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EDITED BY

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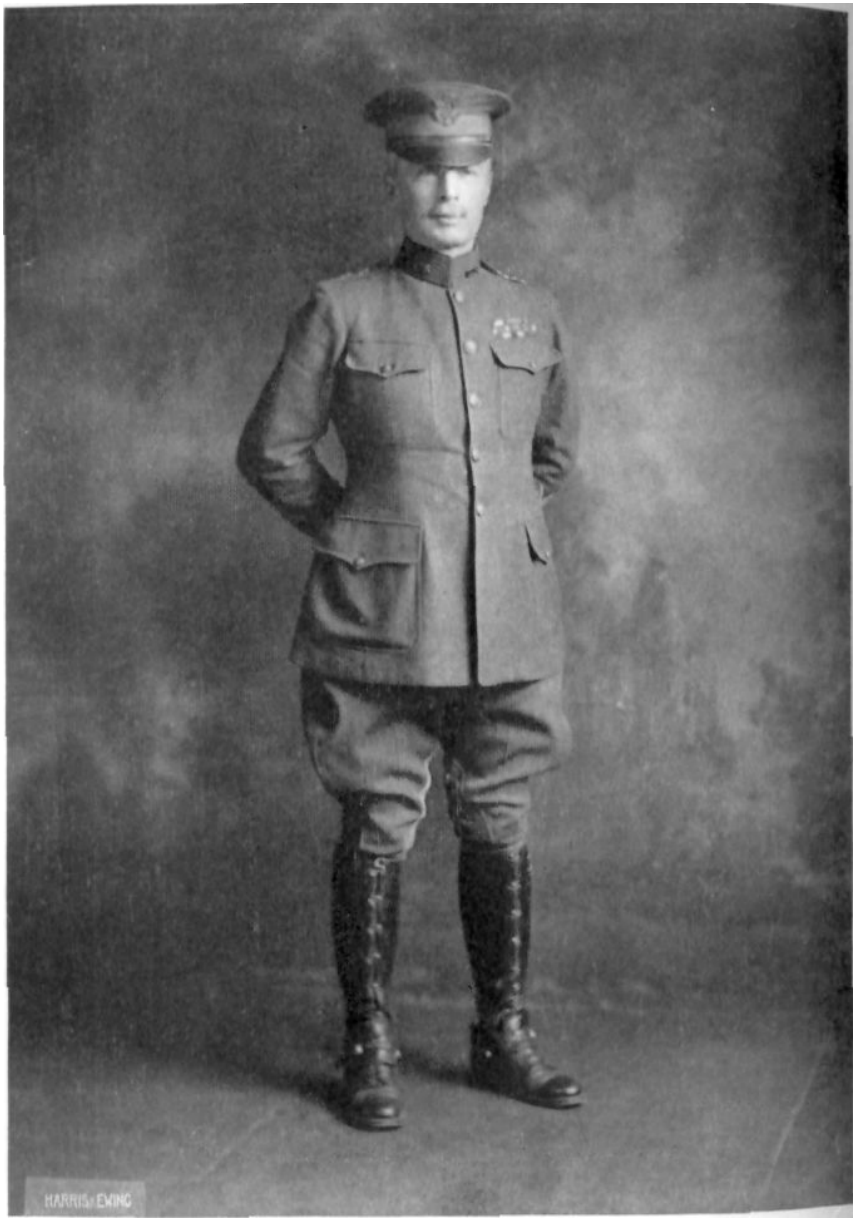


MAJOR GENERAL WILLIAM LASSITER, U. S. ARMY

Appointed Brigadier General May 5, 1917; joined 51st Field Artillery Brigade, 26th Division, in France October, 1917, and commanded it in Soissons and Toul Sectors to May 9, 1918; Chief of Artillery, 1st Corps, May 10 to August 21, 1918; Chief of Artillery, 4th Corps, August 22 to October 12, 1918; appointed Major General August 8, 1918; Chief of Artillery, 2nd Army, October 13 to November 18, 1918; Division Commander, 32nd Division, November 19, 1918, to April 23, 1919; Chief of Artillery, 3rd Army, April 24 to July, 1919.

THE FIELD ARTILLERY JOURNAL

VOL. IX SEPTEMBER-OCTOBER, 1919 NO. 4

The Training of Artillery in France*

BY MAJOR GENERAL ERNEST HINDS, U.S.A., CHIEF OF ARTILLERY, A.E.F.

I. HISTORY

WHEN the American Expeditionary Force was sent to France it was with the understanding that matériel, munitions, horses, etc., would be furnished by the French and British until such time as our own resources could be developed and matériel manufactured and shipped over to supply our needs.

Our Artillery personnel, both commissioned and enlisted, had, therefore, to be trained in the use of new matériel. In addition to this, many new methods had been introduced and perfected during the three years which had elapsed since the war began. New applications of science and new appliances of all kinds in the various arms had been introduced, so it became necessary to train the personnel in new methods. The principles of the use of artillery have not changed, but many refinements had been introduced because of the requirements of trench warfare. This phase of warfare had come about naturally through the inability of either side to take the offensive in such strength as was necessary to success. Germany had to hold on the Western Front while she disposed of Russia and Roumania in the East, and the French and the English were unable to break through; so they faced each other in the trenches until Germany's eastern enemies were disposed of, then she took the offensive again on the Western Front.

* A lecture given at The Centre of Artillery Studies, Langres, France, December 18, 1918.

It was evident when we began our training in France that the trench warfare phase would last for a considerable period of time. While the United States was building up a large force it was therefore necessary to train our personnel in those new refinements of methods, and in some instances in entirely new methods. We had, therefore, to turn to the French and the English for instructors, particularly in artillery, and so far as our artillery was concerned it was mainly to the French that we turned for them.

General Pershing arrived in Paris with his staff on June 13, 1917. The Staff began at once a study of the necessary organization for the A. E. F. and of a system of training therefor. On July 16, a letter of instructions outlining the basis of the course of artillery training was sent to the Commanding General, 1st Division, and by him transmitted to General March, commanding the 1st Brigade, Field Artillery. This system was intended to govern in the instruction of not only that brigade, but also "subsequent brigades to arrive in France."

In order to expedite the training as much as possible, as well as to perfect the artillery in the new methods of refinements, the letter prescribed: "The French authorities have placed at our disposal, headed by Colonel Maitre, a force of officers and men who are selected for their special knowledge of the various phases of artillery work. This French personnel will be utilized as instructors to the fullest extent."

To provide for the instruction of subsequent brigades the letter stated: "It is the intention to transfer such officers and men from each divisional artillery to that of the succeeding division to facilitate the instruction of new units in the matériel, as well as in the new methods developed in this war."

The scheme provided for three phases of instruction of artillery units, *viz.:*

1. Technical artillery instruction, both theoretical and practical, in the Divisional Training Camps.

2. A short period of service at the front, where the regiments would be given an opportunity to improve their training.

3. A period of tactical training with the division to which the unit belonged.

Another phase of training was contemplated and planned: a school for the training of higher artillery commanders and their staffs, and the further training of specialists. Before we reached this phase the necessity for throwing in every available officer and man in the A. E. F. became so great and continued to be so urgent that it could never be done until after the signing of the Armistice.

The first phase, technical instruction, included a theoretical course of about two weeks for all officers, covering the new technical training. Then followed instruction of officers and enlisted specialists; and practical instruction with matériel and horses, and in the direction and conduct of fire.

The general instruction was given (*a*) in the matériel and its handling; (*b*) in firing and the employment of artillery; (*c*) in laying and maintaining telephone lines under present conditions, and in signalling.

The specialists were instructed in liaison, telephones, wireless telegraphy, signalling, the care and maintenance of matériel, and as orienteurs and aerial observers.

A great deal of emphasis was laid on practical instruction in the direction and conduct of fire. The first brigade was not limited as to the amount of ammunition allowed. As a result of the experience of that brigade the allowance of succeeding brigades was fixed at 28,600 rounds of 75-mm. ammunition, and 12,600 rounds of 155-mm. howitzer ammunition per regiment, giving over 500 rounds per officer for the 75-mm. regiments and 200 for the howitzer regiments.

It is believed that the thoroughness with which this phase of instruction was given at Valdahon and later in other camps, together with the great amount of actual firing, resulted in a state of technical training as satisfactory as it was possible to reach in the limited time allowed. As the character of the struggle at the front changed gradually from the methods of trench to those of open warfare, more and more emphasis was

laid on instruction in these latter methods, but there was never any reason felt for a radical change of the instruction.

The second phase, a short period of service at the front, was intended to cover "further training of officers in questions of billeting, supply, protection, communication; further training of men during the fire for effect against the enemy."

The third phase was intended to take up and complete, so far as time permitted, "the tactical instruction of the brigade through a period of training with its infantry division; a review of phases one and two, and further progress in questions of liaison, communications, etc."

Before the completion of the training of the 1st Brigade, General March was designated as Commander of Army Artillery, 1st Army, and was charged "with the supervisory control of the organization, training, and equipment of such of the divisional and corps artillery units as are detached from their respective divisions and corps."

In order to have plants of sufficient capacity to train the divisional artillery as fast as it was scheduled to arrive, three more camps in addition to that at Valdahon were taken over from the French and greatly increased in size, Camp Souge, near Bordeaux, to accommodate three brigades, Camp Coetquidan in Brittany to accommodate two brigades, Camp Meucon to accommodate two, later La Courtine was designated to accommodate one divisional artillery brigade, and when the great rush of troops occurred still another camp, Le Corbeau, was provided to accommodate another brigade temporarily.

Had there been anything like a regular flow of troops to France these camps would have readily accommodated all of our divisional artillery, but for a time, during the spring of 1918, the troop movement consisted largely of infantry, and the artillery camps were not working to capacity. Then the Artillery was sent over faster than the camps could take it, so that a number of brigades had to be sent into training areas, in the vicinity of the camps as far as practicable, until those in training could be gotten out of the way. This state of affairs

was accentuated, in fact, principally caused, by delays in obtaining equipment for the brigades, so that their training could not be expedited nor their equipment completed sufficiently to enable them to take the field promptly.

In addition to training the brigades, it was necessary to provide replacements for officers. This was done by the establishment of the artillery school at Saumur in September, 1917, where field and later heavy artillery officers were trained. The plans for this school contemplated taking young college men from the training camps who had been commissioned in the Field Artillery, and later enlisted candidates for commissions, and giving them the necessary theoretical and practical instruction to fit them for the technical work of artillery officers. It was the policy to send these officers from Saumur to the divisional training camps and the Heavy Artillery Organization and Training Centres to take the course of training with brigades at those places. Owing to the urgent need for officers with brigades at the front it was never possible to carry out this policy completely. Where it was possible, the state of training of officers after passing through the training camp was in general most satisfactory. The capacity of Saumur, at first about 500 students, was increased until it was finally about 1800, with steps under way at the time of the signing of the Armistice to increase it to 2400, that is, 800 per month, the course being a three months' course. About 3340 officers had graduated from Saumur up to October 31, 1918; 348 candidates completed the course on November 30, about 600 will complete it at the end of this month, and a like number January 31st, when the school will be closed—giving a total of about 4900.

The quality of the young officers sent there from the 1st and 2d Training Camps in the United States was very high, and the technical training of these men has given satisfaction in the regiments to which they were assigned. The same may be said generally of the candidates for commission who have graduated from the school. The course covered instruction in Artillery, Matériel, Equitation, Hippology, Reconnaissance, Topography,

the Battery Mounted, Telephones, Wireless Signalling, Ammunition, Ballistics and Dispersion, Preparation of Fire, Observation of Fire, Principles and Methods of Fire, and a considerable amount of Conduct of Fire—actual practice.

The total number of the Field Artillery personnel trained in France, exclusive of the output of the Saumur Artillery School is about 7500 officers and 197,000 men. During one period there were more than 3200 officers and 75,000 men under training in the Divisional Artillery Training Camps alone. The permanent camp staff comprised 100 officers and 2200 men, and the instructional staff consisted of 225 officers and 400 enlisted instructors.

In addition to the training agencies referred to above, we had the Corps Artillery Schools, the Tractor School for Field Artillery at Le Blanc, various schools in the Field Artillery Replacement Regiment, and finally the Centre of Artillery Studies established at Langres.

For the Tractor Artillery of the Corps and Army, the Railway Artillery, the Trench Artillery, and the Anti-aircraft Artillery, Organization and Training Centres and Schools were established at Libourne, Limoges, Clermont-Ferrand, Angouleme, Angers, Gien, Haussimont, Mailly, and Fort De Stains. At these various places there have been trained about 4400 officers and 91,000 men.

The total number of personnel employed at any one time as instructors was approximately 790 officers and 990 enlisted men. The total of all Artillery trained in the A. E. F. amounts to about 12,000 officers and 288,000 men; including ammunition trains the totals are 13,200 officers and 337,000 men.

II. DEFECTS AND DIFFICULTIES

Had circumstances permitted the carrying out of the original scheme of training it is believed that few defects would have developed in it, but with the single exception of the First Field Artillery Brigade, conditions have been such as to make impracticable our adherence to the approved progressive system of

training. The training which was provided for in the application of the second and third phases was not given; with the result that the fighting quality of the brigade and hence the division suffered.

With a very few exceptions brigades have even been deprived of the full benefit of the instruction set apart for the first phase; the slow arrival of essential matériel and the practical absence of horses during this phase are facts well known and this character of the training suffered seriously in consequence. To teach the principles of open warfare properly, mobility is indispensable. It can not be done with immobile guns. And in many of the howitzer regiments there were available during the greater part of the training period only four guns with which to carry on the instruction of the entire regiment. In no other way except by the actual manipulation, in contact and in movement, of the components of a combat division, can such a unit be whipped into satisfactory shape. A certain amount of tactical instruction—combined training with the division—must be given before the training can be considered as complete.

The one weakness of importance in the work of the Divisional Training Camps was a course of instruction for Brigade Commanders, their staffs, and regimental and battalion commanders, supplementing that given at the training camps. The lack of this instruction was realized fully but demands from the front for commissioned personnel rendered it impossible to assign instructors possessing the required knowledge and experience until about September 15th. This course was begun at Meucon and Coetquidan at that time and was instituted at the other camps about the first of November.

This instruction was given in the form of lectures, problems, conferences, and, above all, practical demonstrations. It comprised: "The employment of artillery both in the offensive and the defensive, particularly the former, the infantry formations being assumed; the echelonment of artillery; the rôle of divisional, corps and army artillery, and schemes for their

mutual support; the use of artillery in a campaign movement, advance by echelon, continuity of fire, use of the accompanying gun and the accompanying battery; march tables; preparation of operation orders; liaison. Special emphasis was laid on the necessity for mobility and the crying need for our Field Artillery to break away from its absorption in the so-called position warfare methods, and to overcome the sluggishness which unfortunately at that time characterized many of our units."[1]

The principal defects noted during the Château-Thierry operations were as follows (see Notes on Recent Operations, Nos. 1, 3 and 4):

Barrage orders not sent to the units concerned in some cases in time to permit the necessary calculations to be made.

Smoke barrages not used in some cases where they would have been very effective.

Too much firing from the map and not enough observation of the fire. Observed fire must be constantly sought.

Too little use of shrapnel against personnel in the open.

Lack of proper liaison with the infantry. "Liaison must be pushed as far forward as is necessary to secure information as to the situation and needs of the infantry front line."

Artillery scouts not used to good advantage for protection and observation.

Not sufficient use made of accompanying pieces.

In the St. Mihiel operations these criticisms were made:

Advantage not always taken of opportunities to rest and care for animals.

Lack of promptness in pushing the artillery forward after the infantry had crossed the hostile trenches.

Initial positions of divisional artillery not far enough forward for a surprise attack.

Too much use of the barrage in the accompanying fire instead of using a progressive fire on carefully selected points.

The extravagant methods of map firing were again used too much, observed fire not enough.

[1] Report of Colonel W. S. Sturgill, who was in charge of the instruction.

After the advance, the artillery positions selected were not far enough forward for an offensive operation.

Too great a tendency to use the division howitzers for distant harassing fire. This should not be done unless the operation has passed beyond the range of the corps and the army artillery.

During the first few days of the Meuse-Argonne offensive the following defects were noted:

Not enough use was made of accompanying batteries.

Initial artillery positions not far enough forward. "As the limit of range of the initial artillery positions was reached, a point well known to the enemy, his relatively weak artillery opened with good effect on easy targets. In several instances, our infantry, as well as roads and heavy traffic, were shelled, without a shot from the mass of artillery in our rear."

There were glaring defects in the matter of reconnaissance.

Not sufficient support of infantry by the artillery in the attack of machine gun nests.

Lack of personal supervision on the part of higher artillery commanders in the matter of feeding, watering and caring for animals, resulting in their neglect and abuse.

In the later phases of the Meuse-Argonne campaign, there was marked improvement in the work of the Artillery, as well as all of the other arms. But "the artillery support of the infantry varied much in different units, apparently depending much on the aggressiveness of the artillery commanders and on the orders received from the division commanders." Defects were again noted in reconnaissance, mobility, observation, and liaison; and too frequent use of the barrage and firing from the map. Map firing is frequently of great value, but it should not replace observed fire where the latter is practicable. The barrage is a necessity where the resistances are "practically continuous, everywhere powerful, and clearly known to the attacker." When the resistance becomes irregular the barrage should no longer be employed. "The artillery support must take the form of fire applied promptly and exactly where needed."

As a result of defective reconnaissance accompanying guns "lost touch with the infantry, or failed to find targets, or unlimbered in the open at short range from hostile machine guns. The greatest care must be used in manœuvring within effective small arms range. For the accompanying guns, exposure before firing, and even during firing, invites destruction."

Close support by the accompanying gun does not necessarily mean *direct fire*. We do not want to lose all advantage of the range of our gun. When the infantryman wants to use rifle fire to the best advantage he does not endeavor to get up where his adversary can stick him with the bayonet. Machine guns do not push forward to within hand grenade range. We have not yet solved this question in a perfectly satisfactory manner. In a report from Major General W. S. McNair, commanding the 1st Army Artillery, who was with that Artillery during the Argonne offensive, he discusses the subject quite fully. He sums up the advantages and disadvantages as follows:

Advantages:

1. Moral support afforded our infantry.
2. The actual breaking down of resistances which prevent the advance of the Infantry, such as machine gun nests, single guns, etc., etc.

Disadvantages:

1. Difficulty of manœuvring the guns over open ground in daytime and in keeping up with the infantry.
2. Frequent inability to use direct laying due to invisibility, either from atmospheric conditions or from smoke of friendly barrage.
3. Casualties from passing through hostile offensive counter preparation.
4. Drawing fire on our own infantry.
5. Practical neutralization of guns by hostile fire.
6. Inability to fire due to dead space.

One of the lieutenants who had considerable success with his accompanying guns (and has been recommended for the Distinguished Service Cross), has expressed the conclusion of most of the officers who actually commanded the advance guns:

"I do not believe there has been a mission given to me during this drive which I could not have accomplished better and more effectively had I been more bold and aggressive with my O. P's. and less bold and aggressive with my battery."

The deficiencies above discussed were the result in large part of difficulties which could not be avoided.

In the first place, the training of the Field Artillery Brigades was greatly hampered in the United States by lack of matériel and of trained instructors. They were in general not even fairly well trained when they reached France. The Chief of Field Artillery in official letters to the Chief of Artillery, A. E. F., reported in the majority of cases that the brigades were not prepared for overseas duty, that they were lacking in competent field officers, and in many cases had been filled up with recruits just prior to their departure.

The impossibility of turning out highly trained or even fairly well trained organizations within the short space of time which those organizations were allotted by G. H. Q., to complete their training in the Divisional Training Camps, is evident. The deficiencies in available matériel are well known. Seventy-five millimetre guns were usually available but, as a rule, after July 15th only about four 155-mm. howitzers were available for the entire regiment during the greater part of the training period—in one camp for about three weeks three brigades had but four howitzers in all—in another camp at the end of the training period problems were fired with four howitzers which could not be moved for lack of horses. After June 15th horses were not available in sufficient numbers to give proper instruction in problems involving mobile warfare methods. In one brigade, at least, in a problem involving movement the guns were dragged 600 or 800 yards by the men, horses not being available. Mobile warfare methods cannot be properly taught with immobile guns.

In the original scheme of instruction it was never contemplated that satisfactory training in methods of open warfare could be secured in the Divisional Training Camps alone—nor can it be. Training with the rest of the division is necessary to give the required tactical instruction. It is absolutely essential for reaching a satisfactory state of efficiency, but the emergency was too great to admit of our carrying out this part of the training program.

Our deficiencies in regard to competent instructors may readily be imagined by considering for a moment the fact that we had less than 240 regular field artillery officers of more than one year's service at the outbreak of the war. How many of the 240 were in France is not known, but the number of field artillery officers in the A. E. F. alone at the date of the signing of the Armistice was more than 7500. As a result, we had as instructors at our Divisional Training Camps 12 officers only—about one per brigade—who were in service at the outbreak of the war—the remainder, about 193, were men who came into the service from civil life since then. The difficulty of finding among these men thoroughly qualified instructors in open warfare methods need not be enlarged upon. Yet these instructors were the best that we had—they were all that we had.

The length of time allowed for training in the camps was perforce cut down to about six weeks—a period of time wholly inadequate for the proper instruction of the units, but under the circumstances this was unavoidable.

That the Field Artillery was not as well trained as it should have been is self-evident—it could not be in view of all the difficulties with which we had to contend. The same may be said with respect to the Infantry, the Air Service, the Engineers, and to every other kind of combat unit. We had to pay the penalty for our total unpreparedness. Let us hope that we may profit from our dearly bought experience and avoid that mistake in future.

But in spite of the great difficulties we had to encounter, the artillery was showing great improvement when the signing of

the Armistice brought the cessation of hostilities. From bitter experience it was gaining the necessary tactical knowledge and cohesion it would have acquired to a great degree from the completion of the third phase of our original training schedule.

Our shortcomings have been noted above. Now a few quotations from the statements of German prisoners telling how the work of our Artillery impressed them in the later operations may be of interest. These are but a few taken from Memorandum No. 11, Headquarters Army Artillery, 1st Army, November 5, 1918:

(No. 14, G-2, 1st Army) September 13th—Artillery preparation had flattened everything and destroyed all communication at the end of two or three hours. The American barrage had a demoralizing effect upon the 10th Division in line (82d Lw. Regt.).

(No. 32, G-2, 1st Army) September 30th—Out of the 60 men in the company, trench strength, only 18 or 19 were left, the remainder having been killed or wounded in the BOIS DE FORET by the American artillery.

(No. 34, G-2, 1st Army) October 2d—The 458th Regiment suffered heavy losses from artillery fire in ROMAGNE. A noncommissioned officer of the 20th Regiment, 5th Guard Division, stated that our artillery had "smashed everything" in the GRAND PRE-ST. JUVIN road.

