligation has never met with difficulties nor will a similar registration of machines, turbines and even factories be difficult. Before the war there was a department of subsistence mobilization in every county and all mills, supplies of grain and herds of cattle were registered and allotted beforehand to the service of supply. Through the entire war this service functioned admirably and its organization even served as a model for all the similar services that were organized under the pressure of events to exploit the various resources of the country. The obligations to which the farmers submitted in peace time were no added burden in war and the same thing would be true of the metallurgists, the chemists, the weavers and the opticians.

Everyone understood the necessity during the war of having bread tickets, sugar tickets and coal tickets and no one should be surprised to see these devices put into use on the first day of the next war. It would be much more satisfactory to do this because a rationing of supplies installed thoroughly and efficiently at the very first would be much less severe than if suddenly imposed at the moment when supplies were almost exhausted.

In this way the nation will find itself ready, as a natural result of universal service, to defend itself successfully when the war of machines breaks out again. At the proper moment everyone will go to his post. There will be thoroughly trained cadres ready to coördinate all efforts and give them definite form and while the great economic, industrial and military mobilization is being developed a covering army will be on guard at the frontiers. Behind its machine guns, its field guns, its aviation and all its modern armament an atmosphere of order and confidence will be assured enabling the great French power to unfold itself unhindered. Guarded by its warships the flow of men and supplies will be established which over-seas France will send to support the home land. The country will be ready.

Thus after cheerfully carrying for fifty years their patriotic burden, the people of France will receive the remarkable benefit of

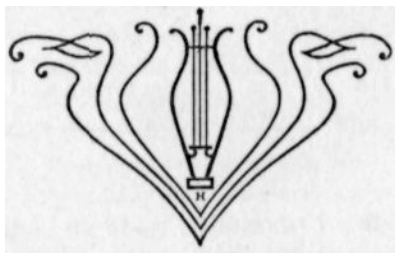
MODERN WAR AND MACHINES

being able to adapt themselves without effort to the exigencies of the modern war of machines. We may well be envied this privileged situation, but it should be recognized that we have earned it by a long period of toil, by self-denial and by bloody sacrifices. France deserves to have the power she holds.

What particular form to give that power is a question for parliament to determine, but public opinion has a good deal of weight in deciding the nature of the foundations on which our reorganized military institutions shall rest. While lightening the burdens of the country as far as is reasonable after a victorious war, the new plans will provide for a general mobilization of all the resources of the country behind an adequate covering force and this double rôle will be played by universal service.

Universal service is the foundation of every French tradition. In the hour of every great crisis the safety of the country has been assured by an appeal to the entire people. When Louis le Gros raised the standard of St. Denis and gathered the communal militia on the field of battle of Bouvines; when the Convention decreed the levy *en masse* and threw out thirteen armies to the frontiers of the Republic; when Jean d'Arc fought before Orleans; Villars before Denain, and Gambetta after Sedan they all saved the day by calling on the entire nation. We all realize it, we who lived through those four years in which the traditional French spirit rose to its highest level; begun by men of twenty to thirty years of age this war ended when everyone, without exception, men, women and children, made their contributions to the battle and then to the victory.

We are all pulling together and we can regard the future with tranquil confidence.



INTERCOLLEGIATE POLO

BY CAPTAIN C. W. YUILL, INF., A.D.C.

SECOND CORPS AREA POLO REPRESENTATIVE

THE Intercollegiate Polo Tournament held at Fort Hamilton was the first of a series of annual elimination tournaments to be played for the Lieutenant General Robert Lee Bullard trophy. The trophy was donated by the Second Corps Area Polo Funds and Judge William N. Dykman, President of the Association of Graduates of West Point. The trophy is to be played for each year, with permanent retention going to the first team winning it three times.

The schedule as played follows:

<i>Preliminaries</i>	<i>College</i>	<i>Score</i>	<i>Ponies</i>
1st Game—May 4th	Yale Cornell	20 3	Using own ponies. 6 own ponies and 6 Camp Vail ponies
2nd Game—May 5th	West Point Virginia Military Institute	9 1	Using Governors Island ponies. Using Fort Hamilton ponies.
3rd Game—May 8th	Norwich Harvard	12 2	Using Governors Island ponies. Using Camp Vail and Governors Island ponies
4th Game—May 10th	Princeton Pennsylvania	16 3	Using own ponies. Using four own ponies and eight Governors Island ponies.
<i>Semi-finals</i>			
5th Game—May 11th	Yale Norwich	25 2	Using own ponies. Using Governors Island and Vail ponies.
6th Game—May 12th	Princeton West Point	8 3	Using own ponies. Using Governors Island and Fort Hamilton ponies.
<i>Final</i>			
7th Game—May 16th	Yale Princeton	12 3	Using own ponies. Using own ponies.



THE FIRST SQUAD AT YALE

Reading from left to right: First team, No. 1, H. P. Baldwin, No. 2, R. L. Dean, No. 3, S. C. Hopkins (Capt.), Back, W. K. Muir, Second Team, No. 1, W. A. Herald, No. 2, R. Hartshorne, No. 3, A. A. Cairns, Back, S. Hewitt, Coach Major R. E. D. Hoyle, F. A., Below Stable Sergeant Jack Bullene and Mascot.



THE PRINCETON TEAM

Right to left: T. Baneroff (Back), W. H. Jackson (No. 3, Capt.), A. R. Weishaar (No. 2), C. W. Newbold (No. 1), and W. T. Fleming (Substitute).

INTERCOLLEGIATE POLO

The tournament was organized by the Commanding General, Second Corps Area, to help primarily the R.O.T.C. and through it college polo. The suggestion for such a tournament came from Captain Samuel White, Field Artillery, at Virginia Military Institute. An enthusiastic poloist, he desired to enter the Virginia Military Institute team to invade the North. General Bullard immediately greeted the idea enthusiastically, seeing the possibilities in it. He detailed the Corps Area Polo Representative, to conduct and manage the tournament, and this officer in turn called for assistance of material, personnel and ponies from Fort Hamilton, Camp Alfred Vail and Governors Island.

The result of the competition is making the R.O.T.C. popular with graduates, under-graduates, and boys preparing to go to college. In addition to giving the advantages of a military training, the sport of polo—the sport of princes—was shown as available to any student qualified to join the unit, and without additional expense to him. It served to bring together the military men of the different student bodies and created between the R.O.T.C. units a greater spirit of competition. By playing on a military reservation and under Army control, the students' acquaintance with and knowledge of the Army was materially broadened.

Invitations this year were limited to eight teams because of the expenses involved, there being no polo funds and a limited amount of Corps Athletic Funds available to back such a tournament. Each team on their invitation to enter the tournament was guaranteed the following expenses:

- (1) Transportation of ponies and orderlies.
- (2) Transportation for six players and a coach.
- (3) Hotel accommodations and meals at Fort Hamilton for the time necessary for the teams to be present on the grounds.

The financing of the tournament was accomplished by selling one hundred and fifty boxes, seating six persons at one hundred dollars each for the series. These boxes were sold to a few only of the many polo enthusiasts in and around New York City. Admission of \$1.50 for the reserved section and \$1.00 for general admission was charged. The financial results not only cleared all expenses, but built up a fund sufficiently large so that the limitation to eight teams will not be adhered to next year.

The tournament brought home to the civilian as well as to army spectators how much the R.O.T.C. has accomplished. Three of the players of the last American International Polo Team as well as the Presidents of the Outdoor and Indoor Polo Associations, attended the games. They were astonished to find that such good polo was being played in the colleges. The college players themselves were

THE FIELD ARTILLERY JOURNAL

of the keenest and finest types of the American college student. Their splendid sportmanship was shown by the occurrence of no incident of poor sportmanship during the entire tournament. The horsemanship of all the teams was very good. Perhaps the most astonishing fact, yet most creditable to the instructors, was that of the two teams competing in the finals, two men on the Princeton team and the captain of the Yale team had never ridden a horse before joining the R.O.T.C.

The polo history of the teams is interesting, though it is so short. The Harvard unit had never played polo before this year, but organized a team on the receipt of the invitation and made the start. Cornell has made a recent start but an enthusiastic one. Both Harvard and Cornell made a creditable showing with the chance next year of coming out toward the top. Pennsylvania is located in a great polo centre, and has a good team with excellent spirit, but no mounted R.O.T.C. unit to foster it. Virginia Military Institute is the only southern college playing polo. They have been playing only a couple of years. Norwich, Yale, Princeton and West Point have been playing polo for the last three years or more.

The final game—Yale vs. Princeton—was fast polo; far above the average game played. Major Devereaux Milburn, America's No. 4 on the International Championship Team, who refereed the game, said that it was splendidly played. Major R. E. deR. Hoyle, F.A., and Major J. E. McMahon, Jr., F.A., merit high praise for the teams they developed, Yale and Princeton respectively, and both deserve congratulations on the results that they have accomplished.

During the games, numerous inquiries were made by parents and by boys themselves, if upon entering college, any student qualifying could enter the R.O.T.C. These boys are becoming enthusiastic about joining the R.O.T.C. and entering into its activities. The Alumni of the Virginia Military Institute held their annual dinner in New York City on May 15th, the night before the championship game. The conversation on college athletics dealt almost entirely with polo. Reports from other colleges are the same and to the effect that their athletic councils are now going to recognize polo as a minor sport.

All the teams in the tournament this year expressed their desire to enter the Second Annual Tournament and in addition other colleges have written expressing their desire to enter their teams. The interest shown by everyone assures the authorities here of a great improvement in college polo, both in the teams and in the ponies for next year, and that this tournament will be made an annual affair, becoming more popular each year.

