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FIELD ARTILLERY
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EDITED BY

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FROM DRAWINGS BY EDWARD C. KUHN, MASTER GUNNER, C.A.C.

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THE RED GUIDON

COME fill up your glasses, I'll give you a toast
We'll drink to the red and the blue,
The first in the battle, the last from its post,
Old comrades so faithful and true;
Here's to friends who have passed o'er the last long divide,
Their spirit is still marching on,
As it did in the days when we marched side by side,
As we followed the Red Guidon.

CHORUS

Then here's to crossed cannon, they never will run,
The limber and rolling caisson,
The clank of the collar and rumble of gun,
As we followed the Red Guidon.

We've soldiered together, brave hearts ever true,
We've marched, we've fought and we've bled
For the dear old flag with its red, white and blue
That floats in the breeze overhead.
We've joked and we've laughed round the camp fire's red glare
From Cuba to distant Luzon;
As we told the old stories that drive away care
'Neath the folds of the Red Guidon.

CHORUS

Come, toss off your tankards, we'll drink long and deep,
Brave hearts ever gallant and true,
To friends who now rest in their long peaceful sleep,
Who once wore the red and blue.
We'll prove true in the future as they did in the past,
Old comrades of gun and caisson;
We'll fight like true soldiers from first to the last
As we follow the Red Guidon.

CHORUS

Then here's to crossed cannon, they never will run,
The limber and rolling caisson,
The clank of the collar and rumble of gun
And *hurrah for the Red Guidon.*

GERALD E. GRIFFIN.

ON THE POLISH-BOLSHEVIK FRONT IN 1919 AND 1920

BY MICHAEL J. FIBICH, MAJOR, F.A., O.R.C.

FOREWORD

I WAS assigned for duty with the American Legation in Warsaw as an Assistant Military Attache and arrived in Poland on the 21st day of September, 1919. During the following year, my continued observations of the operations on the Bolshevik front reawakened all of my natural fighting instincts. The intensity of the latter increased to such an extent, that at the time the Bolsheviks captured Wilna in their advance into Poland, I could no longer resist the temptation to take an active part in a war again, and therefore, submitted my resignation as a Major of Artillery in the U. S. Army. My resignation was accepted by cable on August 12, 1920. The next day I had become a volunteer major in the Polish Artillery and was assigned to the 11th Polish Division for duty.

My experiences embrace the years 1919 and 1920. In 1919, the Poles had succeeded in clearing their eastern frontiers of Bolshevik invading troops and had established their army along a line that resembled somewhat their present boundary. In May, 1920, the Polish Army executed its advance to Kijew. A month later, the Soviets directed against Poland an offensive, the momentum of which enabled the Bolshevik forces to reach the outskirts of Warsaw. In the following August, the Poles launched their counter-offensive. Hostilities ceased in October of the same year by reason of an armistice. Peace was finally signed in March, 1921.

The numerous instances that are related in the following pages are not to be accepted as criticism of the Polish Army as a whole. In the first place they are associated, in the major part, with the activities of the 11th Division. This division, in the period August 13, 1920, to December 7, 1920, was seriously depleted in its numbers of effectives. Immediately prior to that time, it had been through the terrible ordeal of a forced retreat for hundreds of kilometres. The effects of this ordeal might have had minor significance had it been possible to omit from serious consideration, the impressions produced upon the Poles by the numerous murders—some of the murders and tortures could not have been committed by normal human beings—which were perpetrated by the Bolsheviks and the Cossacks upon captured Polish officers and soldiers. Many of the men were very, very tired of war because they had seen continuous

ON THE POLISH-BOLSHEVIK FRONT

service for over six years. For these and other reasons, its morale was noticeably weakened.

In the second place, account should be taken of the difficult and discouraging conditions under which this army was at first assembled, organized and compelled to produce concrete results. It was composed of soldiers who had been brought together in one organization after a political and national separation which had endured over a hundred years. During all those years, the most worthy of all national characteristics had continued to bind them into a spiritual union: the language, their religion and traditions, and the spirit of Polish idealism. It made no difference after the armistice how divergently their psychologies differed in other ways. These sufficed to give them an ideal and an aim, and to unite them in all of their patriotic endeavors since that time.

When the armistice came in 1918, the German and the Austrian Armies fell to pieces in Central Europe while the Bolshevik Army made serious attempts to annex Poland as a member of the Free (?) Soviet Republic. Disorder for a time reigned supreme everywhere. The Central Powers had exhausted the land by their ruthless and systematic requisitions. Ruination and devastation had been the lot of the country during the war, in almost every locality.

For the above reasons, to criticize would not be just. Full justice would be given to this report, however, if our officers will accept the numerous comments made therein, as instructional material for their general information rather than as mere criticisms of a foreign army. Most of the mistakes commented upon have been committed over and over again by armies in the past. This latter can be readily substantiated, for instance, by a perusal of the records of American campaigns, especially during the Revolutionary War and even in France. Amid present international conditions, preparation for war is necessary. The more thorough it is, the fewer important and costly mistakes that must be committed. Only certain of our idealistic statesmen are convinced of the approach of the "Millennium," of the uselessness of standing armies, and of the certainty of ability to create an efficient army "overnight."

Therefore, when reading over the following pages, it would be well to remember that the Polish troops in 1920 composed an army created "overnight." What the condition of the present Polish Army is, after its two years of intensive peace training under the direction of the most excellent instructors, is a question which the future will probably answer.

[NOTE: In the following pages, frequent remarks are made in reference to the American regular army. Such remarks should not be taken for pure, cold-blooded criticism. It is so easy to criticize.

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They are made primarily with a view toward pointing out certain defects that existed and which should cease to exist. Their elimination is necessary if we are to possess a national army beloved and respected by the people of America.]

WITH THE POLISH DIVISION FROM 13TH AUGUST, 1920, TO THE 7TH DECEMBER,
1920

During that critical summer of 1920, just prior to my entrance in the Polish Army, my greatest fear was that it might be "all over" before I could take an active part in the fighting. The prevailing opinion then of practically all the foreigners in Warsaw was, that it could be only a matter of a few days before the city would be taken by the Bolsheviks. Notwithstanding the hopelessness of the situation, from the time that the results of the first skirmishes between the Bolsheviks and the Poles in front of Warsaw had been ascertained, I felt certain that the city would not fall and my reasoning was fairly logical. When a line is in position and other troops are retreating toward it somewhat in disorder, there is indeed always a possibility that the retreating troops may throw those in the line, also in disorder. Well, an opportunity for this possibility actually occurred near Warsaw. But the retreating Polish soldiers were absorbed—"taken in"—by those already in position (most of the latter were boy students and older men) and the line held.

The momentum of the Bolshevik offensive had almost completely lost its impetus by this time and great progress was already being made toward the hurried gathering together and the organizing of sufficient Polish mounted troops which, later on, initiated the campaign that put an end to the raids and the murders by Budena's Cossack cavalry.

It is interesting to note that these later Polish cavalymen were armed with pistols. Formerly, in the first attacks by the Cossacks, few of the Polish mounted men had pistols. On the other hand, every Cossack had been armed with one, and before each clash of troops, had always been able to discharge it effectively into the Polish ranks. But conditions had changed so that they were equally armed at last.

On the day that I reported for duty with the Polish Artillery in Marki, the afternoon of the 13th of August, I was very enthusiastic. My chance for some real fighting in movement warfare had finally come. I recall that the march "to the Rhine" in the American Army might have been more interesting if it were not for the *constant* presence of too many higher commanders "on the spot." When campaigning, soldiers like to be left to themselves as much as possible. Instead of being interesting and even instructive, it caused very strong and emphatic feelings of resentment among numerous

ON THE POLISH-BOLSHEVIK FRONT

civilian and other officers. This latter was especially true of the—th F.A. Brigade which was attached to the —nd Division.

Of divisional artillery there were in all eight batteries of French (75 cm.) and one battery of howitzers (155 cm.). My three batteries were located to the northeast, in the vicinity of Maciolki and Kobylki, about ten or eleven kilometres from Warsaw. The guns were in position and had been doing a lot of firing.

The Polish artillery was suffering for want of adequate supplies of ammunition. In fact, complete shortage existed once for over thirty hours. The reason for this was the hostile attitude of the neighboring powers at that time toward Poland. Germany, Czecho-Slovakia, and Austria refused to let the ammunition pass into Poland through their territories, on its way from France. The French ammunition ship in Danzig had to delay the unloading, for some critical hours, because of the refusal to permit it to dock immediately. Then, again, the Polish infantry units used rifles of various types; the English, German, Russian, Austrian and French. All this tended to make more difficult the ammunition supply.

The above is one of Poland's strongest arguments for a seaport. Its relation and importance to the industrial and commercial life of thirty million people can be readily seen. The lack of an outlet, a free seaport, can mean eventually nothing more than either the deathknell of an independent people or their reduction to a small, unimportant and dependent nation.

Certain prominent Americans like to emphasize on every occasion, the unselfish motives (?) of the Peoples of the world today and their eagerness to take part in the general work for humanity. Is not everyone tired of the war? Those so-called unselfish motives and that interjealousy between peoples were disclosed very strikingly by the attitude which those peoples assumed when barbarous hordes were advancing through Poland. There can be no question at all that the Bolshevik hordes were barbarous; that their natures were similar to those of wild beasts, terribly cruel, inspired, not by national or patriotic ideals but by the lower instincts of greed, plunder and class hatred. Likewise, there can be no question that the Poles were *not* influenced by like sentiments. Yet, not a formal word of moral protest from any nation with the exception of France! Idealism between nations is only skin-deep when material gain and personal profit are at stake. It is well to remember this fact later on in my account when reading the part "The Psychology of War and Peoples."

On the other hand, the Spartacus movement in Germany, quite powerful in those days, was anxiously awaiting the approach of the "Proletariat armies of brother nations." This union, if it had

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taken place, would have probably thrown all of Western Europe into a chaos.

Many of the men did not have shoes or underwear and their uniforms were in very poor condition. Large numbers of them marched barefoot. This lack of clothing was easier to endure because it was then warm out-of-doors. So eager was the desire to obtain some kind of bodily covering, that the Poles, after each fight with the Bolsheviks, would make a great scramble for the battlefield and there search among the Bolshevik dead for shoes, coats, trousers, etc. It was not an uncommon sight when marching along, to see Bolshevik bodies lying about the fields, all or partly stripped of their clothing. Many of the Bolsheviks were well clothed with uniforms which had been captured only recently from Wrangels' Army in south Russia. The following winter and the winter before, the men suffered very much on account of the lack of proper and adequate clothing. In times of privation and dire need, men, even the most cultured and refined, will wear or eat almost anything in their battle against death or starvation.

At first I had eighteen officers. The majority of them had seen service in the former Austrian Army. Some had served in the Russian artillery, while one or two had been with German troops. A few of the officers spoke English; more spoke German, and almost all of them could speak French. Of course Polish was their native tongue. Under such conditions, my endeavors to communicate orders and instructions were very much simplified.

The aims and ideals for which the officers were fighting were remarkably uniform as to their nature and were deeply believed in by all. Even among the enlisted men, many of whom could not read or write, the intelligent understanding of their cause and their reasons for fighting was astonishing for that "oneness" and that almost religious feeling whenever they spoke of this subject. The best evidence that this "oneness" of aims and ideals existed at that time, was the willing and noble endurance, of both officers and soldiers, of the great hardships with which they had to combat. An army, not so united spiritually, would have been the first to extend a welcome hand to the "Soviet" troops. There has never been in Poland any serious trouble with Bolshevik Poles, in spite of the fact that numerous Bolshevik agitators were active in the country. The Poles believed earnestly that they were fighting for the most sacred possessions of man: freedom, language, traditions and religion.

The batteries were doing their utmost to support the infantry in defense. About the same time, a fire was commenced which later became known as the three days' bombardment. Artillery firing was going on almost continuously, one or more guns in each battery



A GROUP OF OFFICERS IN THE BATTALION



THE COUNTRY OVER WHICH THE BATTLES WERE
FOUGHT



THE BATTALION ON THE MARCH



A TYPICAL WHITE RUTHENIAN HUT

ON THE POLISH-BOLSHEVIK FRONT

firing. Whenever it became dark, the Bolsheviks started immense forest fires going, for they feared counter-attacks. These fires would light up the surrounding country, so that even during the nights, our artillery fire could be fairly well observed. In a number of instances, the infantry were compelled to take up positions on a line with the guns and much direct fire was used.

On the 16th of August, the Poles launched their counter-offensive to the north and the northeast. The aim was to cut off the Bolshevik forces which had advanced to the west and the northwest of Warsaw. From that moment on, all the Polish forces began to move forward. My division reached as far north as Nasielsk, where we were placed in reserve for a few days. Then we entrained for Terespol, which is west of Brest Litewsk.

In France, troop transportation by rail was always considered a very uncomfortable experience. But travelling in Poland in this way was, in my opinion, more agreeable. One or more closed freight cars (dependent upon number of officers) were selected for the commissioned personnel. Fresh straw or hay was procured and bunks were comfortably arranged in each car. The enlisted men prepared their cars in the same manner. Any second lieutenant or even a sergeant was considered adequate authority for getting the hay or straw, provided, of course, that the latter was close at hand and obtainable. Such matters did not have to be referred to a colonel or a general, except when it was necessary to procure a supply from a long distance. After having tried a freight car a number of times, I will always say: "Me for the Hommes 40 and Cheveux 8" when travelling with troops.

From Terespol we immediately marched to Brest Litewsk. The 11th Division, as a part of the 4th Army, was made one of the front-line attacking divisions. We remained in the Brest Litewsk area approximately nine days.

During a part of that time, I was placed in command of the artillery within the southern half of the eastern sector. There were altogether within that sector, nine and one-half batteries, including two six-inch Russian non-recoil guns. The division occupied itself with organizing raiding expeditions against the Bolsheviks, with repleting its supplies and getting itself ready for the "jump off."

The Bolsheviks had in operation in this area numerous armored railway and motor cars. The condition of the roads and the number of railroad tracks favored such tactics.

In anticipation of fights with armored cars, I used to get my officers together and talk over with them the means for "bringing down" such targets, especially the railroad cars. On one point I was clear, and that was, that the only way to attack an armored train with artillery was to creep up as close as possible to it before

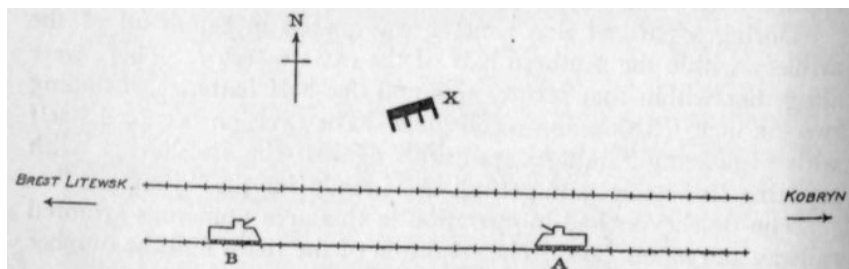
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firing. One or more guns might also have been previously placed in position, and there in concealment awaited the appearance of the train. But only direct fire could be effective.

The armored trains appeared almost always in the same formation. The locomotive (only lightly armored) was in the centre, while a heavily armored car was hooked on to both its front and its rear ends. Each car contained from one to three light field guns and a number of machine guns. The timber and the tools necessary for the construction and repair of bridges were carried along with it. The Bolshevik repair personnel hung on to both sides of the locomotive as it was moving, prepared to jump down, whenever necessary, to repair a track or a bridge.

An infantry battalion was to make a raid on the Bolsheviks, and I was ordered to dispatch one artillery platoon to accompany it. While this battalion was on the march, a Bolshevik armored train was seen about three kilometres away standing on a railway track. The lieutenant desired to creep up—this was possible because the terrain was partially wooded with tall bushes and trees—but the infantry commander ordered the lieutenant to fire at once. As was to be expected, after one or two rounds of adjustment fire, the train moved away. When I learned of this incident, I was very much disappointed. I even called upon the Artillery Brigade Commander personally and complained about artillery being placed unconditionally under the orders of the infantry but I got very little satisfaction.

The following day, another battalion moved forward for the same purpose. This time a battery, commanded by a former Austrian and a very excellent officer, Captain M., accompanied it. Captain M. took up a very original position. To the south of the guns were two railway tracks. The nearer of the two tracks was from 800 to 1000 metres away from the guns.

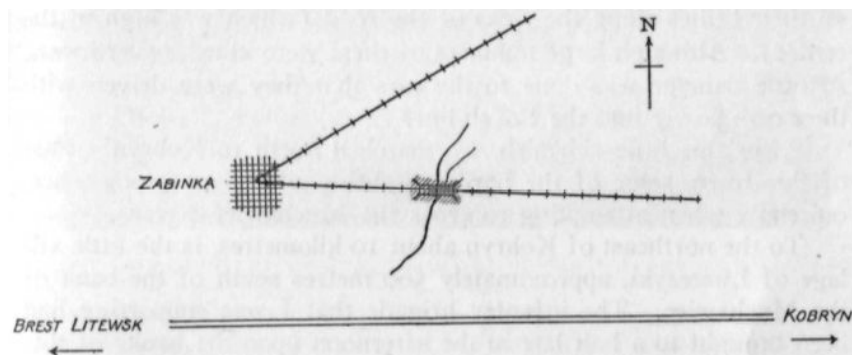


He had been marching to the east and had not observed a Bolshevik train B which had been standing in a concealed place on the outer track. He placed his guns in position at X. Here he waited in concealment. Soon along came train A. When it arrived close enough, the guns opened fire on the locomotive. In one of our

ON THE POLISH-BOLSHEVIK FRONT

former conferences, we decided that it was preferable to aim all fire on the locomotive because from previous observations of such fire, it was noticeable that the shells exploded outside when they hit the armored car. Delayed action fuses only had been used. The first shell hit the locomotive, the steam burst out in different directions making a lot of noise. The train of course stopped, while the Bolsheviks who had been hanging on to the locomotive, jumped quickly to the ground, swearing and shouting.

Then train B appeared on the scene unexpectedly and opened fire on the battery at about 1200 to 1500 metres. The battery endeavored to return the fire of both trains as best it could but the chances were unequal and the guns were soon silenced. B closed in with A and pulled it out of sight. The battery had no casualties. The destroyed train A was later captured by the 16th Polish Division at Maloryta.



At Zabinka, east of Brest Litewsk, there is a railway fork, one line going to the northeast and the other toward the southeast. One Bolshevik armored train was known to be on the southern line about ten kilometres east of the fork. An infantry regiment and an artillery battery were sent forward on a raiding expedition, the mission being to destroy the railroad track and prevent the escape of the armored train. The expedition succeeded in arriving unobserved at a point east of the train and destroyed a large bridge. An attempt was made to approach as close as possible and the artillery opened fire on the train. The Bolsheviks learning that the bridge was destroyed, ran the train westward into Zabinka unexpectedly, shot up the town hurriedly and escaped on the northern route.

The division moved forward now on its advance to the east. South of Kobryn, there is an intersection of two main roads. I received instructions to aid the infantry to hold this crossroad. We were to cut off the retreat of the Bolsheviks who were attempting to reach Kobryn to the north. The trees on either side of both the roads were tall. On account of the deep mud and swamps, it was impossible for men and horses to leave the highways. I used for

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this purpose one battery. Two guns were pointed in the direction of Mokransy and the other two toward Maloryta. The guns were ordered to fire along the sides of roads. Machine guns belonging to the battery were placed between the sections. The infantry, with the exception of the patrols which were reconnoitring to the south of the crossroad, took up a position behind the guns.

About midnight, the enemy attacked with armored motor cars. The artillery replied with one shell per gun per minute. The Bolshevik column was halted about two kilometres away. The captures by the battery (2/11 p.a.c.) consisted of four armored motor cars, two heavy motor trucks, one new Fiat passenger car, a few motorcycles and machine guns. The Bolsheviks were very eager to get by this crossroad because their nearest dead were about 30 metres from our gun muzzles. Evidently they had tried to crawl on their bellies along the sides of the road (which was high in the centre). Although large numbers of them were killed, nevertheless, so little damage was done to the cars that they were driven with their own power into the Polish lines.

After this little skirmish, we marched north to Kobryn. East of this town, some of the hardest fighting of the war took place, especially when attempting to cross the Muchawiec River.

To the northeast of Kobryn about 10 kilometres, is the little village of Luszczyki, approximately 500 metres south of the bank of the Muchawiec. The infantry brigade that I was supporting had been brought to a halt late in the afternoon upon the banks of this river. They had suffered quite a few casualties. On the opposite bank of the river, the Bolsheviks were very well fortified amid their trenches and machine guns.

Then followed one of my busiest nights. It was decided that the infantry was to attempt to cross the river the following morning and that I was to prepare some kind of fire with which to support it. All the artillery officers that could be spared were set to work at making tracings, to an enlarged scale, of the 1/100,000 German map that we had. I had procured from Warsaw for myself adequate supplies of tracing paper. My batteries were located about two kilometres from the river.

At midnight, I appeared at the nearest battery and selected one chief of section and six men to accompany me to Luszczyki which was still burning. The Bolsheviks were firing continually upon the village and vicinity with their machine guns. The battery 7/11 p.a.p. itself was being fired upon by Soviet artillery.

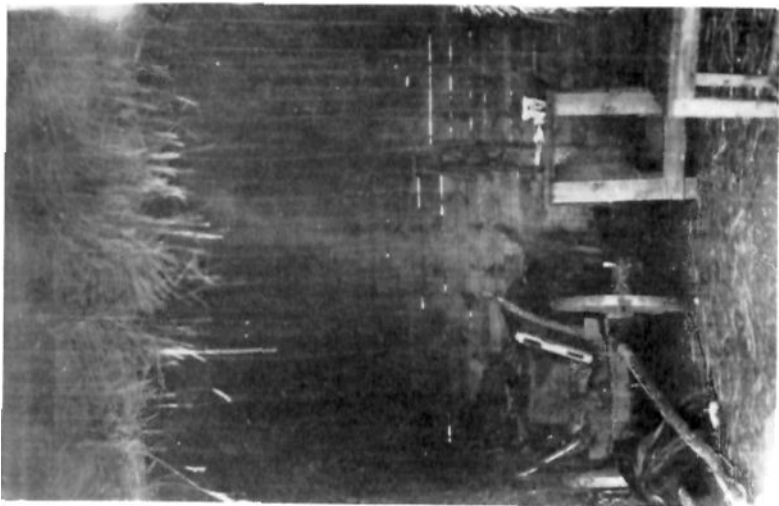
I dismounted and took the men with me on foot, ordering the battery commander in the meantime to send forward to a certain point one of his guns and two caissons loaded with ammunition.



THE CARS WERE DRIVEN WITH THEIR OWN POWER INTO THE POLISH LINES



A TYPICAL VILLAGE IN EASTERN POLAND



MY PERSONAL BAGGAGE WAGON INSIDE MY BILLET

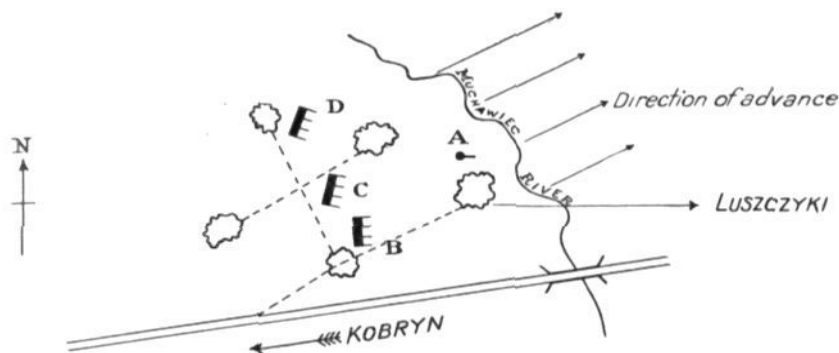


THE PEASANTS SOMETIMES ASSUMED AN ATTITUDE OF WATCHFUL
WAITING

ON THE POLISH-BOLSHEVIK FRONT

I had decided upon a little clump of bushes on the northern end of the village as the station for the advanced gun. A proper place was selected and the gun was drawn to it by hand with the aid of the infantry. Narrow trenches were dug on either side of it for the purpose of giving the men some concealment.

Upon the tracings, I sketched out the plan for the morning's fire. "H" hour was set for 7:30 A.M. Each battery commander and the infantry were supplied with these tracings. Before morning, telephone wires had been stretched to Luszczki, which was to be the point of observation. The



batteries were located at B, C, and D, while the advanced gun was placed at A, about 700 metres from the river. The river was taken as the initial line of the accompany fire.

About ten minutes before the opening of the fire, I took position behind an oak tree about 20 metres to the right of the advanced gun. The infantry commander was close by. As soon as our fire commenced, the single gun had barely fired a few rounds when it appeared as though all the Bolshevik machine guns were concentrated upon it. The men dropped into the trenches. I shouted at the top of my voice for a moment that they continue the fire but not a soul budged. So I walked over to the gun and no sooner had the men recognized me than they jumped up alertly and fired like "H . . ." I observed in front of the gun some twigs which might have interfered with the firing and made a motion as though I wanted to cut them down. But one of the soldiers snatched the hatchet out of my hand and proceeded to cut the twigs himself.

The finest firing that was ever done with one gun took place that morning. After a short artillery preparation, the infantry went over the top, accompanied by the fire of my batteries, and suffered, during the crossing, practically no casualties.

Advanced guns, usually by platoon, were constantly on duty with the advanced party. When the head of the column reached Horsk one of my guns (4/11 p.a.p.) stopped by its fire the further progress

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of an armored motor car. A fragment of the shell had killed the chauffeur and the car, without anyone at the steering wheel, ran to the side of the road, into a ditch, and overturned. The car was new, contained one machine gun, and appeared to have been constructed on a Ford chassis.

We continued to move on in an easterly direction toward Kartusa Bereza. The country through which we were then advancing was stripped completely of everything but hay and straw. We had just marched through parts of the famous Pinsk marshes which lay to our south and east. The horses were keeping up very well. The battalion requisitioned as much hay and straw as was possible.

The men, with few exceptions, slept in barns. Every time I came to the barn selected as my billet, my orderly threw out the upper-half layer of hay because the Bolsheviks had slept on it a few hours previously. As it began to get colder, we made holes for ourselves in the fresh hay beneath and covered our bodies completely with it, so that only the heads were visible. The battalion headquarters was usually stationed in the nearby peasant hut to which the barn belonged.

This is the land of storks. On almost every peasant cottage, one could see gray and white storks sitting alone on the tops of their nests.

The men were feeling good, although somewhat tired. I was never more tired in my life, but the fatigue had a glorious feeling and made one laugh at it. We were short of food for both the men and the officers. Nothing but potatoes and black barley bread had been issued to us for days. The woods were full of wild mushrooms. Small quantities of pork and other grease could sometimes be procured. We could requisition very little from the peasants because the latter had very little themselves.

Yet, in spite of these handicaps, we managed to prepare, whenever conditions and time permitted, a number of princely banquets. We ate potato pancakes, often three times a day. Each battalion headquarters had an official stamp with which all orders and passes were sealed. From time to time, I dispatched a soldier to Warsaw. The battalion order was sufficient to pass him through the lines. My mother had been sending me at intervals, to Warsaw from New York, sugar which was very difficult to obtain in Poland at that time. I sweetened boiled water with the sugar, soaked in it the barley bread with the crust cut off, and then fried it in grease. It was very good when you were hungry.

Memories of kidney stew used to torment me frequently. To get kidneys was out of the question. All we could find was mushrooms. With them we made the finest stew I believe that was ever eaten under like conditions.

ON THE POLISH-BOLSHEVIK FRONT

We drank tea and lots of it, but sometimes without sugar. If our supply of sugar was very scanty, then we found a way to get around that hardship. The Polish soldier would make for himself a large pot of tea or would fill three or four glasses, and allow the tea to cool off a little. He would then place a lump of sugar in his mouth and hurriedly drink down all of the tea. It was good when you did not have anything else.