(No. 35, G-2, 1st Army) October 3d—The company had 75 per cent. losses from gas shelling on September 26th and 27th (4th Company, 112th KUK).

(No. 36, G-2, 1st Army) October 4th—One company as a result of the recent offensive was reduced to 16 men, 7 of these were killed by a shell falling in a dugout.

(No. 41, G-2, 1st Army) October 9th—the 11th Company, 270th Res. Regt., lost 25 men by artillery fire; 45 per cent. of their present trench effectives.

(No. 43, G-2, 1st Army) October 11th—The colonel declares that his regiment (the 11th Regiment) was to make a counter attack about the time the American barrage opened.

The result was complete disaster; the regiment was "completely shattered." The artillery unit of Captain Cramer, which was to prepare the counter offensive, was either captured or broken to pieces; a large number of the officers were wounded or killed.

(G-2, 3d Army Corps) October 14th; from captured documents—An exact report on the amount of heavy artillery and field artillery put out of use says that in one month 13 per cent. of all pieces in line have been completely destroyed by enemy artillery.

(No. 47, G-2, 1st Army) October 15th—From October 6th to 11th the 1st Battalion of the 110th Regiment, 28th Division, lost 65 to 75 per cent. of their combat effectives from artillery fire.

A great number of the 31st Bavarian Regiment were severely gassed: the 30th Bavarian Regiment had 75 casualties from shell fire last night.

(No. 54, G-2, 1st Army) October 22d—The 458th Regiment has suffered such heavy losses that on October 15th it had only five companies, with effectives in each company very low. Prisoners stated that losses were largely due to artillery fire.

(No. 60, G-2, 1st Army) October 28th—Artillery did a great deal of damage, destroying dugouts and machine gun nests, and appeared to be in perfect unison with the advancing infantry.

(G-2, 17th Corps) October 28th—The 3d Machine Gun Company, 196th Regiment, had 10 machine guns put out of action, six men killed, and many wounded during the preparation of the American attack on the 28th.

(G-2, 5th Army Corps) November 1st—Prisoner taken November 1st in region of LANDREVILLE stated that our fire effected a loss of 80 horses and 60 men in one battery a few days before the attack. He also stated that our fire was very accurate, counter battery and harassing fire being very effective, and that the shelling of rear areas produced many casualties. He further stated that our artillery preparation of

November 1st was very demoralizing and isolating in its effect. A young officer of the 54th Army Reserve states that our preparation left only about 30 men out of a battery of 110 men. One gun was destroyed by our fire and the other three destroyed by them before they left.

(No. 66, G-2, 1st Army) November 3d—Captured artillerymen of the 15th Bavarian Division state that in recent days the American artillery, shelling far to the rear areas, had interfered with the supply of munitions to such an extent that the batteries were almost without ammunition.

The following is quoted from the official American communique of November 1st:

"The 1st American Army continued its attack on the west bank of the Meuse in conjunction with the Fourth French Army on its left.

"The perfect coöperation of all arms—infantry, artillery, airplanes and tanks—succeeded in overcoming and disorganizing the enemy's determined resistance and in breaking up his counter attacks. Enemy divisions rapidly brought up were intermingled with units already in line in a vain attempt to stop our advance."

Our 1st Division was the only one which completed the entire schedule of training as originally planned. That division rendered such conspicuous service as to win three citations in orders of the Commander-in-Chief, having one General Order devoted exclusively to the citation of the courage, fortitude and self-sacrificing devotion to duty of its officers and men in the Meuse-Argonne offensive, a record made by no other organization in the American Expeditionary Forces. While the achievements of this division have been due in large part, doubtless, to exceptionally able leadership, it is believed that it is due in considerable degree to the thorough training given as a division. To it not only do *we* render well earned praise, but our enemies likewise add theirs, as the following tribute from a German officer, captured on October 24th, shows:

"I received orders to hold the ground at all costs. The American barrage advanced toward my position *and the work of your artillery was marvellous*. The barrage was so dense that it was impossible for us to move out of our dugouts.

"Following the barrage closely were the troops of the 1st Division.

"We did not believe that within five years the Americans could develop a division such as this 1st Division. The work of its infantry and artillery is worthy of the best armies of the world."

III. THE ESSENTIALS OF ARTILLERY TRAINING

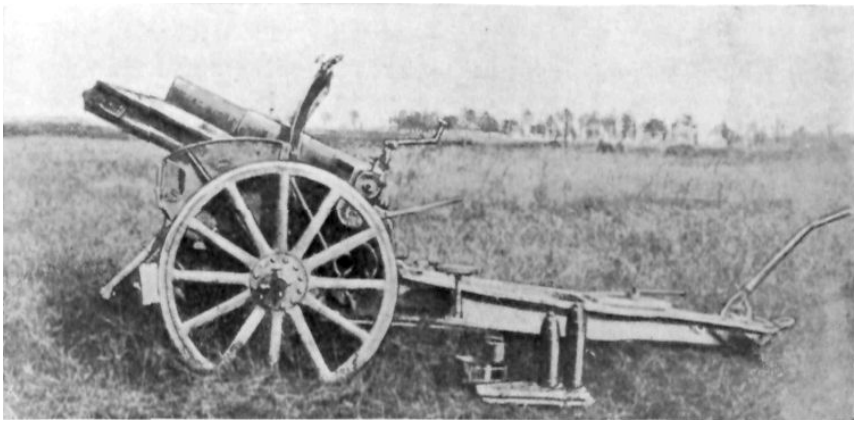
These may be summed up in broad outline under four heads:

1. Discipline.
2. Technical instruction.
3. Tactical instruction.
4. The development of leadership.

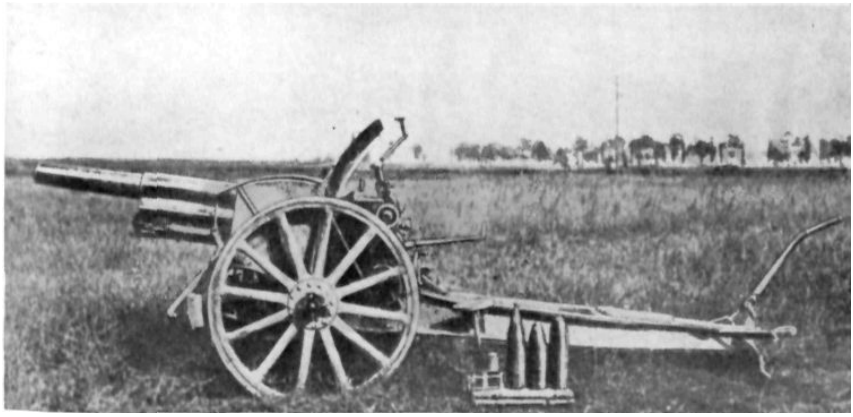
Technical knowledge is necessary, tactical instruction is essential; but without discipline, all military knowledge is of no avail—success can not be assured. Discipline is the first and most vital factor in the military life. Strict unquestioning obedience and prompt execution of the orders of superior authority are evidences of its existence. Courtesy; the avoidance of a habit of criticising the actions, decisions and motives of other officers; neatness and correctness of uniform; punctiliousness in saluting—all tend toward the attainment of discipline.

Technical and tactical instruction cover wide fields, which, of course, can not be discussed in a short paper. The artillery officer is supposed to have been given the technic of his arm before his unit joins its division, and he is usually competent so far as technical matters are concerned. The officer of another arm who has artillery under his command should entrust the artilleryman to solve the technical problems. He should be told what is required only—not how it is to be done. Our experienced commanders know this, but their staff officers and

TYPES OF GERMAN FIELD ARTILLERY



The old or "'98/'09" 10.5-cm. light field howitzer (*l. F. H. 98/09*).



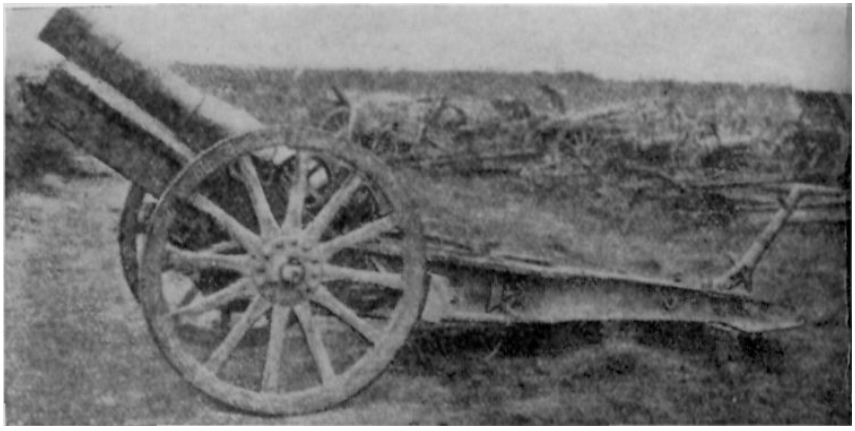
The new or "1916" 10.5-cm. light field howitzer (*l. F. H. 16*).

COMPARISON OF OLD AND NEW 10.5-CM. LIGHT FIELD HOWITZERS.

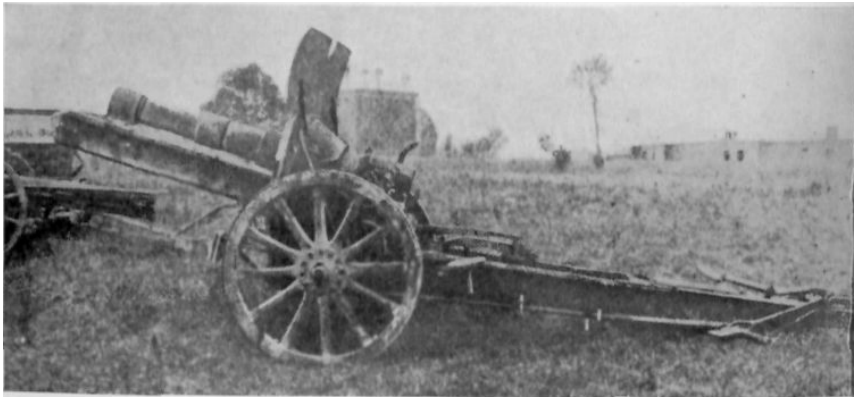
	Old '98/'09 howitzer.	New 1916 howitzer
Calibre	10.5 cm. (4.13 in.)	10.5 cm. (4.13 in.).
Overall length of piece	11.9 calibres = 4 ft. 1 $\frac{1}{16}$ in.	22 calibres = 7 ft. 7 in.
Buffer	Oil buffer, spring recuperator	Ditto.
Limits of elevation on carriage	–13º, + 40º	–10º, + 40º.
Amount of traverse	4º	4º.
Weight of howitzer in action	22½ cwt.	27 cwt.
Weight limbered up without gunners	37 cwt.	45 cwt.
Charges	Nos. 1—8	Nos. 2—7 and No. 9.
Weight of shell	34 lbs.	34 lbs.
Marimum ranges	7,655 yards	9,241 yards (2 c.r.h. shell). 10,499 yards (streamline shell).

Note.—The streamline shell is only fired from the new howitzer and with charge No. 9.

TYPES OF GERMAN FIELD ARTILLERY

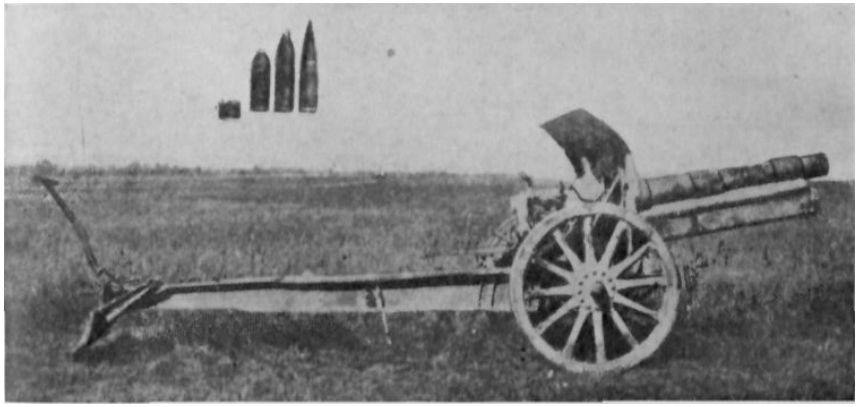


1902 15-cm. Howitzer (s.*F.H.* 02).



1913 15-cm. Howitzer (s.*F.H.* 13).

TYPES OF GERMAN FIELD ARTILLERY



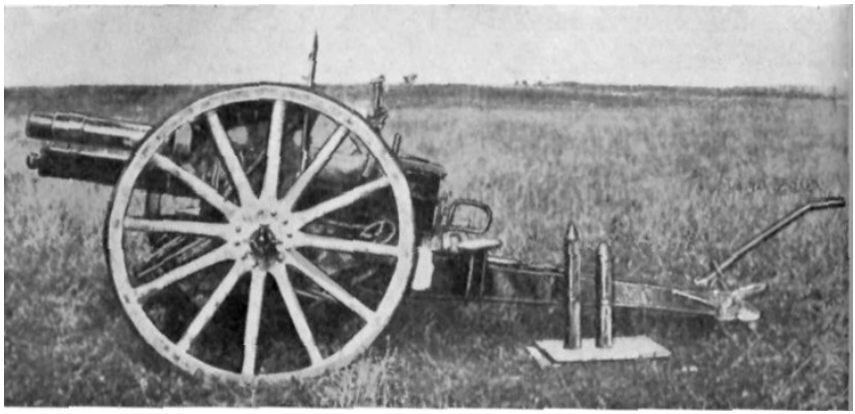
Long 1913 15-cm. Howitzer (*lg.s.F.H.* 13).

COMPARISON OF 15–CM. HOWITZERS.

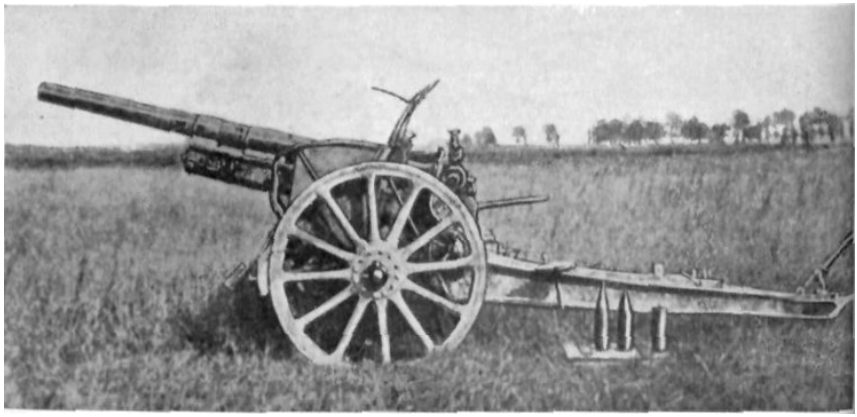
	1902 howitzer.	1913 howitzer.	Long 1913 howitzer.
Calibre … … …	14.97 cm. (5.89 in.) ...	14.97 cm. (5.89 in.) …	14.97 cm. (5.89 in.).
Overall length of piece …	12 calibres = 5 ft. 9½ in.	14 calibres = 6 ft. 10½ in.	17 calibres = 8 ft. 4½ in.
Recuperator … …	Spring recuperator …	Either spring or air recuperator.	Air recuperator.
Maximum elevation on carriage	42º … … …	45º … … …	45º
Amount of traverse …	3º 56′ … …	about 4º … …	about 4º
Weight of piece … …	15¾ cwt. … …	15½ cwt. … …	16¼ cwt.
Weight of howitzer in action	39¼ cwt. … …	—	43 cwt.
Transport … …	All three types were designed for horse-drawn transport, but, owing to the shortage of horses, may be sometimes hauled by lorries.		
Number of charges …	1—6 … … …	1—7 … … …	1—8
Weight of shell … …	92 lbs. … …	92 lbs. … …	92 lbs.
Maximum ranges:—			
With 2 c.r.h. shell …	8,147 yds. (Charge No. 6).	9,296 yds. (Charge No. 7).	9,296 yds. (Charge No. 8)
With 7 c.r.h. shell with false cap … …	—	—	9,624 yds.

NOTE.—All three howitzers fire the same ammunition, except as regards the super-charges and the 7 c.r.h. shell with false cap (*15 cm. Gr. 14 Haube*). The latter is only fired from the long 1913 howitzer and is not fired with Charges 1—7.

TYPES OF GERMAN FIELD ARTILLERY



The old or "'96 n/A." field gun (*F.K. 96 n/A.*)."



The new or "1916" field gun (*F.K. 16*).

COMPARISON OF OLD AND NEW FIELD GUN.

	Old 96 n/A. gun.	New 1916 gun.
Calibre … … …	7.7 cm. (3.03 in.) …	7.7 cm. (3.03 in.).
Overall length of piece …	27.3 calibres = 6 ft. 10 $\frac{11}{14}$ in.	35 calibres = 8 ft. 10 $\frac{5}{16}$ in.
Buffer … … …	Oil buffer, spring recuperator	Ditto.
Limits of elevation on carriage.	–12º, + 16º … …	–10º, + 40º.
Amount of traverse …	8º … … …	8º.
Weight of gun in action …	19.3 cwt. … …	27.5 cwt.
Weight of gun limbered up without gunners.	35.6 cwt. … …	43 cwt.
Ammunition … …	Fixed … … …	Separate (reduced charge, No. 1; full charge, No. 2; issued separately in brass cartridge case).
Weight of shell … …	15—16 lbs. … …	13 lbs. (streamline) and 15—16 lbs.
Maximum ranges …	6,000 yards (at 16º elevation) 8,312 yards (with trail sunk).	6,561 yards (Charge No. 1). 9,952 yards (Charge No. 2 and 4 c.r.h. shell). 11,702 yards (Charge No. 2 and streamline shell).

NOTE.—The old field gun does not fire the streamline shell. With the new gun, the full charge (No. 2) is not used with shrapnel (painted blue) nor with the long shell (blue and yellow). The reduced charge (No. 1) is not used with the streamline shell.

commanders of limited experience have frequently made this mistake. They should never take charge of the technical handling of the arm.

As for the tactical side, a very general knowledge of artillery methods will enable tactical commanders to judge of the efficiency of their artillery subordinates. Their technical proficiency may be assumed. The other important points to be kept in mind are:

1. Reconnaissance, early and thorough.
2. Observation, terrestrial or aerial.
3. Liaison, all possible kinds.
4. Mobility—horses and motors.
5. Accuracy—hitting is essential.
6. Push.

The Development of Leadership.—A report from the Director of Instruction at Coetquidan, who supervised the training of a greater number of brigades than any other of our directors, and who is one of the ablest we had, says in speaking of the variation in the quality of the brigades: "The greatest single element in the development of any brigade was the quality of the brigade commander, the brigade in every instance reflecting the energy, intelligence and (power of) command of the brigade commander."

The command may be well disciplined; its technical training highly satisfactory; and its tactical instruction perfect, yet without a good leader it is like a ship without a rudder. To a large extent the qualities of leadership must be born in the man, yet much can be done to develop in average men the qualities which are necessary in the leader of men.

The leader must be an optimist. He must never allow himself to become discouraged. If so, his men will see it, know it, and be influenced by it. He must cultivate optimism and cheerfulness. The man who is always criticising, finding fault, complaining of hardships, is not fit to be an officer. He must keep up his own spirits in order to keep up the morale of his men.

Morale is as essential as discipline; pessimism never wins battles. He must also be energetic and persistent. Next to discipline, energy and persistence are vital factors in military efficiency. We presuppose average ability, of course. The man of average ability, if he is energetic, if he sticks to it, will go far. The man who does not work can not be efficient nor successful. To genius Napoleon added untiring industry, incessant energy.

Besides possessing energy and persistence, the commander must lead his command. The Division Commander must be the driving force in the division, the brigade commander in the brigade, the colonel in his regiment, and so on down to the corporal in charge of his squad. And this leadership must make itself felt every day, every hour, every minute.

Report of Observation Trip with English Army in England, France, Belgium and Germany, on Horsemastership, Care of Transportation and Equipment

BY MAJOR PAUL C. RABORG, CAVALRY, U.S. ARMY

[EDITOR'S NOTE.—*The following comprehensive report by Major Raborg should prove of great interest to all field artillerymen. The British are conceded to be past masters in the art of horsemastership and all reports we have received tend to show that the condition of their animals, both at home and in the field, far outclassed all others under like conditions in the Allied armies*.]

MARCH 9th:

Arrived in London. Captain A. F. G. Renton, 11th Hussars, assigned to conduct Colonel E. W. Taulbee and myself throughout our trip in England. Left for and arrived at Liverpool this day.

MARCH 10th:

Went to Ormskirk Remount Depot at Ormskirk, commanded by Colonel G. W. Hobson, formerly of 12th Lancers.

En route to Ormskirk I had a long talk with Captain Renton regarding his experience with horses throughout the war. Captain Renton had been with the cavalry throughout the entire period of the war with the exception of the time he had been incapacitated for duty, having been wounded three times. The following points were brought out:

(*a*) His horses averaged throughout the entire time three feeds of grain per day; but there were times when they received only two.

(*b*) His squadron did not at all times keep feed sheets, shoeing records, etc., but Captain Renton stated it could and should have been done.

(*c*) He stated that in his opinion the more times you can

feed, the greater the variety of feed given, and, in general, the more you can baby your horses, regardless of war conditions or possibilities of irregularity, the better they are. He stated that in this war as galloping was seldom required, he worked on the theory of keeping as much fat on his horses as possible, in order to counteract the effect of long, slow marches, usually accompanied by lack of forage.

(*d*) Captain Renton stated that in winter horses should not be clipped unless it was certain that they would always have stabling or horse covers. He cited an example in the 1917 Battle of Arras. In this fight the transportation belonging to the cavalry was unable to get to them, animals had just been clipped and were without horse covers. During the battle there was a blizzard, and the participating cavalry was rendered almost immobile, due to the very large number of animals that died from exposure. He added, however, that this clipping provision did not apply to animals used for transportation, and stated that he believed animals of this type should be clipped at least "trace high."

(*e*) He stated that all chains and metal were required to be kept burnished and polished regardless of conditions of weather or fighting, and that in general their standard of "spit and polish" was maintained.

At Ormskirk we met the officer in charge and his second in command. The former explained his plant and the latter conducted us through it.

There were 4000 horses at this depot, cared for by eight remount squadrons and two veterinary hospital squadrons. (380,-000 horses had passed through this depot during the war.) In general, all English organizations visited by us complained of a shortage of men, due to the demobilization then in progress.