FORT SILL IN WARTIME

BY CAPTAIN E. DURETTE

(From an article in the *Revue D'Artillerie*, translated by the author. Captain Durette was the senior French officer on duty at Sill during the war courses. He directed the work of the other French officers, reporting directly to the Commandant of the School for his own instructions. By his unfailing tact and high professional ability he proved a most valuable aid.)

FORT SILL, in the State of Oklahoma (north of Texas), consisted, at the beginning of 1917, of two distinct groups of buildings: the "*Old Post*" and the "*New Post*." The first consisted of a few stone buildings built about sixty years ago, a relic of the last Indian wars. The second, about eight years old, consisted of modern and comfortable houses.

Fort Sill, as a Field Artillery School, had interrupted its courses since the recent fighting on the Mexican Border, that is to say, three years before. The school buildings were two wooden buildings, one which served as a lecture hall and the other which formerly housed the detachment of soldiers and noncommissioned officers attached to the school.

The school administration had at its disposal a very large reservation, exclusively devoted to the use of the school and the garrison of Fort Sill. Oklahoma was formerly the Government Indian reservation and there lived the various tribes, the names of which are familiar in France: the Apaches, the Sioux, and the Comanches, situated in the arid part of the great dry country which is called the Far West, where rain rarely falls, and has an exceedingly hot climate reaching, during May to September, 113° to 122° F. No vegetation can resist it. In September, a mild and temperate season succeeds these great heats and lasts till the winter, which is not very rigorous. This period, from September to December, is called "Indian summer." Occasionally, severe changes of temperature with violent winds, are the forerunners of terrible storms or whirlwinds, cyclones of dust, which prevent any outdoor work. They are fortunately somewhat rare.

Fort Sill, which had a limited idea of modern war—experience being confined to operations on the Mexican frontier and the manœuvres of the peace-time garrison which participated—was destined to receive thousands of artillery officers on the declaration of war with Germany. On the arrival of the first French artillery officers, August 3, 1917, seventy officers living in tents were finishing a special course begun two months previously.

THE FIELD ARTILLERY JOURNAL

From among the seventy officers who followed the special course, Colonel Snow (at present Major General, Chief of Field Artillery) chose a certain number as instructors at the school. It must be noted that all these officers were remarkable from all points of view, for the most part coming from the U. S. Military Academy at West Point, N. Y., they constituted a solid nucleus for the instruction in artillery to be given at the school. Wisely assigned according to their knowledge, they received an excellent preparation during a few weeks before the arrival of the "First Class." They have given, thanks to their application, activity, zeal, ardor and will to succeed, a most satisfactory result and all that could be hoped in such a rapid improvisation.

Their experience permitted the initiation of other officers in the duties of Instructors. Little by little, their desire to go to the front, the needs of the different services, resulted in most of these pioneers leaving the school by June, 1918. They were replaced by others coming back from France, who had had some experience in the present war.

In August, 1917, there were at the disposal of the School for exercises, manœuvres, etc.:

Two 3-inch gun regiments (1st and 14th).

One heavy gun regiment (9th).

Two motor-truck companies.

These units were what we call in France, on "a reinforced peace organization," each commanded by a colonel. These officers reported directly to the "Commandant of the School" and were not included or attached to a tactical formation (*i.e.*, division of army corps).

The armament consisted at that time of the 3-inch gun, the 3.8-inch light howitzer, 4.7 gun, and 6-inch guns. The following French and British matériel was added in October, 1917. The different types of matériels were:

Three batteries of 75, model 1897.

Four 155 C. Schneider howitzers.

Two others were received at the beginning of 1918. The British matériel arrived at Fort Sill in 1918, *i.e.*, one battery of 18-pounder gun and one 4.5 light howitzer.

On the 18th of September, 1917, the American Government allowed a first credit of \$5000 in order to buy ground in the neighborhood of the firing-ground, and of \$730,000 designed for the erection of a modern Field Artillery School with all necessary comfort. The work began immediately. The hiring of 2000 or 3000 workmen resulted in less than forty days in building all the buildings necessary for lodging the instructors, the students, and the different services of the School.

FORT SILL IN WARTIME

A central building (Snow Hall) consisted, besides the "Office of the Administrator," of eight lecture-rooms sufficient to contain all the students of the same class (200), a room for cinematographic projections, and about fifty smaller rooms, each of them being designed for one section of the same class. Special and well-designed rooms were allotted to the Photographic and Drafting Departments.

In addition to Snow Hall, a separate building, composed of two large sleeping rooms, a lavatory, dining room, etc., was erected for each class of students. Buildings to lodge the future instructors were erected in the vicinity of Snow Hall. There was a large library, a Mess for instructors, and different services and workshops (tailors, hairdresser, etc.). All these different buildings were provided with water, heat, electricity, indoor and outdoor ventilators in all the rooms. Each building bore a number like the streets of a town and the streets were designated by name.

A "School of Arms" (Infantry) was established at about 300 yards from the School of Fire, in the buildings of the Old Post. In consequence of the great importance developed by the Field Artillery School, the Infantry School was ordered in September, 1918, to Georgia. Its buildings were given up to the School of Fire. The grounds in the vicinity of the camp had been left at the disposal of the infantry students who had, with the coöperation of the French engineers and infantry officers, organized a "real war" sector.

The vast extent of the firing practice ground (22 kms. in length, 18 kms. wide) was explored in order to decide on numerous positions for the different batteries. A sector was also established, representing enemy positions. This work was done by the personnel of the Field regiments under the direction of the school instructors. These defensive positions were visited by the students of each class in the proper time. All the material needed for the construction of trenches, batteries, covers, dug-outs, front-line shelters, concrete shelters, observation posts, different liaisons and communications, were supplied rapidly and liberally. Eighteen to twenty battery positions were built and equipped. A complete infantry sector was organized, in every respect similar to those at the Front.

An Aviation School was erected about two miles from the School of Fire. The hangars, built in a short time, accommodated sixty aeroplanes. The course began on the 18th of September, 1917. A detachment of Aero Company No. 3 had two balloons at its disposal in the vicinity of the aerodrome. The Aviation School was a school for aeroplane and balloon observers. The students were ordered there for eight weeks. They attended special lectures daily at the

THE FIELD ARTILLERY JOURNAL

School of Fire, covering subjects they must be acquainted with in connection with their work as observers.

The students who composed the first class called "The First War Class," with the motto, "On the Way," comprising one hundred officers, arrived on the 27th of September, 1917. The greater part of these officers were of the rank of colonels and majors. Each week a new class reported to the school. The course lasted ten weeks, so, after a few months the arrival and departure of the different classes was coincident and the normal capacity of the school of ten classes (2000 students) was established.

Beginning with the third class, whose arrival was delayed on account of delay in the construction of buildings, this plan became effective, and by March, 1918, it was being carried out regularly. The students of each class arrived at Fort Sill on Sunday morning—a few on Saturday—and on Monday morning began the course by attending an introductory lecture by the "Commandant." The daily schedule was from 7:30 to 11:30 A.M., not counting the time necessary to reach the firing positions (in case of firing practice), and from 1:30 to 4:30 P.M.

On Saturday mornings examinations took place in different branches of the course. These examinations were very severe. The officers who did not succeed in their examination were immediately ordered before a Board of Instructors who ordered their immediate dismissal if warranted. I must confess that those who were subject to this disciplinary measure showed a real despair. Besides these working hours, special lectures were often given from 5 to 6 P.M.

As stated above, the general program was outlined for a ten weeks' course. The indoor instruction lasted one hour, the outdoor two or four hours according to the kind of work, reconnaissance or firing practice and observation.

Firing practice started from the fifth week. Each class consisted of six sections: Two for heavy artillery and four for light artillery and trench mortars. Each student had the direction of the fire once every other day, so he handled during the course fifteen problems in firing. The expenditure of ammunition was not limited. Shells were furnished in as great a number as was necessary for the solution of the problem.

Several battery and battalion evolutions took place during the last weeks of the course. All these manœuvres had a well-defined purpose; they were ordered in conjunction with aviation and furnished with all indispensable details. They always ended with a firing practice adapted to the situation.

During the last week, an organized infantry sector was occupied for twenty-four hours by the students of the class. All communications

FORT SILL IN WARTIME

and liaisons were established. Infantry commands and units were represented, different kinds of fire were executed, especially during the night, as ordered by the Director of the exercise.

The students reached the positions in trucks. Daily firing which took place in ten different emplacements required a very large and active service. The ammunition service was well established, the depot stations were supplied directly by the railway.

The program, very complete, as it was intended to prepare a Battery Commander for all his delicate functions in ten weeks, was followed regularly and with application by the students. In spite of severe discipline, which applied to the colonels as well as to the captains and lieutenants, the students had a real zeal and a fine spirit. They applied an enormous energy, and often, the time fixed for the end of their work (midnight) found them busy, working hard, at their desk. In spite of the excessive heat, they endured gallantly the four hours they had to spend in the sun for firing practice in summer. This gives an idea of the purpose and moral effort they showed during their course at Fort Sill.

OBJECT OF THE SCHOOL—THE TEACHERS

The first aim of Fort Sill School was to give the students the minimum of technical knowledge necessary to enable them to handle a battery in battle. In 1917 a certain number of officers left Fort Sill fit for this work.