The further to the east we marched, the more neutral and passive the attitude of the peasants became toward us. I cannot say that this attitude was hostile. Above all else, they were sincerely glad that the Bolsheviks had been driven back. Whatever sympathy they had probably nourished at one time for the Soviet country, was now turned into an intense hatred, intermingled with fear. In instances where there was no eager active support of the Polish troops by them, they assumed instead, a manner of behaving which might be called "watchful waiting." They were not going to offer anything to us until they had first found out to what extent we were going to requisition food and forage supplies from them. The Poles paid for all the supplies that were taken with memorandum receipts or by payment in Polish marks.

But in numerous localities very little of such supplies had been left behind by the Bolsheviks. There was one exception to this, at Sluck, the end of our march. In that locality the Bolsheviks had been concentrating large quantities of food and forage supplies which they had requisitioned in Poland. They did not have time, however, to get away with it all before we arrived.

In those parts of Poland where the Bolsheviks had had time to do real, forcible requisitioning, very little food, in fact, practically nothing was left for the peasants. What they could not take with them they destroyed by fire, barns and all. So the peasants naturally feared that the Poles might take away from them what little they had. I am certain that on the whole, the Polish troops were generous and displayed good judgment.

At times, when my orderly had succeeded by doubtful or undoubtful means in finding something "good" and had prepared a real meal, it was not an uncommon sight to see half-starved peasant women and children standing near by the place where I was eating and looking hungrily on. I was hungry also and had to eat in order to keep fit and because there was not enough to "go around," they had to be ordered away. It was a sad spectacle, but what could one do.

About this time, I had a peculiar feeling that I was ill with appendicitis. My right side was causing me much inconvenience and the doctor feared that the appendicitis was acute. It was without doubt an unpleasant sensation to suspect that one had acute

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appendicitis about 48 miles from nowhere, to the nearest first-aid station where an operation could possibly be performed. The only transportation to that place would be a one-horse country wagon.

The Polish army suffered a great deal from the lack of medicinal and sanitary necessities. In those days, the country was too poor to purchase them abroad in adequate quantities. There were times when it was necessary to leave behind, alone on the road, wounded soldiers, after hurried application of the most elementary kind of first aid.

This pain bothered, rather irritated me to such a degree, that I requisitioned at one of the nearby country estates, a large open carriage and hitched on to it two artillery horses. During the next day or so, I rode in it at the head of my column, while my horse was being led immediately in rear. In a few instances, I observed fire from the carriage and alongside the guns. It was not very long before I had ample proof that it was not acute appendicitis which was causing me the inconvenience. The large noodles that I had eaten over forty hours previously were at the bottom of all the trouble.

I had two orderlies, a personal servant, and one for my horse. The latter naturally was always with me. The former followed me up from place to place and sometimes took his time about it. I requisitioned for him a light country wagon with one horse. It contained my baggage and necessary personal equipment. He was usually the last to leave the billeting place. After gathering together all my belongings, he followed the general direction of the column.

There appeared to be a fair supply of horses in the 11th Polish Division. Frequently, horses were seen roaming about among the trees, of their own accord. Many peasants concealed their horses in dense patches of woods. Whenever possible, I took possession of any stray horses and put them in use in the battalion. If there was need for a certain number of country wagons, the latter were requisitioned from the natives (including a driver) for a definite period of time. As soon as the need for these ceased, each peasant, with his horse and wagon, was allowed to proceed to his home.

On the eastern outskirts of Kartusa Bereza there are two streams. The main bridge had been destroyed by the Bolsheviks and in accordance with an agreement with the infantry commander, I was to cross both streams at 5 A.M. on a certain morning. The peasants informed us that the streams were fordable with horses. The infantry was to cross over a bridge about 3 kilometres down the stream and then to proceed immediately to occupy the ground to the east of the destroyed bridge, that is, in the general direction in which I was to march. They were certain that they would occupy this ground before 5 A.M.

ON THE POLISH-BOLSHEVIK FRONT

At 6 A.M., having been informed by infantry patrols that our infantry had crossed the bridge, I marched toward the stream. My batteries were halted in the town along the side of the road, in column formation. I proceeded ahead with a few orderlies and my adjutant to the nearest stream, in order to search for a place to ford it. Such a place was soon found. I then sent an order by the adjutant to the leading battery to move forward, and digging the spurs in my horse, I called to the orderlies to follow me. I had not proceeded more than about 300 metres in the direction of the second stream, when the Bolsheviks opened up on my little party a terrific fire with machine guns and rifles. My orderlies galloped to the rear as fast as their horses could take them. My horse, for whom I had a lot of respect and who I believe had more common sense than I, instinctively turned on one leg to the rear, stood trembling for an instant, took hold of the bits with his teeth and made for home for all he was worth.

In that short interval my mind worked faster than it ever did. "Will it be safer to go back on the horse or off of him?" was my one thought. I decided that it would be most comfortable to be on "all fours." I therefore made one jump, landed in the soft black turf and crawled back to the stream. There I executed the "Eliza of Uncle Tom's Cabin" performance by hopping quickly over the loose-floating beams to the opposite bank. The Bolsheviks might have captured a major or at least his dead body, had they been more enterprising. But they were certain, without a doubt, that they had "gotten me," especially when they saw my horse galloping back without his rider. In any event, of what good is a dead or a wounded soldier? However, I thought of such a possibility and reached unconsciously to my side to make certain that the pistol was there.

A number of guns were unlimbered, off to one side of the road, and we fired with direct observation, right into the dense moving columns of the enemy. The morning haze had already risen and they were clearly distinguishable. The sight was very impressive. The 75 shells would ricochet along the ground and cut deep ruts in the dirt and into their ranks. They were anywhere from 700 metres to two kilometres distant. It was a case of every gunner for himself. Here and there, one could hear an officer say to the gunners: "Oh! that bunch has enough, there is another bunch over there, give them some." As a result of this mixup, I lost only eight horses.

We continued our march to the east, to the Szczara River. Here the Bolsheviks were well entrenched on the opposite bank. Our infantry occupied the old German trenches which had been constructed of concrete during the World War and which were in

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surprisingly good condition. Right where the Sluck road cuts these trenches about a kilometre from the river, a wonderful view is to be had of both banks. On the opposite bank were the former Russian trenches, now apparently filled with Bolsheviks. The enemy had a few guns and were sending us their messages of greeting, almost too eagerly. My own infantry, for some reason, refused to permit us to send a few in return.

About thirty hours later, the march was taken up again. By this time the Bolsheviks were becoming desperate. We had been driving them very hard. From the peasants we learned that they had been using from ten to twelve horses to a gun. We ceased from now on to march with the infantry or at least, along the same roads. They took advantage of the numerous "short cuts." Our general direction was now Baranowicze. We arrived by forced and roundabout marches, just about 20 kilometres to the west of that city.

When we reached this last place, our infantry were very tired. The horses were also tired. Whenever possible, I had permitted the men who were not mounted, to ride on the carriages and wagons. Some very good marches had been executed. On one occasion, one of these marches included a continuous hike of about 77 kilometres (about 48 miles), and after a rest of about six hours, a further march of 40 kilometres was made. The former had lasted from about 10 A.M. to 3 A.M. A great part of the march was on hard state roads and we naturally made good time. The last few rests had to be increased to about 25 minutes.

From then on, up to the occupation of Sluck, the hardships of both the horses and the men were not so great. The country through which we had to march was fairly wealthy in food. Nearly every soldier was dressed differently. Numerous Bolshevik overcoats and Cossack fur caps were in evidence, which fact was a happy occurrence, as it was already getting very cold.

In France, the infantry had always been criticizing the artillery for not being able to keep up with it. In Poland, I frequently had a suspicion that the infantry did not move forward fast enough for the artillery. All the infantry units in the 11th Division which I had been supporting could not possibly make any justifiable complaints that my guns were not on hand when they were needed. I remained throughout the duration of the offensive on the "heels" of the infantry.

(To be continued)

A DOCTRINE FOR THE USE OF ANTI-TANK GUNS

BY LIEUTENANT-COLONEL C. DEEMS, JR., F.A.

ON page vii, Vol. I, "Tactics and Technique for Artillery," published by the General Service Schools, the following definition appears:

"8. Guns.

(a) Anti-tank Guns. Guns detached from batteries and pushed forward for individual use against tanks."

On page 246 this statement appears:

"Single pieces, for defense against tanks sometimes are detached and posted well forward, covering routes of approach."

From the standpoint of the use of the combined arms, the question naturally arises as to under whose command these guns will fall. Should they be treated largely as accompanying guns which are distinctly a part of the infantry battalion commander's own command, or should they remain under the direction of the division artillery commander, or some other artillery commander?

In the original text relating to the Tactics and Technique of Artillery, Vol. I (but omitted from the present edition), the following appeared:

"5. Anti-tank guns are generally taken from the light batteries of the supporting artillery, and manned by personnel from the same source, although they may be supplied from the Army or GHQ Reserve Artillery. From four to six are frequently placed for protection against tanks along the front occupied by a division, and located so as to cover roads leading from the direction of the enemy and ground practicable for tanks. The individual pieces are placed in concealment and are prepared to deliver direct fire on tanks as soon as they appear and on other suitable targets after the enemy has broken through the front-line defenses. These guns are generally placed between 1000 and 3000 yards from the front line—all under the general supervision of a lieutenant. According to conditions or assignments, they are under the Divisional Artillery or higher commanders.

"Where circumstances appear to warrant such action, guns of selected batteries, of even entire batteries, are installed for anti-tank defense. Under certain conditions anti-tank strong points have been organized."

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It is thus seen that, in the past, a definite policy was set forth which kept these guns under *artillery* command. As this policy no longer seems to appear in our texts, the query naturally is, what is the present policy? Have we any? If we have not, then it is high time that this matter be discussed at length with a view to suggesting a present policy especially as the next war will find, probably, a far greater use of tanks in the offense, even than was the case in the World War.

It is believed that the method of probable use of anti-tank defense will involve the employment of the infantry one-pounder (at the very short ranges), together with such artillery pieces as may be designated for this duty. In addition to this, there may be developed eventually and issued to the Service, machine guns of about .50 calibre, capable of piercing tank armor. These three weapons then would be combined, when opportunity offered, to resist a tank attack. The light mortars, due to their high angle fire, and large probable error, as well as limited facility for rapid changes in range and deflection layings, do not lend themselves particularly to this kind of attack against a small moving target. Due to the great superiority of the projectile of the 75 mm. over that of the 37 mm., both as to striking energy and explosive effect, the former weapon is to be much preferred where choice exists, although it may be expected that the two types will properly be used in combination. Small arms should attack the enemy infantry accompanying the tanks.

Our system of defense is based upon three principal forms—the zone defense, the position defense, or the deployed defense. Let us therefore examine the question of the anti-tank defense as applicable to each of these different situations.

ZONE DEFENSE

This highly organized system presupposes plenty of time for its preparation. Considering the extreme case, approximating the situation on the Western Front, it may be that armies will face each other in close proximity for many months at a time. In such a case, no doubt full use can be made of more or less obsolete guns and matériel not suitable for the present needs of a mobile army. Under this supposition the mobile organization could remain intact, while our Ordnance 3" guns, in many cases, might be utilized. Perhaps some of our captured German 77s would come in for this duty. Thus we would be able to emplace single pieces in suitable positions unencumbered by animals and extensive equipment for them, with only the necessary ammunition nearby. The objections to depending on utilizing as sector pieces guns of a calibre other than that habitually used are that it complicates ammunition supply and

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maintenance (spare parts) and makes training difficult by requiring the handling of unfamiliar mechanism; but, lack of ample equipment in the early part of a war might force their use. For the same reason, this duty might, in some cases, be assigned to worn-out guns. The personnel to man these anti-tank guns could come from the division artillery present, just as it was utilized in the manning of the sector 90 mm. and 95 mm. abroad.

The tactical use of these guns ordinarily would be that they would be dug into the ground, properly camouflaged, and frequently masked by terrain features from frontal observation, so that when the tanks came into view at proper ranges, direct, diagonal or flank fire could be used against them from the direction presenting the largest target to the gunner. The slow rate of travel of the tanks and their relatively short range will not introduce great difficulties in deflection correction.

These guns will lie in this position until the moment of use and then their fire, in combination with that of other weapons, will either stop the tank attack, or they will be overrun by the hostile infantry which follows and be lost. Hence, a factor enters that must be considered—the selection of a weapon sufficient to accomplish the task, but the loss of which will not tend to cripple the manœuvring elements of division artillery. This indicates, in general, it would not be advisable, if other means be available, to detach anti-tank guns from the division artillery proper; although, in cases where they cannot be obtained otherwise, and their need is sufficiently great, this possibility must be considered too.

Consideration has been given to the German view regarding the general "Active Anti-tank Defense" published by their 17th Army Headquarters, September 21, 1918, in which the statement is made that "Mobile field artillery, especially in the case of shortage of guns, in close liaison with infantry has had better results than the fixed anti-tank gun. If at all possible, limbers with strong horses should be kept handy. Anti-tank platoons and batteries should be placed under the orders of the commanding officer of the infantry regiment or battalion." But this suggested use of mobile guns being held ready to move is limited largely by the idea that there will be a shortage of guns, a special condition upon which general principles should not be deduced; moreover, if the anti-tank gun be not initially placed in a concealed position allowing direct fire, valuable time is lost in moving it into position to attack a target that gives fleeting opportunities only as it irregularly appears and disappears in the various terrain features.

In a defensive zone, the preparation of which assumes the opportunity for considerable time, the local infantry commanders of

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the front-line battalions will arrange for the mutual coördination of their rifle fire with their machine guns and such auxiliary weapons as may be attached for use against the enemy infantry. A tank attack may never occur, but these anti-tank guns could probably render most valuable use against enemy infantry, so, to some extent, they should be fitted into the scheme of defense against a purely infantry attack.

The local infantry commander is similarly immediately interested in the use of his one-pounders in case a tank attack is launched, and he will wish to tie in those efforts to coördinate them with the anti-tank guns. This will require a close liaison between the tactical efforts of these two weapons.

The question then naturally arises whether or not the anti-tank guns should remain under the command of the local infantry commanders, or should be under some commander of the supporting artillery. If we assume that about four such guns will be needed on a division front and controlled by some one from the division artillery, the following points will appear:

a. Extensive communications, which are essentially weak; since, in the attack against a defensive zone, the early hostile artillery preparation and other fires will probably wreck them as they will be limited to telephone lines (radio will probably not be available for single pieces) laid between guns (for mutual coördination) and to the rear to such artillery headquarters as would attempt to govern them. When such communications are gone (as might be the case long before the hostile infantry jump-off, due to a heavy preparation), the guns must be fought independently.

b. When the time for their use appeared, the supporting artillery would be busiest in coördinating their efforts as such and the attempted coördination of single pieces, widely separated, probably with broken communications, would not only be an impossible task but one that no artillery headquarters should be burdened with at such a critical time.

c. Detailing an artillery officer to command and coördinate the tactical efforts of several such guns over a division front introduces again the difficulties of long communications, with the commanding officer of these units frequently at such a long distance from the gun he is attempting to direct that he will be unable to observe personally the local opportunities as they appear.

d. These guns essentially fire at targets of opportunity which appear, then disappear, in or behind the masking features of the terrain, perhaps to reappear again after short intervals of

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time. They should not be hampered in any way by waiting orders to be given to them by a distant commander. Proper opportunity should be instantly seized. If a local infantry commander needs their immediate use, he should get it under his own orders, and not be obliged to request it from an artillery officer who is liable to be a long distance away and who may be difficult to reach at all. Like the accompanying gun, the antitank gun is largely justified because it can act more swiftly than supporting artillery against very local targets that require no dense and coördinated concentrations. Hence the most should be made of speed.

e. If it be attempted to control these widely separated guns through artillery command without elaborate communications, then simultaneous coördination of effort becomes lost and individual guns must respond entirely to very local demands. In such case these guns had better act under the direct orders of the immediate local commander rather than to attempt to adhere to a scheme formulated at a prior time, which might not fit an emergency.

The above considerations would seem to indicate that, in order to bind them into the local scheme of defense, in coördination with the other arms, these guns should come properly under the tactical command of the infantry front-line commander, provided then with short communications, and ready to respond instantaneously to local demands. Just as such an infantry commander will arrange for mutual infantry fire support of adjacent subsectors, so should he arrange for mutual support of adjacent anti-tank guns.

If such arrangement be made, it will be anticipated that some infantry battalion commanders will at once take the attitude that today they are burdened with auxiliary arms and that a difficult matter is made worse. It would appear that the answer to that argument is that the accompanying gun in the attack is, under our present scheme, a part of their command and that the proper use of this mobile piece demands far more tactical ability than the efficient handling of a piece of position that conducts its fight from a single point until the last. If the accompanying gun can be commanded properly, the anti-tank gun can be handled much more easily.

When sector pieces cannot be obtained, and when necessary antitank guns cannot be secured otherwise, they must come from the division artillery. Let us examine this problem in the zone defense. Suppose four such guns are needed on a division front. Should they be given by detaching one from each of four batteries, or should a single battery be broken up for such use? It would seem that the answer is clear, and that a single battery should be made to suffer

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the enforced disintegration. This will allow the other batteries to be utilized in the manner for which essentially organized, and not make each of several batteries suffer a severe loss in its fighting efficiency. Such part of the disrupted battery as must be kept withdrawn to the rear—the limbers, caissons, animals, etc.,—can be kept together as a whole for administration and supply, and, if necessity dictates, be used as a reservoir of replacements for the demands made during a later period of manœuvre by other portions of the division artillery. If some other complement of anti-tank guns be needed, say 5 or 6, then in addition to a single battery being broken up an additional section or platoon might be required, but the idea should be to avoid any more disruption of complete units than is absolutely demanded.

The argument may be presented that in order to preserve greater tactical flexibility for more combinations of fire support and for a greater number of manœuvring batteries, it would be better to detach a single gun from each battery as needed. This idea is justified, too, because the detached pieces can be served by diminished numbers and because supply problems become simpler: also, because all batteries are kept functioning and in training (even though on a three-gun basis), and because a single gun can maintain connection and act in harmony with the battery from which detailed. It is believed that the facts already previously presented should outweigh this idea; moreover, the organization of a four-gun battery, rather than one of three guns, is based largely on the ability to make more reliable connections through the observation of fire (based on battery salvos of four rounds each). The handling of a three-gun battery means needlessly handicapping the battery commander.

A review of above considerations would seem to indicate that we are justified in forming the following:

Conclusion

In the Zone Defense, anti-tank guns properly fall within the local tactical command of infantry front-line commanders. No more units should be broken up than is absolutely necessary to provide these guns; and complete units should be so utilized rather than calling for a quota from several units.

THE POSITION DEFENSE

Bearing in mind the fact that, in general, the position defense is utilized under conditions which do not permit the extreme terrain organization allowable in the zone defense, it becomes apparent that there probably will be no opportunity for the use of so-called sector pieces. Time will often preclude their being obtained, even if

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otherwise available. This kind of defense is frequently rather closely connected with prior manœuvre, and it is apparent that these guns cannot be obtained under those conditions in the battle area. The corps artillery contains no pieces of proper calibre for such use. The 75s of the army artillery are presumed to be either portées or motorized; the former should be preserved for strategic use and the latter to meet special conditions. Back again, on the division artillery, will fall the necessity of meeting the demand for such anti-tank guns as will be needed.

It would seem here, when time is limited and the front long, that very immediate demands would sometimes be met by detailing single pieces from batteries nearby to temporarily meet conditions. But this is open to the objection already stated. If there be sufficient time, the same principles should be followed as suggested in the zone defense—keeping to the minimum the number of batteries suffering dismemberment. There would not be so much objection to sending single guns forward from a number of batteries if it was expected that, after performing their special missions, they could rejoin their battery from which originally detached. But such will not be the case if placed on anti-tank duty. Their missions will never permit them to withdraw. They stay to stop the tanks at short ranges; and, if unsuccessful, remain to assist in crushing the enemy infantry. Moreover, even if it were desirable to withdraw, it is probable, because of the short ranges under infantry fire, and the fact that they could not shelter the animals from such effect, it would be physically impossible for these guns to ever make the attempt.

The same difficulties as to long communications present themselves as in the zone defense. Essentially the zone defense is a series of positions, and most of the general conditions of the front-line defense of the zone are met in the defense of a single position. So, again we are justified in drawing the following:

Conclusion

In the position defense, in the general case, anti-tank guns properly come under the command of infantry front-line commanders. They should be secured by breaking up complete units rather than by detailing a single piece from each of several units.

THE DEPLOYED DEFENSE

The deployed defense largely presupposes "Emergency tactical dispositions" for which "the preparation is meagre, limited usually to hasty entrenchments, often constructed according to local needs while combat is in progress." Such being the case, the division artillery will hardly have opportunity for the detachment of anti-tank

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pieces therefrom, since, from time to time the batteries will probably be called upon for more or less manœuvre resulting in less permanent stability of position, and there will be little chance for a thorough coördination of the fire from anti-tank guns, even should they be detailed. Moreover, the opportunities for determining the probable terrain over which tank attack may take place become limited, and, if the position is actually taken up during combat, the approaches to the usual places that might be selected in a position defense for anti-tank guns (which must be emplaced for direct laying well to the front) will probably be so well covered by enemy fire as to prevent occupation—or, if the positions be successfully entered, these guns will be discovered and driven out before they can be utilized in their particular rôle. Since anti-tank guns must be used at short ranges, at which they become targets for enemy small arms, one-pounders, machine guns and artillery, and since they must utilize direct fire against moving targets (which requires their exposure to enemy fire), they must depend wholly on the principle of surprise attack when they come into action. There will be little chance for them to gain positions which will permit them to so act in the deployed defense.

The question might properly come up here as to whether or not the difficulties of establishing anti-tank guns in position, in the deployed defensive, could be greater than those in handling of accompanying guns. The answer is "Yes." The accompanying gun is generally used in an attack made in accordance with a definite plan based on the presumed ability to overcome the enemy in its sphere of activity by combined fire and shock action. It is enabled therefore to go forward with its own troops because the enemy is largely smothered by local superiority of fire. Its movement forward from cover to cover is predicated on the advance of its own infantry, which safeguards it until the time of its employment.

On the other hand, in the deployed defense, taken up during the progress of an action, say as the later phase of a meeting engagement, the enemy has already forced a situation on the defenders which has limited their power of manœuvre and which locally through fire superiority may have pinned them to the ground, making it impracticable for individual anti-tank pieces to successfully gain positions, during daylight, from which they can operate with direct laying for surprise effect.

Yet if a tank attack be launched, the division artillery must make a special attempt to smash it effectually. How can this be done? The attack of such small moving targets usually demands direct fire at a relatively short range (say under 2000 yards—probably much

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less). At such a distance, due to the very slow rate of travel of tanks, deflection changes are simple. The general case must be that of diagonal fire, since the target in most cases will not be directly on a line approaching the fire unit. The light tanks, generally closely preceding the infantry, will, due to the inequalities of the terrain, advance somewhat irregularly in line, thus affording some opportunities for misses on one target in diagonal fire to hit another. If heavy tanks appear, the probabilities for artillery hits become greater due to the larger target presented. It is thus seen that favorable conditions for the action of division artillery against tanks may appear, and as these moving targets cannot be easily attacked by any except the 75-mm. gun of flat trajectory, that some provision should be made for anti-tank action by these units. As time and opportunity for the necessary detachment of individual pieces, except in exceptional cases, cannot be presupposed, these targets then must be attacked by certain 75-mm. *batteries*. In the defense, usually considerable depth in the artillery formation is established. Within a light battalion probably at least one battery will be considerably more advanced than the others. This will allow shorter ranges to be used by this advanced battery and permit it (if the battery commander be near by, as likely he will be) to get better and more immediate observation on fleeting targets of all kinds.

So, in the general case, it may be assumed that there will be some batteries more or less naturally located so as to be able to successfully attack tanks. In order that they may seek proper positions from which the guns can be swiftly run up for direct fire targets, certain batteries should be specifically designated to attack targets of opportunity, and to them would properly fall the antitank duties.

The number of guns, thus, that can be quickly directed on this special duty will largely compensate for the more careful and detailed arrangements that must be made for the use of individual pieces as anti-tank guns in other cases.

Hence we can form this

Conclusion

In the deployed defense, generally, separate pieces will not be detailed for anti-tank duties, but this mission will be given to the more advanced 75-mm. batteries which should be specially designated to accept these and other fleeting targets.

These batteries remain part of the supporting artillery and their command will not be included in that of the front-line infantry commanders.

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If the terrain and conditions are such as will not permit the above action, and, if it be known that the attacking force has tanks, then anti-tank defense should provide for separate pieces being pushed forward.

GENERAL CONCLUSION

In the zone defense and position defense, when anti-tank guns are needed, generally they should be detached as individual pieces and placed under the command of the infantry regimental or front-line battalion commanders. In the deployed defense, defense against attack from tanks most frequently should be effected by entire batteries specially designated to attack fleeting targets, whose command is not included in that of the infantry regimental or front-line battalion commanders.



CONCEALMENT OF ARTILLERY POSITIONS

BY AYMAR EMBURY II, LT. COL., E.O.R.C.

IN a previous article the writer indicated the essentials of a battery position from a general standpoint, and in this article it is intended to describe the technical methods of concealment of a gun position.

Positions are located approximately by sound and flash ranging, exactly by air reconnaissance, especially photographic. It is impossible to say whether in the next war the means of detection from the air will have been improved or the reverse, but it seems probable that photography has about reached the limit of its possibilities while anti-aircraft protection is still not thoroughly developed, so that it is likely that anti-aircraft guns will be successful in keeping enemy observation at least at the height which was the case in the last war. A considerable number of German photographs show that they were taken at heights from three to five thousand metres, and while the American service not infrequently photographed at lower altitudes, this was possible only with considerable loss to our air service; and in the face of great improvement of the anti-aircraft matériel it is probable that most photographs will in the future be taken from a height of approximately five thousand metres.

The writer does not believe that a very great amount of artificial camouflage material is needed even in a war of position. The Germans got along practically without any; the only artificial material that I myself saw in German use appears to have been captured French material, if we except bare chicken wire used as a frame for boughs and straw; and the chief value of artificial material seems to be in the comparative small amount of upkeep that is necessary, whereas with natural material, branches, grass, etc., an incessant process of renewal must be maintained if the position is to be kept concealed.

The camouflage section furnished during the late war, fish nets with raffia or dyed burlap tied to them, these being 9 M. by 9 M. for the 75's and 12 M. by 12 M. for the heavier guns. These were usually carried with the artillery and erected when a gun went into position. They were open to certain objections. In the first place, they not infrequently caught fire from the discharge of the guns, endangering the ammunition supply and the gun crew. In the second place, it was impossible to furnish fish net of a color which would exactly match any given piece of terrain, and while this was

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by no means of as much importance as the average battery commander seemed to think, the very fact of a divergence in color between the camouflage and natural surroundings tended to reduce the belief of the gun crew in the effectiveness of the camouflage and to render them careless in the upkeep of the position.

It seemed to the officers of the camouflage section that artillery should have automatically appreciated the necessity of concealment, but this was not invariably the case, and as a matter of fact, concealment of gun positions was very often regarded by the artillery as a sort of extra fatigue, and performed perfunctorily, if at all. However, the artillery which operated in an active sector soon perceived the necessity for camouflage, even for temporary positions. An instance which occurs to me is when the 26th Division advanced during the Chateau Thierry attack. On the 21st or 22nd, Germans were forced back six or eight kilometres and the 51st Artillery Brigade took open field positions, some of which were occupied for only a few hours, but which were almost instantly discovered and fired upon by the Germans with considerable loss to the brigade. From that time on until the brigade was withdrawn from the sector, about the middle of August, the most meticulous camouflage officer could have found no fault with the battery positions. (See illustration No. 1.) They were selected with care, camouflaged as soon as the guns went into position, even though this was for a short time, and were for the most part unobserved by the Germans, and in consequence not fired on except as they came under such general fire as was directed on all points.