Prevention of Discase:

All animals received were isolated for a period of two weeks; all stables were disinfected continually, or when they were vacated. Disinfection consisted in burning with blow-lamp and

chloride of lime on the floor. An accurate record was kept of each horse. Animals were hair branded by passing a blow-lamp over a stencil, placed on the animal's rump. Each animal has his own stall, equipment, etc., all of this being numbered to correspond with the one given the horse. (A brand made in the above described manner lasts about a month.)

A similar brand was placed on each horse to show that he had been malleined and the date of same.

Horse covers and blankets were disinfected by a sulphur stove in a closed room. Harness and leather equipment disinfected once a week by burning sulphur in the saddle or harness room; other equipment also disinfected by wiping off with grease made of two parts soap and one part kerosene, this rubbed on the under surface of the leather.

All horses were inspected daily by each squadron commander; a veterinarian accompanies this officer always in order to avoid conflict of orders; this is most necessary.

The animals were daily exercised by turning loose in a chute. In going about this chute they were preceded by mounted men who control the pace, and were followed by a few more mounted men to insure that the pace as set was kept. However, almost all of the animals at this depot were shod behind, and I believe no bad results follow as long as they are not sharp shod.

The animals at this depot were fed grain three times a day and hay the same number of times.

The stable guard at night consisted of one man to every 100 horses.

All shoeing was done in a central shop.

All hay was fed in hay nets and oats in tins. Feeding was done as nearly simultaneously as possible. This is necessary, as it prevents excitement on the part of animals waiting for their turn. Hay seeds were collected, placed in water to let dirt go to bottom and then removed, before they had become watersoaked, and boiled. Three pounds of dry seed were found to make 12 pounds of boiled feed, and the feeding power of the

seed against hay was found by actual experiment to be as 7 is to 3, in favor of the seed.

Electric grooming devices were used; the Commanding Officer stated that as to grooming they were satisfactory, but repairs and constant breakage made them unsatisfactory. With one of these machines two men would groom 40 horses in a day. At this depot they had one man to 12 or 14 horses.

A great point here, as in every other organization visited by me, was made of the elevation of non-commissioned officers, particularly sergeants, by giving them separate messes, clubs, added responsibilities and added privileges.

The organization of the Remount Squadron was roughly: two officers, one sergeant major, one Q. M. sergeant, four sergeants and 120 men.

With an organization of this kind at full strength it meant one man to four or five horses.

This remount depot was organized according to stabling capacity. In other words, a proper number of remount squadrons were placed at the depot to handle its maximum capacity of horses. This was the case at all Remount Depots.

All shops, such as saddler, tailor, carpenter, and Q. M. stores for the depot, were centralized.

Peat moss was used largely as bedding. They stated, however, that anything available would be used, such as leaves, saw dust, etc. It was stated further that stone or hard standings were not considered detrimental to animals, providing they were regularly exercised, excepting as to certain cuts and scrapes of the legs caused in lying down and getting up.

There was also available at this depot for disinfecting a portable superheated steam machine similar to our delousing plants. Creosote was put in the water of this machine.

Horses were at this time receiving about twenty minutes exercise per day in the chute. It was stated they should receive two hours. They received one grooming a day.

Bran was fed dry with grain; bran mashes were not regularly fed. All animals received one feed per day of boiled

oats and hay seed; hay screen was not used; hay was shaken out in a forage room which had a clean floor; seeds were then shovelled up.

During the isolation period all animals were dipped twice. Human fæces from the latrines was always burned nightly in an incinerator.

Great attention was paid to the comfort and welfare of the men; it was generally stated that you could not get the maximum results in the care of animals unless your men doing this work received the maximum care and attention.

Brick standings were used throughout this depot.

Feed boxes were disinfected by blow-torch and occasionally by carbolic acid.

In the blacksmith shop we saw men seating hot shoes and using a hoof knife.

Chaff was issued, already cut, to all squadrons. It consisted entirely of straw cut in less than one inch in length by a centrally located electrical chaff machine.

At the dipping each horse as he emerged was thoroughly scraped. The floor was so arranged that the drippings from the animal floated back into the vat. The dip was heated by steam.

Each squadron was provided with a certain number of boilers for cooking hot food.

Bran mash given only to sick animals; same thing applied with crushed oats.

All animals were clipped with what is commonly known as a blanket clip.

Dubbing was used for the preservation of leather.

Chains were cleaned by hand with wet sand.

Another disinfecting solution for leather was a mixture of two-thirds soap and one-third paraffin, heated and then mixed.

The Commanding Officer did not approve of more than four grain feedings per day as long as the ration did not exceed 10 pounds. A veterinarian, who was present when this statement was made, said that in Mesopotamia on a 10-pound grain

allowance five grain feedings were given, and that he considered it necessary whenever possible.

After leaving this depot we went to Aintree, where we walked over the Grand National Course. The jumps on this track look almost impossible for a horse to negotiate. Left for Leicester, arriving there in the evening.

MARCH 11th:

In the morning we visited the 53d Remount Squadron, commanded by Major J. S. Mason. All stables had stone standings; each stall had a small piece of tin nailed over it painted black, on which was written all data pertaining to that horse. The Commanding Officer of this station stated that he believed lights in stables and men walking about worried horses. He demanded one and one-half hours in the middle of each day of absolute silence, and absolute quiet at night. His stable guard were not permitted to walk around the horses; he required them to stay at one end and only go to the animals in case they heard a noise indicating trouble.

At this station horses were exercised from one-half to three hours daily, depending upon their condition, and groomed twice a day; the second grooming being a wisping.

Grain was fed three times a day; horses in run down condition were fed four times. As much water as possible was given. Major Mason stated that he considered the last feeding should never be later than 6.00 P.M. He also stated that he would give a noon grain feed to animals regardless of the work they were doing, whether they were hot or not, but if they were hot he would make the feed very small.

He objected to dipping and used nothing but sprays. He had constructed a Turkish bath for animals, and stated that they should be put in this first to open the pores and then be sprayed.

Saddle equipment and harness were always disinfected after use; all harness cleaned thoroughly once a week, and wiped off each day after using.

All horses were given a bran mash once or twice a week; poor horses once a day. Boiled food was preferred to steamed food. Loose salt was fed with the grain, whether dry or wet. Same method, as previously described, of boiling hay seeds was in use here. Crushed oats were used as much as possible for feed. Chaff was made to consist of both straw and hay. Dry bran was not fed.

Most of the exercising was done in an exercise pen as previously described.

Major Mason stated that for active service the breast collar was the only practicable form for military purposes.

Each halter was connected to the manger by two ropes, the two ropes after passing through the manger being attached to weights. In this manner a horse can never get his feet through his halter shank as there is no slack. Halters were never removed from mangers.

Saw dust or dry bran was used to dry fetlocks.

The use of the knife on the sole of the hoof was not permitted at all.

When horses were sprayed they were dried by putting straw over them under their horse covers.

In Major Mason's opinion, if the hay allowance is reduced it is very bad to correspondingly increase your grain allowance.

This station was very well run and very well kept. The Commanding Officer complained of lack of men.

A central shoeing shop was maintained where one man at the forge kept two men busy nailing.

We left this station at 11.30 A.M., arriving at Melton Mowbray at 12.15 P.M. It was commanded by Major S. G. Sanders, 4th Dragoon Guards.

Steamed or boiled feeds were never given at this station, except to poor horses. Bran mash was fed.

Grain was fed three to four times daily; poor feeders five to six times. Hay seed was not cooked at this place. Under normal conditions each horse received two hours' exercise and one hour's grooming per day. The present forage allowance, which

consisted of 10 pounds oats and 10 pounds hay, was not considered sufficient by the officer in charge.

This station was only for officers' chargers. The animals here were beyond description, most of them being Irish Hunters. A large number were stabled in box stalls and their care was almost perfect. No exercising in pens was permitted here, except to teach jumping. The jumping pen was oval in shape, about forty-two yards by fifteen yards, with twelve yards between jumps. All elementary training in jumping was done in this pen without riders.

The Commanding Officer stated that at times he had to send five-year-old horses to active service; he did not consider this favorably, and said he preferred to send six-year-old horses; but that he would rather send ten-year-olds than five-year-olds.

Leather here was disinfected by sponging with a solution. Metal was cleaned by hand with wet sand.

About two pounds of chaff per day per animal was cut at this station; the chaff was half straw and half hay. Chaff was also put in bran mash. I can see no reason for this.

The Commanding Officer stated that plenty of good bedding was worth oats.

Much to my surprise here, and at other places, an unusual number of animals showed evidence of having had sore backs.

This depot had its own riding hall. A large number of temporary stables had been constructed, consisting of open sheds with cement standings. The same arrangement as to halters, previously described, was used here.

The Commanding Officer stated that he would feed crushed oats to all horses at all feeds, if it were possible. He also stated that stone standings cut the joints of animals. All heel posts were well wrapped with stout rope to prevent horses injuring themselves in kicking.

The majority of horses had pads on the inside of their fetlock joints to avoid bruising and injuring. All whiskers and long hairs were trimmed or singed off animals to smarten them. Horse covers were held in place by surcingle; surcingles were

equipped with small pads that fitted on either side of the withers to prevent sores and slipping.

Stable guard maintained only at night; they were not permitted to go near animals unless they heard a noise indicating trouble.

Period of isolation at this station was only one week, during which time animals were sprayed once.

The upkeep of this depot was the best seen to date; everything in every place was spotless, and the animals were wonderfully groomed.

Left for London on evening train.

MARCH 12th:

Went to Woolwich, which is the station for a brigade of reserve artillery and is their artillery depot. We had lunch with and were taken care of by Lieut.-Colonel G. D. Melville, A. A. and Q. M. C. Saw an exhibition of riding and jumping in the riding hall by student officers, the Commandant of the riding school and some instructor sergeants major.

This school trains officers and non-commissioned officers as instructors in riding with a view to doing away with the old English system of riding masters, the course lasting for nine months. The saddle used is the English enlisted men's saddle, or what is called the Universal saddle. One of the jumps was rather interesting in that it represented a railroad crossing, making an "in and out" with only about twenty feet between jumps. Horses objected to this, I think, largely because of the fact that it was new and on each gate was a large red disk. The first two officers who rode, as did all other officers, jumped in a position far forward over their horses' necks. Both of the first two were thrown. A sergeant major rode the course and was the only man who really sat his jumps as we are taught to in our service. Major Walwin, R.A., was the Commandant of this establishment.

He fed his animals six times a day on a 10-pound grain allowance; he fed no long hay except three pounds the last thing

at night. Chaff was fed with all grain feeds. The following were his hours of feedings:

7.00 A.M.	2 lbs.
10.00 A.M.	1 lb.
12.30 P.M.	2 lbs.
2.00 P.M.	1 lb.
5.30 P.M.	2 lbs.
8.00 P.M.	2 lbs.

The last hay feed was given after the grain feed. The first and last feeds of each day were boiled. Hay seeds were also boiled. He stated he fed his animals all extra feed possible, such as bread, carrots, etc. Bran mash was fed twice a week. He stated that he believed ordinary boiled feeds had no laxative effect, also that lights burning in stables at night did not bother animals, but that men moving about did. Crushed oats were fed only to horses in poor condition. Animals were daily wisped and hand rubbed in grooming. If possible, or necessary, work in the field would be stopped to feed animals the prescribed number of times, regardless of whether they were hot or to continue work that was heating. There was one man to about every ten horses. The Commanding Officer believed that horse standings that were hard made no difference if horses have regular exercise.

I was interested to learn that in the English service all material for shining, such as burnishers, brass polish, pipe clay, etc., was purchased by the men from their own money or by their officers for them; the Government supplies nothing. The Commanding Officer of this organization stated that discipline, shine and polish were entirely necessary and essential if you expect to have well cared for animals. The smartness of equipment and clothing that we saw at this place was really remarkable. Several of the warrant officers were as well clothed and dressed as the officers.

This Commanding Officer believed in clipping all over, including fetlocks.

We next visited the battery stables, found that here they

fed grain six times a day. At this organization the latter part of October or the first part of November animals were clipped all over; the following time during the winter a blanket clip was used. Animals were in brick stables with standings of the same material. Stables were very clean and horses well groomed. One feed of hay was fed in chaff; only two feeds of long hay per day were used. The largest feed was given at noon, but the horses had very little work after this. Stable guard not permitted to walk up and down at night. No bran mash was used; rock salt was hung by wires in front of horses. We saw a new issue horse cover which is longer than ours, goes higher about the neck, and fits the neck more snugly. It was held on by a double surcingle, and was reinforced at the neck.

We visited the gun and caisson park; everything was wonderfully clean, and all metal parts highly polished and burnished.

The Battery Commander told me he would not attempt to feed six times daily in war; he had, however, at all times, regardless of conditions, insisted on everything being polished.

We visited the Veterinary Hospital which trains enlisted men for the Veterinary Corps. This place was by far the most immaculate we had seen to date. The Commanding Officer preferred dipping to the use of the spray for disinfecting, due to the difficulties encountered if you have a large number of horses to handle. Animals suspected of mange or lice must always be clipped around the tail, as this is a favorite place for the parasite.

The dip at the point where the animals stepped off had a vertical drop. Previous dips seen by us had been at an angle; we were told that horses were liable to strike their hocks in going in if the dip were not straight. Calcium sulphide was used for dipping. A Turkish bath, if possible, was given to mangy suspects before dipping.

The Commanding Officer stated that little and often was his principle of feeding; that he crushed practically all of his oats, and that he fed very few cooked feeds.

Lieut.-Colonel Brown, Veterinary Corps, was in command

of this hospital. He did not approve of cooked foods, said he considered changing from soft to dry feed bad for animals. At this stable two ordinary stalls were frequently converted into one box stall by removing the centre swinging board and swinging it across the entrance. All temporary stables had been built in a large square so that horses' tails would be towards the centre of the square; the square itself was left free. The colonel said he considered this a great advantage over stables built in echelon, inasmuch as he could stand in the centre and see everything that was going on in all stables without moving.

At this hospital all shoeing smiths for the army were trained; hot shoes were used for fitting, but the use of the knife was prohibited. The colonel approved of oiling hoofs.

Seventy-five per cent. of the hay ration was fed as chaff; one bran mash was given per week. The Commanding Officer stated he considered dry bran had a laxative effect. He stated further that he considered walking about in the stables and lights burning interfered with animals getting their proper rest. No crushed oats were fed in the bran mash. The colonel stated that he could not get a polo pony or a horse doing similar strenuous work to eat too much oats. He stated further that he did not consider it made any difference whether you fed hay or oats first, as they did not mix in the stomach of a well horse and that bolting was prevented by putting chaff in the grain. He said he would give a feed of grain to animals that were hot, but he would make it small.

Went back to London and left for Aldershot at 9 P.M.

MARCH 13th:

Aldershot corresponds to Woolwich, except that it is for cavalry organizations. We visited a squadron of cavalry, commeneing at 7 A.M. in order to see their daily routine. All equipment was hung on heel posts and was very well cleaned. We saw morning stables, held before breakfast there were no requirements as to dress, men being without puttees and all were without coats.

Men were quartered above the stables.

On this morning there was to be a field inspection by the regimental commanders; saddles had been packed the night before.

No feed sheets or shoeing records were kept, though the officers in charge said they should have been. There was one shoeing smith per troop. No officers were present at morning stables, but we were told that the Squadron Officer of the Day should be. Stables, however, were being apparently well handled by the squadron sergeant major. Stalls were separated by iron swinging bars.

We learned that work started at 6.00 A.M., and that there was none required in the afternoon. All men were young and recruits; officers complained that they had everything to learn, and had never handled animals before.

Talked with a sergeant in charge of the transportation. He stated that breast harness was the only thing for military uses, as it fitted all animals and that when an animal became thin the collar did not cease to fit as in the case with ours. The officer in charge said that chains should always be kept polished. The transport of the regiment was very good, but not what I expected. We were told that all chains on the wagons should be painted and all chains connected with harness polished.

At stables each man grooms his horse or horses, and is excused to clean his equipment as soon as his animal has passed a rigid inspection as to the grooming. The feeding was done at approximately the following time:

Morning feed and watering	7 A.M.
After drill and immediately before stables	long hay
After stables	water and noon feed
4.30 P.M.	grain
6.30 P.M.	grain

Bulk of long hay fed at 6.30 P.M.

Officer in charge said he would feed crushed oats if possible. All animals were clipped to the legs. All equipment was thoroughly

cleaned daily, Propert's soap and dubbing being used on leather.

All men grooming were called to attention on the entrance of officers to the stables.

The ration was 10 pounds of oats and 10 pounds of hay, half of the latter being cut as chaff, the bran used was taken out of the oat ration. Hay seeds were required to be returned to the depot. The grooming done here, as in every place, was of a nature never seen in our service; the men putting much more weight behind their brush, and apparently working hard continuously. The squadron commander had no belief in heel ropes.

All of the troops of this squadron did not feed long hay during stable time. The question of horsemastership is left to each troop commander. Animals were groomed in the stable, and kept standing indoors most of the time. Manes were roached down with hand machines; this roaching was done in the stable, which is bad, as the hair blows about.

Grooming was conducted in the following manner:

Early morning—Brush off.
After morning work—Thorough grooming.
Evening stables—Horses wisped all over.

English horse shoes were the same weight front and hind; appeared to be heavier than ours, and to have more nail holes. We were told that this was to allow the driving of nails in different parts of the hoof in case it was in bad condition.

A hot feed was fed every other night. Crushed feed as much as was possible.

I attended a steeple-chase race meet at Gatwick in the afternoon, saw five races, all of them very good. Condition, grooming and care of animals at this meet was most excellent. Left for Southampton; arrived there about 10 P.M.

MARCH 14th:

Visited Swathling Remount Depot, commanded by Lieut.-Colonel Hambro. This station was manned by ten remount

squadrons and one personnel squadron, having approximately two thousand men. Practically all horses shipped to France had passed through this station, and now all those coming back were going through.

Officers were not permitted to take their own mounts to France unless they first sold these mounts to the Government. Special sales were now being held to permit officers to repurchase these horses, if they so desired, or to purchase mounts that they had ridden during the war and wanted to keep. Mares capable of being used for brood purposes were being selected and held at this station. This depot was established in August, 1914, and had handled 389,748 horses; there were at this time about 3764 animals in the depot.

Animals received about one and one-half hours' exercise per day, and one thorough grooming. This exercise was almost entirely done in pens, regardless of whether animals were shod or not, as long as they did not have heel calks. Poles were placed in the exercise pens about 20 yards apart and about 1 foot above the ground to require animals to jump. It was stated that it increased the efficiency of the exercise greatly. Squadron commanders were permitted to regulate their own horsemastership, but a minimum of four grain feeds per day were required. Some squadrons fed five times. Dipping was the means of disinfecting used here. The Commanding Officer had no objections to hot feeds and crushed oats being fed daily, but stated that if this was done horses acquire the habit of bolting, and not properly masticating their food, and that the digestive juices not being required to work the full amount, when cold or hard feed was given intestinal trouble almost always followed. He stated further, that he would not feed any of the above-mentioned forms of feed to horses in active service. He would, however, give a bran meal once a week, if possible. If the organization was in rest for four or five days he would give some boiled feeds, if possible. He believed in always feeding carrots, potato peelings, bread, etc., and stated that he liked his horses to have a certain amount of fat on them to fall back

on in time of privation. Stated further, that he never shipped horses to France until they were well fattened, and that upon the trip across the Channel no oats were ever fed.

He also stated that he would never give oats to a horse that was hot or going to continue hot work; but that he would water the horse in moderation if the work was going to be continued immediately afterwards. He said a horse was very much like a man, that what hurt the latter would usually hurt the former. He said further that he considered on active service in the field three feeds of grain to be ample; that chaff should always be cut for the sake of economy, and to feed with grain. He said he would hay up an hour after grain, or long enough before grain so that it was all eaten; he preferred the former method because it left the horse something to eat later in the evening. He disapproved of small feedings of long hay, said that any not used as chaff should not be given in more than two feeds. His stable guard were permitted and required to walk about at night. Said that lights in the stable made no difference. His animals were branded for depot purposes by a scissors, cutting the number out of the long hair. He dried animals that were wet from dipping in the same manner as before mentioned, by putting straw under their covers. Creosote was used as a disinfectant on all wood work, and the blow-pipe on all metal. He did not approve of dipping. Chaff and oats were mixed before they were put in feed bin to insure its being thoroughly done. Salt was fed dry, placed on top of each feed.

He did not believe very much in saving hay seeds, or in boiling them. It was stated that nothing but soap was used on leather.

Fourteen days was the quarantine period, during which time the animals were dipped twice and malleined.

Several large sand pens were used to permit mangy animals, or those with lice, to be turned loose in and roll. He said it was a most excellent aid in the treatment of these diseases.

Manure was carried away from stables by a narrow gauge

railway and deposited on an elevated platform; wagons drove up to this and the manure was pushed into them.

Chaff was made of straw and hay mixed and cut less than one inch in length.

Each squadron had a clipping stall, which was entirely sheeted in to prevent the hair flying about.

All tie ropes in saddle rooms were pipe clayed, bits were clean and burnished.

A twitch was used on animals that were fractious while being clipped.

It was stated that the fetlocks of Shire and Clydesdale breeds should never be cut, but that he believed in clipping fetlocks on ordinary horses. This whole depot was alleged to be quite self-sustaining in that they had their own gardens, etc. One squadron we found fed two hot feeds daily. In this they mixed hay seeds, crushed oats, and mangel-wurzel. The hay seeds were put in sacks and tied up for cooking. The squadron commander said he would use the six grain feed policy, if possible, whether the animals were working or not.

This squadron commander alleged that you would fatten a horse more easily with chaff than long hay.

Left at 2.00 P.M. for Romsey Remount Depot, commanded by Lieut.-Colonel Sanders, who had ten squadrons, each of which could care for 500 animals. Each squadron did its own shoeing. Here they prefer the dip to the spray. Commanding Officer stated each squadron should have its own exercise track, the lack of this made it necessary for him to exercise his animals in convoy or lead them. In the latter case one man leads two horses; this method was said to be too slow when one had large numbers of horses to handle.

Horse covers and blankets were here disinfected by steam. They were left thirty minutes in the steam and then thirty minutes more to dry. The disinfector could hold thirty blankets at one time, and turned out about 300 per day.

Two hay feeds were fed daily.

Here again the consensus of opinion was that breast harness was the only practical harness for military purposes.

Experiments had here been conducted with straw and saw dust as forage. Saw dust in any form was found to be indigestible. The Commanding Officer liked long hay in preference to chaff.

Grain was fed five times a day and hay four times. Hay seeds were not boiled, but were saved to feed dry. Salt was fed dry. The Commanding Officer stated that horses returning from France were coming in very good condition.

One of these squadrons fed one hot feed a day; they believed that dry bran had a laxative effect.