The "School of Fire" of Fort Sill was intended as a general artillery school. It began "its great course" on the 27th of September. It was attended by three hundred students, from the rank of captains to colonels. The program of Instruction was carefully elaborated with the personal coöperation of several French officers. In 1918 the school was transformed little by little into a real Artillery School whose objects were:

- (a) To create officers able to handle a trained battery.
- (b) To give to a certain number of officers a supplementary instruction in order to enable them to train their battery, as well as officers and noncommissioned officers besides.
- (c) The preparation of "candidates" for the duties of lieutenant.

The American Artillery Summer School being a school of improvement, whose general program was established for the tactical employment of artillery and different matériels in battle, most of the students who took the course in August, 1917, were assigned as Instructors of the first class. Between the end of their regular course and the arrival of the students of the first Class, they took an extra course for the purpose of specializing in certain branches of instruction. It would have been impossible at that time to have

THE FIELD ARTILLERY JOURNAL

had the same officer teach and direct the students of the same section in all the different applications of the program. Everybody had to hurry, to act quickly, and to apply the program as well as possible. The solution which was taken may perhaps be criticized, but it seemed the most practicable at that moment.

This is the reason why we find, at the beginning, Instructors specialized in the following branches, from which were formed the different Departments of Instruction at the school:

Department of Tactics—Drill regulations, firing data, drill of gun squad and firing battery, marching commands, etc., observation of fire and firing.

Department of Liaison—Communications.

Department of Artillery Engineering—Topography, reconnaissance, cover, shelter, etc.

Department of Practical Ballistics—Probabilities, range tables, close shooting, etc., maps and map firing.

Department of Material—Battery organization and interior economy, matériel (general and special) and ammunition.

Department of Artillery Transportation—Equitation, hippology, harness, draft, driving, motors and tractors.

The Commandant of the School immediately saw the difficulties he had to meet with such a distribution of general instruction. With the numerous instructors whose number, in October, 1917, reached about 180, it was possible at the beginning of the year to consider the reorganization of the program, so that in April, 1918, only three distinct Departments were managing all branches of the course. This was the final step before reaching the aim of concentrating all the different branches in the hands of one officer in charge of the general program.

The three Departments were:

Department of Gunnery—Trajectory, dispersion, estimation of distance, firing data, meteorological data, conditions of the moment, range tables, principle of terrestrial observation (axial, bilateral, lateral observation), aerial communication, service practice, conduct of fire, airplane, balloon observation, firing from the emplacement, and an inspection trip to aviation and balloon fields.

Department of Reconnaissance—Maps and sketches, area sketch, panoramic sketching, preliminary battery reconnaissance, practice with French coördinates, elementary topographic observations, use of battery emplacements, observing stations, map problems, aerial photography, fundamentals of artillery tactics, technical handling of a battery detail, a battalion detail, field engineering, visit to emplacements,

FORT SILL IN WARTIME

camouflage, battery reconnaissance and occupation of positions, occupation of trench positions, of a prepared position, and field demonstration.

Department of Matériel and Transportation—Telephone wiring, test methods, ground communication, fire control instruments, general description and nomenclature of different matériels (3-inch, 75-mm., 4.7-inch, 155 howitzers, 6-inch, 3.8-inch), care of these matériels, fuzes (application and uses), machine-gun, German artillery, French artillery ammunition, special projectiles, supply and care of ammunition, automobile, internal combustion engines (heavy sections), general description of motorcycles, Holt tractor, driving trucks and tractors, equitation, harness adjustment, principle of draft and driving, inspection of full pack and artillery and administration of the battery.

Artillery schools, in their teaching, are the application of the ideas of the Chief of Artillery. They represent for him the means by which he may effect organization, and supervise the instruction of officers and candidates.

The School at Fort Sill, which is the great improvisation of wartime, has at its disposal all necessary matériel. It is the school where practical demonstration has reached its greatest development and also where we find now the newest improvements.



THE SEVENTH

BY COLONEL L. R. HOLBROOK (F.A.), G.S.C.

"COLONEL, can you say something about the Seventh?"

"Can I? Of course—I always do when I get a chance. It was the best regiment that ever went over and the best that ever came back."

"Yes, but why?"

"Well, not because of the superman type—no, I doubt whether we were 'average' when we left—perhaps not even so good as that!"

"What! You don't mean it! You must explain. We thought we were the country's best."

"Yes, of course, but it's so easy to be wrong. Let me explain. You know that when the war broke out the Seventh was only a little youngster you might say, still in swaddling clothes, scarcely a year old. We could hardly yet stand alone, much less walk. Months later the French led us by both hands and then by one, and then? . . . they watched our cautious step grow strong, and then side by side we fought—and then we led and cheered them on!!

"Yes, our peace-time regiment of 750 men was, in June 1917, cut in three parts; two parts were removed, each to be used as a starter for a new regiment. Many of our older officers were sent to other units, and many of our most experienced noncommissioned officers were lost to us through promotion and transfer to other regiments, and so it was that almost on the eve of departure, a month before sailing, we were reduced to 240 men and a handful of officers."

"Yes, and then what came?"

"Our Salvation! The bugle sounded the cry 'to arms' and the President called for men—real men, volunteers for service at the front—and who answered? Red-blooded men who said, 'Let's Go!!' They dropped the sickle and the plow, the hammer and the saw in answer to the call, and soon in one short month we were 1400 strong, rolling along from Fort Sam Houston to the East."

"Yes?"

"Yes, 'Pershing's Own!!' Selected to uphold the best traditions of our army in France—perhaps the most motley array of 'regulars' that ever left our shores, undisciplined, untrained, untried, but full of life and spirit, living now for our country, consecrated to its cause, ready to live hard while we lived and to die hard if die we must—and we were part of the 27,000 that sailed with the First Division, and nearly 25,000 of the First Division were killed or wounded in France!

"Do you remember how each man passed in the name of his

THE SEVENTH

nearest of kin to be notified in case he did not return? Let us pause in reverence and be silent for a moment in memory of those whose cards were drawn from the files.

"You remember how we lay at anchor behind the anchor chains in New York Harbor far down the stream and how the chains parted and we sailed out into the Blue. In my reveries I still see the young boy standing next at the rail gazing dreamily out towards the East and the distant horizon behind which the most horrible drama of history was being played, and in which he was soon to take a part. He turned his head to the West, doubtless picturing in contrast the peaceful home and the loved ones he had left; his eyes moistened and, lost in thought, he bravely swallowed the lump in his throat and went below.

"We sailed the northern seas and for weeks zigzagged through fog and rain and chilling winds; ice-bergs were on the horizon, and the enemy's submarines—well, just where? And the ropes that hung close to the sides of the ship for escape into the seas in case of disaster! I shiver now as I think how cold and leaden, uninviting and deep, was the watery grave that lay below, for in case of attack transports were to scatter for safety, and we—well, we could swim for shore!

"You remember the thrill as the shores of France rose in sight and the aeroplanes came to welcome and escort us in, the first field artillery brigade to reach the shores of France, and the Seventh in the lead!! The French inhabitants crowded the pier at St. Nazaire and the Poilu just back from the English front cried out 'H-a-l-l-e-o!' in welcome to America's 'First Overs.'

"Can I speak of the Seventh? 'Tis hard to stop as I recall the '*voyage*' towards the Swiss frontier in cars built for '*40 hommes ou 8 cheveaux*,' the dawn to darkness preparation for combat at Valdahon, and oh! those beet-fed, fat, flabby, rejuvenated French war horses invalided back to us from the front, forever insisting that for them the war was surely over, so why worry!

"Never will I forget that conference when regimental commanders were told to strip for action and move to the front according to the train schedules. We were to enter the line somewhere near Luneville and would now, just for instruction fire into the German lines and they would reply and we would suffer losses. So it came to pass that we cautiously entered the lines in the Somervilliers Sector and received our baptism of fire in October and November 1917.

"It was here that Battery A, 7th Field Artillery, put down the first American barrage in response to rocket call for help from the front, and America entered the war.

"The cold north breeze swept across the snow-covered ground and half frozen marshes while our batteries 'dug in' making splinter

THE FIELD ARTILLERY JOURNAL

proofs for themselves and cover for the guns. Under battle conditions we began with nothing but a 'site,' and with strong hands and hearts struggled for the ideal—almost attained, when we were withdrawn to winter billets for division training and manœuvres, against the uniform protest of officers and men to stay at the front. However strenuous may have been those days at the front, infinitely were they to be preferred to our crowded billets at Biencourt, and Couverpuits in the Gondrecourt area. It was here in the Valley of the Orne that we struggled to perfect our knowledge of artillery support and to learn our part in action. With body and soul in our work we scorned the drizzling rain and mud, the cutting north winds and the stuffy, smoky billets; but we pitied the horses hopelessly existing on one fourth forage, eating their very mangers and dying of starvation and exhaustion. Daily their numbers dwindled in this Valley Forge! Seventeen fell by the wayside out of less than a hundred in a single days' manœuvre! Regulars as we were, the world will never know of the actual hardships endured by the First Division during the winter of 1917-1918 in this area. Cutting the green saplings from the forest for fires that sizzled without heat; with no decent facilities for bathing or laundry or recreation, we heard not a word of complaint but instead the men, though suffering from engelure (frozen feet) vied with each other in being useful to the enduring inhabitants. There were, to be sure, some at home who knew our plight and toiled ceaselessly for our comfort. While 'Welfare Societies' had failed to reach us, I know one Colonel's wife who through endless toil, self-sacrifice, economy, and pin-money got through to 'her regiment' over 600 pairs of woollen socks beside sweaters, scarfs and helmets, doing more to help win the war than many another who served at the front.