The camouflage section was early informed that our intelligence service looked first on our photographs for indications of regular placing, and that it was extremely likely, not to say certain, that the German intelligence section did the same thing. However, we found it difficult to convince the artillery of this, although that it was the case, was successfully proved by the discovery, after the Chateau Thierry attack, of a number of German air photographs in an abandoned German gun position near Bonnes. This position was extremely interesting to me because it was not correctly located on our maps, but had actually been shot out by a pair of 155 G.P.F.'s of the 146th Field Artillery. In this gun position, I found photographs and a target board indicating as targets two American positions which had previously been installed with my advice. The German gun was located at the point indicated by the arrow on the second illustration. The map position was 200 M. distant. One of its targets was two 75 guns of Battery F of the 102nd Artillery Brigade, located in a clearing in the middle of a piece of woods southeast of Boie du Chatel. This battery was indicated on the German photographs made the 8th of July (illustration



Number 1



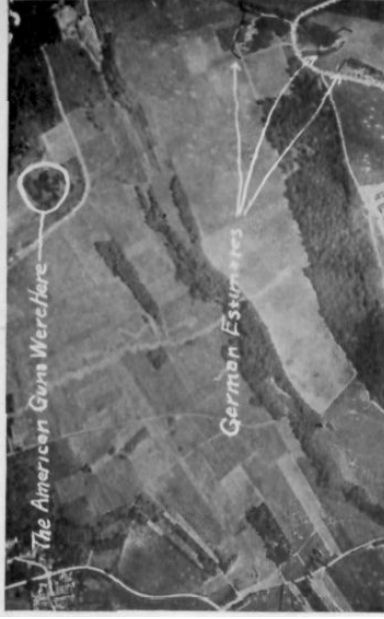
Number 2



Number 3



Number 4



Number 5



Number 6



Number 7

CONCEALMENT OF ARTILLERY POSITIONS

No. 3) as probably occupying a position indicated by a bracket in red* on the photograph; actually the guns were about 100 M. distant from this point. The American photograph made the 16th of July (illustration No. 4) shows the perfection of the German fire on the position they located, but it was so perfect that the guns themselves were not touched. The German intelligence officer who marked this photograph, evidently took the small white spots as a gun position. These white spots occurred in a field of tall wheat, and were, I think, caused by a relief partly lying down along the edge of the road. In the upper corner of this German photograph (illustration No. 3) there is a wavy mark in red indicating a trench, and underneath it is written "N. Gr. 1. 2. 9.", which stands for "Nicht Grossiert, from the first to second week of July," indicating that a careful comparison was made of a series of photographs by the Germans in an endeavor to discover increases in activity. This particular battery was saved by the accuracy of the German fire and by the excellence of its concealment. The guns were almost in the open under small trees with very little headcover, but the ground was speckled rather than of a uniform dark tone and there were not four parallel spots.

The German photograph taken the 5th of July (No. 5) was evidently intended to locate the position of the two G.P.F.'s of the 146th Field Artillery and three probable battery positions were marked on this photograph. The guns were actually about 200 M. distant and were perfectly safe. The patches which the Germans took as probable battery positions were actually made by a French *rouitier* company who had been working on the roads in the neighborhood. The German fire shown on this same photograph has very slight dispersion, either lateral or in distance, and no shot at all hit our battery. These guns were located under very small trees, pear trees as I remember them, which with the overhead nets covering the excavation for the gun positions was sufficient to give a blur on the photograph which had no military significance. These guns were located much closer together than provided for by regulation, not more than 8 or 10 M. separating them, but the position was too small to properly conceal the guns at greater intervals and Major de Bremond, the battalion commander, preferred to violate the drill regulations rather than to put in guns badly concealed, and the intelligence of his decision is sufficiently indicated by this photograph. In the same photograph (No. 5) there is a note in red by the German intelligence officer, "Fahrweg," meaning "foot path." Apparently signs of activity like this were closely observed by intelligence sections of both the Allied and enemy armies, especially

* EDITOR'S NOTE: The German notations on the photographs were all in red. They reproduce in black in the accompanying illustrations.

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when they lead into woods as indicating probable important enemy activities.

The one thing that the camouflage section preached against most continuously was uniform spacing of gun positions, and a photograph taken, the 8th of July, shows very clearly how by this spacing a French battery reinforcing the American 26th Division was discovered. It is marked on the photograph by a bracket as was customary with the Germans; and the beginnings of trench lines, indicated by wavy red lines, were marked as not having increased since the 29th of June. (No. 6.)

Another photograph (No. 7) shows an increase in trench activity and wire indicated by small crosses and noted "Gr. in. d. Woch. s. 25. 6.", which being translated reads, "Increased in the week since the 25th of June." Another bracket indication of a battery position on this photograph is incorrect. The white marks taken for battery positions were actually a small dump; this shows how easily a battery commander can simulate a battery position; but Captain Waters of the 12th F.A. was the only officer I saw who took this trouble. He was entirely successful in diverting fire from the poor position to the dummy position.

Next to the regular spacing of batteries, one of the things most difficult to guard against was the blast marks in front of the guns. The blast of the guns blows off the herbage, leaving a flat piece of ground which photographs white or of a light color. Photograph No. 8 indicates two suspected battery positions which the Germans thought were indicated by blast marks. There were, as a matter of fact, no battery positions in these locations, but in the photograph marked No. 9, the blast marks made by the four guns of Battery D, of the 12th Field Artillery, Second Division, show very clearly. Incidentally, in this photograph, were two 155 howitzers of Battery C of the 17th, which were located in an almost open field with a few small bushes and stunted trees. This position was, so far as can be told from photographs of it, absolutely perfectly concealed, simply because it was put on a piece of ground which has broken shadows over it.

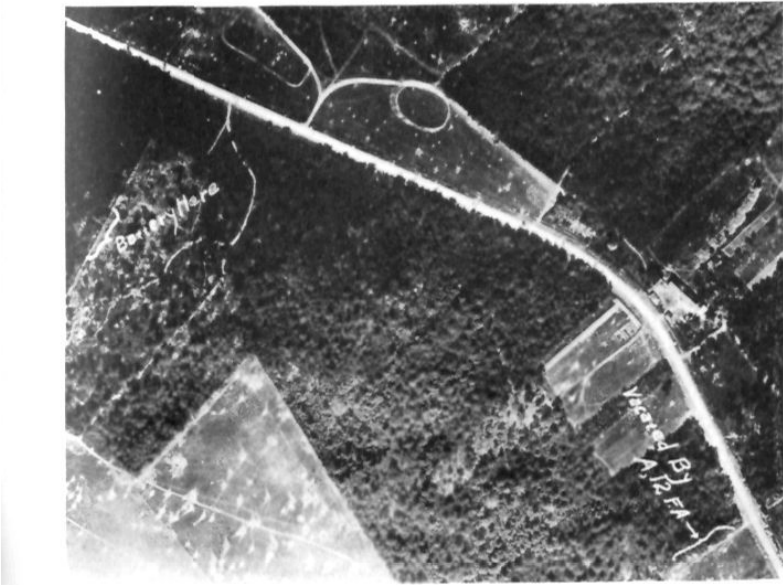
One of the most difficult things in camouflage is to cover blast marks. The Germans very frequently did this by mowing the fields in front of the guns. With small regularly shaped fields customary in France, this was not very difficult to do. We tried to cover up the blast marks, either by stretching horizontal chicken wire camouflage material eighteen to twenty inches above the ground, the edges being irregular in pattern; or by scattering brush over the ground as the blast appeared. This requires care and an accurate knowledge of the photographic value of the terrain; a thing I must confess is beyond me, and is, I believe, beyond most officers, because it can



Number 8



Number 9



Number 10



Number 11

CONCEALMENT OF ARTILLERY POSITIONS

be only obtained by a series of direct observations of the terrain and comparison of these observations with photographs of the same terrain.

The third essential to the concealment of a battery position is the concealment of the means of access to it. It was above noted that the Germans marked new foot paths. Our intelligence section did the same thing, but of all the stupid things that I have ever seen to indicate battery positions, that shown on photograph No. 10 is perhaps the worst. A number of batteries of the 2nd Division were located in the edges of these woods north of Chateau Thierry, near Blanche farm, and it was not possible to get to these batteries without passing across a field. A previous installation had been made on the other side of the Paris road, where they could be reached without crossing the fields, but this was so obviously a battery position and so many paths were shown entering these woods, that the whole area was very heavily shelled and the positions had to be abandoned, Battery D of the 17th Field Artillery losing heavily. On the opposite side of the road the field between the road and the woods was all growing wheat and the circle indicated on this picture was made by perhaps only a single ammunition wagon turning around rather than proceeding along the edge of the woods to come out on the road further down. A continuous road from one end of the woods to the other, without any indication of where one turns, is bad, but not impossibly so. A turn like this can mean only one thing—that ammunition has been carried into the woods and these woods were, probably in consequence of this turn, very heavily shelled. In the spring and early summer when the grass is long and moist very little is sufficient to indicate paths. Short dry grass will bear a good deal of traffic without showing much trace of it, but the numerous paths indicated on this photograph are sufficient indications that things of importance have taken place and are sufficient to draw heavy fire.

I remember asking a French officer once how he kept down signs of circulation, "By posting a sentry?" and he said, "Well, some people like sentry. Me, I put up a little piece of barb wire," and his advice is strongly recommended to artillery commanders.

The Germans, when necessary, confused our observation by making innumerable paths as on photograph No. 11, which is of the German terrain southeast of Etrepilly, made on the 7th of July; and possibly in consequence of the great number of signs of circulation and possibly because of the poor shooting of our artillery, it will be observed that the whole area has been thoroughly shelled. The Germans, who were required to be far more economical of ammunition, preferred, or were able to concentrate their fire, on important points.

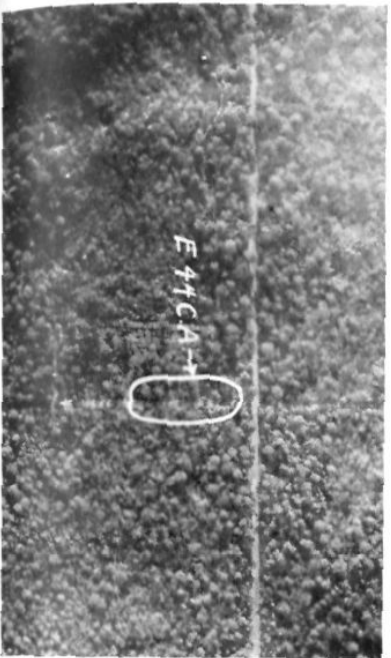
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One of the greatest difficulties with the use of camouflage was the fact that the average artillery officer believed that the erection of a head cover alone would cover his guns. The photograph (illustration No. 12) shows a most excellent head cover for some batteries of the —th Artillery Brigade, which conceal the gun perfectly, but which is more apparent than the guns themselves would have been. This position was not shelled; but that must have been because the German saw no particular reason to shell it and not because it was hidden. Had the camouflage officer selected a small square field and covered the entire field in the way he covered the guns shown on this photograph, he would have had a remarkably good result; as it was, the work was wasted. The position was put up in the fall and the ground had not been cultivated for four or five years; it shows no traces of teams going across it and a little brush over the guns and gun pits would have more nearly concealed guns. This is not saying that the position should ever have been taken, because it is certain that other positions in the immediate vicinity which could have been concealed were available, but such laborious camouflage on an open field position is useless. On the other hand, the single gun position shown in photograph 13 is admirable. The trees about it cast sufficient shadows to blur the junction of the matériel and the surrounding ground, the ground itself is rough and broken and the overhead material covers the excavation and spoil; the position was impossible to locate by air photographs.

The best heavy gun position that I have ever seen (illustration No. 14) was E of the 44th Coast Artillery regiment commanded, if my memory is correct, by Captain Tunstall, of Norfolk, Virginia. I certainly hope I am right about this, because this officer put in the best heavy battery position that I ever saw. It was within 2 kilometres of the German line; the guns were 8" howitzers, they fired continually for six weeks and no German fire came anywhere near them. The guns were located in low woods. The bushes were about ten to twelve feet high and the ground was marshy, duckboard paths were put down and the bushes tied together over the duckboards; in some cases an overhead covering of wire was strung between the tops of the bushes and small branches thrown on this. The gun platforms were of 6" × 8" timber and necessarily large and were covered with chicken wire and bushes on top of the chicken wire. This battery position was practically imperceptible on air photographs and was certainly never discovered by the Germans. Another most excellent position is that indicated on picture No. 15, one gun of Battery D of the 58th Coast Artillery Regiment. All that was necessary in this case was to put in enough overhead camouflage to cover the spoil. This position was located in the Bois de Pretre,



Number 12



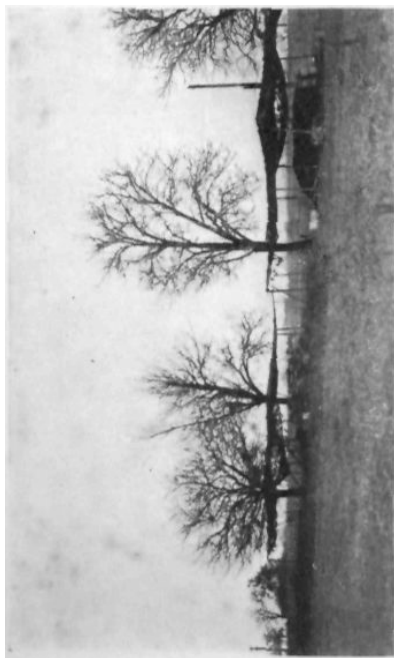
Number 14



Number 13



Number 15



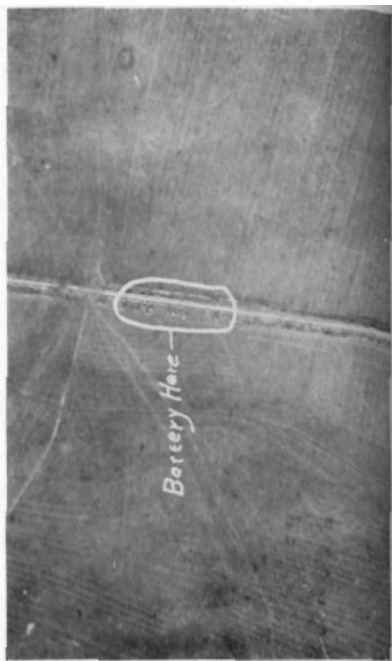
Number 16



Number 17



Number 18



Number 19

CONCEALMENT OF ARTILLERY POSITIONS

which had been practically in No Man's Land until after the St. Mihiel attack, so that the ground was very rough and had been shot to pieces. The road was about forty feet to the rear of the guns and access to the road was covered with overhead chicken wire. It was a most excellent position.

Two vacated battery positions shown on photograph No. 16 were good in that the shadows of the trees blended excellently with the overhead cover to conceal spoil and paths between. This was a battery of the 342nd Field Artillery south of Beney.

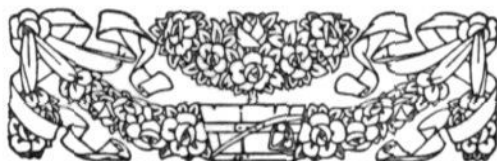
Of all the light artillery positions that I had the fortune to see during the war, perhaps the most interesting was one of the 341st Field Artillery on the Beney-St. Benoit road shown in photographs Nos. 17, 18 and 19. I am sorry that I have forgotten the number of the battery and the name of the commander who put this position in, without any advice from the camouflage section at all. It was a very bare position with slight defilade, and about one and one-half kilometres from the enemies' lines—the furthest advanced of all our positions in that area. The Germans had erected a road screen on the south side of the road which we had reversed and re-erected on the north side. On the north side of this road screen this battery dug in its four guns, covered them with their nets stretched on stakes, which can be seen in the photograph (No. 17) with the net pulled back. Photograph No. 18 shows a couple of the artillerymen pulling the net back in place. This net covers the spoil and also the blast marks; access to each gun position was through the road screen directly on to the road, and the battery commander's dugout and the telephone were on the opposite side of the road, dug under the macadam of the road, making a perfect head protection. The air photograph No. 19 shows no trace whatever of the batteries so far as I can see. This battery kept in position for about five weeks, with but one shell on the position and this apparently due to fire ranging along the road; the battery officers told me there had been no fire directed on the position itself.

The positions here illustrated indicate pretty fairly the value of concealment and the means by which it can be obtained. While I was during the entire war an officer in the camouflage section, I do not believe that any camouflage section as such should exist. Artillery camouflage is a function of the Artillery itself and not something to be forced on them by another corps, and its only excuse during the last war was the fact that we had so little time to learn anything that one could not teach artillery, who have so much to learn, everything that they should have known. Therefore, specialists were created to fill in the gaps in the artillery knowledge. I found also that during the war, the best camouflage was done, not by

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the camouflage section, but by battery commanders who were interested in keeping their men safe, and a very slight knowledge of air photographs and of how battery positions are detected is sufficient to enable a man to conceal a position perfectly.

The rules are very simple: Do not space the guns equally. Pick broken ground for the battery position. Pick a position which can be reached without leaving trails, either by men going to the guns or by ammunition supply. Pick positions which are not subject to enemy fire for other reasons. Keep spoil covered. Get rid of blast marks. Do not erect camouflage which will cast shadows, thereby revealing the fact that there is something important enough to be hidden. The Field Artillery has the most interesting job in the whole army and their importance is daily increasing, and were I an artillery officer, one of the most interesting parts of that interesting job would be to outguess the intelligence service of the enemy.



THE RESERVE OFFICERS' TRAINING CORPS AND DUTIES OF OFFICERS ON COLLEGE DUTY

BY MAJOR LLOYD E. JONES, FIELD ARTILLERY (DOL)
A LECTURE DELIVERED BEFORE THE ADVANCED AND BATTERY OFFICERS' CLASS, FIELD
ARTILLERY SCHOOL, MAY, 1923

NOTE: The author desires to acknowledge his indebtedness to Major R. P. Palmer, U. S. Army, formerly District Inspector 9th District, R.O.T.C., for much of the thought set forth under the headings, "Relations with Students" and "Relations with Head of Institution."

MILITARY instruction in educational institutions, as we knew it prior to the drafting and passage of the National Defense Act of 1916, was carried on under the Morrill Act of 1862, which placed on the colleges the obligation of including military science in their curricula in consideration for the income from certain lands donated by the Federal Government. The intended scope of this instruction was not expressed in the law and the duty of the institution was complete when the machinery was set up within the institution for offering the military courses. Each state was left to decide what amount and kind of instruction should be given. Naturally there arose much diversity in this respect as the several institutions came into existence.

Federal assistance under the original law was furnished the institution in the providing of one regular officer and equipment, which usually was of obsolete type. The help thus furnished was always inadequate in quantity; entirely insufficient to develop training in military science as any other subject in the college could have been developed.

Assuming that it was the purpose of the American people to strengthen their military efficiency by giving instruction to young men of the professional class during their period of higher education, it would be hard to imagine a more inefficient system; where neither the school nor the War Department were definitely in control; where neither had power to go ahead and do the obviously necessary thing and where the whole thing was rendered aimless and futile in the minds of the young men who took the training by providing no subsequent use for their training in the Army, or National Guard.

A speaker and college professor in criticizing this system before a meeting of the "Association of Land Grant Colleges" in 1915 has said: "If our other national enterprises were conceived and carried out with no more acumen than this, we would assuredly fail

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in our first real international competition on equal grounds." Less than a year after these remarks were recorded Congress took action in the passing of the National Defense Act, which is commonly spoken of now as the Act of June third, 1916.

The breaking out of the European War in 1914 speeded action on this measure which was to mean a renaissance for military instruction in American colleges.

The Act provided two important features:

The Reserve Officers' Training Corps (The plant).

The Officers' Reserve Corps (The product).

It was felt at the time the Act was passed that the primary feeders for the Reserve Corps would be in:

- (1) Regular Officers resigned to go into civil life;
- (2) National Guard Officers after leaving active National Guard service;
- (3) Graduates of essentially military private schools;
- (4) Graduates of army training camps (Plattsburg);
- (5) Graduates of Reserve Officers' Training Corps units of universities and colleges.

Even now the main product for the Reserve Corps come from most of the above classes substituting the C.M.T.C. for the Plattsburg camps, with the Reserve Officers' Training Corps units of colleges placing by far the greater number of commissioned officers into the Reserve each year. It is the mainstay of the whole reserve corps plan.

A study of the salient points of the 1916 law in connection with Reserve Officers' Training Corps shows that the weak spots of the old system were improved.

- (1) Law placed no limit on amount of supplies to be issued.
- (2) Permitted the Secretary of War to issue not only modern arms and equipment, but means of transportation, animals for cavalry and field artillery units, forage and subsistence.
- (3) It permitted units of all branches of the service.
- (4) Divided the course into Basic and Advanced.
- (5) Fixed the amount of time per week each of the divisions was to spend on theoretical and practical military instructions.
- (6) Authorized camps of six weeks' duration for Basic and Advanced course with transportation to and from camp at Government expense.
- (7) Authorized the Secretary of War to prescribe a standard course.

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- (8) Provided pay for the Advanced course student while in college and camp.
- (9) Provided the detail of adequate commissioned and enlisted personnel.
- (10) Most important thing it did was to recognize the product of the training in providing the individual a commission in the Officers' Reserve Corps.

An analysis of the operation of the Act of June third, 1916, in connection with Reserve Officers' Training Corps prior to War, indicates that in the fall of 1916 many units were established, but none commenced to function efficiently before the entrance of United States into war. For the most part only infantry units were installed. Colleges were very enthusiastic, in general, many applying for Units before knowing definitely the import and entire meaning of the new relationship. The Unit at Yale was the only Field Artillery Unit organized prior to War.

Major General William J. Snow, Chief of Field Artillery, started immediately after the Armistice to organize a Reserve Officers' Training Corps section in his office.

Major Robert M. Danford, now Commandant of Cadets at the Military Academy, was made chief of this section with one commissioned assistant. General Snow resurrected the National Defense Act of 1916 and with this as an instrument directed Major Danford to organize Field Artillery Units in the leading colleges of the country. After an agreement with the Coast Artillery in reference to the distribution of units, two travelling officer representatives called on about forty selected colleges and where favorable presented plans. Twenty-two Field Artillery Units were installed. Officers were sent out in the winter and spring of 1919 to organize these new activities. Two of the above units have since been withdrawn and now the Field Artillery is in unquestionably the largest colleges of the country: Yale, Harvard, Cornell, Princeton in the East; Chicago, Wisconsin, Purdue and Illinois in the West; Leland Stanford and Oregon Agricultural College in the far West.

Other arms were equally busy during this organization period. The Coast Artillery Corps established about fifteen Units; the Cavalry installed about ten Units; the Infantry organized about one hundred and fifty Units. The Units of other arms and special services: Engineers, Signal Corps, Ordnance, M.T.C., Veterinary, Dental and Medical, bring the total of separate units now operating to about three hundred.

The large problems met by organizers of Units were almost as numerous in the early days of organization as there were units. Summarized in the main they were:

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Temporary:

- (1) The lack of stability of Army Commissioned Personnel in 1919–1920. Discharge of many temporary officers during the fall of 1920.
- (2) Bad functioning of supply system.
- (3) Inability to get good enlisted personnel, particularly noncommissioned officers.
- (4) Lack of confidence bred in college authorities by S.A.T.C., and fear for permanence of Reserve Officers' Training Corps. Resultant fear that the college would build for a Reserve Officers' Training Corps on a shifting bed of sand.

All of these have long since become matters of recollection only.

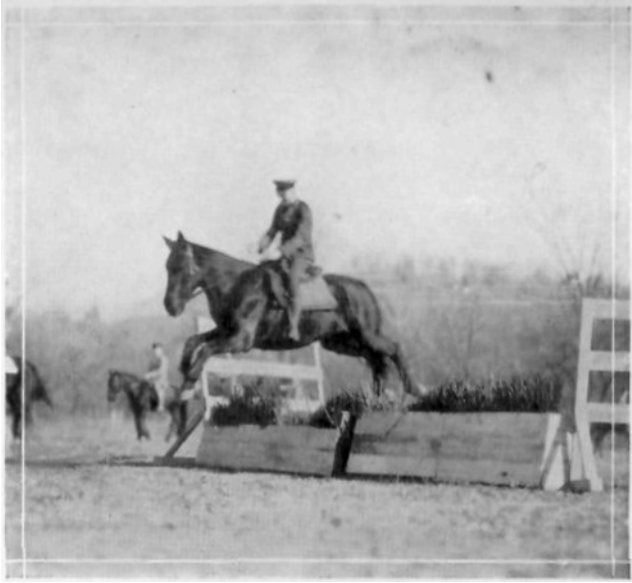
Academic Problems:

- (1) Co-relation of Reserve Officers' Training Corps schedule with other courses.
 - (a) Pre-war three hours of drill with no theoretical work was a matter of the past.
 - (b) Necessity for providing a place in already long-established schedules for classes in Military Science so that many small sections could be taught during academic hours of the day. This was a complete novelty to the college and had to be fitted to many departments of the school, some having as many as nine separate divisions. Two one-hour classes per week were desired for each basic student. Three one-hour classes were imperative for each advanced student.

The arrangement of hours for practical Military Instruction was not such a problem since most institutions schedule it after the close of the academic-day. The amount, however, was to be settled. All these matters required action by each school faculty.

- (2) Academic Credit for Reserve Officers' Training Corps Courses. Colleges had to find a way to fit this additional work into their academic curricula.

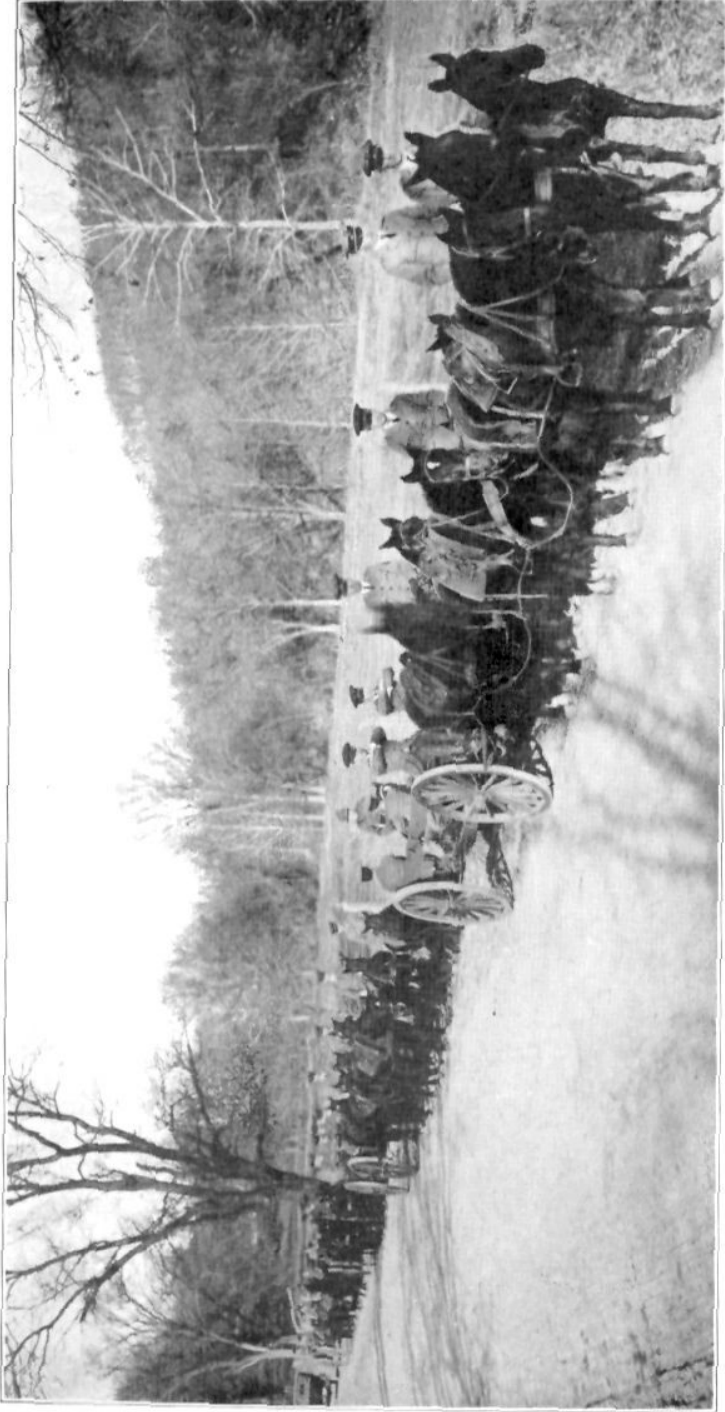
Many colleges or departments of same were operating under fixed and immutable schedules with no place for electives. Adding the course in Military Science without sacrifice of other subjects served to increase from ten to twelve and one-half per cent, the amount of academic work per student.