Propert's saddle soap was used entirely on leather; no oil.

Animals on arriving from France were quarantined for two weeks and malleined once.

Boiling was preferred to steaming, and all feeds were mixed before they were put in feed boxes. The Commanding Officer was a great believer in sand baths, permitting animals to roll if exercised, whether they had mange or not. At this station there were very few hay mangers; hay was almost entirely fed from hay nets.

Chains were burnished by shaking in a sack. In one squadron leather was treated with dubbing on the under surface once a week. This establishment, as others, was in general very clean.

MARCH 15th:

Went to Pitt Corner Veterinary Hospital, commanded by Lieut.-Colonel A. S. Head, R.A.V.C. The dipping solution here consisted of sulphur and lime mixed with water and treated with live steam for two hours. Where possible mangy horses were first given a Turkish bath in a room, the temperature of which was 100 degrees Fahrenheit. The horses were left in from one-half to one hour. Brushes and soap were used on animals, and great care was taken to leave no scales on the animal before he was dipped. Horses with mange were dipped

once a week for three weeks, being made entirely clean by washing first. Dipping was done regardless of weather or temperature, animals being walked afterwards to dry them. The colonel said the most efficacious means of treatment of mange was to grease the horses all over with a mixture of sulphur and lard. The best treatment for lice is to clip the animal all over, then singe, then wash.

The Commanding Officer stated that he believed one thorough grooming a day would prevent mange regardless of exposure, and stated that mange and lice were dependent on proper grooming and proper stable management. He stated that the mange parasite, under ordinary conditions, lives for 15 days. He stated, however, that blankets, horse covers, etc., exposed to freezing temperature would disinfect them. That the mange period of incubation was 15 days, but that it had been known to go 60 days without hatching. He believed that the colder the weather the more the horse should be fed, and that if this were done the animal was better off without his coat than with it.

Stables here were sheds, stalls being about three yards by two yards, with two wooden sleepers put at the head of each stall to prevent pawing. He built a roof similar to a porch covering for the open side of his stables. There were no hay racks. We saw a singeing lamp which burned paraffin. This is good not only to remove lice, but to smarten the appearance of animals.

The colonel believed in small and frequent feeds and said he would not give a fit horse boiled food. Many sheds here had been converted into stables with box stalls. A door at the back of each stall had been reinforced by a split log to prevent damage by kicking. Long hay was only fed at night after the last feeding, the rest being given in chaff.

Operating tables were not used; animals being hobbled and laid on thick mats on the floor covered by a paulin. All animals undergoing painful operations were put under chloroform.

We saw a bag for this purpose which was simply a nose bag.

Left the hospital at 3.30 P.M., returned to London *via* Aldershot.

MARCH 16th and MARCH 17th:

Spent in London.

MARCH 18th:

Left for Boulogne *via* Folkestone, where we were met by Major Houston of the 4th Royal Dragoons.

Left Boulogne for Neufchatel, which is an English Veterinary Centre. Visited Hospital No. 12, commanded by Lieut.-Colonel T. Burridge, R.V.C. His stables were in an old cement works that had been converted for this purpose. In one portion of this stable animals were fed on the ground, but a railroad rail had been laid along the head of the stalls to prevent animals pawing the feed back. He had constructed a number of cement mangers which were very good. He believed in cooked food for debilitated animals. Grain was fed four times daily, and one feed of long hay. He did not believe that five feeds were necessary. His animals were exercised twenty minutes a day on a track. He had one grooming, and had one man to twelve horses. He saved hay seeds and fed them dry.

The dip at this place had a very excellent and novel feature, in that it had a cement foot bath through which animals were led before they were dipped, and in this manner preventing a large amount of mud and filth from getting into the dip. Temperature or weather made no difference in the dipping. Mange and mange suspects were dipped three times every two weeks. His animals were clipped to the legs, well down on the inside of the hind leg, as he stated this was a seat of the mange parasite.

I saw some overhead hay racks which had been entirely improvised from bale wire. This officer objected to spraying on the grounds that the spray could not be kept hot. He fed crushed feed to debilitated animals. Locust beans, imported from Egypt, were one of his main articles of diet. Throughout

this hospital centre work was greatly facilitated by a narrow gauge railway, which hauled away manure, distributed forage, etc. Everything was very clean. All lice cases were treated by singeing. Sand was largely used here for bedding.

Visited Veterinary Hospital No. 13. This was by far the most model institution of its kind seen by us. Every chain on the stables, including those used to close the entrance of stalls, were burnished, and every piece of rope about the stable, such as for swinging kicking bars, was pipe clayed.

The officer in command had pivoted a barrel diagonally through its long axis on his electrical chaffing machine. All his metal was put in this barrel for burnishing. He said a small amount of bran put in the barrel helped. He thought the best thing for this purpose was small pieces of leather cut to about one to one and a half inches.

His feed schedule was as follows:

7.30 A.M.	Grain
10.30 A.M.	Grain
12.30 P.M.	Grain
4.30 P.M.	Grain
7.00 P.M.	Grain

His hay allowance was 14 pounds, of which 9 were chaff. Long hay was fed twice daily at 12.30 and 7.00 P.M. Sand was used for bedding. His kicking bars were double the depth of those normally used. The colonel stated he would feed one cooked feed per day to animals if possible, even if they were working. A bran mash per day to animals not working. Here animals were clipped all over in October.

This officer believed in crushed oats; said he would feed them to fit animals as much as possible.

The animals at this place were exercised by convoy, twenty-four horses on a rope, handled by three men. They were exercised for from one-half to three-quarters of an hour.

The blow-lamp was used entirely for disinfecting on both wood and metal.

The hospital had eight blacksmith forges for a capacity of

2000 animals. Blankets and horse covers were disinfected by steam.

Tar and paraffin mixed were painted on the wood work of the stables. The blackened wood work, white ropes and burnished chains in this place gave it a most striking effect.

Dubbing and Propert's soap was used on leather. The leather here was in very good condition.

Chaff consisted of one part straw and three parts hay.

Operating tables were not used. Animals were thrown on soft pads on the floor. Chloroform was used for operations; said not to be dangerous for normal horses, but that animal's heart should be examined before administering.

Each veterinary hospital was complete as to carpenters, shoemakers, tailors, etc.

I was very much interested in the men's bath room at this place. It was a large room containing mostly shower baths. All fixtures in it were brass. I have never seen a cleaner place in my life; everything scrubbed and polished. I asked how many men were necessary to keep this up, and was told that one man kept it always in this same condition.

This hospital group consisted of four veterinary hospitals and three convalescent horse depots.

We lunched with Major General J. Moore and his staff. He is chief of the veterinary service of the British Expeditionary Force. After lunch we visited convalescent horse depots. These depots were oval in shape, and divided into three parts, each being a section containing stalls and its own large corral, or sand bath, into which the stalls opened directly.

Here we saw standings made of logs, cut about five inches in length and driven into the ground vertically. Also standings made of heavy planks. The former type were considered the most satisfactory, as they did not permit of urine soaking through and collecting under the floor.

Grain was fed three times daily; of this at least two were steamed or crushed. Each section of the depot was surrounded by an exercise track.

Started for Rouen at 3.45 P.M., arriving at 6.45 P.M.

MARCH 20th:

Left for Le Havre in the morning. En route our driver ran into a Frenchman, and most of the day was taken up in settling this affair.

We visited Remount No. 2 at 4.00 P.M. This station was commanded by Major John Taylor, R.S. His labor was largely done by German prisoners. Feeds of long hay at this place for each animal were prepared in a forage room, and bound up with a hay rope. Three grain feeds per day were used. There were about ten animals per man. Hot feeds were fed only to those animals in need of building up. He did not believe in them for normal animals, nor in crushing oats, except for run-down animals. He did believe in the principle of frequent small feedings, however. Long hay was fed twice daily, at 11.30 A.M. and at 7.00 P.M. Animals were here exercised on a track which was oval and consisted of two tracks with corals in the centre. Wire hay racks had been improvised. Wooden sleepers were set in standings to prevent pawing. Hay seeds were saved. Part of the stables were equipped with canvas wind breaks. The dip was used for disinfecting animals; it had rather a novel feature in that it was filled to above the level of the step-off place. An animal in walking did not know when he was going to be submerged with the result that much less balking was encountered. The overhead wire mangers were strongly reinforced by horizontal wires, and we were told caused no trouble due to animals getting their teeth caught.

A hot bran mash, mixed with epsom salts, was fed once a week to animals. Loose salt was fed with dry grain.

Return to Rouen.

MARCH 21st:

Visited Remount Depot No. 1, commanded by Lieut.-Colonel E. C. Tromblings, 8th Hussars. This was the first depot formed in France, having been established on the 5th of August, 1914. It consisted of five squadrons, with a capacity

of 2500 animals, and a picket line capacity of 2000 more. We were told that as many as 3000 animals had been shipped from this depot in one week. The depot was constructed on one central street with squadrons running out to the right and left of it. Some labor was being performed by German prisoners. Each squadron handled only one kind of animal, *i.e.*, officers' chargers, cavalry mounts, etc.

Improvised wire mangers were used; woven wire partitions had been constructed between stalls. A large number of standings were of both the plank and block type. We were again told that the blocks were preferable. Saw dust was used for bedding. The Commanding Officer stated that sand used as bedding was liable to produce colic. Kicking bars were made of double logs. When plank standings were used they were filled in underneath with sand and gravel.

Animals were exercised from one to two hours per day. Exercise pens were not used. There was one grooming per day. In exercising on a rope four men handled twenty-six animals. The Commanding Officer believed that exercising in a track had a tendency to make animals wild.

A narrow gauge railroad was also used here. Tubs of disinfectant were set in each stable for grooming kits.

Feed to be steamed was placed in sacks. Hay seeds were saved and boiled. Linseed was fed every Saturday night to animals, five or six ounces each, which had been soaked for fifty-six hours; this was given in place of bran. Three grain feeds per day; and three feeds of long hay per day, fed before grain. The Commanding Officer said he would feed all crushed oats possible. He believed in oats and boiled feed even for working organizations.

The Commanding Officer did not believe in turning English horses loose in corrals. He did not believe in feeding potato peelings, bread, etc. Loose salt was fed by spraying it on the grain feedings.

This depot was equipped with electric chaff machines and oat crushers.

Riding horses when sent to the front would go fully equipped, saddle, bridle, etc.

In the shoeing shop there was one man at the forge to two men nailing. The rasp was not supposed to be used on the outside of the foot. The blacksmiths were native Indians. Hot shoes were used only to show inequalities of the hoof.

Women were largely employed at this depot. They did all of the cooking for the organizations, clerical work, etc.

We visited the officers' school at Veterinary Hospital No. 6, which was run by Major J. R. McCall, R.A.V.C. This was an agricultural school, intended to fit officers for this pursuit in civil life after demobilization. Animal management formed a large part of the course. We were told schools of this type had been established for noncommissioned officers and enlisted men who were about to leave the service. The officers' course lasted one month. At this place there were thirty to forty students in each class. The faculty consisted of the Commandant, who dealt with animal industry, one poultry expert, and one instructor in agricultural subjects. The Commanding Officer stated that they taught students that in civil life, in commercial stables, all hay should be chaffed. He did not believe in hot feeds for working horses. Said small feeds of grain did not hurt overheated animals. Advocated four feeds of grain for Army animals. Believed in small amount of water for overheated animals, if they were to continue work. Believed in crushed oats. He said, in his opinion, it made no difference whether long hay was fed before, after, or with grain, provided chaff had been put in the grain. Believed that lights in stables and guards moving about greatly disturbed animals.

We returned to Rouen for luncheon, going back to this school at 3.00 P.M. to be present at a demonstration of types of animals.

First type: Heavy draft, Shire, over 17 hands; weight, 1700. Massive throughout, no good for Army work off metal roads, as they are too heavy to handle themselves in mud. Neck should not be too long; very stout and muscular, resembling that of the

stallion; fair slant to shoulders; short cannon bones. All bones and feet large, feathered on fetlocks. Head big and heavy, must not have short, upright pastern. Short back, big girth, good loins, big quarters; must not be "tucked up." We were told this type does not endure hardship well.

Second type: Light draft, crossed between Shire and Percheron. This horse better for Army work, had much more activity; good for heavy artillery type. Otherwise, generally a smaller specimen of the first type.

Third type: Light artillery horse; crossed between Hackney stallion and draft mare. Shoulders draft, depth all over, a very game head with ears well set on. The major was of the opinion that Hackney blood, mixed with draft, gave excellent results.

Fourth type: Heavy draft, part Clydesdale; in general the same as first, but the hair of this breed is much more silky, particularly as to the feathers on the pastern. Pasterns must have good slope, must have great depth all over; not too much "daylight" under animal. This type has more slope to shoulder than Shire. Finest traveller of all draft breeds; very beautiful action at the trot. Hocks in this type should always be close together in action.

Fifth type: Percheron. Good shoulder, with considerable slant, fine forearm and short cannon bones; slant and spring necessary to pastern. Good hips, usually more or less "gooserumped."

Sixth type: Saddle animal. Good neck, long and not thick; head set on well; ears, nostrils, and lips fine. Good eyes. Good slope to shoulder, not too much "daylight" under him. Close coupled, good boned, short cannon bone. Must not have thick withers; good quarters, broad chest.

MARCH 22d to 24th:

Spent in reaching 3d Cavalry Division Headquarters, English Army in Belgium. Route: Paris, Amiens, Albert, Batume, Cambrai, Namur and Huy.

MARCH 25th:

Reported at Division Headquarters. Found that this organization, with the exception of one staff officer, had moved forward into Germany. Lieut.-Colonel E. C. Pragnell, 4th Hussars, A.A. and Q. M. C., of the division advised us to continue to Germany. We accordingly left, passing through Liege, arriving at Headquarters at 5.30 P.M., which were located at Quailbrath, near Cologne. The division was commanded by Major-General R. L. Mullins. Major Houston left us here to take advantage of a leave. Went on to Cologne, where we were billeted.

MARCH 26th:

Reported to Cavalry Division Headquarters, from where we were sent to inspect the battery of horse artillery belonging to the division. We were accompanied by Major J. Grabbe, G. S. O.-3. This battery had 236 horses, 202 men, and 6 thirteen-pounder guns. Horse artillery used with cavalry was armed with this lighter gun instead of the 18-pounder, which is the normal infantry light piece. The battery was commanded by a major, who had under him a captain and three lieutenants. This battery was stabled in the same manner as were many of our organizations, *i.e.,* in a number of small barns, holding from two to twenty animals. The stable management was just as good as though they had been in one stable. The major in command stated that he simply held his chiefs of section responsible, that the work was properly done. The battery was divided into three sections of two guns each; each section commanded by a commissioned officer. The feeding and horsemastership was done by the sections as prescribed by the Commanding Officer. Six feeds of grain per day were fed at the following hours: 7.00 A.M., 10.30 A.M., 12.00 M., 2.30 P.M., 5.30 P.M., and 8.00 P.M.

Only one feed of long hay was given per day, the rest being used in chaff. The long hay was fed the last thing in the

evening. The battery commander stated that he would feed on the march, if possible, in order to maintain this number of grain feeds, and that he always fed as many times as possible, up to six, regardless of regularity.

Leather and equipment in this battery were in excellent condition; dubbing was used on the under surface, and all metal was polished, and entirely free from rust. He said that he had been able to maintain the same condition almost always, even when they were fighting. He said he would feed as much crushed oats as possible, and whenever possible the last feed at night was hot. This latter, he said, was usually impossible during war, as their transport would not permit of carrying the utensils. There was one real grooming a day, with a brush off in the morning and a wisping in the evening. The Commanding Officer stated that an hour's hard grooming was as much as any man was physically capable of at one time. Rust on metal was removed by use of sand, polished with metal polish and burnished. He also stated that breast collar harness was the only form for war. His animals were well groomed and he maintained that he had kept this standard always. They were clipped trace high; he said he did this because they might have to stand outside. All fetlocks were trimmed. No improvised feed boxes or mangers were used. Hay nets and nose bags were used.

Stables had been occupied without disinfecting, though he said he knew mange was present in the town, none had developed in his organization to date.

Hay seeds were saved and fed dry. Bran mash with epsom salts was fed once a week.

He always carried his chaff cutter with him (which was a good-sized machine), and stated that it was the last article of equipment he would part with. Tails of animals were wrapped to shape them. No bedding was received by him, though he exchanged his manure with the populace for straw. He advised clipping and singeing for lousy animals. Animals were watered entirely from canvas buckets, there being one per animal. He

laid great stress on the value of these buckets; said that many times on the march he was able to water by this method, whereas it would have been impossible otherwise.

We left at 11.00 o'clock for the Division Escort Squadron, which belongs to the 8th Lancers. This was purely a show organization, but was the best military horse organization I have ever seen. They were stabled in a large factory with a cement floor; were plentifully supplied with straw bedding, which was kept in place by a woven straw mat all around the edge. Animals were clipped to the legs. I have never seen such grooming; they were positively polished. The animals were of a type far superior to our average officer's mount. Saddle and leather equipment was placed on racks in the centre of the room. In addition to dubbing and soap, polish was used on the leather. Everything that could be was pipe clayed; all metal was burnished. We were showed how to pull a horse's tail; told that the long hairs should first be pulled from the middle of it; that the required length in the English Army was four inches above the hocks, the bottom of the tail being squared by scissors, the top being wrapped to shape it. This squadron had been through the entire war, and there were fifteen men and fifteen horses in it who had never been absent. We were told that in war they had never had a growth of mane of over a week or ten days' duration.

Grain was fed four times a day, long hay once, at night, about four pounds, the balance being chaffed. Grooming was the same as in the battery. Animals exercised one hour per day. The cleaning and polishing of leather extended even to halters. The Commanding Officer of this squadron was very much in favor of small type chunky horses for cavalry use. One boiled feed at night was given daily.

Lunched at Division Headquarters, after which we left for the Machine Gun Squadron, billeted in Cologne. Each cavalry brigade has a unit of this kind, with twelve heavy guns to the squadron, divided into six sub-sections of two guns each, under the command of an officer. Steel hats had been painted and

varnished and insignia stenciled thereon. Guns were transported by pack horses; the equipment of each squadron includes a sufficient number of limbers to permit of transportation in this manner. The packs were very good and compact, but the divisional machine gun officer stated that moving guns in this manner was sure to lay up animals, and that he was entirely in favor of a new form of caisson, to be built very low, for the transportation of guns.

Four feeds of grain were fed daily. The Commanding Officer stated he had never failed to feed grain three times daily during the war. He considered regularity better than feeding as much as possible. He also laid great stress on the necessity of always carrying a chaff cutter. Major H. W. D. Wathem commanded this squadron.

MARCH 27th:

Reported to Headquarters, London Division, where we were sent to Colonel F. Wilson, D.D.V.S., 2d British Army. He was an Army veterinarian, whose experience dated considerably before the Boer War. We had a long, interesting talk with him. He stated that at the beginning of the war the veterinary service had been charged with the maintenance of health, prevention of disease, and supply of medicine. Later this had been changed, eliminating the first responsibility. He laid great stress on the fact that all officers, regardless of rank or branch of service, should have instilled into them a knowledge of horsemastership and kindly feeling towards animals. He said that in 1917 Horse Masters had been introduced in the British Army. They were men who had, of necessity, no veterinary knowledge. All horse masters, veterinarians and remount service, while not actually coördinated, were supposed to and did work in harmony. He was not greatly in favor of Horse Masters; seemed to feel that this work should be done by veterinary officers. He said a certain number of Horse Masters were assigned to the larger units. When a smaller unit was found to be neglecting or having trouble with their animals a horse

master was detailed to actually live with that organization until all difficulties had been removed.

He stated that good grooming was seven-eighths of the prevention of mange. He believed in advance billeting parties to disinfect stables, and that this process should be continued once a week for three weeks after occupancy. He preferred dry heat for disinfecting horse covers and blankets. To disinfect leather he advocated wiping harness with gasoline to remove grease, rather than washing with soap and water, or soap and paraffin mixed. He said the first step in building up horse-mastership was to have compulsory horse shows. He said that everyone in every unit should feel that all officers always looked at animals and equipment, and that if they were not properly kept they would get into serious trouble; if they were they would receive the praise due them. He laid great stress on working up the interest of privates and enlisted men, making them realize by lectures that a horse must be cared for. Wastage of feed must be entirely eliminated; the unit should always check to see that they get their full ration, then should see that every ounce is fed. He stated that the simple things were the things that counted. If a horse was off color a veterinarian should examine at once. If necessary an animal should be evacuated while he is treatable and not wait until he becomes a wreck. The veterinarian's word should be taken in this matter. During the war all English units were allowed ten per cent, spare animals to permit this evacuation. This was not always kept up, but, as a rule, was.

Harmony and interest between the Commanding Officer and the veterinarian is necessary if proper care of animals is to ensue. All officers having to do with animals should get in touch personally by being present at stables, etc. Great care should be used in the detailing of men to the care of animals, and once a man has placed a team in good condition and is proud of them, his heart should not be broken by taking them away from him. Always strive to make horses as comfortable as possible. If animals are billeted all over town, the responsibility

must be definitely placed and the men in charge made to do their work properly. The colonel considered it much better to put horses in small billets than to put them in the open. He laid great stress on remembering that if animals are not right the unit becomes immobile, and that if it is immobile it cannot fight. He stated that an efficient service to look after animals is the best investment a Government can make, otherwise wastage becomes beyond appraisal.

The veterinary service in the English Army supervises the shoeing of animals. He stated hot shoes should only be used to mark the inequalities of surface on the hoof with a view of rasping this off. That the knife should never be used on the sole of foot unless the foot was very long. He advised trimming of the frog with a knife slightly if necessary, but stated, of course, the bar should never be touched.

He advised the clipping of animals as much as the military conditions would permit; if you can blanket your horses or stable them, then clip all over, except legs. If possible do not do this later than the last of November. He believed that if horses had to stand in mud it was preferable to leave the fetlock hair on, but this applied more to feathered hairs than others. If the animal is clipped in November be will grow another coat before the cold weather that will permit him to go without cover. He stated clipping in the English Army had been about as follows: The first winter animals had been clipped twice; the second and third winter once; the fourth winter only parts of the horse once. He said this difference in clipping was largely due to the results caused by the blizzard in the 1917 Arras battle. He advocated the following clip as a preventive of mange: Clip down the gullet on each side of the neck, under the belly, and around tail. Under normal peace conditions clip twice, once in November and at the end of January.

He stated that long coats made horses sweat to such an extent that they lost condition. (While we were in his office he received a telephone message that the English Government was sending out 60 dogs to be distributed as pets among the horse

organizations for the benefit of the men.) He stated the months of February, March and April were the worst for mange, and further that their Army of Occupation had moved into Germany under practically the same conditions as ours, and that they had had a surprisingly small amount of mange, in spite of the fact that they had occupied stables without disinfecting. He attributed this entirely to thorough grooming and good horsemastership. He stated he considered three feeds of grain a minimum and five the maximum, and that these always should be fed with chaff.