"The inhabitants of Biencourt and Couverpuits numbered but 100 each but they gave us their all to help care for some 1400 men and as many horses crowding their spare rooms, their stables, their hillsides and streets. These dear old peasants will never forget our help in cutting up beets for their stock, threshing out their grain, cutting their wood and cleaning the streets—nor the Christmas trees burdened with gifts that brought joy and comfort to their children. Nor will we forget the forbearance of these kindly people, the discomforts and sacrifices they made for us as day by day we heard the enemy's guns just over the horizon, spurring us on to greater efforts in preparation for the approaching conflict.

"Our entry into the sector 'northwest of Toul' was made with clock-like precision. The absence of noise, confusion or excitement in making the relief, the prompt organization of command posts and of observation posts, the establishment of communications and liasion, gave us confidence in ourselves and exhibited qualities

THE SEVENTH

in training and discipline that now marked us 'above average.' Supply trains moving without lights on dark and stormy nights, batteries digging into new positions, 'strafing' back and forth, parties raiding the enemy's trenches, inflicting and sustaining losses during those three months of training, where we held a broad sector unsupported and alone, advanced us to the rank of Combat Division. From now on to the end of the war we were continuously in the fight except when temporarily withdrawn to make good our losses or to move into new positions.

"So vivid is our memory that it is unnecessary to record that it was here in the Toul Sector that Private Adams of Battery D was the first Light Artilleryman to give his life at the front, and that it was here that Lieutenant Jeff Feigl, on duty with Battery F had his name placed on the honor roll of artillery officers 'who unhesitatingly gave their lives in the cause of liberty and justice.' Tenderly we laid them to rest in the little cemetery at Mandres—and shrieking shells passed close over our heads while we performed the last rites to those heroes who forever are the first.

"After 3 months in the Toul Sector we were thrown across France for a sacrifice if need be, in halting the Hun then driving swiftly forward between Aimens and Montdidier. Our part in the war from now on, through Cantigny, Soissons, St. Mihiel, the Argonne, to the heights above Sedan and in the Army of Occupation, are matters of history, but the prolonged artillery fire in the Cantigny Sector still rings in my ears—the darkness of those nights when we marched towards Soissons, the rain, the road congestion, the uncertainty that arose from ignorance of almost everything as we cut into the pocket will ever rise as a nightmare before me and the words of our commander remain unforgotten—'Let no man feel that he is tired so long as he can put one foot in front of another; demand the impossible in order that the possible may be accomplished'—and from across No Man's Land came the wail of the Hun 'Give up no ground to the Americans, for we will never get it back; their artillery is crazy, their infantry is drunk' . . . I believe we merited the fine commendation of our commander-in-chief on a visit to our front when he said: 'I find here a spirit of service and a high state of morale never broken by battle or by hardship.'

"'Above average' we certainly were—perhaps even 'superior' we had now become. The unselfish sacrifice of officers and men, their loyalty to me and their perseverance of purpose will ever urge me on to higher and nobler service; the ideals they sought and traditions they established will ever awaken the spirit and lead on to victory those whose good fortune it may be to follow the banners of the Seventh."

UNIVERSAL CROSS-COUNTRY CARGO VEHICLES

BY "TRAIN COMMANDER"

THE Ordnance Department is now investigating the possibility of a cross-country cargo vehicle which will serve all the arms in the advanced echelons of the army in the field. The advantages of such a vehicle are obvious from the point of view of cost, procurement, issue, repair, etc., etc. It would carry for everyone the common article of food. It would serve to different units the various types of ammunition in the varying amounts required. It should transport, in the ideal condition, all the assortment of signal, ordnance, engineer, infantry, artillery and cavalry equipment and accessories.

A determinate study must take into consideration many things. In the first place, each branch of the service stands ready to argue for the points desirable from its point of view. Next will enter a question of horses and motors. If a selection of motor-transport is made, the question of a self-contained vehicle or a traction unit with a trailer arises. From among the self-contained vehicles we may select a truck, a tank or a tractor type.

It is believed the Tank Corps favors a tank type with the fighting body replaced by a cargo-carrying receptacle. Each branch has its special wishes, however, a closer relation seems to exist between the characteristics required by all arms than is generally conceded. It is probable, however, that the universal vehicle in its perfect sense cannot be found, but that a great reduction in types may be achieved.

The following aims to present a few considerations which enter a Field Artilleryman's mind. The advantages and disadvantages of our present escort wagon being pretty well known, they are not touched upon; nor does the writer feel competent to offer an analysis of the question—horses vs. motors. This paper deals with motors.

With the increase in use of motor transport, it is clearly apparent that some means must be devised for expanding its satisfactory employment beyond the area of good roads which can be negotiated by standard trucks. Considerable study has been given this problem and several experimental vehicles have been produced by the Ordnance Department. Though this work has only met with partial success, it has indicated four rather distinct lines of development, as follows:

- (1) The caterpillar caisson or tractor caisson, which is essentially a conventional tractor designed, however, primarily as a weight-carrying rather than a draw-bar vehicle.

UNIVERSAL CROSS-COUNTRY CARGO VEHICLES

(2) The convertible vehicle in which the track may be applied when required and removed for travel on good roads, leaving in the latter case a conventional truck.

(3) Various forms of tracks or adapters applicable to commercial vehicles without great alteration to these vehicles. This includes the band track of Chase design, several forms of caterpillar adapters applicable to the rear axles of commercial trucks, as well as the Kegressee-Hinstin adapter.

(4) A draw-bar tractor towing cargo trailer or trailers of wagon cart or limbered type.

While the lines of development indicated in (1) and (2) above are interesting in their application to special-purpose vehicles and future possibilities in these types of transport are seen, it is felt that they cannot in the near future lead to the fulfilment of our needs, either in quality or quantity.

Disadvantages now seen in these types, as compared with the draw-bar tractor and towed load, are:

- (a) Less efficient in the transportation of a given load.
- (b) Less mobile, due to concentration of weight.
- (c) Less flexible—both in manœuvre and employment.
- (d) Greater vulnerability and more difficult to conceal.
- (e) The commercial field has not yet reached this stage of development, and consequently their adoption from that field is difficult.
- (f) The cost of their development and production in necessary numbers is prohibitive.

For the above reasons, elimination of these types from present consideration as vehicles suitable for general cargo transport seems advisable.

Sub-paragraph (3) above indicates a line of development that is already reflected in the commercial field in the form of several types of adapters applicable to the commercial trucks and the Kegressee-Hinstin track applied to the Citroen car. This method of increasing the mobility of weight-carrying vehicles should be followed with study and experimental work in close coördination with commercial work of the same type. It should be borne in mind, however, that this solution of our problem is subject to most of the disadvantages noted above in conjunction with the lines of development referred to in sub-paragraphs (1) and (2).

In any consideration of this problem, there is great difficulty in separating the ideal from the practical. The artillery in its early

THE FIELD ARTILLERY JOURNAL

attempt at its solution has sought, combined in a single vehicle, the mobility of the truck and the caterpillar in their respective fields, and the speed of the motor car. All of these features, we realize, are highly desirable and it has been hard to eliminate any of them from our requirements. However, one by one they have been weighed against the numerous disadvantages met in study of the design, construction and procurement of such vehicles; and our specifications have gradually been changed until now we demand little more, if any, than can be found in the commercial field.

The commercial field has for its development work far greater resources than we can contemplate under the best conditions. The development in this field is continuous and progressive, though at times it may be considered conservative and rather slow; for they cannot afford, as ourselves on some occasions, to look beyond what is reasonably assured as a practical success. Their general aims and desires are not radically different from our own. They are constantly seeking increase in mobility, in reliability, and in the efficiency of their vehicles for the transport of cargo. It is true, many of the requirements toward which they work are less rigid than those encountered in the military service, but the general trend of these requirements is toward a vehicle which, though not the ideal from our point of view, is entirely practicable and will at all times be available with the latest tried improvements embodied.

Even though our work in study and design should devise a vehicle which would fulfil our needs in an ideal fashion, it is extremely doubtful that we could obtain its production in time of peace; and its production in war would be at great cost and interference to other industrial activity. However, it is thought that we can, in time of peace, considerably influence construction in the commercial field to follow lines which are manifestly advantageous from a military point of view and do not adversely affect commercial use. This influence may, for instance, take the form of increased reliability and accessibility, increases in strength and quality, and designs capable of slight alteration to produce the higher speeds desired in military use. Such consideration of our needs is now a factor in the study and design of commercial products by one of the largest producers of caterpillar tractors in the country; and through a display of sufficient interest in their vehicles and an assurance of their use in time of necessity, many other producers may be influenced in their design to our advantage.

Coming to the needs of the field artillery, I feel that for the divisional artillery, all vehicles, with the exception of light reconnaissance



ALL IN THE DAY'S WORK



AN AMMUNITION WAGON IN 1918



AMMUNITION TRAINS MOVING UP TO BELLICOURT ACROSS THE
HINDENBURG LINE



AMMUNITION TRAINS BEING RUSHED TO THE FRONT BEFORE THE
SOISSONS DRIVE

UNIVERSAL CROSS-COUNTRY CARGO VEHICLES

cars and motorcycles, forward of the regimental headquarters, should be towed by a standard light tractor used throughout the division. This light tractor would be used for towing the artillery carriages as well as a cargo transport vehicle of approximately the same mobility, and other essentially special vehicles, such as reel carts, etc. Within the regimental headquarters and higher echelons to the rear, trucks will replace the tractor-drawn vehicle to a greater or less degree.