INSTRUCTION IN JUMPING
A Basic Course R.O.T.C. student up. University of Missouri, 1923.



A CLASS READY FOR EQUITATION INSTRUCTION
University of Missouri, 1923.



A COLUMN OF FIELD ARTILLERY STUDENTS ON THE ROAD
University of Missouri, 1923.

THE RESERVE OFFICERS' TRAINING CORPS

Each college has a set standard of points—credit hours or other measure, for graduation or a degree. The question was, were the military courses to be added without credit towards a degree?

Colleges for most part adopted a plan of substitution, dropping certain elective and compulsory requirements and putting in the Reserve Officers' Training Corps work.

Many still after so doing did not give adequate credit. At the University of Missouri in 1919 only three departments of nine, allowed academic credit for the Basic Course and *none* for the Advanced. Now all recognize the Basic Course for two hours per term and all, except two, allow full credit for the Advanced Course.

Academic credit for the Advanced Course is essential to success in colleges where the Basic Course is compulsory. Few juniors and seniors will take this work, voluntarily without credit. In colleges where the whole Reserve Officers' Training Corps course is optional, liberal credit for both courses is necessary.

All these credit matters are now fairly satisfactorily adjusted in every college, though some advance can be made in a number. Credit has been awarded only after showing individual faculty members the educational value of the work taught. Officers came into a situation already tense, with the bald proposal to cut from ten to twelve and one-half per cent. of the existing work and to substitute an equivalent amount of work which faculties heretofore had been slow to recognize as of equal general value. From this it is easy to see that opposition did and still does arise.

The average American lad will not take the Reserve Officers' Training courses voluntarily unless he is given academic credit for them. The young man entering college has a definite aim or purpose in view—the studies pursued are selected with the idea of increasing his chances of success in business. Service, especially National Service, does not appear to him as a part of his job as a citizen. The patriotic appeal to him bears little fruit due to his youth and immaturity.

It becomes accordingly the duty of the college to give him credit for taking the military work. Much campaigning was necessary to get colleges to give credit commensurate with the amount of work the student was required to do. Credit finally came as a result of pressure on the faculty and through actually proving, by taking faculty members to visit military classes, that from an educational standpoint the courses deserved credit. Many other minor problems have been met by every Professor of Military Science and Tactics during the four academic years just closing, but if he has solved the two just discussed and gotten a satisfactory incorporation of his class-room instruction coördinate with the

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rest of the University schedule, secured not less than two class periods and three drills per week per student and obtained academic credit recognition of his courses for not less than ten per cent. of the credit required to graduate, the University has done its full share. Then success depends on the efficiency of those who organize and give the military instruction.

DIVISIONS OF RESERVE OFFICERS' TRAINING CORPS

Senior Division

This division is organized at educational institutions which require four years' collegiate study for a degree.

Junior Division

Units at all other institutions private or public. (In general *per se* the Junior Unit is limited to secondary schools.)

The Senior Division has two separate courses of study:

- (1) The Basic Course.
- (2) The Advanced Course.

The Basic Course is the course of study of the freshmen and sophomore years. At practically all state institutions this part of the course is compulsory. Field Artillery Units exist in the following institutions where enrolment in the Reserve Officers' Training Corps is optional: Yale, Harvard, Princeton, Chicago, Leland Stanford and the University of Utah. At all other institutions the Basic Course is a prerequisite to graduation.

The Advanced Course, or work prescribed for the junior and senior years, is optional at all colleges maintaining a Field Artillery Unit. The enrolment in the Advanced Course as to numbers determines the output of the plant, and the extent to which this object is accomplished measures the success of the Reserve Officers' Training Corps in any particular college.

Courses of Study

The general schedule of subjects with the allotment of same to each college year is prescribed by the Secretary of War. In general, as will shortly be seen, the Basic Course is designed to train a student in the fundamental duties of private and noncommissioned officer. A well-trained basic student therefore upon completion of his course can be looked upon as a valuable by-product of the plant, even if he fails to go ahead with the Advanced Course. The Advanced Course gives the necessary technical and general military instruction to secure a well-balanced Field Artillery Reserve Officer, and trains the student in positions of responsibility and leadership.

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SCOPE OF THE BASIC COURSE

Freshman year

- (1) Fundamentals of Military Science.
- (2) Elementary Gunnery (includes Firing Battery).
- (3) F.A. Drill Regulations.
- (4) Field Artillery Matériel.
- (5) Equitation.

Sophomore year

- (1) Topography and Orientation.
- (2) Motors and Motor Transportation.
- (3) Horses and Stable Management.
- (4) Driving and Draft.

SCOPE OF ADVANCED COURSE

Junior year

- (1) Gunnery.
- (2) Artillery Firing.
- (3) Reconnaissance.
- (4) Communications.
- (5) Battery Mounted.
- (6) Selection and Occupation of positions.

The Advanced Camp is attended at the end of this year.

Senior year

- (1) Military History and Policy.
- (2) Organization and Tactics.
- (3) Military Law.
- (4) Battery Mounted—Selection and Occupation of Position.

The above schedule is the one in force at the University of Missouri and follows practically the War Department general guide. At each college, due to local circumstances, minor departures are allowed from the flexibly prescribed course of study. The Reserve Officers' Training Corps courses have more or less crystallized now at all colleges, and officers going to Reserve Officers' Training Corps duty in the future will have little else to do than teach the courses as now scheduled and study the situation for possible improvements in minor ways.

DUTIES OF OFFICERS ON RESERVE OFFICERS' TRAINING CORPS DUTY

The most important duty officers on Reserve Officers' Training Corps duty are assigned is class-room theoretical instruction. In instruction of this kind an officer will have normally about seven sections meeting twice a week, or perhaps five Advanced Course Sections

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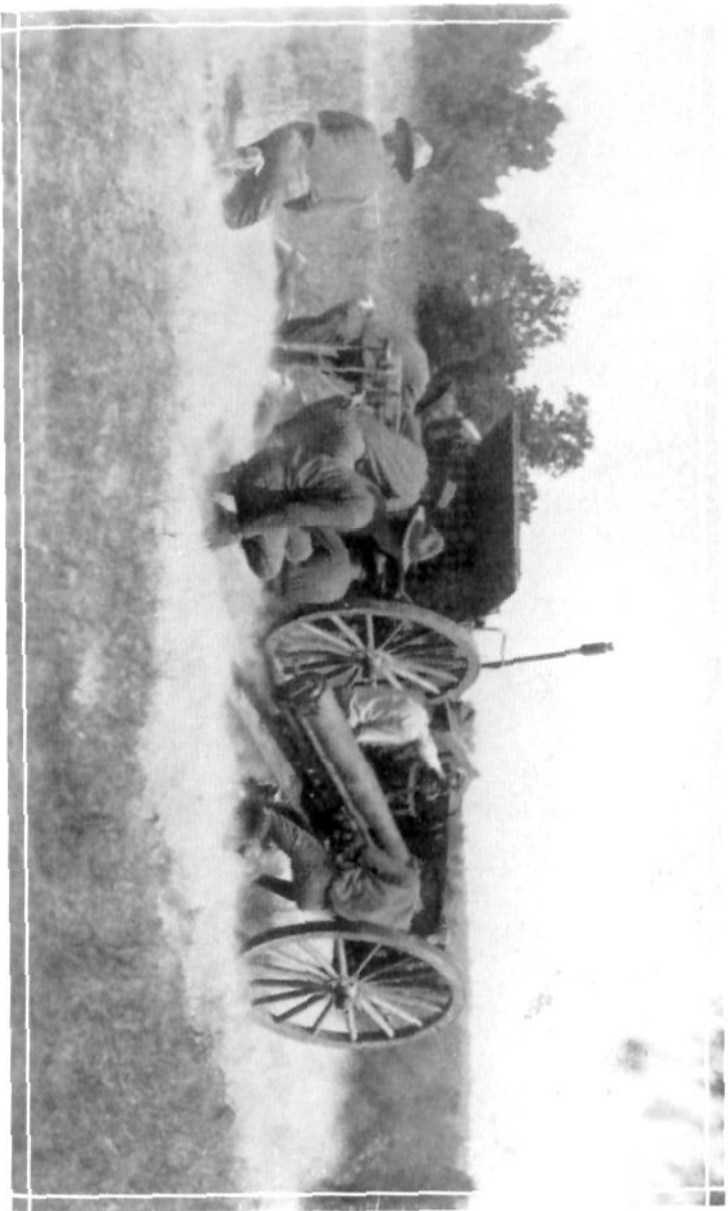
meeting three times a week. He may be instructor in as many as three different subjects in the same school term. In the classroom instruction he appears before the student as a member of the faculty and must compete in teaching ability and pedagogical methods, with the civilian members of the faculty whose profession is teaching in the class room. It is very apparent that all officers of the army are not eminently fitted for such a task. Any officer can improve his handling of the University class room with an honest analysis of his weak points. Many treatises on scientific teaching are available and many of us have improved our talents by a study of such books.

The efficiency, and organization of the class-room work is given a very high relative weight in the War Departments score card for picking the "Distinguished Colleges." It is considered the most important features of the Military work at colleges and without this being given a big place in the Reserve Officers' Training Corps schedule a college can never hope to obtain the above-mentioned enviable rating. As has been intimated, the excellence and thoroughness of the theoretical instruction will determine, in a large measure, the amount of academic credit the faculty will give; it will formulate in the student's mind an opinion of the relative importance of the courses, and lastly, which is most important, it will give the student more military instruction than he can secure in any other way.

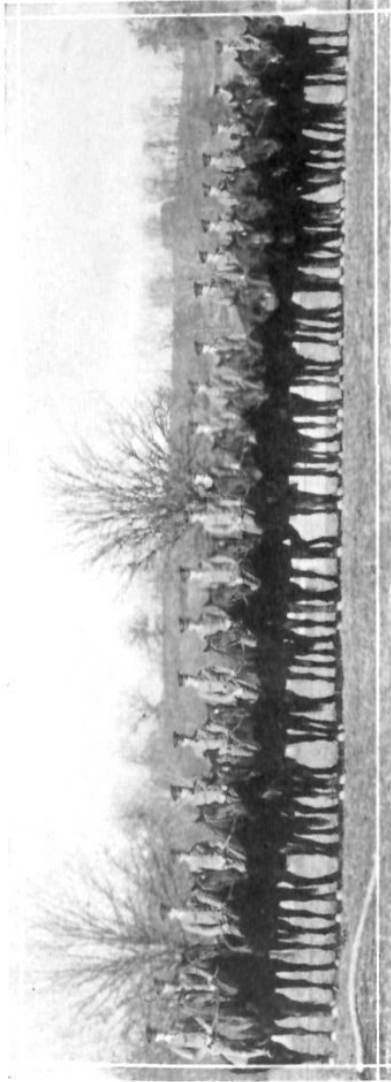
It is not meant that practical instruction could be entirely done away with by any means. A combination of the two is, of course, the most efficient, but if ever the writer had to elect which of the two forms of instruction to sacrifice, in the Reserve Officers' Training Corps, theoretical or practical, he would pick the latter for elimination and guarantee that when the properly theoretically instructed students got to a Reserve Officers' Training Corps camp they would soon be as far along as all others. I am dwelling rather at length on this to duly impress the high degree of weight and emphasis put on class-room work, its efficiency and organization. No classes should be handled by cadet officers.

TYPICAL CLASS-ROOM ORGANIZATION

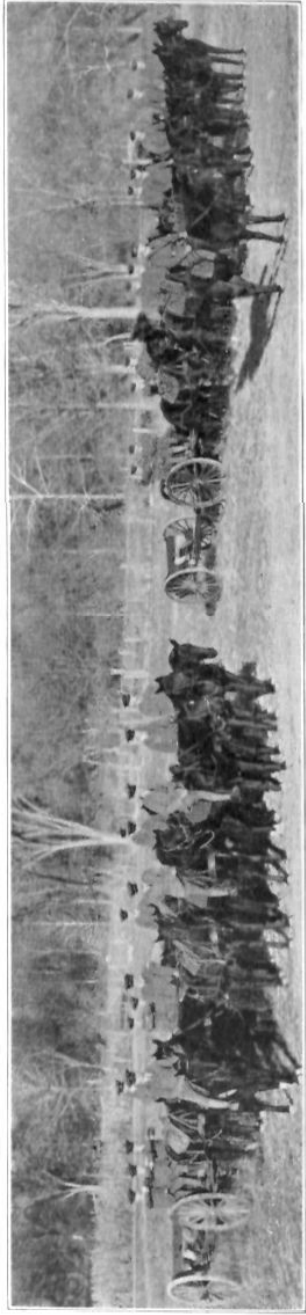
At the University of Missouri each basic student receives two one-hour periods and each advanced student three one-hour periods in the class room per week. This is about one-sixth of his classroom work in all subjects for the week. Sections run about twenty-five in strength. The current year fifty-two sections were meeting. All sections met between the hours of eight and four and all were taught by regular officers. With this schedule, except for Saturday and Sunday, there was never an hour of the academic day when some military class was not in session. About one-third of the above sections were Field Artillery, that being approximately the



BASIC COURSE STUDENTS AS CANNONEERS



THE FIELD ARTILLERY UNIT PISTOL TEAM
University of Missouri.



A PLATOON AT BATTERY MOUNTED DRILL.
All are R.O.T.C. Students, University of Missouri, 1923.

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relative strength of the Field Artillery Unit to the other Unit, the Infantry. Classes are handled exactly on the same basis as other academic subjects. Class rooms are assigned in the regular schedule and textbooks have been adopted. Academic delinquencies in a military subject go through the same channels as one in mathematics or any other subject. This type organization is very largely in force in other colleges as well, but it has not been brought about except through making the various faculties see that what we were teaching was worth while in ways other than military. It has been a hard fight in places, but for the most part the victory is won in all quarters.

TYPICAL PRACTICAL INSTRUCTION

At most institutions the practical instruction comes at 4:00 P.M., two periods to four periods per week. At this period all batteries assemble in regular dismounted formation, rolls are called and then a division is made by classes for the various forms of instruction, dependent upon the time of year; the freshmen to the guns for cannoneer or firing battery instruction, the sophomores to a practical demonstration of the making of a traverse, the juniors to the smoke bomb range, the seniors to assistant instructors in some one of the forms of instruction going on. Instruction of each nature has a regular officer in charge, who is responsible for the proper carrying out of schedules and who both supervises and instructs. As much of the practical instruction as possible is carried on by cadet officers of the Advanced Course to develop them in command and leadership. All army officers are present at this period in some capacity. At Missouri practical instruction is scheduled for four one-hour periods each week.

Practical instruction in driving and draft, reconnaissance, and selection and occupation of position is carried on in three-hour periods, requiring the men during this session to attend but one other hour practical period each week.

A very high state of organization for practical instruction is necessary if the students are to get anything out of periods of sixty minutes. There can be no waiting around until someone finds the chief mechanic to unlock the trail boxes, or find a missing sketching case for a student. Everything has to be ready and "go with the gun." In pistol firing during instruction practice last fall we were able to transport one hundred and seventy-five first-year men one and one-half miles by truck to the fifty-target Pistol Range, let every man fire one score and return to starting point in one hour. This only came after much thought and experiment in efficiently organizing for the work. Necessity for like efficient organization comes all along the line in planning the practical instruction where large numbers of students are involved.

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From the above it can be imagined that officers on college duty have full days. Fourteen hours class-room instruction and four hours practical instruction does not impress one as being much work for one week, but add to the above the necessity for preparing oneself properly each day in often as many as three separate subjects, the thoughtful conduct of several one-hour recitations daily, the marking of examination papers once each week, individual conferences with students and a possible additional special assignment as Executive, Supply Officer, Detachment Commander with stables to manage, or Pistol Team coach, firing daily outside of Reserve Officers' Training Corps hours during the greater part of the year, and you may correct in your mind a popular impression handed down from pre-war days that a college detail consists of three hours dismounted drill per week, a traditional sham battle once a year and the Faculty Club for the balance of the time.

THE ADVANCED COURSE

The measure of the success any particular unit is attaining is the product into the Officers' Reserve Corps. Without numbers in the Advanced Course there can be no output satisfactory as to quantity. There are many factors which put men into the Advanced Course, the *most* important of which is making the Basic Course so interesting that the student will feel he cannot afford to drop out when his Basic Course requirement is finished. This is the only certain way. The average freshman is by virtue of the newness of everything easy to interest, but by the time he has become a sophomore he is apt to become indifferent and blasé. For this reason the second-year class should have the very best officer instructors. The sophomores should be handled in the class room by officer instructors from the military faculty who have the best qualities of personal magnetism, and who are the best instructors, men whom the students will follow naturally. No factor determining the number of students who will take the Advanced Course can be put ahead of the necessity for making the course one of real value, interest and profit.

A second salient point in connection with this question and probably second in importance is the obtaining of academic recognition for the advanced work which is commensurate with the amount of work put in by the student. As has been indicated, this has already been satisfactorily settled in most colleges. At some—and Missouri is among them—there is still some work to be done along this line. There is a wide difference between colleges in this matter. At Harvard twenty-five per cent. of all credit for a degree can be obtained in the Reserve Officers' Training Corps; at Yale twenty-four per cent., with provision for making a major of Military Science. At most state institutions the figures are more conservative and average thirteen per cent. for the whole course, divided four

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per cent. and nine per cent., respectively, for the Basic and Advanced Course. Ten per cent. is considered adequate for credit awarded to Basic and Advanced Course combined.

A third factor is the interest shown by the faculty. Many faculty members still do not realize the re-birth of the military departments since the war. With good results each faculty member was addressed in a special letter during the past school year at Missouri. A detailed explanation was made of the course and a request was made that he support the advanced course enrolment whenever opportunity offered. A hearty response was had from the whole faculty. One Dean, who gives the course in Citizenship, took fifteen minutes from his last lecture to explain the matter to three hundred students and tell them it was their duty to go through the four-year course. Other acknowledged faculty leaders were given special attention and responded excellently.

The Professor of Military Science and Tactics secured the coöperation of the Reserve Officers' Club of Columbia (containing many faculty members), which organization sent a Reserve Officer to speak before every fraternity. These officers urged the fraternity to support the Advanced Course and brought results.

The Professor of Military Science and Tactics appeared before the Civic Clubs, Kiwanis, Rotary and Lions' Club explaining the course.

Lastly, a letter is mailed to the parents of each student when he completes the Basic Course. This stresses the advantages of the course, outlines the monetary side, and explains the relationship to the National Defense.

There are many other things which can be done to advertise the Advanced Course, but the final answer is, after all, in the question of the amount of interest put into the individual during the Basic Course. Without that interest none of the above extramilitary activities can be of any avail.

SUMMER CAMPS

The National Defense Act provided for the holding of summer camps for the further practical training of members of the Reserve Officers' Training Corps.

Advanced Course students are required to attend one camp between their junior and senior years. Basic Course students attend voluntarily. These camps form the climax of the academic year's work and the applications for admittance from Basic Course students at Missouri University this year have exceeded the quota. At nearly all large colleges this condition obtains. More than two hundred from Missouri University Units will be in camp this year, which is twenty per cent. of the live enrolment as of end of term.

The camp is a splendid opportunity to learn to know the individual

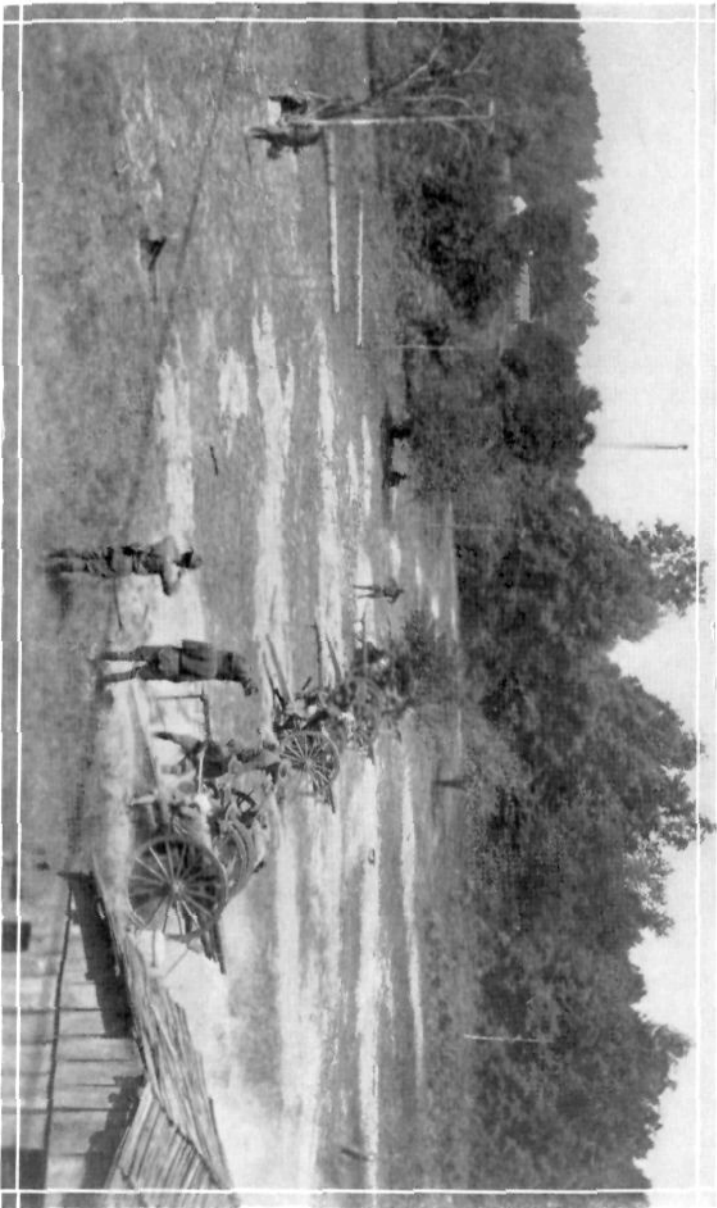
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student and to absorb much of the student collective point of view. After the writer came home from one such camp, he knew what forms of instruction appealed most to the college student and knew better how to handle him. The camp experience is indispensable to an officer on college duty. In the men who go to camp the Cadet Corps has the biggest boosters for the Reserve Officers' Training Corps, the following year, as well as the best students from which to draw the cadet officer and noncommissioned officer personnel. Each of the Field Artillery Reserve Officers' Training Corps camps held for the Seventh Corps Area has been highly successful with excellent instruction and administration. The success of the Field Artillery camps is evidenced by the ever-increasing number attending. Missouri University in 1920 had six students at camp; in 1921, twenty-five; in 1922, thirty-five, and this year seventy have signed the camp agreement. This has come about without any material increase in the college unit during the past two years. These camps start about June fifteenth and run for six weeks. All officers on duty at the college except one are sent each year. It is to most officers professionally the most profitable and enjoyable period of the Reserve Officers' Training Corps year. Much can be accomplished in six weeks. In 1922 two hundred and fifty Advanced Course students fired 15,000 rounds of shrapnel in problems carefully supervised by officers. The last week taking over a battalion of Field Artillery, a march of four days with tactical problems each day, showed that the student personnel had learned pretty well to visualize the functioning of the battery as a whole and could properly handle its components. Student personnel drove, fired and commanded the batteries.

After four years' experience the writer is convinced that Military Science can be taught at college exactly as well as law, engineering, or the liberal arts. The young lawyer, the young engineer, the young business man—must have a modicum of practice before his services are valuable. We must give the embryo officer his practical experience in the summer camps. There will never be more than a few who have had actual experience in war among the officers of the Army because we are safe from war as long as there are large numbers of able bodied leaders who have had training and battle experience. It is only when these veterans are gone or have become incapacitated that we are in danger and will need the leaders whom we are now endeavoring to provide.

RELATIONS OF OFFICERS TO FACULTY

An officer, by virtue of his detail to an educational institution, becomes a member of the faculty of the institution with all the rights thereunto appertaining. This fact should not be lost sight of, but I fear more often is, than not. Even though he realizes his



SERVICE PRACTICE AT CAMP KNOX, KENTUCKY
R. O. T. C. Camp, 1922.



R.O.T.C. STUDENTS AS TRACTOR DRIVERS ON THE MARCH, CAMP KNOX, KENTUCKY
R.O.T.C. Camp, 1922.

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term of duty is to be but a short four years, an officer should interest himself in faculty matters outside of those pertaining solely to his department. This is a politic thing to do aside from all other considerations. The moment a college faculty realizes the military faculty is interested in the school at large as evidenced by an active part taken by each officer in all matters affecting the University, then the military department has gained a collective, sympathetic ear for any measures it desires to place before the faculty.

At some colleges only the P.M.S. and T. has a vote in faculty meetings; at others the heads of the various units, and at still others all officers. It will be to the credit of the Military Department to have every vote it possesses present at every faculty meeting held. Only in this way can University procedure and other details of the operation of the institution be learned. A large university is a complex organization. The acquiring of an intimate knowledge of the manner in which all departments function will take the greater part of the first year, even if every advantage is taken of every opportunity.

It is well from the start to find out who the influential members of the faculty are, who the natural leaders are, and then if there is any military question coming before the faculty consult with such men beforehand.

Each P.M.S. and T. should know intimately the deans of the various departments of the institution. These men next to the administrative head of the institution are endowed with the greatest power. They rule in their own domain. All questions coming before the University Faculty usually are taken to the deans of the various divisions first. An understanding of the personal equation of each dean is a great help to the officer who at some time during his tour must deal with them all. The writer has frequently been embarrassed while on duty at the University by finding many faculty members, who in social conversation, made him realize that they knew a great deal about his job and too often he knew nothing of theirs. I think each officer should make it his business to find out something of the work of all members of the faculty with whom he comes in contact. We all can talk to the Athletic Director about "the ninth inning home run of the afternoon" and "record one hundred yard dash of the day before," but too few of us can talk to the Professor of Psychology or Economics on his sphere of activity. This is peculiar to officers of the army who live so much to themselves following their one chosen profession. If there is a Faculty Club join it, and a great many of these things will work themselves out naturally. Unfortunately, the army officer has in the past sometimes held aloof and found little in common interest with other professors in schools. This has often created a feeling that the

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Army personnel was undemocratic. I sincerely believe the more civilian faculty members the military faculty can know collectively and individually, the more firmly entrenched the military cause will become.

RELATIONS WITH STUDENTS

The relations to be maintained with students will depend somewhat upon the customs that exist at the different schools. No field in school work offers such a fine opportunity to study the human side of college life as does the position of an officer on college duty. He gets in the closest personal touch with the student. His influence on the students will be very great. The officer should habitually set an example in courtesy and treat students as young gentlemen—not only in their position as prospective officers, but as prospective men of affairs. The matter of addressing students by their "rank" or by the term "mister" varies with the institution. In many of the best institutions the practice is to use the term "mister" in class, at drill or otherwise officially. It is suggested as being adaptable to most schools, is respectful, democratic, and conveys a lesson in courtesy to old and young students alike.

The officer on college duty must gain the students' respect. He must, therefore, know his job and permit no opportunity for criticism. It is thought that he should be accessible to students at stated office hour periods and students encouraged to visit him for conferences, personal or official.

RELATIONS WITH HEAD OF INSTITUTION

The head of the institution should be regarded by the senior officer on duty with a college as "Commanding Officer" in all matters affecting academic administration. School heads differ greatly in their personal characteristics. These must be studied and every effort made to know the school head from all angles. Many are intensely interested in the Reserve Officers' Training Corps program. All recognize its value. An officer may often fail in getting concessions for his department by merely making perfunctory demands for them as rights under War Department orders, whereas a study of the school authorities will make possible a more thoughtful, effective and tactful presentation of his needs. The officer must constantly keep in mind that his department must be made to fit the *college*.

RELATION WITH THE TOWNSPEOPLE

The size of the cities in which colleges are located varies widely. In the typical small college town the officer personnel can become a factor in the social life of the community. In using the word "social" it is used in its larger sense to denote social relationship of

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all kinds. Membership in some one civic club is excellent for the interests of the Military Department. Every opportunity should be taken to play a part in the society of the community. The average group of a civilian community still holds the idea that army people are clanish and socially undemocratic. No opportunity should be lost to disabuse the public's popular ideas on this matter.