He said that if it were possible all hay should be chaffed, if this were not the case long hay should be fed in not to exceed two feeds, and that regardless of irregularity always feed as many times up to five of grain as possible. He advised the use of crushed oats for animals in poor condition only. The same for boiled foods. If possible always give one bran mash a week. He said he considered dry bran to have the opposite effect of a laxative. He believed in frequently mixing a little dry bran with food. He stated it was not essential that animals have salt, and that he had known them to go over long periods of time without it, showing no bad effects. When loose salt is issued it is better to make salt water of it than to feed it dry. He mentioned the disadvantage of mixing feed in a common place, as it meant some animals would not receive their full share of grain. He was very much opposed to the exchanging of grain for less amounts of other forms of feed, as it necessitated a reduction of grain to the fit horses. He said he believed no animal should receive less than eight pounds of grain per day; that heavy draft animals in the English Army had been reduced as low as eight pounds. He did not believe that guards or lights in stables interfered. He said calcium sulphide dip was the most efficient and should not be used unless it is heated to 110 degrees. He stated further that the dip was preferable to spraying, due to the time involved. He thought nothing could be as good as complete immersion, and called attention to the fact that harm could be done by spraying and too vigorous

rubbing with a brush. He stated that in the field there was one cardinal principle for the treatment of mange, that all cases should be immediately evacuated and never treated within and by an organization.

Reported to Headquarters, London Division, at 2.00 P.M., commanded by Major General Sir Sidney Lawford. We paid our respects and were told to report the following morning.

MARCH 28th:

We visited a battery of field artillery, commanded by Major J. D. Milne. Some horses were stabled in wooden sheds with wood standings. Three grain feeds and three of long hay per day were being fed. Again all were in favor of nothing but breast harness for war. Dubbing and soap only leather cleaning materials. English artillery drivers do not use cantle pack, their blankets are strapped on the off horse, causing many sore backs we were told. Cannoneers' packs are carried on vehicles. Saddlers we were told go to school before assignment to batteries. Nose bags were plain canvas sacks; this was put on under the nose band of the halter to prevent spilling the food, and was said to be very satisfactory. Hoof hooks are not issued in the English Army; they are made by the blacksmith. Dandy brush was used to take off mud; hair brush to clean. Each horse has his own water bucket. All spare straps were issued, none made. Hand clippers issued. This battery was equipped with a new picket line which comes in sections, each section four feet and nine inches to each horse. Animals were fastened to a loop in one end of the section, after the sections had been joined; this insured that each animal had a proper amount of space and prevented crowding on the line, due to tie ropes slipping. This organization commander was in favor of halter chains instead of rope. His feed schedule was as follows:

7.30 A.M. Water and feed, grain and chaff, 3 lbs.
10.30 A.M. Two lbs. long hay.
12.30 P.M. Water and feed, 3 lbs. grain and chaff.
2.00 P.M. Two lbs. long hay.
5.00 P.M. Water, 3 lbs. of grain and chaff.
9.30 P.M. Two lbs. long hay.

Crushed oats and boiled food to thin horses only.

We left at 11.30 A.M. for Division Ammunition Column, commanded by Captain E. H. Bindless. The horse-drawn unit of this column consisted of three sections, the first and second artillery, the third small arms ammunition. Each section divided into two sub-sections. Harness was treated with soap, soft and hard mixed together by boiling, and some dubbing. Metal had been kept bright even in war time.

Horsemastership and care of equipment in this organization was excellent. Enlisted men were largely drawn from Indian troops. Animals were exercised every other day without transportation. He said the idea of dress exercise (with transport) was necessary in order to keep up the men's pride in their organization. He laid great stress on the necessity for discipline, shine and polish. Each man had two sets of harness and two mules to care for. Saddle and harness rooms were in wonderful condition. He stated that when men knew how to clean harness its upkeep to the proper standard can be done with a very small amount of labor, much less than that which follows even a day's neglect. He called attention to the fact that leather girths not folded, but having a cut edge caused many galls, that this could be stopped by the use of a felt pad; he preferred the folded leather. Splits in leather girths also caused chafing. This officer had secured a number of wine casks that he had cut in half, carrying them under wagons to be used for watering purposes. He also laid stress on water discipline which we witnessed. He chaffed about five or six pounds of hay per day out of eight. He gave only one feed of long hay and that at night. Grain four times, water three times. For mixing his forage he had run two wagons together, back to back, utilizing the floor space thus gained. His long hay was fed in nets. He stated he groomed twice a day and sometimes three times, divided as follows: Twenty to thirty minutes in the morning; an hour and a half at noon, and twenty minutes in the evening. Wisping was not part of his daily routine. He insisted on the under surface of halters and neck collars being cleaned daily; he also

stated that breast collars were the only practical kind for war. He was violently opposed to clipping, and stated that clipping had killed more horses during the war than shell fire. He insisted that breast collars of harness always be adjusted high. This organization used mules entirely.

We visited another battery of field artillery. This organization fed three grain and two long hay feeds per day. Animals were all picketed outside, due to the fact that mange had been discovered and stables were being disinfected. Its animals had no horse covers. No special effort was made to save hay seeds; chaff was always fed with grain. The organization commander stated he had not always kept his chains polished during the war. He laid great stress on water discipline. Hay nets were used entirely; no improvised mangers.

We had luncheon at Division Headquarters, afterwards visiting Division Train commanded by Lieut.-Colonel F. B. Lord. This officer had commanded the train of the 24th English Division when I was on duty with that organization in front of St. Quentin in October, 1917. Though the weather was bad and the sector more or less active, I have never seen animals and leather and transportation in better condition than was his. At that time they had no cover for animals except such as could be improvised.

He stated that the secret of success with animals was individual supervision and interest in their care on the part of officers. He fed his heavy draft animals grain four to five times a day, the evening feed being the biggest. Long hay was fed four times. He believed watering and grooming were the principal items in horse management, and laid much stress on water discipline. He always had fed hay during early morning stables. In the morning, first water, then hay up, then groom. Grain was fed as follows: In the morning 2 pounds, at noon 2 pounds, 2 pounds in the evening, and balance at night. Feeding should be varied according to horses. He did not run a feed sheet, but made his officers and noncommissioned officers

responsible for this. He watered in the morning, at noon and in the evening.

His train consisted of four companies; headquarters company for division troops, the three others for brigade units.

The wagons used in this train were on the whole of the G. S. type, though there were one or two limber types in each company.

Strength, roughly, 400 men, 300 horses, 126 wagons, all teams two horses, driven from box, one driver and one leader per wagon. The colonel believed in trace-high clipping, or clipping all over if you have covers. If animals were in stables, even if clipped all over, he would not put on horse covers. He did not believe animals should stand on stone or cement floors without bedding. Stated hay should not be fed on the ground. He stated that one of the most important things was stable ventilation.

The colonel stated his metal was always kept free from rust, even in war, and that discipline, "spit and polish" were necessary in any horse organization. His harness was washed with soft soap, then treated with dubbing mixed with paraffin. The leather was soft.

He was a strong advocate of breast collars. Said that, in general, breast collars, traces and breeching should be in one line parallel to the ground, as nearly as possible, in order to get the maximum draft. He said one should be able to get the breadth of both hands between the breeching and the buttocks, and called attention to the fact that withers pad of breast collars must always be kept clean; also that the adjustment of harness was largely dependent on the conformation of the horse. Stated that in burnishing chains in a sack torn-up newspapers helped greatly. He saved his hay seeds, to be used with chaff, and selected the worst of his hay for chaffing. One bran mash a week was given, if possible, no work the next day. He did not like boiled foods or crushed oats, except for animals that are poor. He reiterated the necessity of personal observation in

horse management. In this organization all men did the morning cleaning of stables.

On all wagons each wheel was fitted, on the axle, with a large drag washer, to which ropes could be attached in order to pull the wagon out of mud by hand; each wagon carried two drag ropes. Eight fitted shoes were nailed to the wagon in a visible place. He spoke of the necessity of reinforcing tails boards with extra wood, the grain of which should run in the opposite direction to that in the board. His saddler inspected all leather daily; the farrier all animals. Driver and loader were equipped with rifles, which they never carried on their backs. The traces of all English military harness are made of steel cable, covered with leather. Complete sets of all kinds of repair tools, both for harness and wheelwrights, were always carried. Also a portable canvas watering trough that the colonel alleges to be necessary. In peace times he had all his old horse shoes made over into new ones.

Chaff was fed with every grain feed. He stated he would not part with chaff cutters. He demanded that all concerned with the stable management always watch droppings for evidence of undigested food. He advocated the feeding of linseed, which should be boiled four to five hours, making a jelly. He also believed in all extra kinds of feed possible. He fed loose salt dry with grain; he preferred to always keep a piece of rock salt in each manger, and was a great believer in locust beans when he could get them. He had them broken up before feeding. He did not believe in feeding more than one and a half pounds per day, mixed with other foods. He stated that if one had to feed barley it was better to parch it, and if parched it should be crushed. To fatten a horse, he stated it was excellent to feed corn boiled four or five hours, also giving the horse the water to drink.

MARCH 29th:

We were sent to the 122d Infantry Brigade of the London Division; there visited the battalion transport of the 23d Middlesex

Battalion. This organization also separated in small billets. It was very well run, and the stable management most excellent. We saw the first hay screen here. Chaff was mixed with salt brine; four grain feeds were fed, two of long hay. Animals were well groomed. The organization was in process of changing light draft horses for mules. In spite of this even mules recently received were in excellent condition. The Commanding Officer here laid great stress on discipline. He believed in clipping. Harness rooms were in excellent shape, the leather the softest we had seen. This officer had secured from England, free, oil, which he used as a preservative. He had no belief in boiled or crushed oats, except for poor horses. He kept a feed book for animals. On inspection this was found to be complete and up to date. Also a horseshoeing record. His billeting conditions were probably the worst we had seen on our trip. His horsemastership and the results shown were as good as any witnessed. He reiterated the opinion of others as to the great necessity of chaff cutters.

Esprit de Corps

BY 1ST LIEUTENANT GEORGE STEWART, JR., INFANTRY, U. S. ARMY

[EDITOR'S NOTE.—*For the following essay by Lieutenant Stewart we are indebted to Captain Charles C. Haffner, Jr., formerly of the 301st Field Artillery. In forwarding this essay Captain Haffner has this to say on the subject, in which we agree: . . . "I believe that its grasp of the essentials and its power of suggestion will be a distinct help to all who are faced with the problems of leadership, both in service and civil life. . . . I have come to feel more and more clearly through eighteen months experience as a Battery Commander, both in this country and in France, that in the last analysis men and not guns fight, and that the leader's first and perhaps most difficult task is to make 'men.'*

"Any inspiration he may himself obtain, or any matter he may be able to use in fitting others to command, certainly should not be neglected.

"We are committed as a nation to a policy of defense by our citizenry trained to meet an emergency, and the 'esprit' of the citizen-soldier not only made possible our great success in the present war, but is our strongest hope in times to come."

Lieutenant Stewart has had the experience of having served as a private in the ranks, candidate in an officers' training camp, commissioned officer and instructor in the Central Officers' School at Camp Lee, Va.]

INTRODUCTION

ESPRIT de corps is not the spirit of single individuals, it is not the gusty spirits of passion that blow now one way and now another: it is the steady on-push of the spirit of the group, it is the trade wind compared to the squall—the consistent, dogged, united, triumphant attitude of the regiment toward what it must face.

Esprit de corps is a continuous, contagious, spiritual attitude toward one's work and one's co-workers, one's comrades in

arms, toward the man who sleeps next bunk. It is based on unselfishness, a giving up of one's own personal advantages, which may lie in the line of extra rest, food or furlough privileges, in order to lighten the common load. It embraces the personal phase, making one's self right; and the group phase, making the group right. It continues to us from those who have gone before, it is handed down from the dead and the dying, it is resident in many famous regiments and descends from decade to decade as the generations of recruits fill up the gaps left by the absent veterans. Some have it before they join up, it comes with their mother's milk, it is native to their blood; others don it with their uniform. However gotten, its essential nature is the same. Typlady says, "An army is more courageous than the individuals who compose it. The coward finds sufficient courage for his job while doing it with his regiment and the brave is at his bravest. He has a courage which is not his own but which, somehow, he puts on with his uniform. He does deeds of daring he could not have done as a civilian. The army has a corporate courage and each soldier receives a portion of it just as he receives a ration of the army's food. It is added to what he has of his own."

Esprit is handed on by the living from man to man as runners pass to each other a token of distance run. The voices of the great dead seem always to call us onward. They speak to us in accents still more clear because of the sacrifice they have made. The spirit of the dead calls in the words of Lieut. Col. John McCrae, himself killed at the second battle of Ypres, serving with the Canadian forces.

"In Flanders fields the poppies blow
Between the Crosses, row on row,
That mark our place; and in the sky The larks still bravely singing fly, Scarce heard amidst the guns below.

We are the dead.
Short days ago we lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie In Flanders fields.

Take up our quarrel with the foe,
To you from falling hands we throw the Torch—
Be yours to hold it high;
If ye break faith with us who die,
We shall not sleep, though poppies grow
In Flanders fields."

What is esprit de corps? It is the cutting edge of the instrument, our regiment, without which it would be dull and less effective.

I. Esprit is not dependent on personal welfare.

Esprit is not dependent upon being well fed. If plentiful food were necessary to the fighting spirit of men the great leaders of the world would have lacked men-at-arms. Garibaldi offered neither food nor quarters nor provisions: Washington welcomed his men to the privations of the northern winters: Cromwell led men who were ofttimes hungry. Those who united and freed France were not nourished save by the scantiest of rations. Good food is one of a soldier's greatest boons, but when great issues are up, he can and will fight hungry.

Smart uniforms do much to create pride and snap in an organization. The clean-cut appearance of natty uniforms delights the eye and rejoices the heart of every true soldier. Good equipment is a great factor in morale and good discipline, but it is not indispensable. In the rigors of the campaign clothes grow old; and although the smartness of the uniform may grow shabby, still the alertness of the spirit may not sag.

Much is said about esprit depending upon reward or decorations or promotions, but such is not generally the case. Recognition for services does do much to stimulate men to further effort and is by virtue of its inherent justice a legitimate thing to look forward to, but the great leaders of the war have labored long before the world gave them its acclaim. Lincoln struck a deep note on this subject when he said as a rail splitter, "I will study and get ready and maybe the chance will come." Among the game folk there is more looking forward to the

success of their cause than the personal honor which might accrue to them.

Neither is esprit dependent upon praise, although wise words of commendation will often prove to be a currency which will avail more than gold.

Victory is not necessarily the prerequisite of esprit. The British are noted for their spirit in hard places; doggedness in reverses has with them become a national trait. When an officer says to his men, "Be British," it means something. It recalls grim attacks in the deserts and on the African hinterland, Britain's seamen on guard in the North Sea keeping the channel ports open; it recalls Ypres and Mons and Neuve Chappelle; it arouses the fighting traditions of Nelson, of Maud, of Allenby, French and Haig. Smashing, fighting spirit does not depend on victory, although victory will do much to develop esprit.

II. Esprit is based on unselfishness.

Every man's life has some centre. His thoughts and actions may revolve about himself and cause him to be very narrow—a poor companion, a shirker, or perhaps pleasant enough, but nevertheless self-serving. A man may conceive a higher plan than merely providing for himself and his very nearest friends which is a necessary thing, and lose his life in the life of his company, or his regiment. Esprit de corps demands just this. Efficiency, not favoritism, must be the dominant note and preclude the possibility of selfish men promoting the interests of any one clique. Nothing will kill esprit quicker than a haunting doubt that hard work will perhaps not receive its due reward. Nothing will promote esprit quicker than to know that honest effort will be noticed and receive its just due.

Back of the great records of the Princess Pats, the Gordon Highlanders, the Black Watch, the fighting Chasseurs and the smashing American regiments one finds the secret of their esprit to be unselfishness—a willingness to give all for the sake of all. Jesus Christ said: "Except a grain of wheat fall into the ground and die, it abideth alone; but if it die, it bringeth

forth much fruit. He that loveth his life shall lose it; and he that hateth his life in this world shall keep it unto life eternal. If any man serve me, let him follow me."

To-day I heard the chaplain of our regiment say there were only four things a man might do with a grain of wheat, or with a life: destroy it, grind it under foot, and let the dust of it blow about the ground; consume it and let it be turned into new energies within the body; store it up and see year by year the shrinkage within the bin; or plant it and see the seed apparently die and decay, only to spring to life and yield forty, sixty, one hundred fold!

An officer on the Western Front had his son serving in the ranks of his own company. He wanted a volunteer for a dangerous duty. His own son stepped forward and the father sent him on the task. Here was individual heroism. I have before me a picture of a French officer who asked for a volunteer for a perilous enterprise. The whole line stepped forward with hands uplifted to be given the job. Here was esprit de corps!

III. Esprit is fundamentally spiritual.

By this I mean it does not depend exclusively upon excellence of drill or richness of attire, but on a clear, agreed, common goal ahead—something lofty enough to inspire worship and tangible enough to be understood by you and me and by Bill who sleeps next bunk to mine.

A careful study of history will reveal a growing tendency to look out for the interests of others as well as for number one. As the arts developed and men were able to wrest a better living from the earth, this idea of being our brother's keeper grew, and with this idea all the other relations of brotherliness as well as the element of protection. It is brotherly relations that have bound the Allies together with hoops of steel.

"A new commandment I give unto you, That ye love one another; as I have loved you, that ye also love one another." The essence of these words of Christ reveals much of what is fundamental in the consideration of esprit de corps.

IV. How esprit is kept through adverse circumstances.

It is easy enough to be on the crest of the wave when things hump along nicely, but the big men are those who can "pack up their troubles in their old kit bag" and make things move under great stress. A soldier is a specialist in overcoming difficulties. Hard places to him are a matter of course, it is part of the day's work, it is well understood that the mud and rain and cold and enemy will all besiege him, but his job is to conquer for his cause.

As one seeks into the source of esprit and enquires how it may be kept under adverse circumstances he finds that two things help most. First, a previously formed determination, and second, the habitual set of the will of the average man in the ranks. The first step in arriving anywhere is to know where one wants to go. The first measure taken to insure a fighting spirit is to determine beforehand what attitude we shall take when we run up against mud, cold, deceitful propaganda, or machine gun nests. Secondly, the daily mental habit, the steady growing, constant determination of you and me as we prepare for action soon develops into an indomitable will to win. "As a man thinketh in his heart so is he." As we determine to-day in the practice areas and on the march we shall execute to-morrow in the blazing towns and in the bullet-swept entanglements.

V. Who creates esprit de corps?

Who creates esprit de corps? You and I do, who constitute the regiment. You and I and Bill who sleeps next bunk to mine and all the others, plain men like us, who live as we do, love as we do, and undergo the same torture of mind and body. Who creates esprit de corps? Many things stimulate it, help it, prepare the way for it, and make it easier to maintain, but the men who create it are the men who undergo the fatigue, who dig the trenches, who carry the packs, who storm the field works, who march and drill and sweat and shoot. Esprit is from within, it cannot come from without, save as persons without give ideas and thoughts to us within. "The Kingdom of Heaven is within you."

VI. The secret of esprit de corps.

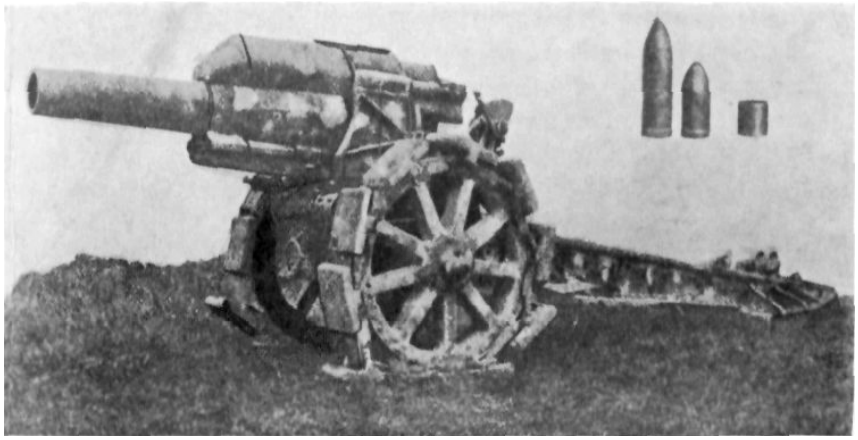
What is the secret of esprit de corps? No one idea or thing but rather many ideas and things. Among these we might consider: alertness to right and to wrong and a steady advance of the right against the wrong wherever the two conflict. I have seen officers and noncoms who, with a few wise words, have done much to make barracks speech cleaner and barracks life wholesome. Then I would name the practice of justice, such justice as President Wilson speaks of when he says: "First, the impartial justice meted out must involve no discrimination between those to whom we wish to be just and those to whom we do not wish to be just. It must be a justice that plays no favorites and knows no standard but the equal rights of the several people concerned."

Confidence, too, plays a large part in esprit de corps; confidence in one's leaders, confidence by the leaders in the men in the ranks. The Stonewall Jackson type of man has always brought fighting spirit with him. Confidence, also, in the God who is the Father of all men on both sides of the line will do much to help the soldier's spirit. A sense of security and faith is like an armor of steel. Rupert Brooke felt such a confidence when he asked:

"Who is so safe as we?
We have found safety with all things undying, The
winds and morning, tears of men and mirth,
The deep night, and birds singing, and clouds flying,
And sleep and freedom, and autumnal earth.
We have built a house that is not for time's
throwing—We have gained a peace unshaken
by pain forever.
War knows no power. Safe shall be my going,
Secretly armed against all death's endeavor;
Safe though all safety's lost; safe where men fall:
And if these poor limbs die, safest of all."

One must add a certain abandon of one's self and a generosity of speech and action to the things which make for spirit. The elimination of special and separate interests and a well formed

TYPES OF GERMAN FIELD ARTILLERY



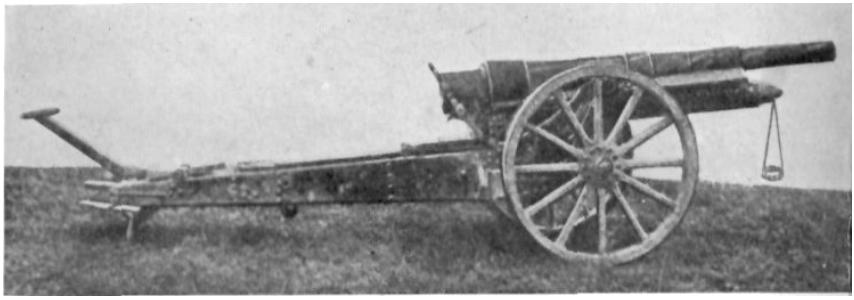
New 21-cm. Howitzer or "Long Mortar" (*lg. Mrs.*).