The strategic mobility of the artillery so equipped would require, when greater speeds than obtainable from the tractor are desired, the transport of these tractors in trucks, the truck towing in rear the tow of the tractor. With the light tractor considered, no great difficulty should be encountered on this account. However, it is thought that except for moves in small commands where extreme speed is necessary, the convoy speed of the tractors themselves will be satisfactory.

With the medium (Corps) artillery, we find a considerably heavier weapon than that with the division, for which a larger and heavier tractor has been prescribed—a tractor of about $7\frac{1}{2}$ tons weight. There are several tractors of approximately this size and type available in the commercial field, and though no active test of such a tractor is now being conducted, it is contemplated, as funds for the purpose become available. It is thought that the supply of this tractor from the commercial field without undue sacrifice in the characteristics we require, is highly probable.

A reduction in the types of motive power within a command indicates the use of this tractor not only for the traction of the artillery matériel, but for the draft of suitable trailers to supplement the motor truck when necessary in the supply of ammunition, and general cargo for this matériel.

The strategic mobility of this matériel would be obtained as suggested for the light matériel, through the movement, where high speed is required, of the tractor on a heavy low trailer drawn by trucks which likewise draw the matériel itself.

For the heavy (Army) artillery, our present requirement is a tractor of approximately 15 tons weight. The commercial field from which such a vehicle can be obtained is extremely limited, and it is doubtful that such a heavy vehicle designed for commercial use and approximating in characteristics our requirements can be obtained.

A consideration, however, which is believed to be well worth careful thought, is that of the employment of the medium or corps tractor in units of two as the motive power for this matériel. Such a solution has the advantages of:

THE FIELD ARTILLERY JOURNAL

- (a) Reducing the types of motive power required;
- (b) Broadening the commercial field from which this motive power can be obtained;
- (c) Probably increasing both the tactical and strategic mobility of the matériel.

On the other hand, disadvantages and objections to this solution are readily seen, as follows:

- (a) Two tractors in tandem are more difficult to handle than one;
- (b) Somewhat greater road space required;
- (c) Greater original and upkeep cost.

However, these disadvantages are partially offset by the added flexibility obtained through the use of small units and the fact that the increased cost thus suggested is applicable but to a comparatively small part of the artillery.

The supply and strategic mobility of this matériel would be similar in principle to that outlined under medium (Corps) artillery, it being borne in mind that the relative importance of the motor truck for direct supply increases rapidly with an increase in calibre and weight of matériel.

Various types of vehicles have been studied and some constructed in the attempt to develop a suitable cargo-carrying vehicle for draft by the draw-bar tractor. Most of this work has contemplated the caterpillar type, which on test has proven unsatisfactory and, it is thought, impracticable for this purpose. A few types of commercial trailers have been tested, but sufficient effort to adapt the best of these commercial vehicles to our use has not been made.

Through an extensive and practical test, the Field Artillery has found marked satisfaction in its ammunition vehicle for the light field gun, *i.e.*, the caisson and limber. The limbered characteristic of this vehicle give to it a mobility as well as a flexibility of handling and employment that is not obtained in vehicles of the wagon type.

There are now on hand several thousand of these vehicles which are to be salvaged. Without undue expense, they can be converted through the elimination of the present ammunition chest and its replacement by an open-top body, into a 2-wheeled cargo-carrying vehicle. Two of these limbered would form a 4-wheel load.

Such a vehicle as this, it is thought, would generally fulfil the requirements for cross-country cargo transport within the division, and offers promise of more practical advantages than any other type thus far considered. These advantages briefly outlined are:

1. *Motive Power:*
 - (a) Light tractor standard within the division;
 - (b) Available commercially.

UNIVERSAL CROSS-COUNTRY CARGO VEHICLES

2. *Cargo Vehicles:*

- (a) Simple, sturdy and easy to manufacture;
- (b) Mobility equal to that of division gun;
- (c) Use in units of one or more, depending upon conditions of draught;
- (d) Each unit sufficiently light to be easily man-handled;
- (e) Ratio of pay load to weight of vehicle greater than unity;
- (f) Easily concealed;
- (g) Sufficiently light to be handled in single units by the smallest of commercial tractors.



CURRENT FIELD ARTILLERY NOTES

The Field Artillery Board

AT the beginning of the present year the Field Artillery Board had on hand the following subjects for trial, experiment, preparation or investigation as the case might be:

1. Reel carts.
2. 105-mm. German howitzer.
3. Adjusting artillery fire from balloons and airplanes.
4. Self-propelled mounts.
5. Divisional tractors.
6. Experimental ammunition for 75-mm. guns.
7. Experimental 4-round ammunition boxes.
8. A. B. No. 3 fuzes.
9. Saddle-bag modification for dismounted canteens.
10. 15-ton Barrett automatic lowering jack.
11. Caterpillar adapters for 8" howitzer and 155-mm. guns.
12. Divisional guns.
13. Washers under fuzes, 155-mm. howitzer ammunition.
14. Horseshoes, non-slip.
15. Tractors, reconnaissance.
16. Modification of aiming stakes.
17. Periscope, observation.
18. High burst ranging.
19. Sound and flash ranging.
20. Tables of equipment, field artillery.
21. Training regulations.

Since the beginning of the year, the following subjects have been submitted to the Board:

22. Flashless powder, P. A. No. 2.
23. Powder charges, experimental, 155-mm. howitzer.
24. Experimental sight mounting for 75-mm. gun, French.
25. Flashlights.
26. Waterproof clothing and tents.
27. Special regulations for gunners' examination.
28. Laced boots for enlisted men.
29. Signalling panels.

The following is a short description of the foregoing subjects and a short summary of what has been done by the first of June:

Reel Carts.—This is a study of battery and battalion reel carts to determine if the present type is satisfactory, or if not, to devise improvements. Certain modifications have been made, which so far have proved very satisfactory. Test is not complete.

CURRENT FIELD ARTILLERY NOTES

105-mm. German Howitzers.—After the war the War Department found itself in possession of about one hundred 105-mm. German howitzers. In order to use these howitzers with American ammunition, it will be necessary to rechamber them. The test before the Board is for the purpose of determining the suitability of these howitzers for divisional howitzers, to supply present needs and also war needs before production could be attained on the newly designed divisional howitzers. No progress has been made on this subject, as the ammunition is not yet available.

Adjusting Artillery Fire from Balloons and Airplanes.—This title is a misnomer, the subject was actually a text of the suitability of two instruments designed for the purpose of locating targets by an observer in a balloon or airplane. Neither instrument proved at all satisfactory; but ideas for a new design were worked up, which, it is hoped, may be incorporated in a new and more satisfactory instrument.

Self-propelled Mounts.—There are under test at present, a Holt, Mark VI, 75-mm. Mount; an Ordnance design 1916, Mark VII, 75-mm. Gun Mount; and a Christie mounting either a 75-mm. gun or a 105-mm. howitzer. This test is to determine the mechanical suitability of the mounts and to secure the Board's recommendation as to their tactical use. In addition, this test is to determine the value of the convertible wheel and track principle as illustrated in the Christie. The test is about completed and will be sent to the Chief of Field Artillery very soon.

Divisional Tractors.—There are under test (a) Model 1918, 2½-ton Artillery Tractor, equipped with Cadillac engine and auxiliary oiling system, Ordnance design; (b) Model 1918, 2½-ton Artillery Tractor, equipped with Class B engine, Ordnance design; (c) the Model 1920, 2½-ton Ordnance Tractor, White 16-valve engine, and a novel transmission; (d) four Fordsons, equipped with Hatfield-Penfield adapters; (e) and two Holt T-35 Tractors. The object of this test is to find, if possible, a tractor suitable for divisional artillery, and to determine its value relative to horse traction. In addition, it is to find a commercial tractor that can be obtained in quantity to tide over any emergency during the first part of a war. This test is not yet completed.

Experimental Ammunition for 75-mm. Guns Equipped with A. B. No. 3 Fuzes and Packed Four Together in a Newly Designed Box.—This ammunition has non-hygroscopic powder, which feature allows it to be packed in a light and easily handled box. The ammunition comes ready fuzed with a new type super-quick fuze. This test has been completed and it was found that the hygroscopic feature, the new container, and the fuze all functioned satisfactorily.

THE FIELD ARTILLERY JOURNAL

Saddle-bag Modification for Dismounted Canteen.—This is a simple modification of the saddle bag to permit a dismounted canteen to be used by a mounted man. It was suggested by an enlisted man, of the 2nd Field Artillery, who perhaps had frequently found himself aboard a horse with a canteen attached to his belt. This test has not been completed.

15-ton Barrett Automatic Lowering Jack.—This jack is a commercial railroad jack which it is proposed to substitute for the hydraulic jack used in lowering the 155-mm. gun into firing position. The test showed that the jack is much superior to the hydraulic jack now used.

Caterpillar Adapters for 8" Howitzer and 155-mm. Guns.—These adapters are designated to replace the wheels on the 8" howitzers and 155-mm. gun. In addition, they permit the 8" howitzers to be fired without the use of a firing platform. This test has been completed and it was found that the adapters functioned satisfactorily on the howitzer, but not on the gun.

Divisional Guns.—These guns were built to conform as nearly as possible to the recommendations of the Calibre Board. The guns are extremely long, the trunnions are near the breech end, the range is about 15,000 yards, and the calibre is 75 mm. The principal points of interest in the test are: Box or split trail, independent, or non-independent line of sight; maximum elevation required; maximum weight allowable; type of breech block, type of shields, etc. Considerable progress has been made on this test, but it is not yet completed.

Washers Under Fuzes, 155-mm. Howitzer Ammunition.—This is a test to determine a suitable means of keeping the Mark IV fuzes from falling out of the 155-howitzer shell during firing, especially in the 5th and higher zones. This test has not been completed.