Lastly, each officer going into a college community should realize that on the whole it is one of very puritanical ideas and principles and that an officer will be quick to receive criticism for the slightest slip of conduct. This is only natural on account of the prominence officers occupy in a community essentially peopled by civilians.

To return to the details of the Reserve Officers' Training Corps course, many brother officers will be astonished, as well as pleased, to learn that the average freshman of today can execute as well as teach, dismounted drill; that he can mount the guard and tell you the duty of each member thereof; that he can not only tell you the name of any part of the automatic pistol, but he can fire it with safety and accuracy; that he can roll a pack, pitch his tent and arrange his equipment for inspection. He can tell you the proper name of any part of the three-inch Field Gun, explain its function, and act as any member of the gun squad thereof performing his duties with accuracy and speed. He can give you the salient constructional points of all other field guns up to the 155 GPF, figure firing data and explain the fundamental principles of field artillery gunnery.

The average sophomore can make an excellent position, road or panoramic sketch, perform the necessary topographical operations in connection with orienting a battery, knows the importance of and how to secure proper camp sanitation, can explain completely the functioning of a gas motor, drive any vehicle assigned to the Field Artillery, and handle an artillery team with equal facility. He is becoming a good instructor and begins to find at the end of this year that there is a real job to learn in the art of handling men.

The average junior can fire a battery of field artillery; he can compute corrections of the moment and apply them, perform the duties of any member of the battery detail, operate, test and maintain the Field Artillery telephone, set up and operate a radio telephone, and has a good idea of the tactics of the battery and battalion.

The senior becomes a disseminator of information concerning our military history and policy, learns the duties of the J.A., law member, president and members of a court martial and court martial procedure, is taught the tactics of the Infantry platoon, becomes familiar with Sergeant Hill, "Captain A," the "lone tree" and "Red Barn" and is developed into a well-rounded Reserve Officer. Is the Reserve Officer Training Corps worth Federal Funds and National Effort? The answer is left with you.

REMARKS ON THE OPERATION OF MOTOR MATÉRIEL

BY CAPTAIN CHRISTIANCY PICKETT, 83rd F.A.

THE development of motor matériel for military uses is still in its infancy and the usage of those types already developed is still in an experimental stage. One of the big problems that today confronts an artilleryman on duty with a motorized regiment is the coördinated use of the heterogeneous types of motor matériel provided in the tables of organization. A glance at the table below will make clear the necessity for a study of ways and means.

Type of vehicle	Use for which intended	Normal speed miles per hr.
Tractor 5-ton	Towing or draft	4 to 5 miles
Truck 3-ton FWD	Capacity	10 miles
Dodge Touring	Passenger	15 to 20 miles
White Reconnaissance	Passenger (Detail)	15 to 20 miles
GMC Truck	Light Capacity	15 miles
Motorcycle (Side-car)	See below	25 to 30 miles

The table shows a widely varied list of vehicles ranging in uses from heavy draft track vehicles of very low speed to light rubber tired vehicles designed for high speed. At once the conclusion is drawn that these vehicles cannot be paraded together for a review or ceremony of any duration without certain harm to all or part of the vehicles. This conclusion appears obvious and yet it is a regrettable truth that some officers through ignorance or indifference have allowed and required them to move together for long periods.

It would be well first to briefly catalogue these types of vehicles according to their respective specialties and faults. I have often heard the remark, "These —— motorcycles are no good; they burn themselves up," or "These —— FWD's are worthless; they dig into the mud and stay." These and similar remarks are founded upon observation of isolated cases of failure of the vehicle damned, under *certain circumstances*. The general statement that any of these vehicles is "no good" will not hold water. They are *all* good. Experts have tested them and recommended them for our use and a common characteristic of them all is that they rank high in durability and ruggedness under the use they were designed for. I make the statement that they are all good; it should be modified to read "They are all good for something." If a person wants a vehicle that will swim through mud, pull through sand, climb mountains, tow

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heavy loads, go slow or fast without heating up and still show no results of wear and tear, I suggest that he take a three months' leave this year and try to design one; there are none being manufactured at present.

Let us take first the 5-ton tractor. It is a vehicle of almost unlimited power and traction under nearly every condition. It is not made for speed nor use on hard roads. For every two hours of driving it requires one hour of work, greasing and tightening at the end of the day's work. Hence its average road speed is 4 miles an hour and day's march about 20 miles. Except when military necessity dictates otherwise, it must reach its destination at least two hours before dark in order that it can be looked over, tightened, oiled and greased. (In this connection it might be mentioned that tests under various conditions have rather tended to show that the use of 600-W or a mixture of grease and 600-W is better for use in the roller bearings than pure grease.)

Next for discussion is the 3-ton truck. I will discuss the FWD because of its prevalent use in the Field Artillery. It is axiomatic that trucks are built for capacity and not speed. It would be better to add that trucks are further not built as towing vehicles. On hard roads in a peace-time march, it is not a bad idea to couple the rolling kitchen to the Battery FWD and send it ahead of the column to gain two hours and stop at a place where there is water to cook the noon meal. The truck should carry no load in this case. It should not as a rule be used to tow other vehicles out of holes or habitually struggle along with a trailer and a load in its body. The transmission and centre, front and rear differentials are built stoutly to withstand punishment, but are not altogether proof against the shocks that occur from towing when the chain gets slack and jerks taut again. Make it a rule to do your towing with tractors as that is what they are designed for. The FWD has many limitations. It will dig into the mud and bury itself and on slippery roads, finding poor traction it is hard to steer and heads for the ditch. But on hard roads its powerful motor will pull any hill, and it will do wonders in dry sand. It is prone to overheat under hard pulls in sand, however, and should be given every chance to cool off. Its habitual speed is about 10 miles per hour, and it will stand being run behind a tractor column for a moderate distance. It is equipped with a governor, but this is very easy to break without any sign of its having been tampered with. The best governor for reckless drivers is the 104th Article of War.

The Dodge Touring Car is so well known that it needs little discussion. It should not be made to follow a tractor column very long. On broad roads it is a good vehicle to "ride" the column in. Like other vehicles it is subject to damage from abuse, but remarkably

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sturdy for its type. What few places it will not pull through, it can be pushed out of by man power.

The White Reconnaissance Car is a very flexible vehicle. It should not be used for towing anything heavier than a motorcycle and no more than 14 persons should occupy it at one time. Overloading its rim cuts the pneumatic tires. It can go at a speed of 40 miles an hour for short distances without harm to the car and may be so used in an emergency, but not at other times. A good rule is to forbid the use of fourth speed on this car, as this speed tempts drivers to such an extent that there is more speeding and reckless driving of Whites than any other vehicle. And this, of course, results in remarks on the payroll under the 105th Article of War.

The GMC truck is built for either light capacity or personnel. There are very few places it will not go, but like all wheeled vehicles, it is not meant to leave the road.

Lastly, we come to our greatest problem—the motorcycle with side-car. This has one use and one only—to carry officers or scouts or messengers on urgent business at high speed on good roads. It should never be required to run off a road, in deep sand or mud, nor should it be paraded with tractors or forced to follow a slow-moving column. It depends for cooling on the breezes that strike the flanged blocks at high speed. At low speed, running in second speed, the motor races and overheats and very quickly ruins itself. Rough use of a motorcycle jolts everything loose from it. A new motorcycle, run 15 miles without stopping behind a tractor column, and then forced to go across country through mud, across ruts and fields and deep sand for another 15 minutes, is no longer worth more than fifty cents to the Government, except for junk. Appropriations for transportation by railway, etc., during these times, make it very difficult to get parts for motorcycles, and they should therefore be used as little as possible. If they are taken out for a road march, the best place for them is on a rope behind another vehicle.

The use of motor transport may be divided into: (1) Use in time of war, and (2) use in time of peace.

The sacrifice of motor transport to abuse without due cause is never justified. In time of war, however, in cases of life and death, I would say "Tear them up when necessary to save life or influence the course of an operation in the field."

In time of peace I believe we should be forced to worry along with old types of vehicles in semi-serviceable condition both because it is economical, if not carried too far, and it gives us valuable experience in their care. In time of war, I say that every motorized organization should be immediately issued brand new stuff, as it will need to be new to stand the test of war. Moreover, men suffer

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enough fatigue through the ordinary movements in war without adding to their load by having them handle old worn vehicles. Further, these would block the precious arteries of supply by stalling and have to be pushed aside and abandoned.

While I am still on the subject of motor transport as used in war, let me emphasize the growing importance of training in the care and operation of motors. I am of the opinion that nine-tenths of all draft and hauling in time of war should be done by motors. I believe that every regiment of Field Artillery that is organized after the declaration of war should be *motorized*. Why? Because, whereas horses may be plentiful in this country, trained draft horses are scarce and almost limited to those in use in regular army regiments. In the second place, trained drivers are even more scarce than their teams. Thirdly, animals must be fed whether they work or not, and the transportation of their forage is a bigger problem than the transportation of motor fuel. In the late War, where the routes of supply were jammed, the bulky issues of hay were thrown aside and oats alone were sent up. A horse will not live on oats. Without that full comfortable hay belly, the poor beasts gnawed the bark from trees, chewed up roots, and even devoured their hay nets when they had the chance, and they died by thousands from this cause and because the greater part of them were untrained, fat, sleek French farm animals. Who, has not seen the shameful abuse of animals during the past war, has at least heard of it and shuddered. Leaving out the arguments of expediency and efficiency, we are impelled by humanity to protest against the repetition of that wholesale loss of animal life through their lack of care by green and undisciplined soldiers.

Now, it may be argued that green and undisciplined men will also work havoc with motor transport. True. But then how much easier for our great industrial nation to replace motor vehicles as they wear out in war than to replace horses, who have to be bred, raised, broken and trained to harness. And how much quicker it is to repair a burned-out bearing than to knit a broken bone! As a lover of animals, I would rather see a \$3000 truck torn up in three months' service than witness the course of a horse through abuse and starvation to death in the traces. Finally, a new motor vehicle will stand up with a certain amount of repair through months of neglect and poor lubrication, while the life of a hungry, tired, rain-soaked horse is a matter of days, and when he falls, he has to be destroyed. For the regular army regiments this does not apply. With whatever changes in personnel they undergo, they will enter the war with a fine herd of hardened, trained horses and a fair percentage of trained drivers and outlast the motorized regiments.

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To come back to the original subject, there is another classification system that applies more generally to the use of motor transport. The use of motor transport may be divided as follows:

1. Operating alone:
 - (a) Manoeuvres in peace.
 - (b) Manoeuvres in war.
 - (c) Marches in peace.
 - (d) Marches in war.
2. Operating as a part of a force with other arms:
 - (a) Manoeuvres in peace.
 - (b) Manoeuvres in war.
 - (c) Marches in peace.
 - (d) Marches in war.

1. (a) and (b). When operating alone at any time the problem is simple. In manœuvres each of the vehicles assigned to an organization is put to its appropriate use without tangling up with any function of another vehicle, always bearing in mind the principles evident from the study of each vehicle's peculiarities and specialties. The only difference between the use of motors in manœuvres in peace and in war is that in peace the tactical situation must be subordinated to the consideration of care of the vehicles while the emergencies of war demand a reversal of this procedure.

(c). When operating alone in time of peace on a march for practice or change of station, the following detailed procedure is recommended. At breaking camp each day the wheeled vehicles are formed and sent ahead together at a speed varying from 8 to 12 miles per hour according to the condition of the road and the length of the march. A lieutenant accompanies them. The rolling kitchen behind a truck proceeds about 10 to 12 miles with this column and stops by a shady place where there is water to cook dinner. The rest of the column waits to eat dinner and proceeds on to the new camp site which will be selected by the lieutenant in charge of the wheeled vehicles unless already chosen. The rolling kitchen waits until the tractor column arrives, when the men with this column are fed. The rolling kitchen then moves on into camp and is not used until the next day. A field range is carried on a GMC or other truck and arrives with the wheeled vehicles at an early hour. The mess sergeant has it set up and starts preparing supper. It is ready for the Battery when the men have brought in all the vehicles, pitched tents, greased, oiled and gassed and washed up. Motorcycles, except one kept with the tractor column, are tied behind other wheeled vehicles with a rope and used only when the lieutenant in charge wants to send a message back, or a scout ahead, or in case he wants to ride up and down the column enforcing march discipline. The tractor column takes its own time on the road, halting every two

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hours and proceeding at about 3½ miles per hour. If the leading tractor maintains a speed of 4 miles per hour, the column will move at about 3½ miles per hour average. If a tractor falls out for adjustment, the mechanics at the rear of the column in the Dodge light repair truck, drop out and work on it. It moves ahead when repaired at a normal rate of speed, catching up at a halt of the column.

(d) In time of war this procedure will be followed where and insofar as the tactical situation permits. It cannot be done when operating in the face of an enemy in war of movement as the separation of the elements of the Battery would be out of the question. But in a march of concentration behind a stabilized front, nothing but crowded roads should prohibit its application in part or in whole.

2. Operating as a part of a force composed of troops of other arms. This condition is a trying one in all cases.

(a) and (b). Wherever a motorized battery has to follow troops of other arms the wheeled vehicles must undergo a strain. The tractors can readily reduce their speed to follow foot troops and the only strain is on the men's nerves and patience. But where the bivouac is reached in daylight, there is time for work on the tractors and rest for the men. But the wheeled vehicles are forced to go at a speed far below that which is good for them. They cannot go ahead and disorganize the column if it is a large force and they cannot fall behind and confuse the units of the trains. All the wheeled vehicles can stand this but the motorcycles; they must be towed by a rope behind a truck. The others must go a great part of the time in second and keep as cool as possible by utilizing every little halt to stop the motors. They will nearly always start up again promptly as they are warm. Drivers must be watchful of their oil level and keep their radiators filled. They must also be on the alert to detect the absence of hot wind which means the fan isn't going. Whenever a vehicle overheats it must stop, unless it is a matter of life and death. In a manœuvre in peace time a wise commander will not apply the conditions of simulated war too strictly to the motorized battery, but will allow it freedom of operation where possible until contact is gained, when this is no longer necessary. In manœuvres in war, however, the rules are rigid and the tactical situation must have precedence and sway over any other considerations. The artilleryman must therefore use his ingenuity as outlined above to save his "stuff" from too great a strain, while conforming to the plan of action and order of march.

(c) and (d). Marches in peace time, when not in connection with a manœuvre have as their sole object the orderly movement of troops and matériel from one place to another. Therefore motorized troops should clear the camp and start first each day as they will

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keep well out of the way of foot troops that follow, while cavalry can pass if necessary, any motor-drawn matériel. With the motors out ahead, the same procedure as outlined for a march in peace time alone will apply.

For a march in time of war, where motorized batteries are part of a large force composed of other arms, the tactical situation must, of course, take precedence, and it will nearly always demand the marching of field artillery in the column with other troops. Here is the same trying situation I just described, where wheeled vehicles must run at low speeds. This is a problem I am free to admit I cannot solve further than to say that every precaution must be taken to prevent overheating of motors. I feel sure, however, that we will not be left long in this quandary, as there are new developments every day which meet our needs, and new vehicles which have better military characteristics are being designed.

The Army is full of "hobby riders." These people provide a lot of good after-dinner jokes for us and they are the characters we discuss in the Club when we get to telling our reminiscences. They are cranky monomaniac specialists and often neglect the study of broad general subjects which the average officer needs. But they are the *thinkers*. They are the men whom we have to thank for the development of modern weapons and methods. They, and not you and I, are going to point the way not of the difficulties I have treated in this paper and out of all other difficulties. I have tried merely to stimulate interest in the betterment of certain conditions and to point out the best methods I know for handling these special situations.

This country is becoming a machine-driven land and its people are by thousands and millions becoming masters of these machines. The gasoline motor ranks first among them all and from among the thousands who follow it and study it, there will appear a hobby rider. It is to him I dedicate this article. I hope he wears an O.D. uniform.



A STUDY IN AMMUNITION SUPPLY

BY COLONEL OLIVER L. SPAULDING, JR., FIELD ARTILLERY, OF THE
HISTORICAL SECTION, ARMY WAR COLLEGE

IN a study recently undertaken of the initial phase of the Meuse-Argonne Operation, it was noted that among the records of one of the divisions concerned, the 35th, there were unusually good reports of the operations of the divisional ammunition train. This suggested the desirability of analyzing them and comparing them with the reports of firing, to see if an impression could be gained of the actual movement of artillery ammunition on the battlefield.

The results are set forth below. The picture painted may be incomplete and inaccurate in many details, for the reports upon which they are based have their discrepancies and gaps. The broad outlines, at least, seem to be reasonably clear; and the whole is submitted as a contribution to the exploration of a somewhat neglected field of tactics.

The 35th Division entered the Aire valley as the right division of the 1st Army Corps. Its front of attack was from Boureuilles to Vauquois, about 2500 m. at the start. The left flank was to be generally on the Aire, so that at Varennes its direction changed sharply from north to northwest; the right, meanwhile, was to keep straight north to Véry, and then incline only slightly westward, so that the front rapidly extended, and at the farthest point reached was about 5000 m.

SEPTEMBER 26TH

The advance began at 5:30 A.M., September 26th. It was supported by the 60th Field Artillery Brigade, reinforced for the occasion by nine French light batteries and ten heavy. In all, the division controlled 21 batteries, 84 pieces, 75 mm.; 9 batteries, 36 pieces, 155-mm. howitzers; and 7 batteries, 28 pieces, other heavy artillery. This gave 148 guns, besides trench mortars and besides Army artillery firing in this region.

Fire was opened at 2:30 A.M., for wire cutting and destruction, the original positions being grouped about the Côtes de Forimont. At 5:30 the rolling barrage started, using all the 75's except one battalion of the 128th, which, together with all the heavy guns, had targets behind the barrage lines. The barrage moved 100 m. in four minutes; it was fired by three pieces per battery, four rounds per gun per minute, giving 216 rounds per minute on a front of 2500 m., or one round per minute on every 12 m. front. The

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artillery preparation and barrage were thoroughly effective, and the infantry met no serious checks until it approached the enemy's second position south of Varennes and Cheppy, between 8 and 9 A.M.

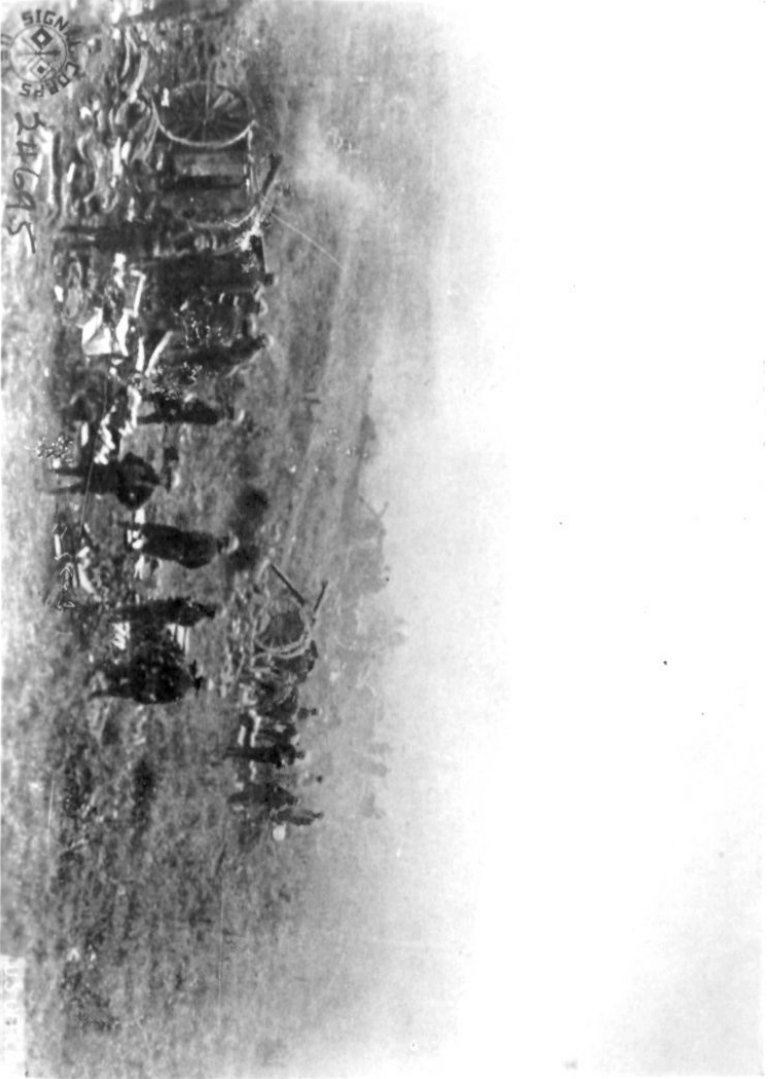
This position also was carried, but with much more difficulty and loss; for the barrage had passed here at 7:40, and batteries had begun to fall out from this work to prepare for a move forward. Up to this point the resistance had been largely by machine gun and artillery fire from the front, the latter mostly by the map and unobserved. From here on, however, mention becomes more frequent of artillery fire from the left, the heights of the Argonne up toward Apremont being still in the enemy's hands. The Army artillery was charged with counter-battery work there, but had not been able to hold down the hostile guns; the divisional artillery all had targets within its own territory.

For the advance, the American regiments constituted the first echelon—the 128th and 129th F.A., twelve batteries of 75's, and the 130th, six batteries of 155-mm. howitzers. The French artillery, remaining in position, had nine batteries of 75's, three of 155-mm. howitzers, and seven of other heavy pieces. Of these, the heavy pieces fired for interdiction upon the enemy's rear areas, and the light regiment was charged with protective barrage for the night.

The first unit to move was the 129th, which had been farthest to the rear, at Hill 290, two kilometres northeast of Neuville. It moved at 8:30, passing east of the Côtes de Forimont and then taking the road to Boureuilles. At 9:35 the 1st Battalion of the 130th moved out by the Neuville-Varennes road. The 128th started at 10, one battalion following the 129th and one the 130th. The other two battalions of the 130th moved by the Neuville-Varennes road about 11:30.

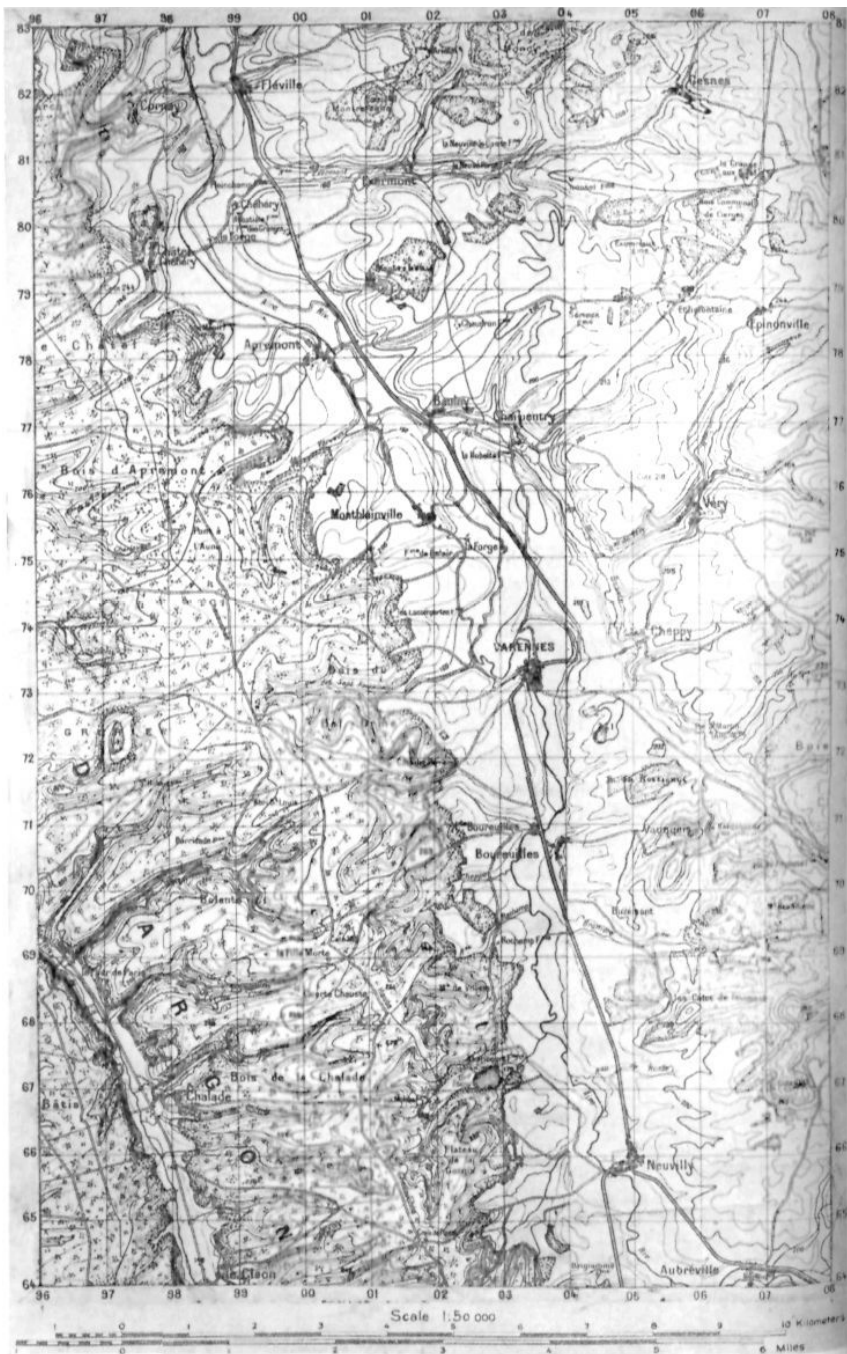
The teams were complete, except in the combat train of the 128th, but some reports mention exhaustion of the horses. The plan of advance, it will be seen, put the heavy regiment and one light battalion on the main highway, three light battalions on the side road paralleling it through Boureuilles. These were the only roads crossing the lines within the divisional area. They were known to have been blown up south of Boureuilles, but the division engineer informed the artillery commander at 8:30 A.M. that they were passable for wagons. Passage was very slow and difficult, however, and serious traffic jams occurred.

The 129th, leading the column on the side road, finally made its way through and got into position at 4 or 5 P.M., north of the Bois du Rossignol. The battalion of the 128th on the main road turned out of column, placed one battery in firing position south of Boureuilles to respond to any calls that might come from the infantry, and joined the battalion on the side road. Both battalions



DAWN ON THE COTES DE FORMONT
Battery D, 128th F. A. September 26, 1923.

ARGONNE — MONTFAUCON



A STUDY IN AMMUNITION SUPPLY

found a position about 7:30 P.M. north of the Bois du Rossignol, and the rear battery was then brought up. The 130th did not get beyond Boureuilles. There was no firing by any of the American batteries after 8:35 A.M.

In calculating ammunition expenditure, some care is necessary, for serious discrepancies are found as to days and hours between the reports of the brigade and its component parts. These may generally be harmonized, however, and a fairly reliable conclusion reached, by careful comparison. In many cases the discrepancies are caused by the fact that some of the reports run from midnight to midnight, others from noon to noon.

The artillery brigade had four days' fire at the outset. The ammunition expenditure reported for September 26th is 37,033 rounds 75 mm., and 4486 rounds 155 mm. This latter figure is taken by the brigade commander directly from the report of the 130th F.A., and hence does not include the fire of the French 155's. It is probable, therefore, that the former figure includes only the American light regiments, and not the nine French light batteries. The 155-mm. expenditure works out at one-half round per piece per minute for the time the regiment reports firing, or about one and a quarter days' fire for the regiment. For the light batteries, calculating the barrage firing according to the orders and estimating other firing at one round per piece per minute for the time the guns are reported in action, the expenditure works out at 6580 rounds for the 128th and 10,870 for the 129th, about one and one and one-half days' fire, respectively. The brigade report would give two and one-quarter days' fire.

Ammunition supply, of course, gave no trouble, for the firing was all from the original positions. Nearly all the four days' fire allotted seems to have been placed near these positions; for the reports of the ammunition train mention moving very little from Rarecourt and Evres, where the division received its allotment, after the commencement of operations.