COMPARISON OF 21–CM. HOWITZERS OR "MORTARS"

The new long 21-cm. howitzer or "Long Mortar" (*lg. Mrs.*) differs from the former pattern or "Mortar" (*Mrs.*) by the length of the piece and a corresponding increase in range of 875 yards. Both howitzers fire the same ammunition. Streamline shell and shell with false caps are not in use.

	"Mortas."	"Long Mortar."
Calibre	21.1 cm. (8.3 in.)	21.1 cm. (8.3 in.).
Overall length of piece	12 calibres = 8 ft. 4 in.	15 calibres = 10 ft. 3 in.
Recuperator	Air recuperator, constant recoil.	Air recuperator, constant recoil.
Maximum elevation on carriage	+70º	+70º
Amount of traverse	4º	4º
Weight of piece	51¾ cwt.	52½ cwt.
Weight of howitzer in action	7 tons 5 cwt.	About 8 tons.
Weight of piece on travelling carriage	4 tons 2 cwt.	—
Weight of carriage limbered up	4 tons 8 cwt.	—
Transport	Both howitzers are designed for horse-drawn transport, the piece being carried on a special wagon.	
Number of charges	8	8
Weight of shell	The long shell weighs 265 lbs. and the short shell 185 lbs.	
Maximum ranges:—		
2 c.r.h. long shell ('96 n/A.)	10,280 yds.	11,155 yds.
1.5 c.r.h. short shell (1914)	9,952 yds.	10,280 yds.

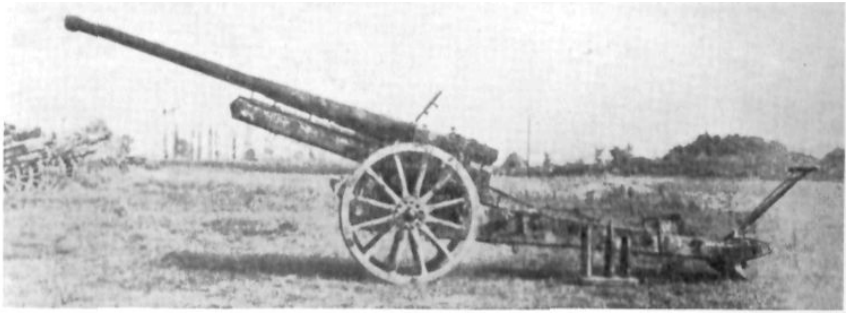
TYPES OF GERMAN FIELD ARTILLERY



1904 10-cm. Gun (*10 cm. K. 04*).

1914 10-cm. Gun (*10 cm. K. 14*).

TYPES OF GERMAN FIELD ARTILLERY



1917 10-cm. Gun (*10 cm. K. 17*).

COMPARISON OF OLD AND NEW 10–CM. GUNS.

	1904 gun.	1914 gun.	1917 gun.
Calibre … … …	10.5 cm. (4.13 in.) …	10.5 cm. (4.13 in.) …	10.5 cm. (4.13 in.).
Overall length of piece …	30 calibres = 10 ft. 2½ in.	35 calibres = 12 ft. 1 in.	45 calibres = 15 ft. 6 in.
Buffer … … …	Oil buffer, spring recuperator; constant recoil.	Ditto; variable recoil …	Ditto; variable recoil.
Limits of elevation on carriage	–5º, +30º … …	0º, +45º … …	0º, +45º
Amount of traverse …	7º 52′ … …	7º 52′ … …	7º 52′
Weight of gun in action …	54 cwt. … …	—	—
Ammunition … …	The 1904 and 1914 guns fire a 40-lb. shell with a full and a reduced charge (separate ammunition). The 10 c.r.b. shell with false cap weighs about 1 lb. more than the 2½ c.r.b. shell. No details are available concerning the ammunition of the 1917 gun.		

Marimum ranges:—

2½ c.r.h. shell	full charge	12,249 yds. … …	12,467 yds. … …	— yds.
	reduced charge	9,788 yds. … …	— yds. … …	— yds.
10 c.r.b. shell with false cap.	full charge …	13,889 yds. … …	14,327 yds. … …	21,326 yds.(??)
	reduced charge …	— yds. … …	— yds. … …	— yds.

public opinion against selfish cliques does much to counteract any bad feeling.

To be open and above board in a company is one of the greatest single elements in the creation of esprit de corps. Nothing gets so to the core of a man as to have a half formed idea that he, himself, is not fully trusted.

Then I might add the will and the patience to teach the awkward, the silly, and the ignorant as one of the sure secrets to success. Labor is not lost in teaching and drilling an untoward man into the fullness of the stature of a man-at-arms.

Men may be of equal bodily strength, they may have the same education, the same hard period of training may be accomplished by each, but most often the distinguishing characteristic of each man is his spirit. "It is the spirit that quickeneth." To some the meanest job is an opportunity to show the wealth of a manhood that can glorify any honest duty. Such men always go strong.

And now as we look at the long roll of honor the poignant question comes to you as it comes to me—do I have the makings in me of the thoroughbred man whom to know is to catch the contagion of spiritual daring and good will? As those who have not yet apprehended, we press on in the Service of God and Country. "To serve God, do good, honor the King; else wherefore born?"

The Artillery Information Service

BY CAPTAINS GEORGE A. MONAGON AND JAMES BRUCE, FIELD ARTILLERY

THE efficiency of the employment of Artillery in modern warfare is dependent upon the efficiency of the agents of observation and their coördination, in order that accurate and prompt information may be given to Artillery Commanders and to Artillery Units. No matter how well trained the Artillery Units may be, nor how capable the Artillery Commander, neither can properly function unless there is provided, in the first place, targets accurately located, and in the second, information regarding hostile batteries, enemy circulations, works, etc., which will form the basis of a plan of operation. The preparation of schedules for counter-battery, destruction, interdiction and harassing fire requires a thorough knowledge of the enemy positions in the terrain under consideration.

Prior to the war, in neither the French nor the British armies was an organization contemplated which would at the same time collect and distribute information of special use to the Artillery. The need for such a service was very soon felt, and the French created the "Service de Renseignment de l'Artillerie" and the British the "Reconnaissance Service." In the United States army it was known as the Artillery Information Service, the part which concerned more strictly artillery information being based upon principles developed by the French, with the Counter-Battery Office patterned after that of the British, or more strictly, that of the 1st British and Canadian Corps, which were taken as models.

This important service was not developed to its maximum during the few months our Expeditionary Forces were in the field. It did, however, render excellent service and was indispensable to the American Artillery during the fall of 1918.

The study of the Artillery Information Service was begun,

by a section of the Staff of the Army Artillery Commander, First Army, in November, 1917.

Visits were made to the British and French fronts and conferences were held with the Engineers, Air Service and the Intelligence Section of the General Staff.

By January, 1918, the general scope of the work was decided upon. Arrangements were made to train a few officers of each Field Artillery Brigade on the British and French fronts.

The rapid arrival of American Artillery Units, together with the fact that the French could take only a limited number of officers for training each month, made it difficult to even partially train the number required. Due to the limited time allowed this instruction was unsatisfactory; communications were not touched upon, nor was the counter-battery service. Observation was taught only as it touched on the Flash Ranging Service.

However, somewhat over two hundred and fifty officers were trained at the French front in this service and a few officers, selected with the view of their becoming Corps Counter-Battery Officers, were sent for instruction to the British front. Afterwards, on going to the front with their organizations, these officers equalized the deficiencies of their short preliminary training by soon gaining a very practical insight into the work of this service with the result that in many of the Divisions and Units of Corps and Army Artillery, the work was carried on effectively.

No Infantry officers were instructed. This proved to be a great handicap when the American army began to operate, as the Infantry Intelligence officers knew little of what kinds of information were useful to Artillery.

Probably the greatest difficulty the Artillery Information Service had to contend with was a lack of knowledge of the service in the Artillery brigades. They did not know there was a service to furnish them with as complete information of targets as was available; that this information was furnished in the form of bulletins and special maps; that their observation could

be arranged for them; that adjustments could be arranged for by plane, balloon, flash or sound ranging. They could not differentiate between information that was important and should be sent immediately to the nearest Artillery Information officer, useless information, and that which could be sent in by messenger or in bulletin form.

Following the operating schemes of the French and British armies, and for obvious reasons, the principal office for collecting, coördinating and distributing information was provided in the Army Corps.

Corps Artillery communications were also placed under the Artillery Information Service because they were vitally necessary to a quick information service.

The efficiency of the counter-battery and fleeting target work depended primarily upon the rapidity of transmitting information and operation. Obviously, it would be advantageous to have counter-battery and information controlled by the same officer. It was, therefore, decided to put Corps and Army operations, as far as it concerned counter-battery and fleeting targets, under the Artillery Information Service.

The first Artillery Information Service to be established was at Headquarters Army Artillery, 1st Army, in the early spring of 1918. The organization of the service in the 3d, 4th, and 5th Army Corps occurred later, the staffs in each case being composed of men trained in the A. I. S. School of the 1st Army. The 2d U. S. Corps operated with the British without artillery.

By the 1st of October, 1918, the A. I. S. in the 1st Army had developed as follows:

Its functions were:

To keep the Army Artillery Commander informed as to the enemy artillery situation and as to targets for our own artillery.

To recommend counter-battery work to be done by the Army.

To coördinate the counter-battery work in the different corps.

To furnish the Operations Section with lists and maps of enemy targets classified as to:

ARTILLERY INFORMATION SERVICE

1. Importance.
2. Nature, *i.e.,* targets for interdiction, bombardment, sensitive points for harassing fire, etc.

To furnish units with all information as to targets, observation and communication.

To establish and control flash and sound ranging sections.

PERSONNEL

The office was organized as follows: One Chief of Section; one Assistant.

In addition to having general supervision of all work, one of these officers visited the Corps every day to insure proper coordination of counter-battery work. Frequently enemy batteries were discovered firing across one corps sector. As an example, in the Meuse-Argonne operation, it was the rule rather than the exception for enemy guns east of the Meuse to harass troops in towns and on the roads in our 3d Corps area. These guns were in the sector opposite the 17th French Corps and fired across the 3d Corps. It was generally necessary for the 17th Corps to be ordered by the army counter-battery officer (Artillery Information Officer) to silence these guns.

In preparations for general attack these officers recommended the counter-battery work to be done by the Corps and that to be left to the Army. They later studied the Corps plans to be sure that all enemy batteries would be taken care of by the most effective fire available.

They spent a great amount of time with the Operations Section, as the information service could be improved only by being in thorough touch with operations going on or planned.

They conferred with G-2 of the General Staff at least once a day.

One officer was in charge of each of the following services and departments: Flash and Sound Ranging; Map Department; Report Centre; The Daily Bulletin; Study of Enemy Batteries; Study of Air Photos; Study of Targets other than Batteries; Observation.

LIAISON OFFICERS

The Army A. I. S. maintained at all times a liaison officer with each Corps A. I. S., and the A. I. S. of each Flanking Army, and with the headquarters of the Air Service operating with the Artillery.

The Corps liaison officers were intended primarily to be Sector Officers; that is, as Corps were constantly being ordered to other parts of the line and new Corps ordered in, these officers were to study the terrain on a certain part of the front and were then to be in liaison with whatever corps occupied it. They were not to change as the Corps changed. Their duties were to have an accurate knowledge of every detail of the terrain in their sector; by a daily written report supplemented by telephone reports to keep the Chief of Artillery of the Army constantly informed of all movements, friendly and hostile, including changes of battery positions, activity of batteries and aircraft, movements on roads, etc.; to coördinate and supervise the Flash and Sound Ranging Sections on the Corps front: when not in discharge of their duties to the Army, they were to act as assistants to the Corps A. I. S. officer.

It is very necessary for these officers to have sufficient transportation to cover daily their Corps Area. A motorcycle with side car would be sufficient. The practical difficulty in the way of these officers in the campaigns of 1918, was that owing to the general shortage of transportation they were confined to the routine of the Corps office, and although doing excellent work as assistants to the Corps A. I. S. officer, were not of as much use as had been expected to the Chief of Artillery of the Army. Their value was demonstrated, however, by sending to the Army a daily written report covering in detail all artillery activity within their respective sectors, by assuring the prompt arrival at Army A. I. S. of the Daily Bulletins published by their units, and making telephone reports when information of special interest was at hand. Telephone communication was at times very difficult to maintain and often valuable information was delayed in transmission.

G-2 of the Army assigned one liaison officer to the Army A. I. S. This officer visited the A. I. S. many times each day. He furnished copies of all reports of interest to the Artillery received by the Intelligence Section, and in return was furnished with all information received by the A. I. S.

One liaison officer was detailed to the headquarters of the Observing Squadrons working with the Army Artillery. He lived with them and was able to eliminate many difficulties in coördinating the two services that had previously existed. The hangars were widely separated from the batteries and telephone communication was poor. He was able to make communication more direct by cutting out centrals, running cut-off lines, etc. He had supervision over all prearranged shoots, visiting both the batteries scheduled to fire and the observers, assuring that both the time and the targets were thoroughly understood. He kept the airmen acquainted with the location of panels, hostile batteries and the situation in general as it developed from day to day. He received the observers' reports first hand upon their return from a mission, reporting by telephone to the A. I. S. information of exceptional interest. He rendered daily a written report to the Army A. I. S.

This officer also arranged for taking any special photographs desired by the A. I. S., and he kept in touch with the G-2 officer who had the distribution of routine photographs in charge, and arranged for copies of all photographs which it was necessary to study in the A. I. S. office.

FLASH AND SOUND RANGING

An Engineer officer highly trained in Flash and Sound Ranging had charge of the Flash and Sound Ranging groups. He made frequent inspections of the forward posts to insure their functioning in an efficient manner. He prepared in advance for the Flash Ranging Groups, and for all artillery units, special maps indicating suitable observation posts to be occupied in case of forward movement. These studies were usually made from relief maps and air photographs. He arranged

for all forward movements and was responsible for the prompt occupation of the new positions. This service furnished extremely valuable information whenever visibility permitted.

The Sound Ranging Sections moved into forward positions only after the line stabilized. This service was of marked value only in stabilized sectors.

MAP DEPARTMENT

All Artillery Objective maps were supplied to units through the Army A. I. S. The officer in charge of this department supervised the making of all special maps and was responsible for the accuracy of the same. He conferred each day with G-2 of the Army and furnished to them the precise location of all known hostile batteries. He recorded all hostile battery positions reported as active each day, and prepared and published each thirty days a monthly "hostile battery activity chart," showing the enemy artillery organization on the army front, the calibres of each, if known, and the number of days each battery had been active. These maps were especially valuable in estimating the situation prior to an offensive.

THE REPORT CENTRE

The officer receiving telephone reports was charged with keeping in constant touch with the liaison officers attached to the flanking armies and all Army Corps either by telephone or messenger. Telephone communication was difficult at times and dispatch riders were often resorted to. All information received by him was at once sent to the Chief of Artillery, G-2, and the officer in charge of the Daily A. I. S. Bulletin. Through these reports the Chief of Artillery and his staff were kept constantly informed of the enemy activity, the location of our own and the enemy front line, areas shelled, etc. Many reports of transient targets and enemy batteries active were reported directly to this centre. These reports should have gone to Corps Headquarters for immediate action. While fire was usually executed by units of army artillery, the time lost in the transmission

of the messages, usually one to three hours, rendered the effect of such fire very doubtful. Had the corps maintained a perfect counter-battery organization, such targets could have been subjected to fire in two or three minutes: while the personnel of the hostile battery were manning their guns and before transient targets were out of range.

THE A. I. S. BULLETIN

The A. I. S. Bulletin was issued daily and covered the period six hours to six hours. The officer in charge of this work received copies of all reports coming in, selected those of importance and interest and published same to the entire artillery command. This bulletin was delivered daily by dispatch rider to the Aviation, Flash and Sound Rangers, Balloons, Headquarters of all artillery commands, Flanking Armies, G-2, etc. Hostile battery positions discovered during the period, suspected positions, new works of any description, observation posts, new geodetic points, etc., together with special information which the Chief of Artillery desired to communicate, were published. Shelled areas, number of shots fallen in the sectors, destruction accomplished by our own artillery, the amount of gas received, number of enemy planes observed, balloons in ascension, the location of our front line, our casualties, etc., were among the interesting items it contained.

STUDY OF ENEMY BATTERIES

One officer had charge of hostile battery activity. A card index system was used. Every known battery had a conduct card showing location, number of guns, whether casemated, calibre, number of rounds fired daily, habitual objective, etc. A record of suspect batteries was also kept and these as soon as confirmed would be transferred to the regular system. The Army A. I. S. confirmed all hostile battery locations and made them official. Battery positions were confirmed and numbered only after a study of photos.

STUDY OF AIR PHOTOGRAPHS

The study of air photos occupies the entire time of two officers. Much valuable information was deduced from this source. The Air Service was under the direct control of G-2. The A. I. S. requested photos of certain areas as they were desired. This was not always satisfactory, and it is believed that if planes had been more plentiful photo squadrons would have been assigned to the A. I. S. and directly controlled by them. The French and British both had adopted this system and it proved very satisfactory.

From the study of air photographs could be determined the exact coördinates of individual pits. They gave warning of newly constructed hostile positions before they became active. In many cases repairs and new works under camouflage were discovered, and blast marks and other signs of activity or occupation in known positions not reported as active were revealed. Through these studies we discovered the routes of approach and ammunition supply which became targets of harassing fire.

It was an excellent means of estimating the accuracy and effect of our own fire. The lack of planes prevented its use in this manner to any great extent.

STUDY OF TARGETS

The study of suitable targets for the artillery was of great importance. These studies were made from the mass of information received by the A. I. S., from the study of maps and relief maps. Particular attention was paid to distant targets for the army artillery groups, the railway artillery, and our bombing squadrons. Targets for all calibres were classified in accordance with their importance and urgency, accurately located on special maps and furnished to the Operations Section of Army Artillery. All targets for interdiction and harassing fire, bombardment, and destruction were portrayed on separate maps, and with each were furnished the metrical coördinates, a description, and, if possible, a photograph.

Prior to an offensive exhaustive studies were made of the enemy works in the zones of Corps and Divisional Artillery.

All strong points, such as important trench intersections, reinforced dugouts, posts of command, telephone centrals, observation posts, trench mortar batteries, etc., were placed on maps and given a first, second or third urgency. These became charts of destruction to be effected by Divisional and Corps Artillery.

The preparation of these documents rightfully belonged to the corps services, but their lack of trained experts and incomplete organization made it necessary for the Army A. I. S. to provide the same for them.

The A. I. S. maintained and kept up to date, for the Chief of Artillery, an activity map, scale 1/20,000, of the entire army front. On this map were the locations of all hostile batteries, certain and suspected. Each was represented by a colored pin, the color indicating calibre. If active during the twenty-four hour period, a small brass ring would be placed around the pin. If counter-batteried, a black ring would be placed over the brass one. An inspection of the map would make apparent the efficiency of our own counter-battery organization as all enemy batteries should be engaged as soon as reported in action. Large black pins representing enemy balloons were plotted in the points of ascension, a ring indicating they had observed during the current period. Our front line was shown up to the minute.

The locations of all American Artillery units, posts of command, flash and sound ranging sections, balloons, etc., were given. At a glance the situation up to date was apparent.

To sum up the A. I. S. informs the Artillery Commander of the strength and disposition of the hostile artillery.

It keeps him informed on all objectives of our own artillery, their situation, importance, vulnerability and the possibilities of observation.

It effects a practical and technical organization of observatories and is in a position at all times to indicate an observatory appropriate for the observation of fire on a given objective.

It weighs, studies, coördinates, expands and distributes the information it receives. It enables the artillery to strike more quickly and more effectively.

"Allez! Allez!"*

French Horses vs. American Drivers

BY 1ST LIEUTENANT LEWIS E. REIGNER, 11TH FIELD ARTILLERY

WASTAGE of horses in war is to be measured by conditions of battle, and while no terms of actual or potential loss can be based entirely upon the origin of the breed, it has been declared by American artillerymen in France that foreign stock did not "stand up." Animals were deemed poorer, though they had cost more ($500 the head), than those used in the United States. We can let this point go by with the remark that, owing to the emergency, horse details, in scouring France, had to take what they could get. But it was hardly to be expected that the petted mares and geldings of Brittany could equal in stamina the hard beast of our ranches. What odds, for instance, had a huge soft near-Percheron, drafted from his stable fireplace and easygoing market cart, with a range horse, turning his back to the cutting wind and sleeping with comfort in a snowdrift?

These notes upon the service of French animals, in the campaigns of the Vesle, Meuse-Argonne and Scheldt-Lys, have been compiled from observations in three regiments of field artillery. The difficulties discussed here were typical of many new commanders' experiences. They could not be dodged. Like troubles must be met again. Some of these may be modified, or averted.

Horses were killed (or evacuated, the same thing, for they seldom came back to their own) by disease, by wearing out, by gunfire. In some mounted organizations, casualties were greater than sixty-five per cent. of the total number of animals in service. During the summer of 1918 the average life of an artillery horse at the front was set at ten days. Officers, fresh from training camp, were reminded forcibly of the obligation resting upon them for the care and conservation of horseflesh.

Incidents of campaign proved that the regulations on the

* Fr. "Come, come!" (Giddap!)

subject had been drawn up with peculiar care and foresight, for when this discipline relaxed, or was allowed to unbend, for one reason or another, reduction of draft-power was immediate.

Errors and omissions of administration were laid at the door of "exigencies of the moment," but such shortcomings too often carried cruelty in their train and were costly in their results. It was possible to get horses through almost any kind of situation, as is evident from instances herein quoted, when the drivers were considerate or the horse officer aroused sympathy perforce. Most casualties can be traced to a loose screw, and losses by hostile fire are occasionally augmented because someone has slipped a cog in reading his orders. There have been battery commanders, who, while they were busied at the P.C., or at the gun positions, and having entrusted the serious and important work of the "echelon" to lieutenants, or even sergeants, checked the horses from their lists of worriments.

MALLEIN PREVENTS GLANDERS

If the officer who was put into complete charge of department B and allowed to hoe his own row, understood animals and was conscientious to a degree—well and good. He managed to keep his caissons going at night and to move his guns at any time. If he could not spot the beginnings of equine ailments and was not competent, lacking practice in handling horses, to detect the faults of personnel, he might have been able, nevertheless, by sheer sense of duty, to hold his teams up to the mark. But it is doubtful.