Horseshoes, Non-slip.—This was simply a rehearsing on the old subject, nothing particularly new having been offered. The Board concluded that the necessity of sharp shoeing, or special shoes, except for a small number of animals, will be very rare.

Tractors, Reconnaissance.—Two tractors have been submitted to the Board for test. Both have aluminum waterproof boat-like bodies with Chase track for road and cross-country going and a small propeller and rudder for crossing deep streams. One tractor weighs about 1100 pounds and is equipped with a Henderson motorcycle engine, while the other weighs about 1600 pounds and is equipped with a Franklin engine. Although the test is not complete it seems apparent that horse enthusiasts have no need for worry.

Modification of Aiming Stakes.—These are standard aiming stakes fitted with crossbar near bottom to aid in forcing them into

CURRENT FIELD ARTILLERY NOTES

hard ground. Board recommended that organization commanders be authorized to modify aiming stakes where nature of ground made it desirable.

Periscope, Observation.—This is a German periscope captured by American troops at Montfaucon. Fully extended it gives an elevation of about 75 feet. The test is held up by a broken cable on inside of telescoping parts.

High Burst Ranging.—This is a study of methods used during the recent war with the idea of developing a new method which will overcome some or all of the defects of the old system. A method has been devised which has some new features and which has given some very excellent results. The final report on this test will probably be submitted sometime in July.

Sound and Flash Ranging.—This is also a study of methods used during the recent war with the idea of improving them when possible. Not much progress has been made in this test.

Tables of Equipment, Field Artillery.—Peace tables for 75-mm. guns are completed; the war tables are being worked on.

Training Regulations.—Several of the Training Regulations have been completed, and work is going steadily forward on the remainder.

Flashless Powder, P. A. No. 2.—This powder contains fish glue and oxanilid, which preparation was supposed to eliminate the flash of the 75-mm. gun. Test showed that flash was practically eliminated, but there were undesirable features of obnoxious gas, fouling of bore, and sparks.

Powder Charges, Experimental, 155-mm. Howitzer.—This test is an attempt to devise an aliquot part charge for the 155-mm. howitzer. The chief advantages of an aliquot part charge are: Ease of manufacture, and avoidance of waste from parts of charges left over after any firing in zones short of the maximum. This particular experimental powder is divided into ten aliquot parts. The test is awaiting the shipment of the powder.

Experimental Sight Mountings for 75-mm. Guns, French.—This is a device to be put on the French gun so that American Panoramic Sights can be used. There are two types, one made from tubular steel and the other from bar steel. Both have given fairly satisfactory results, but the test is not finished.

Flashlights.—These flashlights have self-contained generators, thereby avoiding the use of batteries. The idea is that this type of flashlight might be suitable for a reserve supply. The test is awaiting shipment of the flashlights.

Waterproof Clothing and Tents.—This material has not yet been shipped to the Board.

THE FIELD ARTILLERY JOURNAL

Special Regulations for Gunners' Examination.—The Board is working with the heavy regiments stationed at Fort Bragg to compile a gunner's examination which will be sufficiently searching, but not too exacting.

Laced Boots for Enlisted Men.—The problem of finding a suitable leg covering for enlisted men has received much attention and thought for several years. A covering suitable for a cannoneer may not be at all suitable for a wheel driver. Various types of covering have been tried, canvas leggings, leather leggings, putties, etc., but none of them have proved entirely satisfactory. This test is to determine the suitability of ordinary commercial laced hunting boots.

Signalling Panels.—These panels have not yet been received by the Board.

National Capital Horse Show

THE Artillery had its usual entries this year in the National Capital Horse Show in Washington. The veteran prize winning team from Battery "A," of the 16th Field Artillery, voluntarily remained out of the gun team contest. Prizes in this event then went to Battery "C," 16th Field Artillery, first, Battery "A," 16th Field Artillery, second, and Battery "B," 16th Field Artillery, third.

The bay team from Battery "A" which did not enter has an enviable prize-winning record. Among the coveted prizes they have carried off are the blue ribbon at the National Horse Show at Madison Square Garden in New York, 1920, 1921 and 1922, the blue ribbon in the National Capital Horse Show in Washington, 1921 and 1922, and the blue ribbon in the Army Horse Show, Washington, D. C., in 1922. The lesser cups and prizes they have carried off make a sizable list.

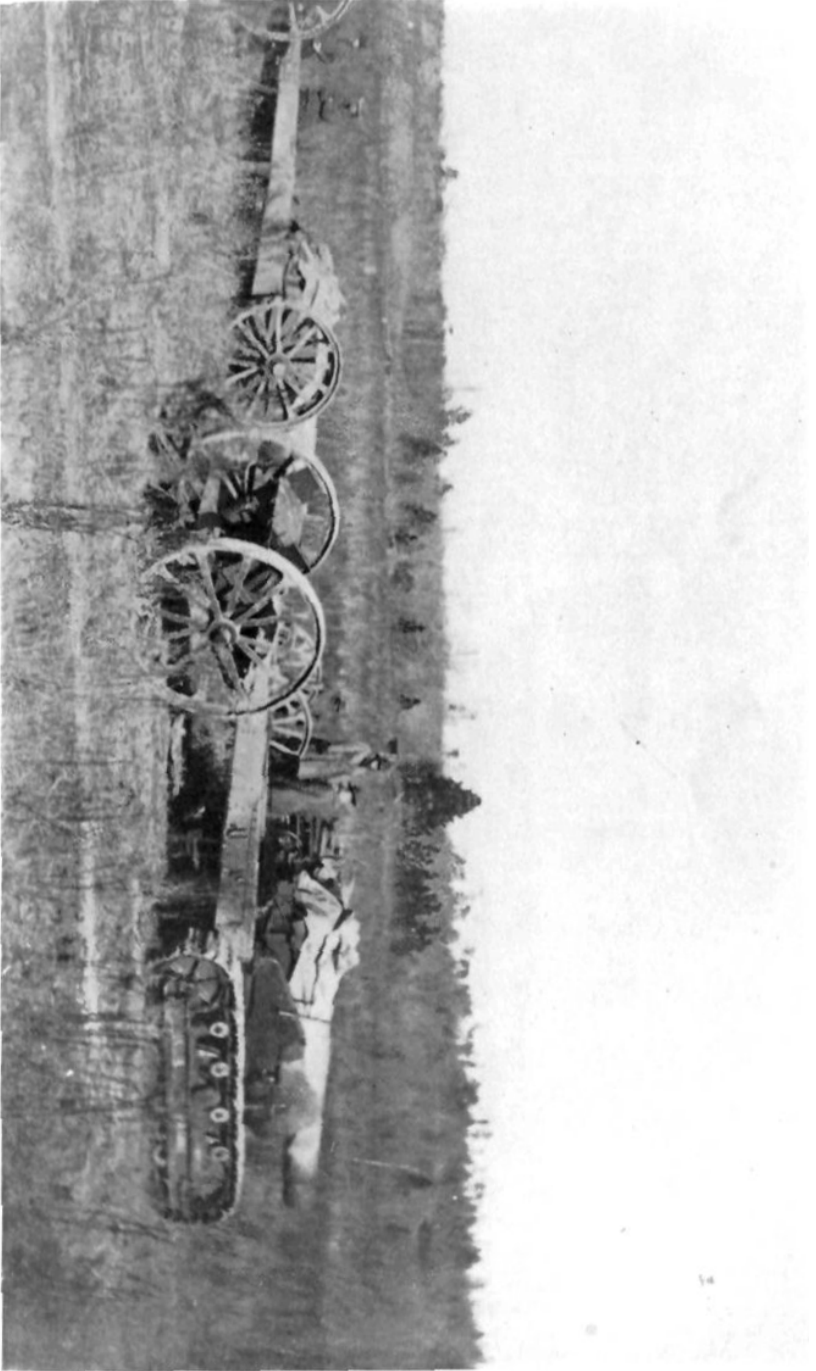
The animals are of a type ideal for Field Artillery, each having a fine head, well set ears, mild eyes, and the general characteristics that go with good disposition. They are well ribbed out, short backed, with firmly set necks, well muscled buttocks and straight legs. All animals have exceptionally strong, short, and clean lower legs, and well set strongly walled and soled feet. The breeding of all animals is unrecorded, but it is believed that they are the best results of the wartime purchases of mature animals in the open market.

Individual descriptions of the horses of this team are as follows:

Dud: Bay gelding; height, 16-1; weight, 1350 lbs.; age, 9 years; received May, 1920; near wheel.

Babe: Bay gelding; height, 16-2; weight, 1375 lbs.; age, 9 years; received May, 1920; off wheel.

Little Dick: Bay gelding; height, 15-2; weight, 1350 lbs.; age, 11



CATERPILLAR ADAPTERS FOR 8" HOWITZER



PRIZE SECTION, BATTERY A. 16TH F. A.



PISTOL SQUAD ALABAMA POLYTECHNIC INSTITUTE

Top row left to right: E. F. Harlin, J. F. Nettles, E. S. Wood, B. K. Naftel, A. M. Perdue. Second row: W. B. Wood, J. A. Wilson, J. W. McIntosh, J. C. Jester, H. Cobb.

Bottom: J. L. McKinnon, Captain of Team.