SEPTEMBER 27TH

During the night of September 26th–27th the infantry was reorganized, in preparation for a renewal of the attack. No heavy artillery had yet succeeded in reaching a forward position; and while twelve light batteries had crossed the old lines, most of them had marched until well into the night and were not yet ready to fire. Orders of the corps called for advance at 5:30 A.M., but in view of the artillery situation it was necessary to postpone the move; 8:45 was suggested, and 6:30 finally decided upon.

As was natural under the circumstances, it was difficult to arrange for artillery support. Only one battalion fired—the 1st Battalion of

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the 129th; two batteries fired a rolling barrage starting at Charpentry and moving 100 m. every three minutes to Apremont, the other battery taking Baulny as a target. The position was at Hill 221, southeast of Varennes, so that the shortest ranges were over 5000 m. This support naturally proved inadequate, and the advance made was small.

The French regiment of light artillery was out of action all day, trying to move to advanced positions but blocked by road congestion. The three French 155-mm. howitzer batteries remained in their original positions, engaged in counter-battery work; their targets are not reported. The other French heavy batteries seem not to have been under the jurisdiction of the division for this day—at least no mention is made of them. The 129th F.A. kept up a desultory fire upon Charpentry and Baulny. At 4 P.M. headquarters of the artillery brigade moved forward to Cheppy.

At 5:30 P.M. another attack was made, this time well supported by artillery. There was a rolling barrage starting at the Charpentry-Eclisfontaine road, fired by the 2nd Battalion of the 128th, at Hill 221, by the 1st Battalion of the 129th, at the same place, and by one or two batteries of the 2nd Battalion of the 129th, west of Cheppy. The 1st Battalion of the 128th had just moved up from the Bois du Rossignol to a position east of Cheppy, and did not fire. One battery of the 129th, west of Cheppy, fired, on information from the infantry, upon a German battery just west of Montblainville. The whole 130th got out of its traffic jam, took position at Varennes during the afternoon, and fired from 5:30 to 6:30 along the line Apremont-Montrebeau. The infantry reached the line of Baulny Ridge, and some detachments pushed as far as Montrebeau, but many Germans still remained south and west of that wood.

The artillery brigade reports expenditure of only 1190 rounds of 75-mm. ammunition, and no 155 mm. for this day. This is too small. The discrepancy is due in part at least to the fact that the brigade reports on this point run from 6 P.M. to 6 P.M. An estimate based upon the firing reported gives 1320 rounds for the 128th F.A. (one battalion); Lieutenant Lee, historian of the 129th, calculates 2445 for that regiment, a figure which is entirely reasonable for the reported firing. This gives 3760 rounds for the light guns. An estimate for the 155-mm. howitzers of the 130th F.A., based upon firing reports, is 720 rounds. For the guns in action, this is 110 rounds per piece in the 128th, 157 in the 129th, and 30 in the 130th—from a third to a half day's fire.

Supply of this amount of ammunition seems to have given no trouble. The actual number of caissons in service in the batteries is not known; but it may perhaps be assumed that they could and did bring with them to the advanced position two-thirds of a day's

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fire, or 200 rounds per light gun and 100 per heavy howitzer. Four days' fire had been placed in the original positions, or stood to the brigade's credit at Rarecourt; total, 57,600 rounds 75 mm., and 14,400 rounds 155 mm. The expenditure on the first day has been discussed; taking it as 17,600 rounds light and 4400 heavy, there remained 40,000 rounds light and 10,000 heavy. If the batteries carried forward two-thirds of a day's fire, there remained in rear roughly 30,000 rounds light and 7600 heavy.

The ammunition train reports the following movements up to midnight September 27th–28th:

From old positions or Rarecourt, 13,340 rounds 75 mm. and 2024 rounds 155 mm., leaving in rear 16,660 rounds 75 mm. and 5576 rounds 155 mm. Of the amount moved, 5040 rounds had been delivered to the 128th F.A., 1700 to the 129th, and 2024 to the 130th; the remainder was in dumps along the Neuville-Varennes road, or held in the train.

The regiments, then, had stocks over night which may be estimated as follows:

The 128th carried forward 4800; expended 1300, leaving 3500; received 5000, making 8500, or over a day's fire. The 129th carried forward 4800; expended 2500, leaving 2300; received 1700, making 4000, or a little over a half day's fire. The 130th carried forward 2400; expended 700, leaving 1700; received 2000, making 3700, or one day's fire.

SEPTEMBER 28TH

The corps orders for the 28th called for an advance to the Fleville line, each division independently. The 35th made no general attack, but all regiments advanced, and reached the line of Montrebeau wood. The artillery was now all in advanced positions, most of it ready to fire, but little was done in the morning. The brigade reports a rolling barrage from Exermont north; but this could have no relation to an attack upon Montrebeau, and evidently is an error for September 29th. Several advances of guns were made during the day; the final positions were:

128th F.A., 1st Battalion Charpentry, 2nd Battalion Véry.

129th F.A., 1st Battalion Charpentry, 2nd Battalion Cheppy.

130th F.A., Varennes.

219th R.A.C. (French), 2nd Battalion Véry, 1st and 3rd still in rear.

317th R.A.L. (French), battalion one kilometre southeast of Varennes.

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The guns were more active in the afternoon, firing barrages north of Montrebeau, counter-battery in the region of Apremont and Châtel Chéhéry, and other fire less clearly described. Some of the counter-battery was very effective, but definite locations were hard to secure. Many of the opposing batteries were in the territory of adjoining divisions, especially to the left on the slopes of the Argonne, and it was necessary to use caution in distributing fire. Three batteries of French 105-mm. guns, in position south of the Varennes-Cheppy line, were again placed at the disposal of the brigade about noon, and took part in counter-battery work.

By reason of the vagueness of firing reports, no estimate of ammunition expenditure can be made as a check on the brigade report, as has been done for the previous days. A rough check may be had for the 155's, since the 130th F.A. reports its total expenditure in the Varennes position, while the brigade gives daily figures. The regimental total is 5492; the total of the daily figures in the brigade report is 5638. The total 75-mm. expenditure reported by the brigade, September 26th–30th inclusive, is 63,132, which is not far from the "four days' fire," or 57,600 rounds, which the brigade commander says he had at the beginning. Hence, except for the slight discrepancy that the brigade reports are from 6 P.M. to 6 P.M., instead of from midnight to midnight, we may accept the brigade figures tentatively, merely noting that they are probably a trifle high.

There was no movement from Rarecourt or Evres on this day, and the only movement from the original positions was 1600 rounds 155 mm. delivered at the new position of the 130th F.A. at Varennes. This left in the rear areas about 16,600 rounds 75 mm. and 4000 rounds 155 mm. All the rest of the movement, about 10,000 rounds 75 mm., was a second rehandling.

It has been shown above that a quantity of ammunition, picked up by the train in the original positions, had been placed along the Neuville-Boureuilles-Varennes road. From this stock some 1700 rounds were taken on the morning of the 28th to the 1st Battalion, 128th F.A., east of Cheppy. When this battalion moved forward to Charpentry, 1350 rounds, left in its position at Cheppy, were moved for it by the ammunition train, and 1700 rounds were delivered to it from the roadside dumps. The 2nd Battalion of this regiment moved up from Hill 221 to Véry, and 540 rounds from the dumps were taken to it there. From the old positions at Hill 221, there were 1850 rounds delivered to the 1st Battalion, 129th F.A., at Charpentry, and the same battalion got 1500 from the dumps. Besides this, 1700 rounds were delivered at Charpentry from the dumps, but it is uncertain which regiment got it—probably

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the 129th, since it reached that position earlier and so doubtless did more firing.

The total receipts in firing positions on this day, then, were:

128th F.A., 1st Battalion	3400
(This in addition to the 1350 moved by the ammunition train from one firing position to the other.)	
2nd Battalion	540
129th F.A., 1st Battalion	3550
2nd Battalion
Total 75-mm.	7490
130th F.A., 155 mm.	1600

In the light regiments, battalions are here treated separately, instead of regiments as heretofore, because they became widely separated on this day, and the regimental units no longer operated normally.

If the 130th F.A. carried over from September 27th, as calculated above, 3700 rounds, received 1600 as just shown, and expended 580, it ended this day with 4800 on hand, or one and one-third days' fire. The brigade commander has said that he felt some misgivings as to his supply of 155-mm. ammunition on the 27th and 28th; but if these figures are anywhere near correct, these fears must have been based upon incomplete information at his headquarters.

We can not find, as on previous days, how long the light battalions were in action, but we can estimate how long each was in firing position. A comparison of reports gives the following approximations. Most of the firing seems to have been done in the daytime, so only the period from 5 A.M. to 7 P.M. is considered:

- 128th F.A.—1st Battalion southeast of Cheppy 5–8 A.M., moving 8 A.M.–5 P.M., Charpentry 5–7 P.M. Ready to fire, 5 hours.
 2nd Battalion, Hill 221 5–6 A.M., moving 6–11 A.M., Véry 11 A.M.–7 P.M. Ready to fire, 9 hours.
- 129th F.A.—1st Battalion Bois du Rossignol 5–8 A.M., moving 8–11 A.M., Charpentry 11 A.M.–7 P.M. Ready to fire, 11 hours.
 2nd Battalion west of Cheppy 5 A.M.–7 P.M. Ready to fire, 14 hours.

The total 75-mm. expenditure reported by the brigade is 2264 rounds, or one-sixth of a day's fire. Apportioning this on the basis of hours in position, we get in round numbers:

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- 128th F.A., 1st Battalion 290 rounds, or one-twelfth day;
2nd Battalion 520 rounds, or one-seventh day;
129th F. A., 1st Battalion 630 rounds, or one-sixth day;
2nd Battalion 810 rounds, or one-fourth day.

The state of supply at night, then, may be taken as follows:

- 128th F.A.—1st Battalion carried over 4250; received 3400, making 7650; expended 290, leaving 7360, or two days' fire.
2nd Battalion carried over 4250; received 540, making 4790; expended 520, leaving 4270, or a little over a day's fire.
- 129th F.A.—1st Battalion carried over 2000; received 3550; expended 630, leaving 4920, or one and one-third days' fire. This battalion was the first to go forward as far as Charpentry, and reached there, according to this calculation, with only a little over a half day's fire. There was, therefore, some perfectly justified anxiety in the battalion; but the supply was soon established, thanks to some excellent work by the ammunition train.
- 2nd Battalion carried over 2000; received none; expended 800, leaving 1200, or only one-third of a day's fire. This caused no anxiety, however, since the position was within a few hundred metres of an ammunition dump, and the battalion's own combat train could have supplied it if necessary.

SEPTEMBER 29TH

The corps orders for the 29th called for another advance, by each division independently, starting at 5:30 A.M. Division orders gave the direction as Exermont and the woods beyond, parallel to the Baulny-Fléville road. For the artillery, they called for a rolling barrage ending one kilometre north of Exermont, fired by the light guns, and a standing barrage of heavy howitzers one kilometre north of Exermont; this to cease on arrival of the rolling barrage, and the howitzers to shift to the Argonne heights.

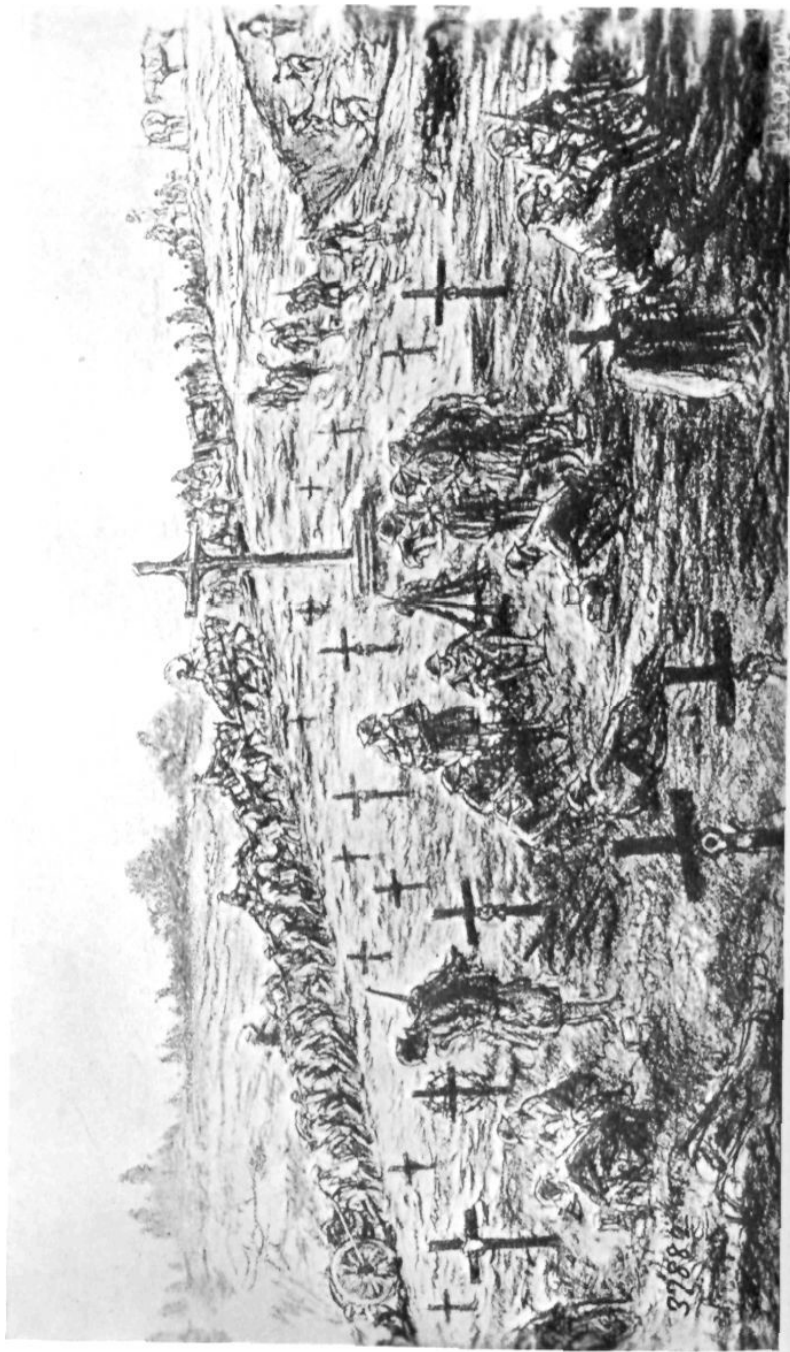
The rolling barrage was fired by three light battalions, the other—1st Battalion 128th F.A., at Charpentry—firing on direct call from the infantry. The barrage was originally intended to start at the line 80.0, 200 m. north of Montrebeau wood, but this was changed to the line 80.6, just south of Exermont, by brigade orders, about 3 A.M.

The attack failed; a few small parties reached the Exermont line, but could not hold it, and fell back to Montrebeau. Meanwhile a defensive line had been established by the division reserve at Chaudron Farm, and all were directed to retire to this for reorganization.



130th F. A. Co. 23879

VARENNES
Battery C, 130th F. A., September 27, 1918.



TAKING ARTILLERY AROUND THE MINE CRATER ON THE ROAD TO VARENNES

Drawn by Captain W. Morgan.

A STUDY IN AMMUNITION SUPPLY

The Germans followed up this movement, and made slight counter-attacks, but these were repulsed without difficulty; the artillery was called upon for barrage when needed, and the responses seem to have been effective.

Artillery fire from the Argonne heights was a powerful factor in the German resistance. As noted above, the division's heavy artillery fired in this region from time to time all day, when it could be spared on the divisional front, but this gave neither the necessary weight nor volume, even when added to the fire of the 28th Division on the left. The Army artillery could not at first assist, since Army orders, evidently in anticipation of a general advance, prohibited fire so far south. Late in the afternoon such fire was arranged for and executed, but no reports are found showing any of it in the morning, when the infantry was fighting for the Exermont line.

On this day, as on the preceding one, the firing reports are too indefinite to permit even an approximate calculation of ammunition expenditures by battalion. Hence it is again necessary to make a study of firing positions and the time spent in them, accept the brigade report of total expenditure, and so arrive at an estimate of the apportionment of that expenditure; then review the records of the ammunition train.

The positions of the American guns were as follows:

128th F.A. (75 mm.); 1st Battalion Charpentry, 2nd Véry.

129th F.A. (75 mm.); 1st Battalion Charpentry, 2nd Cheppy.

130th F.A. (155-mm. howitzers); Varennes.

French batteries attached to the division were:

219th R.A.C. (75 mm.); one battalion reached Charpentry and took position east of the American batteries already there. When the infantry fell back to Baulny this battalion retired to Cheppy, but seems to have returned later. The brigade report says this took place on the 30th, but this is probably an error; unless, indeed, there were two such changes. The 2nd Battalion was at Véry, 3rd moving up to Cheppy.

317th R.A.L. (155-mm. howitzers); one battalion near Hill 221.

451st R.A.L. (105 mm.); one battalion (possibly two) south of the Varennes-Cheppy line.

The American batteries, the only ones for which ammunition reports are available, made no changes of position, and each of the light regiments had one battalion at Charpentry, the most advanced and hardest fought position. Hence we may assume that there was no material difference in their ammunition expenditure. The brigade reports 10,418 rounds 75 mm., 2313 rounds 155 mm. This

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gives 5200 rounds to each light regiment—say 3000 rounds to each advanced battalion and 2200 to each of the others. Battery "A," 129th, reports 1250 rounds, which would indicate that this apportionment is not unreasonable.

No. 155-mm. ammunition was moved by the train, with the exception of 189 rounds from the original 130th F.A. position to Varennes.

Movements of 75-mm. ammunition were as follows:

From Neuville to Varennes, 1000 rounds; this was merely shifting from a rear dump to a forward one.

From Rarecourt to Cheppy, 810 rounds. This was a new draft upon the allotment of the division, not previously handled. Since no stock was maintained at Cheppy, it must have gone to the 2nd Battalion, 129th F.A., the only light guns there.

All the rest of the movement was from the Varennes dump. The 1st Battalion, 129th F.A., at Charpentry, got 1700 rounds; the 2nd Battalion of the same regiment, at Cheppy, 1000. One caisson company took 1800 rounds forward to Véry for the 2nd Battalion of the 128th; this battalion refused to receive it, so the company brought it back again and delivered it at Cheppy, a few hundred metres from the dump—the company report says to the 1st Battalion, 129th, evidently meaning the 2nd Battalion, for the 1st was not there.

The state of supply, then, was as follows on the evening of the 29th;

1st Battalion, 128th, Charpentry, on hand 7300; expended 3000, leaving 4300, or a little over a day's fire.

2nd Battalion, 128th, Véry, on hand 4200; expended 2200, leaving 2000, or something over a half day's fire.

1st Battalion, 129th, Charpentry, on hand 4900; expended 3000, leaving 1900; received 1700, making 3600, or one day's fire.

2nd Battalion, 129th, Cheppy, on hand 1200; received 2800, making 4000; expended 2200, leaving 1800, or one-half day's fire.

130th, Varennes, on hand 4800; expended 2300, leaving 2500, or two-thirds of a day's fire.

SEPTEMBER 30TH—OCTOBER 2ND

September 30th marks the beginning of a period of rest and reorganization for the whole army. At 11 P.M. on the 29th the First Army issued an order suspending attacks, and directing the corps to organize a defensive position. The 35th Division ordered

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a line of resistance along the Chaudron Farm road, with a second position on Baulny Ridge. The artillery was active all day, doing even more firing than on the 29th, mostly in barrages called for by the infantry or ordered from above. The 129th F.A. seems to have done more than the 128th, although this may be merely because their reports are fuller. The division was relieved on the 1st, except the artillery, which remained in support of the relieving division until October 2nd. The amount of firing reported for those two days, however, is small.

The brigade report shows an expenditure of 12,227 rounds 75 mm. and 1115 rounds 155 mm. on September 30th. These figures may be accepted, subject to the same reservations as on previous days. Perhaps 3500 rounds for each battalion of the 129th and 2500 for each of the 128th may be a reasonable distribution.

The movement of ammunition on the 30th includes 3650 rounds 75 mm. from Rarecourt. This presumably completed the movement of the original four days' fire allotted, for the brigade commander says that he received notice from the corps chief of artillery that his allotment was exhausted. The total movement was as follows:

Neuvilly to Varennes (rehandling from rear dump to forward one), 5193 rounds 75 mm.

Rarecourt to 2nd Battalion, 129th F.A., Cheppy, 3650 rounds 75 mm.

Varennes to 2nd Battalion, 129th F.A., Cheppy, 1700 rounds 75 mm.

Varennes to 2nd Battalion, 128th F.A., Véry, 1840 rounds 75 mm.

Old to new position, 130th, 500 rounds 155 mm.

The state of supply on the night of the 30th, then, may be estimated as follows:

1st Battalion, 128th, Charpentry, on hand 4300; expended 2500, leaving 1800, or one-half day's fire.

2nd Battalion, 128th, Véry, on hand 2000; received 1840, making 3840; expended 2500, leaving 1300, or one-third of a day's fire.

1st Battalion, 129th, Charpentry, on hand 3600; expended 3500, leaving only 100 rounds.

2nd Battalion, 129th, Cheppy, on hand 1800; received 5300, making 7100; expended 3500, leaving 3600, or one day's fire.

130th, Varennes, on hand 2500; received 500, making 3000; expended 1100, leaving 1900, or one-half day's fire.

Statements from the ammunition train are found, showing ammunition on hand in the light battalions at 8 A.M. and at noon.

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These are not of great value for present purposes, for this was a day of rapid fluctuation in stock on hand, but the following table shows that the calculations are at least not entirely fantastic:

Battalion	Calculation early A.M.	Am. Tr. 8 A.M.	Am. Tr. noon	Calculation night
1st, 128th	4,300	2,000	2,000	1,800
2nd, 128th	2,000	2,850	3,900	1,300
1st, 129th	3,600	3,500	3,000	100
2nd, 129th	1,800	2,400	4,800	3,600
Total	11,700	10,750	13,700	6,800

The division was relieved on the night of September 30th–October 1st, but its artillery remained until October 2nd in support of the relieving division. The amount of firing reported for these two days is small—4537 rounds 75 mm. and 1629 rounds 155 mm. There is no reason for assuming any great difference in expenditure, and each light battalion may be taken to have expended about 1100 rounds in the two days.

Movements by the ammunition train were as follows:

From rear dump (Neuvilly) to forward dump (Vareennes), 5600 rounds 75 mm. October 1st.

Neuvilly to 1st Battalion 128th, Charpentry, 600 rounds 75 mm. October 1st.

Vareennes to 2nd Battalion 129th, Cheppy, 3000 rounds 75 mm. October 2nd.

Vareennes to 1st Battalion 129th, Charpentry, 100 rounds 75 mm. October 2nd. (The ammunition train reports that this exhausted the 35th Division ammunition at Vareennes.)

Old battery positions near Côtes de Forimont to an Army dump at Neuvilly, 9700 rounds 75 mm. and 2200 rounds 155 mm. mostly on October 2nd. This evidently represents salvaging and turning in an unexpended balance of the divisional allotment.

The state of supply on the evening of October 2nd may be calculated as follows:

1st Battalion 128th and 1st Battalion 129th, Charpentry, on hand 1900; received 700, making 2600; expended 2200, leaving 200 each. These two battalions are considered together, for if assumptions as to stocks are reasonably correct most of the firing done by the 129th must have been from stock of the 128th. But the distribution of the expenditure on these days is not material,

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the important point being rather the total amount at Charpentry.

2nd Battalion 128th, Véry, on hand 1300; expended 1100, leaving 200.

2nd Battalion 129th, Cheppy, on hand 3600; received 3000, making 6600; expended 1100, leaving 5500, or one and one-half days' fire.

The total of 75-mm. ammunition remaining in the batteries was then about 6000.

130th, Varennes, on hand 1900; expended 1600, leaving 300.

SUMMARY

It is now possible to collect and discuss the foregoing estimates and calculations.

For the purposes of daily computations it was found convenient to assume that the batteries themselves carried forward certain stocks when they left their original positions. No error results, however, from an erroneous assumption here, since these assumed quantities are included either in the estimated expenditure or in the stock remaining on hand October 2nd. But the whole operation will now be treated solely from the point of view of the ammunition train, and such assumptions will be discarded as unnecessary. Accurate figures will be used where available, but many are in round numbers only, so the final results may be considered highly satisfactory if the check is anywhere near. Thus, in many cases, the caisson companies say simply "filled," and we have no means of determining the exact number of rounds; but we do know that the train was operating 35 caissons in the two companies, so our estimates are not mere guesses, but should be reasonably close.

The original credit of the division at Rarecourt and Evres was four days' fire, or 57,600 rounds 75 mm. and 14,400 rounds 155 mm. The ammunition train reports show 8453 rounds 75 mm. and 408 rounds 155 mm. drawn after September 25th; hence we may start calculations on September 26th with 49,147 rounds 75 mm. and 13,992 rounds 155 mm. within reach of the gun positions at Neuville and the Côtes de Forimont. Ammunition was served to the batteries direct from Rarecourt and Evres, from the Forimont stock, and from temporary dumps established by the ammunition train along the road from Neuville to Varennes. These dumps are variously and vaguely described, but for present purposes may be treated as one stock. At the close of operations, salvaged ammunition was turned into the First Army.

A tabulated return of ammunition may be made as follows. Ammunition picked up in the evening and held in the caissons of

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the ammunition train over night is treated as if picked up in the morning.

75 MM.

Date	Rarecourt		Neuvilly-Forimont		Dumps		Advanced positions		Army dump	
	-	+	-	+	+	-	+	-	+	-
Sept.										
25.	49,147	49,147								
26.	999 2,997	999 2,997								
27.		2,880	2,880 6,480 880 1,700 1,400	6,480			880 1,700 1,400 1,060			
28.						1,440 270 540 1,700 1,500 1,700	1,440 270 540 1,700 1,500 200 1,700 1,850	1,152 200 1,850		
29.	810		1,000	1,000			810 1,700 1,000 1,840			
30.	1,300 1,483 864		5,193	5,193			1,300 1,483 864 1,700			
Oct.			4,788	4,788						
1.			864 576	864	1,840	1,840	576			
2.			9,700			23,000 109	3,000 109	9,700		23,000
Expended			17,450					33,206		
Totals	57,600	56,023	52,911	18,325	19,399	31,614	36,408			

This table, it will be noted, makes no assumption as to ammunition that may have been brought into the area, shifted within it, or removed from it in the caissons of the batteries. Any such stocks may reasonably be assumed to cancel out. Each entry shows a separate item, reported by the ammunition train as taken up from one place and laid down in another.

Precise checking of figures was not to be expected, but the results come surprisingly close, and give some degree of confidence that our

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picture of the ammunition situation is reasonably correct. It appears that some 56,000 rounds were laid down on the Neuville-Forimont line, and 53,000 removed therefrom, including expenditure and salvage, but not including any that may have been brought there or removed by the batteries themselves. Of this, 3000 rounds on each side of the account were shifted from point to point on the same line. The discrepancy is 3000. In the intermediate dumps up as far as Varennes, 18,000 rounds appear to have been laid down and 19,000 removed. One item of 3000 is doubtful, the train reporting it as from a *corps* dump; if this was the case the amount removed was 16,000 rounds. The discrepancy is 1000 rounds over in one case, 2000 short in the other. The number of rounds laid down in advanced positions was 31,000, and 36,000 were expended or removed, including about 3000 rounds shifted from one position to another. The discrepancy is 5000.