If, on the other hand, he failed in technical knowledge of his job and was not superb of initiative—pity his horses! Besides the enemy at the front they were beset by assailants in the rear, to wit: Influenza, thrush and scratches; pneumonia, mange and fistulous withers, to say nothing of glanders, kicks, bites and the spontaneous injuries of service. Available statistics give the percentage of glanders as but one in a hundred, an admirable condition due to constant malleining.

Organizations which had had almost a year's training in

America in light and heavy draft approached the stolidity of "chevaux" and the intricacies of "harnais" with enthusiasm. There was no time for preliminary teaming. European horses, listening for the rustic "chk, chk," were unresponsive to the niceties of the aids; not understanding English, they were deaf to the Yankee twang. Yet this was no excuse for beating them. Schooled in shaft and tandem the rural charger quailed before the new sensation of pairing. Sublime patience on the part of the driver was the formula for this.

Accustomed to the soothing encouragement of peasant owners (horse phraseology with which French artillerymen were, of course, familiar), teams in the Allied organizations passed willingly along the crowded highway, while American drivers struggled and struck, wondering why their animals did not jump through their collars in response to their appeals, couched as they sometimes were, in promises picturesque to the point of perfection. And soon one heard this ingenuous explanation: "The French have kept all the best horses." But it was hardly that.

MEASURES AGAINST ROUGH TREATMENT

It was necessary for officers to guard against rough treatment of mounts in consequence of this misunderstanding. In one battery two men were punished severely and summarily, one for clubbing a horse about the head, the other for beating a tattoo on the ribs with a blacksmith's hammer. As a rule, however, drivers were good to their teams, but in cold and wet, amid exhaustion and depression, the iron hand and the all-seeing eye of the vigilant horse officer alone obtained for his charges the watering, handrubbing and covering which would have been bestowed without exception in less trying circumstances.

While there were days in some regiments when feed was short, the diminished ration was generally local. A good driver could always police enough grain for his pair. Wise section chiefs had little bags of oats tucked away in the trail or in the caisson pockets, or in the fourgon boxes. Armfuls of hay were

swooped up from dumps along the road to be divided by handfuls at the halts. The horses enjoyed this feeding out and they pulled so much better for these trifles. Grazing always could be depended upon to eke out the roughage.

If embarrassment existed from lack of any sustenance among artillery horses, it arose from insufficient water. At Cohan (Soissons sector) August, 1918, the teams of a regiment of 155's were sheltered in a wood at the top of a steep hill and the only water supply was a spring ditch three-quarters of a mile below. Machine gun and ammunition train sections camped on the banks and blocked the approaches. Animals plunged down the soft sides and fouled the stream or tried to balance on the edge, stretching out their necks in vain to get the coveted drink. A driver must spend two hours at each watering twice a day. He must groom, eat and get in his sleep so he could haul shells all night. Oh master mind of that officer, whose middle name was "Echelon," who could solve this problem!

WATER BY AIR SERVICE

In October, 1918, several regiments were established in the Argonne on the road from Les Islettes to Varennes, during a week of rain. Picket lines were limited by order to eight horses each, although on account of the thick woods preventing enemy observation it was safe to water by organization at the "brigade creek." This schedule involved yanking pairs up and down a forty-five degree slope, with involuntary baths for men and horses; waiting for hours and whiling away the time with verbal and manual encounters. Out of this unsatisfactory arrangement, an energetic young officer, an Iowan, whose native interest in horses never lagged, found a way that cut the time for watering in two and he earned the general's O.K. and exclusive right to first crack at the drinking place. He rigged an aerial bucket from the stream to high bank, dragged a couple of old troughs several thousand yards, and had a clean supply which the animals could enjoy without gymnastics and wet bellies.

The same lieutenant had a habit of prowling up and down a

train all night, forcing his men to jump out with their buckets at every stop, to take advantage of the vicarious faucets and engine tanks. He turned aside a number of teams from their rapid progress toward the scrap heap and restored many a hopeless wreck to life and "duty." But the man was tireless, he could handle horses, he could beat any man at his own game, and so he was admired, and imitated—for which his horses gave abundant thanks, no doubt.

Mares are believed to have lasted longer and to have done better work than geldings. Stallions dropped off like flies. A certain regiment of "Heavies," horsed in France, was issued stallions at the average rate of eighteen per battery. These horses excavated their stalls and demolished partitions, racks and mangers; they burst harness asunder like string, twisted off poles and made the night resound with roar and rampage. With what pride a section selected eight trumpeting steeds for a dashing gun team! Alas, few of them lasted thirty days, and but one survived the campaign and his driver was a first-class stableman. Yet none was killed by gun fire. A broad Breton mare, "Rabbit Ears" they called her, pulled three wheelmates to death and came through the hardest kind of three months, losing very little flesh at that. She was hit twice by shell fragments and she had the mange, but she was as good as ever when she was "turned in" in March, 1919. She had a good driver.

Another mare, whose case was reported from a light regiment, after being disabled by fistulous withers, a kick in each hind leg, a severe cold, mange and scratches, "came back" at the end of field service, although she had dragged along at the tail of the column, a hideous spectacle, for two months. For her cure she was assigned to one man as a bad bet. He won.

PREVENTION OF SORE BACKS

Kicks on the inside of the hock were of frequent occurrence. The nasty swellings that resulted could be reduced only by extended and careful attention. Animals with this habit of displaying the heel at random must be kept apart at all times, for

their is no credit in taking chances with them, and ropes or leather do not prevent their raising a rumpus in harness.

Fistulous withers were caused by pinching under the heavy French saddle, by failure to lift the blanket beneath the bars, and sudden exposure to cold and rain of the sweating back. The regulations are clear upon this question of gradually cooling a heated back. In fact, there is only one thing to do and that is to remove the saddle *upwards* and turn a dry fold of the blanket to the hair. In darkness or whenever he thinks he can get away with it, a man will *pull* his leather and roll and pack and blanket and rifle (in the howitzer regiments) from his weary mount, throw it upon the ground and run after his "chow." It is safe to say that fifty per cent. of horse diseases started from this sort of sloppiness. When the near horse had been rendered unfit in this way, he was shifted to the off side and relieved of the weight of a driver. When both animals were affected—well, these are some of the knots that a horse officer must not allow to be tied. Fistulas can be cured in about eight weeks if the veterinary and his assistants regularly drain and pack the orifices. But it means horses "unfit for duty," with those heavy guns to be dragged, and nothing to put in the traces. A battery commander who can keep just this species of injury off his diary has won half his battles.

Scratches became rife among several organizations stationed for a month near Poperhinghe, Belgium. As many as seventy horses were stabled in hangars on old aviation fields, and while the shelter was the best obtained in the campaign in Flanders, conditions underfoot soon were intolerable. To meet this state of affairs the following means were employed: The floors were ditched and drained and dried by pounding cinders into the black clay. Straw was obtained by trading for manure with the Belgian farmers. Solid roads were built from hangar to waterhole to highway, so that dry footing was assured, and to construct these causeways was something of a task in that country where stone was at a premium and even the duckboards disappeared over night. The men patched the worst places with

the sides of old "elephant" huts, hammered flat and turned daily as they bent upward under the pressure of travel. Only the fetlocks which were badly affected were trimmed. An order existed against cutting off the natural crop. The British horses were always long-haired about the coronet. (Incidentally there were many points of value which could be gleaned from the English Allies, for their loss of animals was not more than thirteen per cent. all told.) Legs were brushed down twice daily. Every morning, rain or shine, and it was seldom shine, the horses were taken out for a road march. In the afternoons they were led out to graze, for the grass was green through the winter. The hangars thus being clear the greater part of the day, the stable floors had time to dry.

A light artillery regiment whose officers were faithful to this routine showed its stock in such good condition that it was singled out for praise and example. Some neighboring organizations, on the contrary, bewailed the fact that they "hadn't horses enough to get the matériel to the train." This was after the Armistice and there was no lack of time, and drastic reports were made of several batteries, in which mange and scratches contended for the majority of victims.

COPING WITH PARASITES

Thorough daily inspections for parasites proved to be the one method of coping with skin diseases. There was no use in taking anything for granted and assuming that only the lesser evil was at hand. Immediate isolation, disinfectants, clipping and manual extraction of the larger pests must be done sooner or later, and a gramme of prevention was worth a kilo of cure. Brushes will be scarce, shortage of creolin will occur, there will be no washes of lime for stables and the supply company will say "they are on the way." The horse officer must be able to provide substitutes, and he can find none better than a series of evolutions entitled, "Grooming by Detail."

Special efforts to encourage the stable crews have their own rewards. For the stable sergeant, the farrier, and the "vet's"

assistants, the feed boss and the smiths, there is no poetry in war. Theirs is a dismal round of washing, syringing, draining, salving, sponging, tearing sacks for bandages, and holding their noses. "While others fought to win the prize, they sailed thro' bloody seas." In the field when the battery was fighting they rustled the fodder. In billet when the battery was resting, they worked just the same, as the barracks doggerel runs:

> The farrier has a helluva time, Parlez vous,
> Countin' oats behind the line, Parlez vous,
> Over the top with a bale o' hay,
> Ole Watts he works all night an' day—
> Hinkey, dinkey, Parley vous.

Horses can stand in the rain at night without injury, provided they are exercised briskly in the morning. Horse covers, because of their great weight, were abandoned in August, and in October drivers were singing, "If we only had them now!"

One organization lost seventeen animals under one burst of a German "88" before Montblainville because the order against picketing in groups had been ignored. So many were the injuries that the medical detachment was pressed into service to pick up the spurting arteries with their forceps and to save the horses from bleeding to death. Veterinaries favored the "open" treatment of wounds; that is, removing the dead flesh, using aseptic precautions and applying no linen bindings.

Teams which had to haul ammunition seventy-two hours without rest were kept in fair shape by frequent short feeds of grain and shifting in turn from wheel to lead.

Drivers looked upon the double-tongued chariot-de-pare as a horsekiller and took the position that the cut-under fourgon could carry just as much and save animals more than the United States combat wagon. However, the light French vehicle was built for travel on solid roads and would hardly be suitable for all-around work in America.

Poison gases, when they had any effects upon horses, caused a drooping of vitality and paved the way toward less resistance to influenza. Any number of animals passed without apparent

harm through fumes that caused the instant evacuation of men. There were no enthusiasts upon the subject of horse gas-masks, and these appliances were generally laid aside after the first attempt to adjust them.

The harness supplied American batteries was at first confusing, but drivers soon mastered it, and when opportunity offered they revised it after their own models, dropping the heavy curb bits and the double reins intended for draft animals. The off saddles, which could not be ridden, and were useful only to sling pouches, fell by the wayside from the start. Indeed, from the large number of "McClellans" to be seen with French harness, every soldier was alert to trade his leather. The iron snaffle bits of the foreign bridle rusted easily and could not compare with our non-corrosive metal. The breast collars had the merit of being wide and of being easy of adjustment to the point of the shoulder, so that a maximum of draft was produced with a minimum of irritation. The wearing inner surface, though five inches in depth, was of a kind of chrome leather, which required the most careful cleaning to prevent sores. The quality of the hide was unassailable. Rope traces stood the strain well. At Arcis-le-Ponsart thirty-two horses were hitched to each of several howitzers (155) to master a slippery hill, and there were but two breaks in the long tensile surface.

ROUTINE AND MORALE

A tendency exists in campaign at times to feel that routine can give way to irregularity, of which hurry is the chief component. An officer is tempted to let to-day's duties slide because he will not be "checked up" to-morrow. An impression existed among new outfits at the front that discipline was overdone and that little niceties of garrison could be overlooked. But those organizations were more successful which were not distracted by changing scenes and ephemeral interludes, but maintained their schedules in spite of "quips and quirks and wanton wiles." Sometimes an officer would give himself a vacation and make it up by a spurt when a superior "nailed" him.

One can liken this kind of lieutenant to that improvident farmer who sits out the rainy day on his porch, thankful for a heavensent excuse to loaf, instead of using the hours, denied him for work in the fields, to scrape his rusty mowing machine. There was an executive before Apremont who held reveille and retreat formations of the firing battery regardless of the rest of the world.

His chiefs of section reported under heavy fire: "First section in order, sir." "Second section delayed by enemy burst, sir." "Third section No. 48 boiler punctured at mess, sir." "Fourth section extinguishing camouflage fire, sir." Here they are, subordinating shocking experiences to ordinary duties. Can you beat morale like that? You can not! Why, therefore, should not the horse officer reap the benefits of treading the "even tenor of his way" with similar ceremony, something like this: "Gun section horses in order, sir." "Second caisson, three scratches, one lousy, drivers on extra duty, sir." "Fourth caisson, sore back, driver reported, sir." This was done by a battery with excellent results. A little wholesome publicity of this kind reduced carelessness by fear of "razzing" and the competition it involved, and worked wonders with the rival caisson corporals. There is a lot of truth in the old sergeant's rule: "Keep 'em busy. It takes their minds off the war. If they snail, write their names in red."

A Day in an Advanced Report Centre of the Artillery Information Service

BY ARTHUR B. CHILTON, FORMERLY CAPTAIN, C. A. R. C.

THERE are, in my opinion, few Americans who are not wiser for their experience in the Army during the Great War. Of the many things that I, as a "civilian officer," learned in my Army experience, the greatest surprise was the opportunity as well as necessity for originality and imagination among the junior officers.

The *modus operandi* of an army always seemed to me to be like a chess game—the general officers played the game, while the under officers and men were the "men," who, though they had different "moves" and prerogatives according to rank, were circumscribed in their actions by rules, regulations and orders. And I should not be surprised if this view is still entertained by a majority of civilians. But experience has entirely reversed this idea of mine, and now I regard an army as being composed entirely of generals, from the private up, and the orders received by each rank from higher authority as but a general pointing of the way.

My conversion to this view took place between August 29 and October 8, 1918, while in charge of an advanced report centre of the Artillery Information Service of our First Army, which report centre was first established at Ancauville, in the Toul sector, on August 29th, and moved to Essey on the second day of the St. Mihiel offensive, where I remained until I was ordered to organize a similar report centre for the corps sector on the left bank of the Moselle.

In the city of Toul, on August 29, 1918, I received orders to proceed to Ancauville and establish an advanced report centre; that I would have assigned a corporal and four men from the Signal Corps, that we would be furnished a telephone

switchboard; that we were to collect and exploit artillery information—this was about the extent of the instructions. I confess I was not enthusiastic at the prospects, but on October 8th I would not have traded experiences with many officers who had been fortunate enough to have been in that sector during the same period.

Arriving at Ancauville, my first job was to find a suitable dugout for an office and sleeping quarters, and a mess. This accomplished, my detail reported, and their unlikeliness further depressed me. I made a mental vow to have three out of the five relieved. They had but lately come over to France, and were about as "green" as Paris-green. But the way every one of them entered wholeheartedly into the enterprise, the readiness with which the linemen would "shoot trouble" when lines were broken (which was very often), frequently under fire, in rain and darkness, and the watchfulness of the operators during the long hours of the night—all these produced a feeling of admiration and respect for them.

After a few days it became apparent that one officer could not keep himself on the job for twenty-four hours a day, seven days in the week; therefore a lieutenant was detailed to assist in the work, and from that time forward we took turns at work and play.

In this paper I shall relate the experiences and events of a day, which I hope will prove interesting and which will show into what the advanced centre developed, how we were of service in the operations, and what a fine "box seat" we occupied in the interesting events of those days.

Place: A dugout in Ancauville.

Date: Any day between August 29th and September 12th, "D" day and "H" hour.

I had just finished a twenty-four-hour vacation; that is, one full day in which I considered myself off-duty, with the privilege of going wherever chance transportation would take me. This time I had gotten as far as Toul, where I had indulged in the luxury of a bath, had eaten three good meals, purchased a

fresh supply of reading matter, and felt ready for a strenuous tour of duty.

At five o'clock in the afternoon, or rather, at seventeen hours, I informed Lieutenant Bennett, my assistant, that he could consider himself at liberty until the next afternoon at five, but he declined and said that he would go out the next morning and pay a visit to surrounding units and "sell out service" to them. He was a good salesman and politician, too, and both helped in our work.

My bunk was in the same "room" as the switchboard. I sat down to read the latest news and to eat some chocolates which I had been fortunate enough to find that day in a commissary. I noticed a violent buzzing at the board, and saw that two drops were calling lustily. I found that during rush hour time was saved by operating the board myself, so I took the operator's seat, and got busy. Drop 10, Balloon 88, said that a Boche plane was threatening him, and to please tell the antiaircraft that his altitude was 1200 metres, but would come down to 800 metres if the Boche continued to threaten him. The other drop, No. 2, was Flash Ranging Section 80 (FRS), who reported that several enemy planes were active over the left of our sector. First I called the anti-aircraft, and as they were a French outfit, I had a hard time in making them understand. Probably other agencies had this same news and it was being exploited by them, but we could not presume anything. So I 'phoned it to the Corps air squadron, to the three divisions in our sector, and to Corps Headquarters. By that time, the antiaircraft battery, only one hundred yards away, was firing away in good fashion. I called the chart-room of the balloon, who connected me with the observer in the basket. He said he couldn't talk then as he was too busy watching the Boche. Before the connection was taken down I heard the observer exclaim: "Jump, jump!" I dashed upstairs, and saw the observers coming over the side and—an instant of suspense—their parachutes opened out and they were safely away from the burning sausage. The Boche had fallen out of the sky, and

after burning the balloon was hastening back to his lines, through a fine barrage of our "Archie" battery. When he had almost reached safety, two Spads swooped down on the back of the Boche and fired a burst of machine gun bullets into him. He fell out of control behind his lines. Again, the FRS, the Corps, the divisions, the air, the anti-aircraft battery were called and what we had seen was related. The next day the aviator came to us for confirmation of his victory.

I relinquished the board to the operator, but it was not many minutes before Sound Ranging Section 5 (SRS) told us that a battery of 150's were firing at the rate of one shot per minute from X4573, objective unknown. I directed the operator to give the information to the Heavy Artillery Commander (HAC), to the Corps Artillery Headquarters, and to inquire of the divisions if the shots were falling in their sectors. Just then the HAC asked for a connection with a battery of 155's, and we heard him order 50 rounds on the offender.

I began thinking of making a journey to our mess for supper, when we heard a big shell scream through the air—a sound that was getting more familiar every day. I called the SRS and FRS and asked them to locate the battery. Five minutes later FRS 22 reported that a Boche 170 battery was firing on an ammunition dump located near their central, but no location of the enemy battery had been made. It was not until several shots had been fired that the FRS called and gave the location as Y1343. This news was distributed as quickly as possible. But we never learned whether it was used.

Things having quieted down, Lieutenant Bennett and I ventured to supper. While there one of the linemen came in with a memorandum that a certain enemy battery was in action. Recognizing the location, we gave him directions in what manner to disseminate the information.

After supper, a French lieutenant and an American artillery officer called, and we passed a few very pleasant hours, with the help of a violin, a guitar, and a mandolin. But there were interruptions. For instance, at 7.36 the left division reported

that there was a "strafe" going on of their front lines, and requested information as to where the enemy batteries were. No one could get a good location. Both SRS and FRS reported different coördinates. After an examination of our records for the past few days we found where a certain battery of 77's had been firing on this same divisional sector, so we concluded that the old location was the accurate one. This we 'phoned to the divisional artillery, to the HAC, and to the Corps. We also called the FRS and SRS again, and suggested that it might be V3454. This location they confirmed a few minutes later. Then the division called and reported that they would be unable to take on the shoot, and asked that the HAC help them. The HAC asked us to order fire from a certain battery and to give them some mustard. After the orders were transmitted we called the division, and later, after the fire had been delivered, we called them again to see if it had relieved them. They said it had, and were thankful for the assistance.

We settled back to our music, but we were not allowed to continue long. A lineman came rushing in and said that some 77's were falling right there in town. Very interesting news! The SRS and FRS and the divisional O. P.'s could not be called quickly enough then. FRS 23 promptly convicted X6754 as being guilty, and the HAC, at our urgent request, allowed us to order 50 rounds of 155's. That battery was located just to our rear, and how good those shots sounded!

At eleven o'clock we retired. As I was on duty I remained dressed, but was dozing off, when I heard the operator talking to someone. He repeated the "Sir" so often that I ran him away from the board and took the receiver.

"This is General X. I want to know what is going on out there. We can hear a lively barrage here at headquarters."

"Nothing at all, General. Our sector is quiet. It is in the sector on our left that you hear the firing."

"Are you quite sure?"

"Yes, sir, very sure. All sources of information have been questioned, and our sector is perfectly quiet at this time."

Orders came from the Corps, a few minutes later, for a program of fire beginning at 1 A.M. When the program began at 1, we received a call from one of our artillery P. C.'s, who wanted to know what the noise meant, and requested to be allowed to get in on the fire.

Shortly after 2 A.M. the operator woke me, and said that the Flash-Rangers reported that the town of F—— was being filled with gas. The operator had a job in waking me sufficiently to get a rational response—and then came my job, waking first one officer after another. The HAC had to be informed, but said that it should be exploited by the divisional artillery. The divisional artillery was then called, and, while I suppose they were thankful for the information, one need not expect thanks at 2 A.M.—except from those being fired upon. Then we called the information officer of the division—and we had to keep up with the roster of officers on duty there or we would make a terrible mistake in arousing the wrong officer. Meanwhile the fire on F—— continued. FRS was again called to see if any new locations had been made of other batteries taking part in the "strafe." But the line was dead! The operator was sent for the lineman, who went out, and after an hour's search found the trouble. He reported that three 77's had fallen too close to him to be comfortable, and that he had stumbled over some barbed wire.

The Flash-Rangers then reported that the sector was again quiet, and I thereupon retired for a second time, and got four hours of sleep. The operator had received two reports in the four hours, but they were of such minor importance that he did not awaken me.

I waked at six, and found two of our balloons already in ascension. I called them both, talked to the observers, and learned the position of the Boche balloons. The visibility was excellent, and I requested the observers to be especially watchful for a certain offending Boche battery near a cross-roads, which had fired every day for a week.

All sources of information were then called and asked for

a general report covering the night, which information was reported to the HAC, the Corps Headquarters, to the divisions, and to all others that seemed to us to have an interest in the various items.

Just before leaving the dugout for breakfast, a group of heavies called and asked that I hunt an ambulance for one of their men who was wounded and they had no transportation for him at the moment. Far from the original purpose of the A. I. S., I thought, but I hunted around the town and finally found an ambulance company among some ruined buildings, and one was sent to our friend in need.

At 8.30 the cross-roads battery opened up as usual, and was reported promptly by a balloon. I called another balloon and the observer in that basket also caught the flash. The HAC was informed, and he ordered counter-battery work, with adjustment by the two balloons. The adjustment was carried on through our board, and we assisted in making the corrections. The whole affair was very neat, so we thought, and we were pleased to spread such news all over the sector. And at lunch, an infantry officer was relating how some big shells had been harassing his outfit that morning. I was very glad to tell him that we had caught the battery and had given him a hundred rounds of 155's.