CURRENT FIELD ARTILLERY NOTES

- years; received Batry. "D," 19th F. A., May, 1920; near swing.
- Big Dick: Bay gelding; height, 16-1; weight, 1375 lbs.; age, 9 years; received May, 1920; off swing.
- Mike: Lt. bay; height, 15-2; weight, 1275 lbs.; age, 10 years; received Sept., 1921, Camp Meade, Remount Depot.
- Pat: Lt. bay; height, 15-2; weight, 1300 lbs.; age, 9 years; received Sept., 1921, Camp Meade, Md., Remount Depot.
- Dixie: No. 87; chief of section mount, 1920 and 1921; received May, 1920.
- Dave: No. 1; chief of section mount, 1922; received September, 1922.

F.A.R.O.T.C. Pistol Tournament

LAST winter the National Rifle Association offered trophies for pistol marksmanship in the Field Artillery R.O.T.C. Units. The Unit scoring the highest number of points would receive a cup; the members of the team in second place would receive individual silver medals and the members of the team in third place would receive individual bronze medals. The competition was to be held annually. The cup would be held until lost in competition a succeeding year.

The competition was organized. An entry fee of five dollars was required of each unit entering. The dismounted course as given in paragraphs 87, 88 and 89 of Pistol Marksmanship, fired with the 45 calibre service pistol, was chosen as the test. Teams were composed of five members of a Field Artillery R. O. T. C. Unit.

The course was fired by the various units who desired to enter this year, between April 1st and May 15th. The results follow:

<i>Team Standing</i>	<i>Score</i>
1. Alabama Polytechnic Institute.....	2113
2. University of Missouri	2061
3. Oregon Agricultural College	2028
4. Princeton University	1993
5. University of Utah	1974
6. Harvard University	1944
7. University of Oklahoma	1913
8. Purdue University	1897
9. Leland Stanford University	1860
10. Texas A. and M. College	1857
11. University of Illinois	1857
12. University of Wisconsin	1826
13. University of Chicago	1595

It was necessary to disqualify the team of Cornell University with a score of 2064, due to a breach of the rule that all firing must

THE FIELD ARTILLERY JOURNAL

be done in one day. Ohio State University and Culver Military Academy entered teams but were prevented from competing by reason of extremely unfavorable weather and range condition.

The highest individual score was 429, made by J. W. McIntosh of Alabama Polytechnic Institute.

New Jersey Reserves

THE New Jersey Association of the Reserve Officers' Association held its first annual convention at Trenton on May 19th. The keynote speech of the convention was delivered by Major J. H. M. Dudley, a general staff officer during the war and the pastor of a local church in peace. It was a lay sermon on war, patriotism, citizenship, and the need for national defense.

Before adjournment the Association adopted the following statement of principles:

"We, the members of the New Jersey Association, Reserve Officers Association of the United States, in Convention assembled at Trenton, this 19th day of May, 1923, desiring to make clear to our fellow-citizens our views on the subject of National defense and military preparedness, do make the following statement:

"This Association is composed of Reserve Officers of the Army of the United States. Nearly all of its members were in the army during the World War, and are therefore fully cognizant of the horrors attendant upon war.

"As an Association we are entirely opposed to war except for National defense or in defense of the weak and the oppressed, under which circumstances to fight becomes a sacred obligation.

"We believe that one of the best means of avoiding war is to be prepared for war; that the bully among the nations is usually too cowardly to attack the well-armed and the well-prepared.

"Believing these things we believe it our duty to support and assist our Government in the development and execution of a military policy for the United States which shall provide adequate National defense.

"We believe that the National Defense Act as passed by Congress and the plan of National defense worked out thereunder by the War Department, is the best system of National defense ever devised for this Country. In order to carry out this system and make it effective it is necessary for Congress to appropriate sufficient funds. This Congress has failed to do. Congress in its wisdom has seen fit to increase appropriations for rivers and harbors at the expense of appropriations for National defense. We believe that this is wrong; that it savors strongly of petty politics, and is unworthy of the Congress of a great nation.

CURRENT FIELD ARTILLERY NOTES

"We note with alarm that certain persons and organizations have been spreading within our Country propaganda of a particularly pernicious kind, aimed to induce American men and women to oppose military training and to refuse to fight or to take an active part in defense of their Country in time of war. To such persons and organizations we say that unless they are prepared to defend this Country of ours in time of danger, they do not deserve to enjoy the privileges and blessings of citizenship. We warn all such persons and organizations to desist from their treasonable practices and we call upon all patriotic and civic societies within the State of New Jersey to join with us in combating all extreme pacificistic and non-resistant propaganda, and to replace such by a propaganda based on truth and reason, to the end that this great Country of ours and its people may continue to enjoy the blessings of liberty and prosperity and may be prepared to repel all aggression and to champion the down-trodden and the oppressed throughout the world. Eternal vigilance is the price of liberty."

The Colorado Endurance Ride of 1923

THE Colorado Endurance Ride for this year is to be held the last of July and the first of August. These rides receive the approval of the War Department and among the sponsors are The American Remount Association and the U. S. Department of Agriculture.

These contests are designed to stimulate general interest in the breeding and use of good saddle horses of a general utility type, possessed of stamina and hardiness and at the same time having the necessary quality to render them suitable for use in the mounted service of the United States. In particular, it is desired: (a) To demonstrate the value of type, soundness, and proper breeding in the selection of horses for long and arduous work under saddle. (b) To ascertain and to demonstrate the proper method of training and conditioning horses for long and severe work under saddle. (c) To encourage horsemanship in long distance rides. (d) To ascertain and demonstrate the best methods of caring for horses during and after long, severe work, without artificial aids or stimulants.

Major Henry Leonard, U. S. M. C., who will be one of the judges, in commenting on the ride in *the Remount*, says the conditions adopted are identical with those which will govern the Eastern competition of 1923, some of the salient new features being the reduction of the total maximum permitted time for the five days, from 55 hours to 50 hours; however, this is coupled with the modifying provision that a horse may not exceed 11 hours on the road in any one day. One groom is allowed for each horse at the night station; the use of bandages or rubber pads disqualifies a horse.

THE FIELD ARTILLERY JOURNAL

The weight to be carried this year is 225 pounds, which is the same as last year's impost in the East, but is an increase of 25 pounds for the Colorado Ride over last year's weight. Another provision adopted for the Colorado Ride of 1923, which has always pertained in the East but was not heretofore prescribed in the West, is that which requires that a competing horse be at least half-bred of some recognized breed; in other words, his sire or dam must be a pure-bred.

The Sponsors' Committee when considering this matter in 1922 recognized fully that, from many standpoints, it was a sheer waste of time to permit the entry of horses of unknown breeding; for even assuming the possibility that such a horse could win, no useful information would be derived from his performance, inasmuch as one would have no clew as to how to reproduce him. However, it was deemed wise to open the entries to scrub horses for one year, in order to render it abundantly clear to ranchmen that the proper type of blood horse excels the horse of no breeding at any task, whether it be running at high speed, or carrying weight for long distances. This having now been satisfactorily demonstrated, entries have been restricted to horses of known breeding, from whose performance useful information may be derived.

The Colorado Ride, while being in terms identical with that conducted in the East, will in fact be a very much more severe ordeal, due to the circumstance that on several days of the Ride the midday halt will be between 1,500 and 2,000 feet higher than the start; on two more days it will be more than 1,000 feet lower. These heavy gradients, if negotiated successfully and with approximately equal speed, will unquestionably make a better showing for the Colorado horses.

The preliminary examination of entered horses by the judges and veterinarians will occur on July 29, 1923, the day next but one following the Horse and Colt Show at Broadmoor; the latter has been arranged for July 27, in order that the Endurance Ride Entries may participate. The Ride proper commences on the morning of the 29th of July, and terminates on the evening of August 3d; the final judging and award of prizes will occur on August 4th. The latter event will, as formerly, be made an occasion of ceremony and it is anticipated that, following established precedent, the Governor of Colorado will make the presentations to the winners.

The prizes awarded will be the following:

First prize, \$600; silver cup; blue ribbon; Arabian Horse Club medal; Horse Association of America medal; the Morgan Horse Club trophy.

CURRENT FIELD ARTILLERY NOTES

Second prize, \$400; red ribbon; Horse Association of America medal; the Morgan Horse Club trophy.

Third prize, \$300; yellow ribbon; Horse Association of America medal; the Morgan Horse Club trophy.

Fourth prize, \$200; white ribbon; Horse Association of America medal.

Fifth prize, \$150; pink ribbon; Horse Association of America medal.

Sixth prize, \$100; green ribbon; Horse Association of America medal.

An individual silver cup is awarded each year to the winner of first prize and becomes his absolute property.

The name of the winning horse, the names of his rider and his owner, together with his time and condition scores, are engraved upon the Broadmoor Cup, which latter remains permanently at Broadmoor. The individual cup above mentioned is similarly engraved.

In addition to the foregoing, a bronze medal, contributed by the Horse Association of America, will be awarded to each horse which finishes the ride successfully, whether he finishes in the money or not, such medal to be suitably engraved with a record of the facts so that the same may become a permanent record of a fine feat creditably performed.

Polo

THE Del Monte Club won the Pacific Coast Championship by defeating the Cardinals of San Mateo on April 15th. Del Monte had previously eliminated Fort Bliss by a score of 10 to 6. The Cardinals eliminated the 11th Cavalry and the Artillery team from Hawaii: The Hawaiian Team composed of Major J. Milliken at number 1 with a handicap of 2, Lieutenant-Colonel Beverly Brown at number 2 with a handicap of 3, Major C. Brewer at 3 with a handicap of 2 and Captain J. M. Swing at 4 with a handicap of 2 had previously won the Pebble Beach Cup, the novice event. During their first games they gave promise of carrying off the championship. Their teamwork, and individual play was of a high quality and their ponies equal to those of any civilian team on the coast. At Riverside an attack of influenza laid up their ponies. Thereafter they were handicapped by the inability of their animals to stand up in a gruelling contest. Another season will see this team a strong contender for the championship.