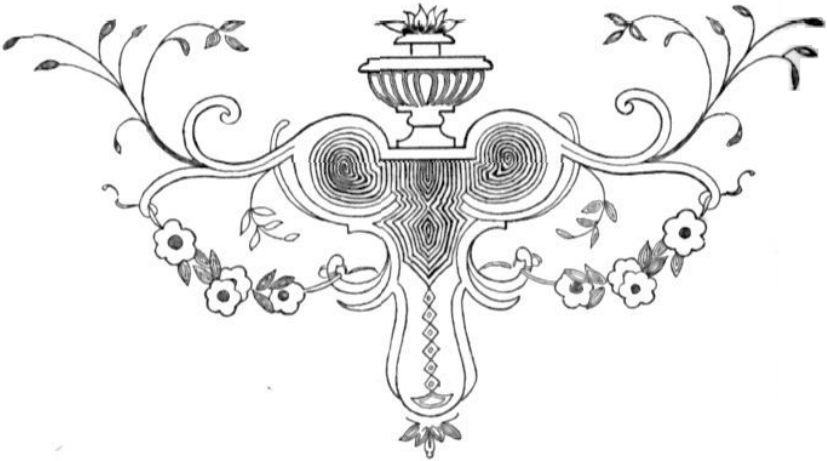
All these discrepancies are to be accounted for (*a*) by movement of ammunition in battery caissons, (*b*) by errors due to the use of round numbers, and (*c*) by inaccurate calculations of expenditure. They are too great to be admissible in a property return, but in a property return the balance would have been arbitrarily struck by changing the expenditure figures, thereby reducing the historical value of the record. Here each estimate was made independently, on the available evidence, and no change made after the final check.

A similar table for 155-mm. ammunition follows:

Date	Neuville-Forimont		Varennes position		Army dump
	Rarecourt				
	-	+	-	+	-
Sept. 20-25.	13,992	13,992			
26.					
27.	408		680	680	
			360	408	
			576	360	
28.			1,600	576	
29.				1,600	
30.			500	500	
Oct. 1.			792		792
2.			1,477		1,477
Expended			4,486		6,300
Totals	14,400	13,992	10,471	4,124	6,300
					2,269

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Some of the discrepancies, both in light and heavy ammunition, are doubtless covered by ammunition left with the relieving division. Its ammunition train reports taking up a considerable quantity, and batteries may have taken up more at their positions; the division commander estimated the total at a half day's fire. But the significance of this is doubtful, since we do not know whether or not the 35th Division included this in its reported expenditure, nor do we know where this ammunition was found.



FORT SILL—THROUGH A RESERVE OFFICER'S FIELD GLASSES

BY KINGSLEY MOSES, F.A., O.R.C.

AN entertaining and instructive article in a recent issue of the *Scientific American* brings out the fact that different kinds of animals see colors in different aspects. Dogs, cats and guinea pigs vision the shades of the prism as if tinged with gray; chickens do not perceive blue at all; crabs, caterpillars and fish are probably color blind.

The analogy may be carried further, and more pertinently, by the suggestion that all humans—notably regular officers and reserve officers—do not see exactly alike.

What, therefore, the reserve officer sees of Fort Sill may not have mirrored itself in precisely the same way on the retina of the regular. And though, unlike the hen, the reserve officer has been frequently able to see blue in its most distinct and profound shades of gloom the atmosphere of the School of Field Artillery is by no means entirely ultramarine.

To this difference in vision or perception may be imputed, then, any apparent errors of mis-sensings of the writer. He comments on Fort Sill as seen through his own field glasses, selecting targets as he is himself able to distinguish them instead of depending upon an instructor's hypothetical mil scale.

The practice of attempting to train Reserve Officers of Field Artillery so that they may be of some service in supplementing the personnel of the Regular Army in the event of war has only recently been put into effect. Two classes of these amateur officers have passed through the "mill at Sill." And, at present writing, there have been no serious casualties.

Of the high standard of the curriculum outlined for Reserve students there is no question. Anyone who really grasped all of the subjects presented would, *ipso facto*, be a capable artillerist; anyone who—even with a red line across his certificate of proficiency—succeeded in passing the course must, perforce, know something of the science made illustrious by Napoleon and Foch. Of course, no one ever does ingest and assimilate all of this curriculum in three months, even digest such crumbs as he can snatch in the daily drive. This would be too much to expect of student officers, too much to demand of instructors. Nevertheless—

The first problem in training Reserve Officers appears very like the old cooking recipe for rabbits; first catch your rabbit. Of the several thousand Field Artillery Reserve Officers in the United

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States only fourteen could be induced to take the Fort Sill course this year. Eighteen had been provided for by Congressional appropriation, two from each corps area. These eighteen were to take the Battery Commanders' course; were presumably captains. Actually the roster of the class included six captains, three first lieutenants and five second lieutenants. One corps area sent no representative, two other areas sent but one officer.

"Catching the rabbit" would seem, consequently, to be the first problem. It is of little use for Congress to appropriate funds if the Army cannot find candidates upon whom to expend the money to advantage. But this is a matter for the careful thought of the Army; not for the comment of the writer. It is a matter nevertheless vital to the persistence of the whole Organized Reserve idea; and it would appear that unless some way may be found of stimulating interest the plan for a Reserve force which can prove of any value must be abandoned. If this observation be true of the Field Artillery, which of its very nature is the most fascinating branch of the service, how much more must the condition affect the other arms.

Nor is the three months' course for Reserve Officers at Fort Sill calculated to encourage the enthusiasm of any but the most earnest and enthusiastic young civilians. Excellent as military training is, the very speed at which the students are driven, the intensity with which they are crammed, would deter most men who are accustomed to the comparative ease and luxury of civilian life. It is the rare and highly ambitious young man who devotes eight hours of solid, unremitting work to his business: fourteen hours a day of high-pressure work is no unusual average for a student in the Reserve course at Sill. In time of war when the incentive of patriotism is a powerful stimulant such training is none too hard. But in time of peace, with glory, adventure, duty—whatever may be the motivation—not immediately discernible, the very rigor of the work is a deterrent. Tired, utterly weary physically and mentally, the Reserve Officers dragged through their last month at Sill with little thought save the coming of the glad dawn of Graduation Day.

Granted, now, however, that in retrospect things look more rosy. It was a splendid curriculum, well carried out. Instructors, as human as their pupils, were often weary and dull; more often animated and brilliant. The mounted duty, the long rides over windy prairies and along the shaded glades of Medicine Creek were hours of delight. To the mathematician there is no hardship in the intricate class-room problems precipitated by meteorological messages and the rolling barrage. Most delightful of all are the windy afternoons on some high hilltop from which, sighting out across Apache Gate, the terrain below Signal Mountain, or even across that dismal swale which sweeps between Arbuckle and Dodge Hills, the student officer bangs

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away at "a very conspicuous target." That he often fails; that "Cease firing" dins dolefully in his ears—What does that matter! For after all what shooting can compare with the sport of firing the 75s; what game of Bengal or Congo is big enough to be worthy of a boat-tailed H.E. shell! A man's game truly: sport worthy of the Emperor Bonaparte who with such sport humbled the earth.

Of the social atmosphere of the post no praise can be too fulsome. In what vagrant moments of leisure there were every amusement and entertainment was supplied. The old swimming hole under the gray palisade of the bluffs was a Bethesda of physical and mental respite; the comical, but none the less practical, golf links which zig-zags the parade, quite adequately served its purpose; horses to ride at will, gave many a pleasant Sunday: all doors were unlatched, an hundred hands stretched out in genial fellowship. "What a pleasant place to play," said the writer—an hour after graduation. "But who ever got a chance to play?" gloomed the pessimist.

That the extreme rigor of the course was the result of a definite and deliberate plan was perhaps indicated by General Hinds in his parting exhortation that we carry home word that the Army is not loafing, not lazy, not inert.

No, none of us will do that. But, on the other hand, is it entirely desirable that the graduates of the Field Artillery Officers' Reserve course be messengers only of the miseries of life in the Army? Is it the plan of the Army to turn out fourteen fairly competent artillerymen each year; or, preferably, to assure the lively interest and enthusiasm of several thousand civilian friends?

The writer relishes the work of the Field Artillery. No thrill in life is quite comparable to the triumph of well-executed firing; to the true sensing "Effect—target!" Sill, with all its desolation, has the uncouth charm of the open West; in silhouette Mount Scott and its terracing ranges stand black below the bronze glory of the twilight; guns spitting their orange flashes through whirl of rain and thunder is a scene not easily forgot.

Yes, we love the Field Artillery. But must she, should she, be always such a grim virago of a sweetheart!



THE BOY GUNNERS OF LEE

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

(Continued)

NOTHING could have been finer than a certain action of Colonel W. T. Poague's, which the writer regards as one of unsurpassed heroism. The writer knew Colonel Poague well, and served with him during the two years before his death as an officer of the Virginia Military Institute. As a man, his character was well known and appreciated by his fellow officers and contemporaries, who witnessed it grow fuller, and gentler, and sweeter with the passing of time. Often, as one conversed with this man, the delicacy of whose nature, the clearness of whose mind, the purity of whose life, and the stamina of whose character were all exceptional, one could note a flash from his softening eye which seemed as a momentary reflection of the sun of other days. There was about him an air of quiet repose, too dignified to find its source in resignation, springing from the peace and contentment of his noble soul. Occasionally there spread over his countenance an expression which close scrutiny centred in the light of his eye, an expression which appeared now and then as he recalled to mind the stirring events surrounding the military career of his youth. The meaning of that look was unknown to me until step by step I placed together the scattered record of his deeds and then I understood. Of one incident in his career alone I shall write, an incident which has never been presented in history in the fullness which it merits. It shall not be one of his many heroic deeds when as a lieutenant, and later as the commander, of the gallant "Rockbridge Artillery," he followed the fortunes of Jackson in the Valley, to Sharpsburg and to Chancellorsville. Nor will it be that unparalleled march through rain and mud and snow by which he brought his command to the field of Fredericksburg. These exploits were superb, but others vied with him in like service. It was in the sombre wilderness of Spottsylvania that Poague loomed up preëminent against the sky of Southern valor.

When the battle of the 5th of May, 1864, closed, Ewell and Hill's Corps had already formed a junction at a point about half-way between "Parker's Store" and the Orange Turnpike, and Poague's Battalion was well up on the firing line. Longstreet had been ordered to make a forced march during the night in order to arrive upon the field before dawn. All through the night Hill's advanced troops, who had maintained themselves so resolutely during the day

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against Hancock's six divisions, heard the enemy preparing to renew the attack in the morning. Worn and much disorganized by the fighting of the previous day, and expecting Longstreet to relieve them during the night, the infantry failed to prepare for the impending blow. But not so with Poague's battalion on the ridge in the clearing.

At 5 A.M. Hancock's troops swept forward like an avalanche of blue, and by the sheer weight of superior numbers rolled Hill's line back past Poague's Battalion, which stood alone like a wall of flame across the Federal's path. Not until the great masses of the enemy came face to face with the Confederate guns did they cease to press forward, but no troops could pass through such a storm of fire as that which Poague then opened upon Hancock's men. Inspired by their commander, the gunners plied their pieces with almost superhuman energy; the muzzles belched their withering blasts, the twelve guns blended their discharges in one continuous roar, and there among them, clinging to them as a shipwrecked sailor to a spar among the breakers, stood Lee himself, above whose head the smoke of the four lone batteries hovered like spray in the teeth of the onrushing gale.

The great commander knew then full well that between him and disaster Poague's Battalion stood alone. What glory for a soldier! This single incident brought more of honor to the little colonel of artillery than has come to many men throughout ages of warfare. The occasional sudden light which I have seen in those soft, mild eyes was akin to that which must have shone from them as he stood among his guns in the battle line of May 6, 1864, the last bulwark of his country's defense, and in the very presence of his immortal commander.

For a while as General Lee stood among Poague's guns, his fortunes indeed hung in the balance. After sending a courier to hasten the advance of the First Corps and another to prepare the trains to be moved to the rear, he at last discerned the dust thrown up by the hurrying feet of Longstreet's men. In perfect order, with ranks well closed and no stragglers, the double column swung down the road at a trot. Regardless of the confusion which beset their path, the brave and eager infantry pressed on to the point of danger. In the van rode Longstreet at his best, ardent for the fray, as if but now he had slipped the leash which held in check his straining columns.

On this occasion Longstreet was magnificent, but Poague was the greater of the two, for he alone and unsupported, had denied the enemy a victory ere Longstreet arrived upon the scene. And yet his part in this critical affair is scarce referred to in the various accounts of the Battle of the Wilderness. Even Morris Schaff,

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whose writings are fraught with the noblest sentiments of appreciation, and whose studious work on the Battle of the Wilderness is by far the best yet written, overlooks the heroism of Poague, though no more ready hand than his ever brought the pen to bear with sweeter touch for friend and foe alike.

But while Poague was overlooked by the contemporary historian, not so by Lee. One year after the Wilderness, when disaster again pressed close upon him, when dangers beset his army and all seemed lost, it was the gallant Poague that Lee called upon at Appomattox to lead the way for the remnant through the Valley of the Shadow of Death. And when the shrivelled host at last stood huddled together submissive to the hand of Fate, still another shot rang out defiant, another ring of smoke soared upward to the sky, where Poague with his dauntless battalion in the van chafed at the final decree. No. It was not a spirit of resignation which made those eyes so mild, so soft, for how often until the end, as at Appomattox, came that flash that made us feel no heroism could transcend the limits of his soul.

On still another occasion the artillery was destined to save Lee from defeat. At Petersburg when "the Crater" rent asunder Lee's line, and the onrushing Federals were making for the gap, it was the youthful fever-stricken Lieutenant John Hampden Chamberlayne and Major Preston Gibbes who manned the only remaining gun in Elliott's shattered salient and held back the men of Ferrero's Negro Brigade. For a time they alone remained between Mead and victory. But soon came the one-armed Colonel John Cheves Haskell to their relief with his guns, and later Mahone's Infantry. The names of Haskell, Chamberlayne, and Gibbes are proud ones in the annals of American artillery.

In the fight at Stephenson's Depot, when Hill was advancing down the valley to seize Harper's Ferry, after driving the Federals from Winchester, it was Lieutenant Contee of Dement's 1st Maryland Battery, Andrews' Battalion, Edward Johnson's Division, who held the railroad bridge with his section against the flying and desperate enemy. Fourteen out of sixteen men, including Lieutenant Contee, fell, but Lieutenant John A. Morgan, of the First North Carolina Regiment, and Lieutenant Randolph H. McKim (the late Reverend R. H. McKim, of Washington), attached themselves to the section and continued to work the single remaining piece. (A section consisted of two guns, and not of one as at present.)

The charge of Caskie's Richmond "Hampden Battery" at Newberne, North Carolina, where it was serving with Dearing's Battalion, Pickett's Division, Longstreet's Corps, in February, 1863, was a notable exploit. Captain W. H. Caskie, a mere boy, actually

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led the infantry assault in this battle with his galloping battery. Almost instantly his horse fell, but the gallant young officer seized a musket and ran on foot at the head of his battery. Seeing that Caskie was dismounted, General Pickett sent him a fresh mount, and the former, throwing himself into the saddle, led his guns to within one hundred yards of the battle line. For his conduct on this occasion Caskie was soon made major. "Willie" Caskie and "Willie" Pegram, both of Richmond, were playmates in their boyhood days.

There were so many deeds of exceptional nature performed by the gunners in the Campaign of 1864, that it seems invidious to mention some without referring to others. There was the superb action of Lieutenant Morgan Callaway, of the "Pulaski (Georgia) Battery," who, with two guns adroitly concealed on the flanks of the gap at Cold Harbor, continued his fire until the enemy's infantry were actually upon him, and still continuing in action drove them back, for which he was individually mentioned in orders. And then there was the exploit of Colonel Wildred Emmett Cutshaw and Captain Asher W. Garber, at Spottsylvania. Unable to draw off two guns of the Staunton Battery which they had seized when they broke into the "bloody angle," the Federals had left them between the opposing infantry lines. Cutshaw and Garber, the latter commanding the "Staunton Battery," and the former the battalion to which that battery belonged, rushed to the pieces with a handful of cannoneers, turned the pieces upon the enemy, and there between the lines, with thousands of eyes upon them, continued to ply the guns until they were actually seized by the enemy. And almost coincidentally with this deed was that of Captain Charles R. Montgomery. "Morris Battery," Page's Battalion, who with the only two guns of the battalion which had not been captured, and accompanied by only six cannoneers, moved laboriously down a ravine to a point within two hundred yards of the enemy's flank and continued his fire until three full caissons had been exhausted.

One of the most remarkable exploits of the field artillery during the war was that of Lieutenant Gale's section of the "1st Maryland Battery" at Petersburg, under the immediate command of the brilliant McIntosh. Advised on the 22nd of June, 1864, that two Federal corps were leaving their works opposite Hill to seize the railroads on his weakened right, General Lee sent Hill with three divisions of infantry to meet the enemy, while the artillery was held in the lines. Hardly had Hill moved off when McIntosh, with Gale's two guns, passed over the entrenchments, galloped across "no man's land" to within a few hundred paces of the hostile line, and opened with canister upon the flank of the moving Federal column. To his support soon came Lieutenant Wilkes with his section of Clutter's

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Richmond Battery. The four pieces under McIntosh actually isolated an equal number of Federal guns which were seized and drawn off by the Confederate gunners. Not only did McIntosh throw the hostile column into confusion, but he frustrated the whole movement upon Lee's right. This is the only recorded instance of which the writer knows in which light artillery operated in the open fields between two lines of entrenchments. Such a thing was only possible under the leadership of one possessing the dauntless character of that soldier lad from South Carolina—David Gregg McIntosh. After the war Colonel McIntosh married the sister of his former comrade in arms—Colonel William Johnson Pegram—and settled in Maryland, where he died in the fall of 1916, the senior surviving officer of Lee's Artillery.

Most of the officers who I have mentioned were men of aristocratic birth. It must not be thought, however, that a democratic spirit did not prevail among the commissioned personnel of Lee's Artillery. One of the most respected field officers in the Artillery Corps was Joseph McGraw, a teamster of Irish blood, aged twenty, who rose to the rank of Lieutenant-colonel. This remarkable officer was "discovered" by Pegram, in whose original battery ("The Purcell") he enlisted, and was rapidly advanced by him through the lower grades. He was a young man of powerful frame and exceptional ability to command men. His courage was proverbial. While sitting on his horse at Spottsylvania a solid shot tore away his left arm, leaving only a stump in the shoulder socket. For an instant his subordinates paused in their work to proffer him assistance, but perceiving their intention, he cried out in unshaken tones—"Don't mind me, men, I'm all right—give 'em hell!", and then fell forward from his saddle without a flinch or a cry of pain. Upon regaining consciousness, Major McGraw refused to receive the usual anaesthetic, and exercising the prerogative of his authority as senior officer to the surgeon in attendance upon him, commanded the latter to remove the shattered stump of his arm, which was done without eliciting a groan from the patient, or a blink from his marvelous blue eyes, while he quietly puffed away at his pipe. One of his officers undertook to commiserate with him over his wound. "Pretty bad; reckon I'll be off duty thirty days," was the laconic reply. When General Lee heard of the wounding of McGraw, he said: "I very much fear the Artillery will lose one of its best officers." Not long after this Colonel Pegram, who was sitting in his tent at Petersburg, heard a mounted man approaching, contrary to his orders against such reckless exposure in the trenches. McGraw rode up to the tent, calmly saluted with his right hand, and reported: "Sir, Major Joseph McGraw returns to duty." Just before the withdrawal of the army from Petersburg, he was again promoted



LIEUT.-COLONEL WILLIAM THOMAS POAGUE



BRIG.-GENERAL EDWARD PORTER ALEXANDER



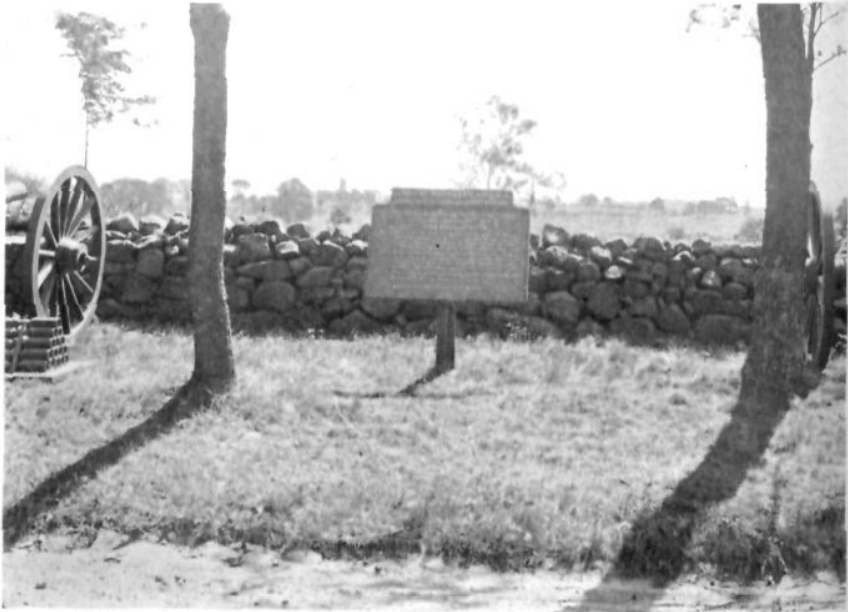
COLONEL THOMAS HENRY CARTER



LIEUTENANT-COLONEL JOHN CHEVES HASKELL



AT GETTYSBURG



WHERE ALEXANDER SUPPORTED LONGSTREET

The guns in the foreground are restored to their position the morning of the second day. As the Confederate Infantry advanced, Alexander moved out to the Peach Orchard ridge, extending to the right from the white building just over the marker. The wooded crest of Little Round Top is seen in the right distance.

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and placed in command of twenty-four guns. On the retreat he jocularly remarked that he held the unprecedented record of having lost twenty-three guns in twenty-four days! (His guns, without horses, were left in the trenches.) McGraw did not boast, as did Bernadotte, that he had never lost a gun, for he knew well that the man did not live who could question his conduct in battle.

The finest artillery manœuvre on the field of battle known to Lee's army was, perhaps, the charge of Alexander's Battalion of six batteries across the fields at Gettysburg from its original position to the Peach Orchard, when that position was seized by the Confederates. It is probable that no more superb feat than this was ever performed by so large a body of artillery on the battlefield under fire. For five hundred yards the foaming horses dashed forward under whip and spur, the guns in perfect alignment, the carriages fairly bounding over the fields. Every officer and noncommissioned officer rode at his post; not a team fell or swerved from the line, except those which were struck to earth by the blizzard of Federal shell that was hurled upon them by fifty guns. Most of the enemy's projectiles overshot their mark, and as the great line of twenty-four guns and over four hundred animals reached the position abandoned by the enemy, "action front" was executed as if by a single battery. Hardly had the teams wheeled and the pieces cleared their pintle-hooks when again a sheet of flame burst from the line of guns as Alexander's magnificent battalion went into action. Few artillerymen have experienced the sensation that must have come to the battalion commander at this moment. Never had he seen such a perfect manœuvre, even at the United States Military Academy, where he had formerly served as Instructor of Artillery. Surely there could be nothing more thrilling than that of galloping at the head of such a line of artillery, with the awe-inspiring rumble of two hundred wheels and the clatter of innumerable feet close behind. The momentum of that great mass of men, animals, and carriages must have almost forbid the thought in Alexander's mind of checking the force which he had set in motion. But with his mount bounding along as if borne on the breeze of the pursuing storm, and his quick eye searching the terrain for his position, with hundreds of breathless men and horses watching his every movement, what must have been his feelings as his right arm shot upward! No words from him were necessary, and if uttered would have been useless in the dull roar of the onrushing mass. No voice but that of Jove himself could have been heard. And yet, the swoop of the hawk is not more graceful nor more sudden than what followed. Every man and every beast knew his part and performed it joyously. Mistakes at such a time would have been fatal. And then, out of the orderly chaos which ensued, the dark warriors came to rest as if,

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in the ominous silence, gathering breath with which to shout a new defiance while the attending men and animals were springing to their accustomed posts. But now the joy of the charge is forgotten, though every hand and limb is still trembling with the old thrill. A greater joy is in store for all, for flash! bang! scre—e—ch * * * bo—om!—a shell has burst among the flying foe.

In a few seconds the fifty Federal pieces which had opposed Alexander's advance across the fields, are joined by many others in a stupendous but vain effort to crush him in his new position, and then the artillery of both armies rends the air with the deep notes of the guns and the crescendo of bursting shell, while the earth trembles as if Jove has placed his feet upon the pedals of his mightiest organ. Truly might Mars have applauded the tremendous throb, and looked down with delight from his Olympic seat upon the fire-wreathed arena of Gettysburg, for never in this world had such a war-like scene been set before. Small wonder that Alexander cherished no regret at having declined the command of an infantry brigade. Surely there was glory enough for any soldier to be found at the head of the command he led across the fields and into action in front of Little Round Top, and under the eyes of a hundred thousand men, and ample reward, too, for on that momentous day the young Georgian, at the age of twenty-six, won the star of an artillery brigadier!

One more incident in connection with Alexander's Battalion should be recounted. While Taylor's or Eubank's old battery was charging with the battalion, Corporal Joseph T. V. Lantz was struck from his limber by a shell which broke his legs above the knees, and soon died. To one of his comrades who came to his aid, he said: "You can do me no good; I am dying; follow your piece!" Nearby lay the lifeless body of a young cadet, Hill Carter Eubank, who, only a few days before, left the Virginia Military Institute to serve with the guns of his father's old battery! Of such calibre were the enlisted men in Lee's Artillery.

One of the most extraordinary incidents may be cited to illustrate the fortitude of Lee's "gunners." In the battle of Malvern Hill, a cannoner in Stribling's "Fauquier Battery" named Joe Kendall—a plain country lad—lost one of his arms, and in the excitement of the conflict was permitted, upon his insistent request, to hold, with his one hand a number of loose horses, which had been left under cover. "At least I can do that much," he urged. Soon his lifeless body was found lying at the feet of the horses, the bridle reins of which were gripped in his stiffened hand. Kendall had bled to death, but remained faithful to his charge even after death! In honor of this humble but heroic private soldier the

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Camp of Confederate Veterans of his home county—Fauquier—was named.

There were many striking instances which might be cited to illustrate the manner in which the gunners defended themselves and their guns against both infantry and cavalry, but space does not permit this. A Confederate gun was ordinarily not captured until actually taken possession of by the enemy and withdrawn from the field. The defensive ability of the cannoneers was remarkable and on many occasions they were known to save their guns with their sponge and rammer staffs. During Early's Valley Campaign, when the infantry and cavalry were completely demoralized by repeated defeats, Colonel Thomas Henry Carter armed his cannoneers with carbines and protected his own column of artillery while on the march against the enemy's raiding parties. Early made some harsh criticisms concerning his cavalry and infantry, but always specifically excepted his gunners.

One frequently reads of the conflicts between Morton's Horse Artillery of Forrest's command with gunboats on the Tennessee River and elsewhere in the West. There were many instances of such affairs in Virginia. There were several along the lower Potomac and Rappahannock in the spring of 1861. On the retreat from Yorktown, a Confederate battery engaged a flotilla of gunboats on the York River. Along the Rappahannock in 1862 and 1863, there were frequent conflicts between light batteries and gunboats near Port Royal, and throughout the fall of 1864, Colonel Carter, with a battalion of light artillery, was constantly engaged from the north bank of the river with Federal gunboats on the James, and preyed with great effect upon the enemy's shipping about City Point. The exploits of Carter's Battalion at this time, operating far down the Peninsula under cover of darkness, and concealing itself in the dense swamps by day, would fill an interesting volume. Some of the artillery raids in which he engaged entailed the greatest hardships upon men and beasts, and required extraordinary daring and stamina on the part of all. The writer knows of no other instance where field artillery, entirely self-supporting, was utilized for such hazardous and extensive raiding operations. Carter's rapidly moving batteries frequently ventured many miles in advance of the lines about Richmond, unattended by escorts of any kind, and his men, equally skilful as gunners, cavalry scouts, and infantry patrols, fought according to the circumstances first as one, then as the other. There were times when whole batteries were cut off from their base of operations for several days, finally working their way back to the friendly lines through the swamps and along the byways of that densely wooded section. Such service was not exceptional in the South, for cavalry, or even for small parties of dismounted

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troops, either during the Revolution or the War between the States, but for field artillery it was unprecedented. Verily, Carter was the Marion of the Artillery. It is said that as he sat cross-legged upon his saddle in the midst of his guns at Seven Pines, while the hostile shell rained down upon his battery, General D. H. Hill, of iron nerve and noted for his rugged speech, rode up to Carter, saluted him, and declared that he would rather be the captain of the King William Artillery on that day than President of the Confederacy. "Old Raw-Hide," as Hill was dubbed by his men, was not given to pretty speeches. Carter, like many of his illustrious compeers, was a graduate of the Virginia Military Institute. He was a kinsman of Lee, and it was to his home that the great soldier repaired immediately after Appomattox. His daughter later married Captain Robert E. Lee, Jr., the soldier whose conduct at Sharpsburg we have noted.