In the East the War Department team has been making a most promising start. They have played the following line-up:

THE FIELD ARTILLERY JOURNAL

<i>Player</i>	<i>Position</i>	<i>American Polo Assn. Hdc.</i>
Lieut. C. C. Jadwin	No. 1	2
Major J. G. Quekemeyer	No. 2	3
Major J. K. Herr	No. 3	3
Major H. D. Higley	No. 4	3

This team has defeated Penllyn, Bryn Mawr, and Philadelphia Country Club, thus winning the Second Wooten Cup and by vanquishing the Green River and Penllyn Clubs they have won the Bryn Mawr Cups.

The Army now holds the Junior Championship and Rathbourne Memorial Championship Cups. These must be defended at Narragansett Pier in August. Following the plan of last year, which won the championship, the ponies and players are being assembled at Mitchel Field, Long Island, early in June, for practice and training. About July 25th they will be ordered to Narragansett Pier for the tournament. Lieutenant-Colonel Lewis Brown and Majors A. R. Wilson, W. W. Erwin, and L. A. Beard will make up the team. Twelve (12) ponies from West Point, four (4) from Fort Bliss and sixteen (16) from Washington, will be shipped to the team.

Another Championship event has been added by the American Polo Association, *viz.*, "The 12-Goal Championship," for teams not exceeding 12 goals—no player over 4 goals—without handicap. This will also be played for at Narragansett Pier in the above-mentioned tournament in August. The Army plans to try for this event. The team will be recruited from officers in and near Washington. The try-out and training of this team, which will be in Washington, will give the Capital City more good polo than it has had for a long time. It will also develop replacements for the Junior team, for whether the Junior team wins or not this year, we most likely will lose one or more men next year by having handicaps raised or being unavailable. The members of the Army 12-Goal Championship team have not been definitely selected yet. The candidates are quite numerous. They will leave Washington for Narragansett Pier about July 25th.

Ordnance

As indicated in the article "Universal Cross-Country Cargo Vehicles," the War Department through the Ordnance Technical Committee is studying the specifications of the type, or minimum number of types as may develop, for the cross-country vehicles to supply the army in general. After the determination of the type or types required, it is planned to investigate the possibility of procuring it in the commercial field. Failing satisfactory results in this

CURRENT FIELD ARTILLERY NOTES

latter effort, independent development, or a combination of independent and commercial design will probably result.

The Ordnance Department is preparing a new, uniform type for the range tables. There are no departures in data from the old ones worthy of special note. The principal changes will be for uniformity between the various pamphlets, in size, shape, color, arrangement of contents, etc.

Just a Bum Bugler

A bugler once tried to bugle Tatum,
The bugle was old but the bugler was new,
The troops were encamped in a wild silvan glade,
And the echoes played tag with the discords he made.

The Colonel, a jolly old Cavalry file,
Thought "Stables" was sounding and rose with a smile,
Turned sleepily over and murmured "I guess,
That Music's been drinking, pretty much more or less!"

A Veteran Captain who had heard war's alarms,
Sprang into his trousers and yelled "Call to Arms,"
The Sky Pilot robed in his pajamas white,
Said, "Why's that danged church call a-blowing tonight."

The Medico late from a man who had snakes,
Thinks "Sick Call" is sounding and suddenly wakes,
And mutters a swear word, I fear eight or ten,
And vows that he knows Grady's got 'em again.

A Shavetail Lieutenant just out of the Point,
With chills in his gizzard and aches in his joints,
Thinks "Mess Call" is sounding and suddenly shoots,
Full out of his blankets and into his boots.

Then a man just turned in from his quarterly spree,
Fell out of his blankets and cussed Reveille,
While a Rook just enlisted, with thoughts homeward bent,
Tho't sure t'was a "General" and pulled down his tent.

In the meantime the bugler who caused the uproar,
Went back to the guard house to bugle no more,
And then as he smoothed his curly red pate,
Tried to think what had caused the rumpus so great.

But the regiment's Baby a few tents away,
Snuggled closer to mother to sleepily say,
"What's that call, mother dear, stirring up such a noise?
I should think they'd know better'n wake little boys."

But mother says Hush-a-by-baby-dear-do,
It's Daddy's new bugler a-blowing Tatum.

FROM THE FORT SILL GUIDON.

EDITORIAL COMMENT

Membership

It is a pleasure to announce for any regiment a one hundred per cent. membership in our Association. In the last few months this has occurred in the 2nd Battalion of the 7th at Madison Barracks, New York, the 1st Battalion of the 83rd at Fort Benning, Georgia, and the 118th Field Artillery in Georgia. The former two organizations are isolated battalions of Regulars. The latter is a National Guard regiment. It is believed this is a record for any National Guard regiment in support of its service publication.

At the close of the war, there was a slump in our unusually high wartime membership. This was to be expected, due to separations from the service and the unsettled conditions throughout the Army. From the low point the membership has steadily risen. It is higher in actual numbers now than the pre-war list, but not so high considered proportionally to the total number of Field Artillerymen then and now. The old members are still with us, and many new ones have joined. The proportional decrease is due to the number of new officers still to join.

Our Association and the new officers who are not yet members need each other. The men who can unite the two are our old members. These latter will be rendering a praiseworthy and appreciated service by telling the new officers about the Association and the JOURNAL.

Honorable Mention in the Essay Contest

In our last issue announcement of the winners of first and second place in the Essay Contest was made. The Judges have awarded honorable mention to the following authors and essays: Lieutenant-Colonel Clarence Deems, Jr., F. A., with "Some Observations on Accompanying Artillery"; Major William A. Pendleton, 4th F. A., with "Recruiting and Training Artillerymen"; First Lieutenant Abraham R. Ginsburgh, F. A., with "Food to Fight"; and Captain Josiah A. Wallace, 4th F. A., with "Ammunition Supply for a Regiment of Pack Artillery."

BOOK NOTICES

(The Field Artillery Association undertakes to secure for its members copies of any military books or publications.)

THE MARNE, HISTORIC AND PICTURESQUE. By Joseph Mills Hanson.
(Published by A. C. McClurg & Co., Chicago.)

To our artillery readers a short sketch of the life of the author of this book will be interesting. Joseph Mill Hanson, Captain, A. E. F., was born at Yankton, South Dakota. His first book, "The Conquest of Missouri," was published in 1919 and was followed by other volumes based on Northwestern history. Commissioned Captain, 4th South Dakota Infantry, National Guard, 1916, he served on the Mexican border until March, 1917. The regiment was reorganized into the 147th Field Artillery soon after America's entry into the war, and sailed for France in January, 1918. In connection with his military duties, Captain Hanson made many trips along the entire length of the Marne River, gathering impressions and historical facts which now appear in his book.

The author writes in an easy and interesting style of the routine at American G. H. Q. at Chaumont; of the first battle of the Marne; of the fight at Chateau-Thierry, and the other military episodes of the World War occurring on the Marne. However, these are but incidents in the journey down the river. The theme is more picturesque and romantic than historical or military; it touches equally on the camps of Attila, the Hun and the vineyards of Epernay. The military reader will find it a pleasant sidelight to the study of the tactics and strategy executed along the banks of the Marne between 1914 and 1918.

POST-WAR ORDNANCE. By Major Leroy Hodges, O. R. C. (Published by Richmond Press, Inc., Richmond, Va.—\$1.50 paper, \$2.00 cloth bound.)

The book is quite as broad as its title indicates. It begins with a short review of our post-war army organization and ordnance organization. From this it leads on to all the guns, mounts, ammunitions, tractors and devices that are being developed. The text is profusely illustrated and is written in a popular style which, though accurate, is easily read. The book should prove very interesting and valuable to those who desire a view of our present ordnance development, but whose time or training do not permit them to delve in involved technical treatises.

THE FIELD ARTILLERY JOURNAL

GERMAN OFFENSIVE OF JULY 1918. (Published by the General Service Schools, Fort Leavenworth, Kansas. Price \$3.00.)

The book is one prepared by Colonel Conrad H. Lanza, F. A., Chief of the G-2 Section, General Service Schools, primarily for the use of students of Military History at those schools. It treats of the battle near Chateau-Thierry between July 13, and July 20, 1918. The text is not a narrative statement, but consists of German, French and American documents, arranged as nearly as may be in chronological order and comprehensible sequence. These documents, to the number of over 600, are orders, memoranda, war diaries, intelligence reports, messages, letters, etc., etc. No attempt has been made to draw any conclusions, or in general to comment on the documents themselves. The collection makes an excellent book of sources and will prove valuable to the close student of a modern battle or a searcher after facts.

OPERATIONS OF THE TWENTY-NINTH DIVISION. (Compiled by Major W. S. Bowen, C. A. C. Published by the *Coast Artillery Journal*, Fort Monroe, Va. Price \$1.25.)

This is another source book composed of orders, reports, etc., covering the operations of the 29th Division east of the Meuse River, between October 8th and 30th, 1918. In addition to the reports of all the units, from that of the Division Commander down to and including those of all the platoon commanders, this book contains the messages sent from and received at Division Headquarters, and a specially prepared 1/20,000 French Plan Directeur, which embraces the front occupied by the 29th Division.

THE LIBRARY, *U. S. M. A.* lacks the following numbers of the 1884 class bulletin, and would be very glad to receive this issue in order to complete the library set. Numbers 5, 10, 14, 19, 21, and after.