As my mind dwells upon the arrival of General Lee at "Pampatike," whither he hastened from Appomattox, to find in that secluded retreat a brief refuge from the world, I can picture nothing more touching than the greeting that there awaited him. It is a scene for a master brush.

I seem to see the outstretched hand of Carter firmly clasp that of his immortal commander, as the great soldier dismounts and ascends to the shattered portico of Carter's wrecked but still hospitable home. And then I seem to see the two gray-clad, silent warriors, with bowed heads, and firmly compressed lips, enter the darkened doorway, where the beautiful mistress of "Pampatike" greets them with a tearful welcome. No words are uttered as the door closes behind them, and if uttered would be but a mockery at this moment!

And then I seem to see out there on the broad, neglected lawn, 'neath the patriarchal shell-scarred oaks that line the driveway, an ancient darkey, still faithful to that home, with caressing hands slip the martial battle-stained trappings from the weary back of old "Traveller," and turn him out to graze and rest. No longer at "Pampatike" do the winds play over the fields of tasselled wheat; no longer the generous grain bins hold their yellow freight of yore, but out there where old "Traveller" roams are tender grass of spring and the budding trees that alone seem to give promise of a fuller measure and a better day to come!

Oh! that was a bitter time for Lee, his kinsmen and his people. But if there were sobs and tears at "Pampatike" where all about were the charred reminders of the flames of war that had swept over even that once happy home, the world did not hear and see them. And so, let us avert our eyes from the sacred scene, leaving the great captain there in the home of the veteran "gunner" who, like his

THE BOY GUNNERS OF LEE

comrades, had served him so faithfully for four long years—leave them there alone with "Sue Roy," typifying as she did the heroism of Southern womanhood—leave them there in the peace which has come to them all at last.

But it is not of Lee and his "gunners" alone that I think. Often my mind dwells upon those mute warrior steeds, who were surrendered at Appomattox—those warriors who drew the guns.

It was due to Grant's magnanimity that many of them were turned over to their former masters, for every soldier who claimed to own a horse or a mule was permitted by Grant's generous orders to retain his animal for farming purposes. And so, many of the poor, half-starved beasts that had survived that awful retreat exchanged the gun and the caisson for the plow and the harrow, the implements in that struggle for existence which for the next decade was to prove far more cruel and distressing for Lee's veterans than the war through which they had already passed.

Who can tell what were the emotions of those gallant gunners when first they struck the plowshare of peace into the poverty-stricken soil of their native fields. Did not the war-stained harness, which still hung from the backs of those weary, worn animals, recall to their minds the charger and the martial trappings of a hundred battlefields? Did not the dumb patience of those faithful brutes, bearing like themselves the wounds and scars of battle, hold for Lee's veterans gunners a lesson of fortitude, and impress upon them the fact that together, the old war horse and the veteran, they must labor on for the salvation of the Southland?

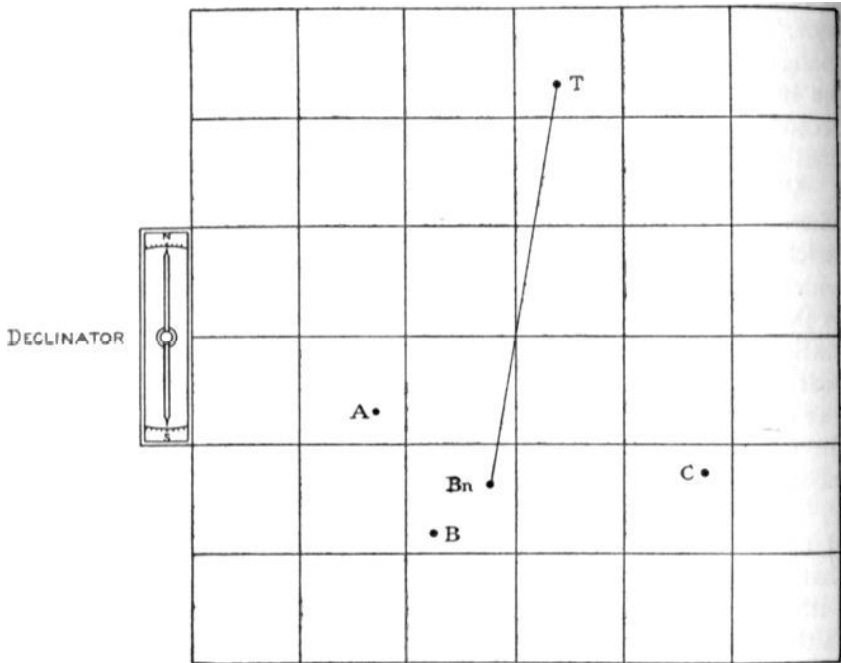
Ah! it is sweet to believe that those brave "gunners," often as at dawn they led their old artillery teams from the leaky shelters that stabled them, recalled the reveille of other days, and perhaps, with manly tears in their eyes, gently stroked the muzzles of those faithful steeds. Or that, perhaps, as they rested together, men and beasts, in the heat of noon-tide 'neath the generous shade of some spreading oak, the sighing of the nearby pines recalled to their minds the rush of the guns, the hastening feet, the swelling roar of the battle of another day, and admonished them to be brave so that when the final Appomattox came upon them they might be released from the plow of life with the same consciousness of duty well performed, that filled their souls on that April day in 1865—that day when nature, with her scented fields and budding trees, sought to sweeten the bitterness of defeat, and soothe with her fragrant breath the fevered brow of a vanquished army!

THE END

FIRE DIRECTION

BY "BATTALION COMMANDER"

THE guns having been placed in action to fit the requirements of the tactical situation, the most important duty of the Battalion Commanders in their exercise of fire direction is the designation of targets. There has grown up as a result of tactical problems marked on gridded maps, the practice of designating targets by coördinates. While this is a very simple



BATTALION PLANE TABLE

problem on the map, it is not so simple on the ground. With an accurately gridded map it is a simple matter to locate oneself on the map. It is a problem of extreme difficulty to locate a target (on the ground) at a distance of from 2000 to 10,000 yards, except by some laborious and time-taking process, generally embracing triangulation. At the same time it is impossible to tell the relative location of two targets, one of which is accurately known, while the other is in the same general direction—as seen by the Battalion Commander.

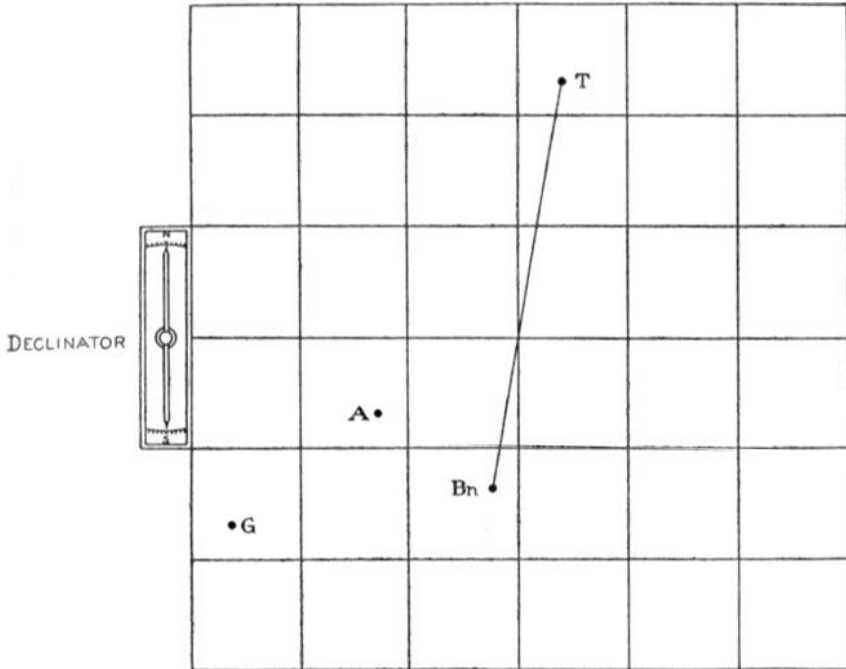
In the designation of targets, great facility may be obtained by having the three Battery Commanders close at hand. While this may be practicable in many cases, it can hardly be considered as a

FIRE DIRECTION

normal procedure, as many serious objections to this method exist.

It is quite true that from all O.P.s a common distant reference point may exist. The reverse is also true. But even if the former be the case, to insure identification of the target or area, relocation for the O.P. of the Battery Commander concerned is almost essential. With a reference point close in, the problem is even more difficult.

The problem therefore becomes one of relocation. The solution of



"A" BATTERY PLANE TABLE

triangles is one subject to considerable error and takes time, thus prohibiting quick shifts from one target to another, or quick concentration of all guns on a target area.

A graphical method is therefore highly desirable. Such a method with the present equipment is proposed. This is the plane table. The problem would be solved as follows:

The Battalion Orientation officer, knowing the location of his own O.P. and those of the batteries, will plot these on his plane table, with a degree of accuracy dependent upon the time and facilities available. He will give to each battery the location of the Battalion O.P. and the Battery O.P. so that both the Battalion Board and the Battery Board will be the same. If the Board has been gridded and some arbitrary system of coördinates adopted the location of different targets may be given by coördinates, or it may be given by a system of polar coördinates, that is, by an angle and a range.

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It is believed that this latter will be preferable for quick work. A combination of the two may be practicable.

Assume that the Battalion Orientation officer has made his plotting of his own O.P. and those of the batteries as indicated by the accompanying sketch of the Battalion plane table.

To "A" Battery he has given the position of his own O.P. and that of "A" Battery and has also given him the location of the declinator. "A" Battery's board will then appear as in the accompanying sketch.

"A" Battery Orientation officer declinates his Board at the Battery O.P. The two Boards are thus oriented on the north pole, within the error of the declination. Assume a target at T. The Battalion Commander, laying the alidade on T with the range given by the range finder, locates T on his plane table, and sends either the coördinates of this point, or the angle with the Y line and the range to "A" Battery. The latter then plots the target by either one of those systems of coördinates and computes data for the guns.

This method involves the accurate use of a range finder—particularly that of the Battalion, and an accurate orientation of plane tables. Its accuracy will be sufficient to put the target in the field of view of all Battery Commanders' instruments and will result eventually in the production of an excellent firing chart for further firing.



EDITORIAL COMMENT

Colorado Membership

THE officer personnel of the 58th Field Artillery in the Colorado National Guard has reached a 100 per cent. membership in the Field Artillery Association. We are glad to welcome the new members.

Fort Sill Through a Reserve Officer's Field Glasses

This article, found in the preceding pages, is of value as showing the views of one of the recent students from the Reserve Corps. There are two errors which may be made—one, that not enough work is given to make it worth while for an officer to give up his business to take the course; the other that too much work is required. Between the two there is a happy medium, which incidentally is one of the most elusive things in the world in any walk of life. For this happy medium the School authorities are continually searching in all courses at the School. But as each individual's idea of a happy medium differs from every other, the problem is a difficult one. However, the most serious of all errors would be to send officers away with an impression that some of their time was wasted.

The JOURNAL is pleased to receive and print this article, and invites articles of a similar nature, particularly from those officers taking the Short Courses.



CURRENT FIELD ARTILLERY NOTES

General Pershing on the United States Army

THE graduation exercises of the Army War College at Washington were held June 28th. Among the speakers were Secretary of War Weeks, General Pershing and Major General McGlachlin. Especially noteworthy for the American citizens were the remarks of General Pershing. Referring to the War College and the Army in general, he spoke as follows:

"The other day the War College was referred to as one of the great centres of culture in the United States. To the uninformed, which includes practically every one except those immediately connected with the institution, this would seem an absurd claim. Yet I believe there is foundation for such a statement, and it is but evidence of the breadth of vision essential to the efficient Army officer of today.

"In no other army is it so imperative that the officers of the permanent establishment be highly perfected specialists, prepared to serve as instructors and leaders for the citizen forces which are to fight our wars. The one-time rôle of a Regular Army officer has passed with the Indian Campaigns and the acquirement of colonial possessions. Our mission today is definite, yet so broad that few, if any, have been able to grasp the possibilities of the new fields opened up by the military policy now on the statute books.

"I wish especially to emphasize the necessity for broad vision in study of work concerned with the development of this military policy. Our view is no longer circumscribed by a Regular Army small and widely dispersed, but we must visualize great citizen forces brought into being through established basic units. The economic, political and purely defensive factors are as yet but dimly realized. I often find myself wondering today why we thought as we did yesterday, only to be similarly amazed tomorrow that we saw so few of the possibilities of today. There are officers, fortunately in constantly diminishing numbers, who cannot turn their minds from concentration on a diminutive Regular Army, successfully and gallantly fighting the country's battle, as in Cuba and the Philippines, or serving at isolated stations along the Mexican Border. Those days have not entirely passed and probably never will

CURRENT FIELD ARTILLERY NOTES

pass, but they are now of secondary importance in the general scheme of National Defense.

"You gentlemen are leaving the War College at a most auspicious moment. The General Staff has now digested the lessons of the World War and the earlier years of its own development and has become a wonderfully effective machine, admirably arranged to carry out its mission. The Citizen Army has made a beginning, a troubled period of confusion and narrow vision. It is now vigorous of body but still facing the usual vicissitudes of the earlier period. The task awaiting in your new assignments is to carry forward this work, to inspire yourselves, your associates and every part of this huge machine for the National Defense, with a democratic spirit of coöperation and common understanding.

"In serving on the War Department General Staff or at Corps Area Headquarters, it is difficult to avoid a detached and impersonal attitude which soon carries one out of sympathy with the subordinate organizations and, especially, with the humble individual worker in the ranks. It is hard for the man at the desk to see with the eye of a troop commander or of a business man struggling with self-imposed duties as an officer of the National Guard or Reserve Corps. Unintentionally misunderstanding arises and coöperation fails. It is the special duty of the Regular Army officer to avoid this possibility. As a matter of truth, the establishment of a sympathetic understanding is more important than the performance of any routine duties.

"While not professional soldiers, men of the National Guard and Reserves are prompted to service by a patriotic devotion to the high conception of citizenship. Of all our citizens, they deserve praise for the energy that leads them to spend months and often years in readiness. These are the men you are to counsel, instruct and guide. Your ideals of national obligation and your standards of efficiency are likely to be theirs. To insure the success of our military policy, the officers of the regular establishment must rise to a full appreciation of their new responsibilities and must bring to the task enthusiastic effort and efficient leadership.

"In another sense this class resumes active duty in the army under new conditions. We now have this month for the first time a completed scheme of mobilization of the nation's manpower. While these plans are at present more or less imperfect, they will form a substantial basis of further study, and many of you will be involved in their

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improvement. Formerly, our studies were limited to a vague academic consideration of a possible army for which no provision had been made, but today we must deal with divisions, corps and armies, the skeleton organizations of which are well on toward completion. The development of this and all other plans must continue to inspire our best efforts. If we can bring our countrymen to realize the wisdom of a reasonable state of readiness, and if we can succeed in maintaining an efficient basic organization of both the regular and the citizen forces, then our duty will have been performed."

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

The F.A. R.O.T.C. pistol competition cup has been completed and the accompanying illustration shows some of its beauty. It is built from a 4.7 case. This body is gold lined with a dark brown exterior finish. The handles and applied designs are in silver. This year it goes to Alabama Polytechnic Institute. A silver medal goes to each member of the winning team, and a bronze medal to each member of the second and third teams.

Colorado Endurance Ride

The entries to the Colorado Endurance Ride to be held at Broadmoor, Colorado, beginning the morning of July 29th, are coming in as this JOURNAL goes to press. This ride will be one of the most severe yet held. Reports of the results will appear in our next JOURNAL.

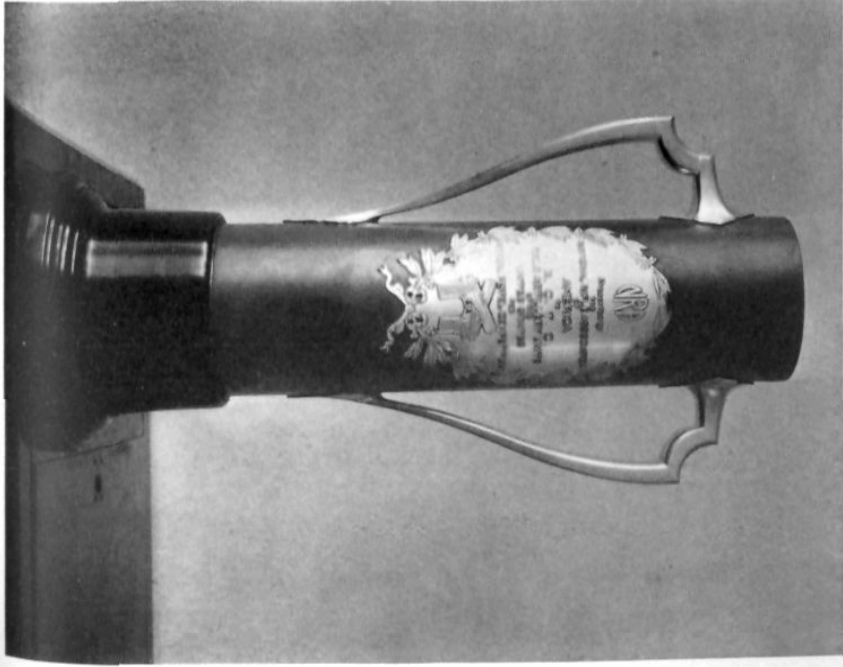
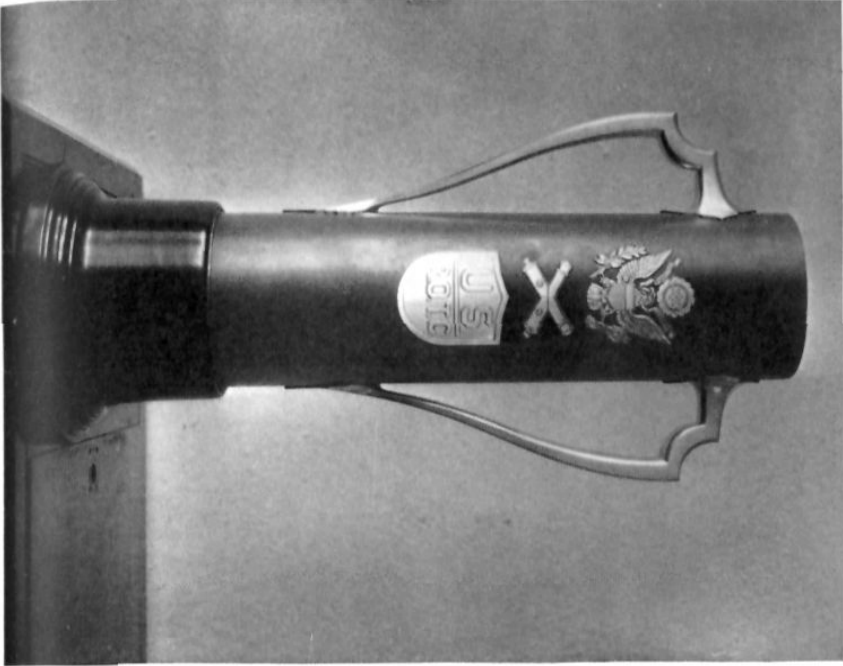
Polo

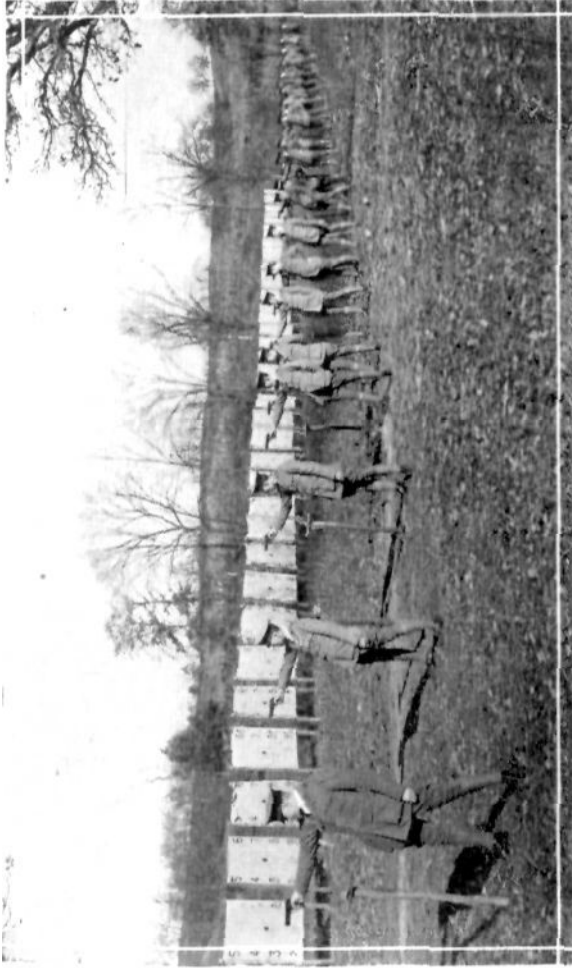
The International Cup

The American Polo Association on June 27th formally voted to accept the challenge of the Hurlingham Club of England for the international cup now held by the Americans. The matches will be played off in America in September, 1924. The latter date is selected rather than in June or July as heretofore, to comply with the desires of the English players.

The Junior Championship

Our Army team, at present holding the Junior Championship Cup, has been valiantly working to prepare themselves to defend their trophy. The ponies were assembled as indicated in the last JOURNAL. Majors A. H. Wilson and L. A. Beard have been playing at one and two. Lieutenant Colonel Lewis Brown has been playing





THE FIELD ARTILLERY PISTOL RANGE
University of Missouri, 1923.

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at three with Major W. W. Erwin at back. Major J. K. Herr has been playing in the early games at the two and three and four positions. The players as at first assembled were out of practice. Their team work was of course not up to finished form and the mallet work showed need of attention. However, they won their way to the last round in their first tournament for the Third Westbury Challenge Cup at Meadow Brook. They were defeated by the Meadow Brook Ramblers, composed of R. P. Smith, Jr., E. C. Bacon, F. S. Von Stade and R. E. Strawbridge, Jr. Previous to this, they had eliminated teams playing such men as Devereaux Milburn and Louis Stoddard. The Army team should improve greatly during their preliminary games and the prospects point to successful defense of their title.

The Army Twelve-goal Team

The candidates for the Army team to compete for the twelve-goal championship at Narragansett Pier are working at Washington. The eligible candidates are Major R. E. D. Hoyle, Major V. P. Erwin, Captain A. P. Thayer, Captain M. E. Jones, Lieutenant C. C. Jadwin and Lieutenant T. Q. Donaldson. A number of other officers, who will not be available to play at the tournament, are playing at practice games. There will be a strong contender for the Army in this class.

Boise City Tournament

By arrangement with the Boise Polo club a tournament was held at Boise, Idaho, from May 30 to June 13, 1923, at which were decided the Ninth Corps Area championship and the Northwestern championship. The Boise club defrayed all expenses of Service teams attending, and thus made possible the Corps Area tournament.

The five teams participating were: the Boise club; the 11th Cavalry, from Monterey; the 10th Field Artillery, from Camp Lewis, Washington; the 7th Infantry, from Vancouver Barracks; and the 38th Infantry, from Fort Douglas.

By agreement each team played every other team, and the Corps Area championship was awarded to the Army team having the highest percentage of victories over other Army teams. To determine the Northwestern championship, the two teams having the highest percentages played a final, deciding game.

Both championships were won by the 11th Cavalry. The 10th Field Artillery was runner-up for the Ninth Corps Area championship and Boise for the Northwestern championship.

It was only in the final game that Boise was defeated, for in the preliminary play that team had defeated all four Army teams. In this last game the 11th Cavalry, which in the preliminary game with

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Boise, had been weakened by the injury of Major Chandler, team captain, was at full strength and gained a decisive victory. On the other hand, the Boise team was weakened in the deciding game because of an injury sustained in a prior game by Mr. Herbert Lemp, team captain, which prevented him from playing more than four periods.

The 10th Field Artillery team showed great spirit and with more advantages in the matter of mounts would be much more dangerous. In its game against Boise it came from behind when everyone thought it was decisively beaten, and nearly tied the score in the last few seconds of play. Its best work was done by Major Rucker and Captain Guernsey.

Hawaiian Polo

The Hawaii Polo players plan a tournament beginning September 20th. The Commanding General of the Ninth Corps Area is making an effort to enter a team. Due to congestion in the transport service, the possibility of securing passage is still questionable. A team sent out there would stimulate a desirable reciprocity in return for the visit of the Army team from Hawaii last spring.

Colorado Springs Polo

Four teams were entered in the Colorado Springs Tournaments this year. The teams with handicaps were as follows: Colorado Springs—14, Fort Leavenworth—9, Fort Sam Houston—7 and Fort Sill—2. Fort Sam Houston won the First and Second Handicap Tournaments and Colorado Springs won the open Tournament. Lieutenant Corpening of the Fort Sill team was injured in the Second Handicap Tournament. The Sill team thereafter lost what had promised to be a victory, the team leading Fort Sam Houston with 9 to 4 in the fifth period when the accident occurred.

United States Army vs. British Army

The English Army polo team sails for America August eleventh. They come at the formal invitation of the American Polo Association. This invitation was accompanied by correspondence between General Pershing and the British Chief of Staff, so that while the British team is to meet our best civilian combinations, we are assured of a match between the English and American Armies. In sending their team the English designated General Beauvoir de Lisle as their manager. Major General Bullard has been appointed to act for our Army.

Some doubt has been expressed as to the outcome of the interarmy

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play. Unlike America, the best polo talent in England is found in the Army. This has not been the case heretofore in America. The British team will undoubtedly be better than a thirty-goal combination. Our best selection from the Army will probably fall ten or twelve goals short of theirs. Whatever the outcome in point of scoring, it is felt the results in encouragement of polo and mounted work in general will discount all discouragements.

The final selection of the American Army team has not been made. Without doubt it will be the team which defends the Junior Championship.



THE RED GUIDON.

Words and Music by Dr. G. E. Griffin.

Animato.

f

mf

1. Come, fill up your glass - es, I'll give you a toast, We'll

mf

drink to the Red and the blue; The

first in the bat - tle, the last at its post, Old

The musical score is written in 6/8 time with a key signature of one flat (Bb). It consists of a piano introduction and three systems of vocal and piano accompaniment. The piano introduction is marked *f* and *Animato.* The first system of accompaniment is marked *mf*. The vocal line begins with the lyrics "1. Come, fill up your glass - es, I'll give you a toast, We'll". The second system of accompaniment is also marked *mf*. The vocal line continues with "drink to the Red and the blue; The". The third system of accompaniment continues the piano accompaniment. The vocal line concludes with "first in the bat - tle, the last at its post, Old".

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com - rades so faith - ful and true, To

The first system of the musical score features a vocal line in the upper staff and a piano accompaniment in the lower two staves. The key signature has one flat (B-flat), and the time signature is 2/4. The lyrics are: "com - rades so faith - ful and true, To". The piano accompaniment consists of a steady eighth-note bass line and chords in the right hand.

friends who have passed o'er the last long di - vide, Their

The second system continues the melody and accompaniment. The lyrics are: "friends who have passed o'er the last long di - vide, Their". The musical notation includes various note values and rests, with the piano accompaniment providing harmonic support.

spir - it is still march - ing on, As it

The third system continues the piece. The lyrics are: "spir - it is still march - ing on, As it". The piano accompaniment features a consistent rhythmic pattern, and the vocal line maintains the melodic flow.

did in the days when we marched side by side As we

The fourth and final system on this page concludes the phrase. The lyrics are: "did in the days when we marched side by side As we". The musical notation shows the final notes of the system, with the piano accompaniment ending on a sustained chord.

THE RED GUIDON.

3

CHORUS.

fol - low the Red Gui - don. Then here's to crossed cannons, They

nev - er will run, The lim - ber and roll - ing Cai -

son, The clank of the col - lar, The

rum - ble of gun, As we fol - low the Red Gui - don.