The Flash-Rangers called at 10.05 and reported that a lot of Boche infantry were boldly marching in close order down the road from P—— to N——. We figured how long it would take to deliver fire on them, and the HAC allowed us to order fire on the "set-forward" point, V7867, which could be observed by the FRS. The battery just to our rear did the shoot, and at the appointed hour we heard the 155's start out on their flight. FRS promptly reported that Boche soldiers were scattering themselves all over the landscape—and that was the last of close-order infantry movements in that sector for some days.

Lieutenant Bennett was out all morning, calling on our neighbors. It was not long until he was calling our correspondents by their first names!

The Air Service called at 10.45 and reported that an aviator had returned reporting that he had seen a battery in action at X8990, and the location was very accurate. The HAC ordered fire on the battery at once.

At noon, the Sound-Rangers reported that the cross-roads battery had fired 15 rounds. So our 100 rounds had not taken effect! But they reported a slightly different location and it was "pip" accuracy, as the British say. The HAC would not fire again. Now that we had a good location, he said, he would save him for a destructive shoot.

Between noon and 3 P.M. the sector was quiet. We had time to write letters, to read a story or two, and to give our quarters a general cleaning-up. Shortly after three, however, it seemed like everyone wanted to talk at once. The Sound- and Flash-Rangers, the balloons, and others reported batteries in action of various calibres, and from various directions. We had time only to report them to the artillery commander directly concerned, and not until four o'clock could we exploit the whole affair to all interested.

While this rush of business was going on, an artillery officer called, who was in charge of the communications for a divisional artillery P. C. He appeared greatly pleased with the prospects of good results in running a line into our board.

A French lieutenant came in at four, bringing with him bread and butter, and we promptly put our "canned-heat" into service, and soon we had "tea for three"—the limit of our cooking capacity!

Five o'clock, and Lieutenant Bennett assumed command. I remained "at home" that evening, but spent the next morning with an artillery group commander and assisted him in his search for good battery locations for his outfit which was coming into the sector.

"Such, my Sossius" (as Plutarch would say), is the record of one day's events in an advance report centre of the Artillery Information Service, which we have set forth in the best manner we could, from our diary and from our memory.

DISCUSSIONS

Artillery Training—Progress vs. Retrograde (Continued)

ROGER D. SWAIM, FORMERLY MAJOR, 102D. F. A.

LIEUTENANT-COLONEL ANDERSON in his defense of "Pre-War" methods of training asserts that "on every occasion in which the Allies or the enemy succeeded in crossing the trench system the methods of artillery fire used in position warfare had to be abandoned. . . . *observed fire with the old methods of computing firing data had to be relied upon*."[1] He means, then, that the officer conducting the fire saw target, guns and aiming point and used P-T or the parallel method. If such was actually done in this war I hope one who can actually testify to the facts will say so. I do not believe it was, and except in very unusual circumstances, I do not believe it will ever be done again.

I will admit that many new officers did not have the advantage of familiarity with the value of the mil and with observation and adjustment of fire and became perhaps overenthusiastic over the Saumur methods. I will admit that there was a tendency to neglect observation and adjustment of fire. Thorough training in the observation and adjustment of fire is necessary and observation and adjustment should be sought for on every occasion.

But our policy should be:

1. To have accurate maps and map making service.
2. Adopt the French compass-goniometer.

[1] The paragraph in Lieutenant-Colonel Anderson's article to which reference is made is as follows: "In 1914 and 1918, and on every occasion in which the Allies or the enemy succeeded in crossing the trench system the methods of artillery fire used in position warfare had to be abandoned. Rapid and numerous changes of position were required, and observed fire with the old methods of computing firing data had to be relied upon. If maps were available, they were an assistance, but elaborate orientation methods took too much time, and were neglected and discarded by the officer who had had training and knew how to calculate firing data by the old methods and who knew how to properly observe his fire and handle his sheaf."—EDITOR.

3. Lay and fire by map whenever possible, using the most accurate orientation methods which the time allows.

4. Observe and adjust if possible.

5. If no map is available the so-called "Pre-War" methods should be used.

Let us assume that in open warfare a battery commander is to occupy a position and execute a mission. He has an *accurate map* and a *compass-goniometer*. He can determine at a glance that his battery is "about there" on the map and his target "about here," and he should not at the worst be more than a total of 400 metres out on both. This would mean at worst 100 mils in deflection at 4000 metres range. With ruler and protractor he quickly measures and orders his executive to lay with azimuth, say, 250 from the Y line, if the map has one; if not, then from magnetic north, and range 4000 and, informing his executive that he has located the battery approximately at coordinates 46.55 and target at 75.87, leaves the executive to establish the battery in position and rides to find an O. P.

While waiting for the battery to come up the executive should be able to improve the location of the battery so that the error in location will be reduced and will, of course, improve his laying to that extent. And after the captain has reached his O. P. he may be able to improve the location of the target and so to improve his laying. But under our assumed conditions his error in initial laying will be only 100 mils. Less skill and less time might cause greater error. More skill and more time will result in less. It is believed, however, that the *time* will be less than would be required to find a position from which an aiming point can be seen, an O. P. from which laying by P-T or the parallel method can be employed, and that the initial laying will generally be closer to the target and therefore the time required for adjustment shortened. Morever, it will make firing possible in wooded and in low rolling country where aiming points are lacking and observation close up to the target necessary.

Substantially the method here outlined was actually employed

by French officers and high bursting shrapnel used to identify their shots.

Something like this method was used by the artillery of the 26th Division where an observer for the battalion indicated targets by coördinates, the battery commander laid and fired from the map, and the fire was observed and errors reported by the observer as in the case of a balloon observer, the battery commander making the necessary changes to bring the fire on the target.

CURRENT FIELD ARTILLERY NOTES

Gas-s-s-s-s

BY MAJOR JOHN NASH, 313TH FIELD ARTILLERY

ONE close friendship, born of the war, was severed November 11th and, strange though it may seem, brought joy to the hearts of the American Expeditionary Force. For the gas mask went into the discard this date and that inseparable companionship of the American fighting man with this wicked little wartime contraption ceased happily and forever.

It is safe to say that no article of the soldier's paraphernalia in France was so uniformly disliked and yet so jealously guarded and cared for. It is also equally safe to assert that his first thought, when he learned on the morning of the 11th that Willie had thrown the sponge into the Rhine, was:

"Here goes the —— old gas mask."

It didn't weigh much but it sure seemed that a great burden had been lifted from our chests and shoulders.

But pest though it was, the great American soldier clung tenaciously to it, and even if he did "forget" to use it at times, and used only the mouth-piece at others to save his nose, strange creature that he was, he slept upon it at nights and cursed vehemently his luck when misplaced or appropriated by a pal.

The ordinary or garden variety of mask—for the benefit of the homefolks—was a sort of canvas bag which held a tin box of magic chemicals, and connected by a rubber tube to the facepiece of rubber and glass, a mouth-piece, a valve, and horror of all horrors, the rubber tweezers, which, gripping the nose affectionately, forbade all thought of breathing through that organ.

It was awful, simply awful. Ask anybody.

There was another type for the highbrows and battery executives, somewhat easier, Tisso by name, after the bird who concocted it, but we never saw anybody but Sam and Henry

Baker wearing 'em down our way. Sam wore both, but he had three guns, too, and never shot anything but a rat in a dugout in Cunel.

There were gas masks for the horses, too, which some drivers have been known to wear in a pinch. We usually got them on the "animules" once, but—never again. But that's another story which Rip Crosbie can tell you about.

Masks, however, of themselves, while bad enough, were aided and abetted in their discomforting endeavors by the gas which they were designed to circumvent.

There were several species of gas familiarly prevalent at the front and possessing various and sundry degrees of harassing qualities.

The first and most persistent, of course, was that packed neatly in hostile shells, which when deftly dropped into friendly areas, emitted fumes, both dangerous and obnoxious, and quite—er-er—annoying.

The second was that which wafted consistently from the tail ends of gasoline propelled vehicles, causing not infrequent and unnecessary alarm to throat and nostrils.

The third arrived nightly in long intelligence reports from G-2; and the fourth gushed intermittently from Brigade Headquarters.

The latter three were, of course, amusing but harmless.

We were gas mask veterans alright when we went into the lines, but most of our practice with this weapon of torture and defense had been in the pure and fragrant atmosphere of Brittany, unsullied save for the occasional fumes of cider and "white mule." We had slept, and eaten, and fretted, and slobbered, and fought the mimic battles of training days in masks, and had spent hours, and days, and nights with them, but new little of the real article save for those few highly illuminating facts disseminated by the Stophlet school.

But we were gas-shy, nevertheless, and worked our klaxons and tin-pans overtime for the first few days in the lines before we learned to distinguish the real cry of "wolf."

We got our first alarm in the 2d Battalion early on the morning of September 26th and frantically donned our masks against the odors of a 155 banging away on our left, and cigarette smoke in the dug-out. Dike Gilliam and Foxy Crandall sounded the tocsin on this occasion and came near starting the rolling barrage an hour too soon by their weird and raucous cries of Gas-s-s-s.

Tim Armstrong was sick in the bunk and we had to grab him by his "red thatch roof" and force the pincers on his nose, much to his disgust.

Tim was kinder Flu-ish, and wanted to be gassed.

And then they came every five minutes on the night of the 26th. Every rattle within ten kilometres or more was passed on and floated over towards Hill 281, causing a wild scramble into masks and muttered, muffled imprecations against the enemy and his methods. We slept in fitful installments, and slobbered intermittently on our rubber mouth-pieces. The gas non-coms maintained an air of learned dignity, and sniffing the atmosphere cautiously, would pronounce it uncontaminated (never had been) and authorize a removal of that pressing little band around the brow.

But we were learning, and in a few days gas shells falling near Arras and Rheims were not bothering us much in the neighborhood of Verdun, and alarms from the channel ports passed on over us unnoticed and rattled and klaxoned on their way to the Swiss border.

Our noses and nerves were becoming educated. But we became too educated after days at the front, callous from much war, and grew lax and somewhat defiant. We demanded a good healthy sniff before we would flip the tin-hat and duck in.

This attitude was disastrous at times, for we frequently found ourselves with a chestful before we knew it, and then swore by all that was good and holy that the mask leaked, and said awful things about Stophlet and his crew.

And then, too, the ever-thoughtful Germans didn't always announce the title of a shell in advance. You could tell a regular

one by its peculiar behavior, but the Boche inconsiderately were wont to fire a regular H. E. in which gas was a "ringer," and you choked while watching for the fragments.

Gas was an everpresent danger, but like all other things, the great American soldier gleaned humor from everything that came his way. It had its light side.

It swooped down thick in Cunel one afternoon while the "One John" Paul, quite naked and coiled like a snake in an old iron kettle was killing time, cooties, and all records for sanitation, with a wee bit of water and a big cake of Fels-naptha.

I leave the rest to your fertile imagination, my friends and countrymen. I am no artist and words fail me. Gee, but it was great!

But it wasn't ever thus. We had our days.

For instance—

The whole brigade plus a few French batteries thrown in, on October 7th, shot mustard and phosgene into the little town of Brieulles from four to six A.M.

For the cannoneers of the 313th F. A. that was one of the grandest and most glorious mornings of the entire war.

Damage to the Bore of Guns by the Formation of Pastilles

NOTE RECEIVED FROM ARTILLERY DIVISION, CANNON SECTION, ORDNANCE DEPARTMENT, U.S.A.

THE examination of some 962 French 75-mm. Field Guns, Model 1897, disclosed that 186 of them had been damaged in the bore in a manner that suggested conditions which had not hitherto obtained in Artillery fire. These guns represented 19⅛ per cent. of the number inspected.

The damage to the bore appeared in the form of depressed areas to which the French have given the name "Pastilles." It was found that guns so marked contained from 1 to 8 of these so-called "Pastilles." In order to determine their cause, gutta percha impressions, local analyses, and a study of the character and depth of these indentations have been made.

Pastilles occur generally in the bottom half of the bore and near the chamber, with the centre of the indentation or impression coinciding approximately with the centre line of a groove. The indentation varies in diameter from ½ inch to ¾ inch, and the depth is generally from .01 inch to .05 inch, with the sharper side of the indentation usually towards the breech. The grooves and adjacent lands are equally depressed, but it is noticed that little or no distortion takes place. After the pastille has formed, erosion begins in the groove and apparently proceeds rapidly and eats into the adjacent lands. It is evident that the pastille is formed by a substance which has taken the form of the lands and grooves and which was deposited thereon in a molten condition. The form of the pastille shows further that there was a uniform bearing and that it was produced by a substance that was approximately hemispherical, such as a small amount of metal which had been chilled from a molten state by contact with a relatively cold smooth surface.

It is thought that the anti-coppering compound used by the French is the cause of these pastilles. This compound is an alloy of 60 per cent. tin and 40 per cent. lead, which melts at about 190º Centigrade. About 1 gramme of this material is used in service ammunition of French manufacture to prevent

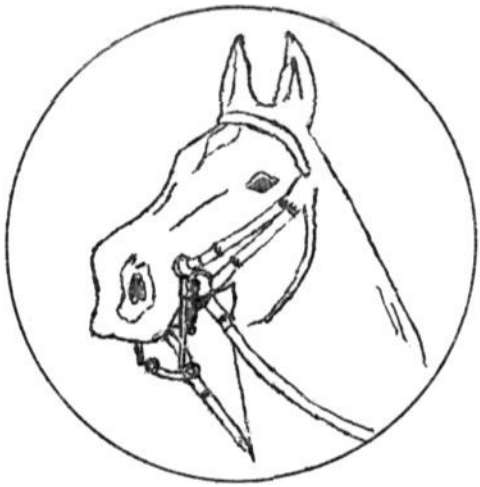
the accumulation of copper, while special ammunition prepared for the removal of excessive copper deposit contains 10 grammes of this alloy. One of the forms in which this alloy is used is that of a flat ribbon made into a coil, and a study of the gutta percha impressions made from certain of these pastilles indicates that the substance which has taken the form of the lands and grooves had not been completely melted, as the original shape or section is well defined in the depression. Should the decoppering alloy be melted but not completely atomized, a small quantity in a molten stage brought into contact with the relatively cold bore would be chilled and assume the form of a button, as noted above.

Should copper be present at this particular part of the bore, its combination with the anti-coppering compound may increase its hardness and also cause the alloy so formed to adhere firmly to the gun.

A second characteristic form of pastille is shown in certain other of these 75-mm. guns. The position of this form of pastille in the bore is the same as the first mentioned, but differs in size and is generally arranged annularly around the entire bore. It is thought that this can be ascribed to a similar cause, the only difference being the form and size of the deposit.

The inspection of the bores of one hundred and forty-two 155-mm. G.P.F. and three hundred and twenty-nine 155-mm. Schneider howitzers has disclosed one pastille in the G.P.F. and five pastilles in the howitzers. These pastilles were in every case near the muzzle and were of the form which we have first mentioned.

There have been a large number of German captured guns and howitzers of various calibres and types examined for pastilles and none have been found. It is also to be noted that pastilles have not been observed in British artillery. This may be regarded as significant, as neither the British nor the Germans had, up to this date, made a practice of employing a decoppering alloy.



The Artillery Horse's Prayer

BY CAPITAINE DE CONDENBOVE, FRENCH ARMY

"To thee, my master, I offer my prayer.

"Treat me as a living being, not as a machine.

"Feed me, water and care for me, and when the day's work is done, groom me carefully so that my circulation may act well, for remember: a good grooming is equivalent to half a feed. Clean my feet and legs and keep them in good condition, for they are the most important parts of my body.

"Pet me sometimes, be always gentle to me so that I may serve you the more gladly and learn to love you.

"Do not jerk the reins, do not whip me when I am going up-hill. Do not force me out of the regular gait or you will not have my strength when you want it. Never strike, beat or kick me when I do not understand what you mean, but give me a chance to understand you. Watch me, and if I fail to do your bidding, see if something is not wrong with my harness or feet.

"Don't draw the straps too tight: give me freedom to move my head. Don't make my load too heavy, and oh! I pray thee, have me well shod every month.

"Examine my teeth when I do not eat; I may have some teeth too long or I may have an ulcerated tooth and that, you

know, is very painful. Do not tie my head in an unnatural position or take away my best defence against flies and mosquitoes by cutting off my tail.

"I cannot, alas, tell you when I am thirsty, so give me pure cold water frequently. Do all you can to protect me from the sun; and throw a cover over me—not when I am working, but when I am standing in the cold.

"I always try to do cheerfully the work you require of me: and day and night I stand for hours patiently waiting for you.

"In this war, like any other soldier, I will do my best without hope of any war-cross, content to serve my country and you, and, if need be, I will die calm and dignified on the battlefield; therefore, oh! my master, treat me in the kindest way and your God will reward you here and hereafter.

"I am not irreverent if I ask this, my prayer, in the name of Him who was born in a stable."

EDITORIAL

War Department Office of the Chief of Field Artillery

WASHINGTON

OCTOBER 17, 1919.

An Open Letter

To the Members of the Field Artillery Officers' Reserve Corps:

Several members of this Corps have recently resigned. While I do not question the motives of such men, I regret to see the resignations. It is a movement in the wrong direction. I would like to see the Corps grow larger, rather than smaller. We have now something over 7000 members—about as many officers as we had enlisted men in the field artillery of the Regular Army at the outbreak of the war. But in any war, officers are needed in enormous numbers—few things held us back more in this war than the lack of trained officers. We had only 275 in the field artillery of the regular establishment with at least one year's service when we started; we had nearly 23,000 officers in the field artillery when the Armistice was signed. And notwithstanding this enormous number, I was short. I expected to be "on easy street" by January 1, 1919.

The situation of the reserve officer is unsatisfactory to him at present; so is that of the Regular; none of us is satisfied with existing conditions. But that is the natural and inevitable result following such a war as we have just had. A period of readjustment is necessary. Our immense army and military plant has to be liquidated. We are, in business parlance, in the hands of a receiver. But just as a receivership in business puts a concern on its feet, so in military matters, we will emerge from this receivership as a "going concern." This is no time to be discouraged or pessimistic. I regard the Reserve Officer as one of our most important military assets. I intend to work out a plan which will make the position both useful to the field artillery

and interesting and instructive to the officer. But it will take some time; it will probably require legislation by Congress. And that is a body that cannot be hurried by the military. So what is needed now is patience.

And, in the meantime, while we are trying to work out some plan that will be sound, that will accomplish the desired results, and which, at the same time, will not take too much time from the busy reserve officer's business life, I want to keep in touch with you. To do this, the office will mail you periodically (say once in two or three weeks) a bulletin giving interesting field artillery information, statistics, data, etc. In addition, we shall try, wherever there are enough reserve officers in the same locality to justify it, to send some field artillery officer of the regular establishment to deliver a lecture or talk on interesting features of our army, on actions in which the field artillery played a conspicuous part during the war, and on kindred subjects. I also plan to use this lecturer to maintain for me the personal touch which I think is so important, to answer your queries, etc. I hope some of you reserve officers will also give us the benefit of your experiences. I feel very proud of the work done by our arm during the war—you have even more reason to be proud than have I, for most of you were active participants in the stirring events. I feel deeply gratified to you for having added new laurels to the field artillery; we must not lose touch with one another. Friendships formed through war associations should be the most enduring in life, and should grow stronger as the years roll by. The reserve corps will form an organization to keep us all in touch with one another, and this is an additional reason for my desire to see it grow. The resignations have been few—but so, also, have been the recent additions.

In making of this Corps the splendid and efficient body it should be, and the national asset for service it should become, I ask for your help. I shall especially appreciate any suggestions you can make, and I solicit you to send them to me. I realize fully that conditions surrounding the reserve officer in one part

of the country are entirely different from those in another part; it is only by helpful suggestions from many reserve officers scattered all over the Union and in different walks of life that sufficient data can be collected here to formulate a plan that will be practicable and successful in securing and maintaining an effective Field Artillery Reserve Corps, so that when the next war comes—as come it will, sooner or later—we may not again be caught so unprepared.

So, those of you who have leisure and constructive ideas, please give me the benefit of them. And, in the meantime, I am,

Very sincerely,

WM. J. SNOW,
Major General, U. S. A.,
Chief of Field Artillery.

"All Together—Let's Go!"

AN effort was made to fight the great war from which we are now emerging with the service divided into three forces—the Regular Army, the National Guard and the National Army. In this national crisis it became necessary to combine these more or less antagonistic forces into one United Army of the United States in which all worked for the success of the whole. If these forces drift apart, if advantage is not taken of the cohesive spirit that has been developed in the services generally, it will be increasingly difficult as time goes on to develop a really national force in periods of emergency.

By their close association on the battle fronts of France, the different arms of the Regular Army have been drawn together in mutual understanding and respect to a degree that had not existed before the war. It is hardly too harsh to say that the traditional attitude between the arms of the service in the old Regular Army was one of thinly veiled suspicion, jealousy and antagonism.

This present foundation for better understanding which the war has left as an incidental legacy puts the army on the threshold of two choices, either we may revert to pre-war disjunction,

or we may sustain and strengthen the cohesion developed during the war. Inertia and a negative attitude will allow the service to drift back into the old conditions. On the other hand, a positive decision is necessary if solidarity is to be maintained and increased.

There are several reasons why an imperative necessity exists for cohesion, throughout the services. The most important only will be enumerated.

First, there has been much misunderstanding and criticism arising not only from the mistakes of the Regular Army, but as well from the mistakes of the National Guard, the hastily raised levies, the emergency enactments of Congress, and the historic lack of military policy and provision on the part of successive administrations and the American people. Therefore, a united front should be presented by all arms of the services to repel unjust criticism that may be leveled at any particular branch. At the same time, this solidarity should hold an equal willingness for each arm and the services at large to accept and profit by just criticism.

Secondly, there is in certain quarters a disposition to saddle upon the country a military policy which would perpetuate and increase the evils of our past history in political interference and divided control. This propaganda can not make headway with many of the thinking people of the country, provided the services themselves do not destroy confidence by friction and disagreement of ideas within their own ranks.

Again, without unity of purpose and harmony of doctrine no arm of the service and no one of the forces composing the army can achieve its full measure of efficiency and usefulness. Mutual confidence is as necessary to success in the efforts of the different arms as in the relations of a family or in the transactions of business and banking.

If we agree that we ought to get together, the question then is, how are we going to do it? First of all, the services must realize that a radical overturn of thought and attitude is a human possibility, frequently exemplified. This nation was founded on the conceptions of individualism which in the

eighteenth century were cropping up independently in several quarters of Europe, and which dominated the political and economic practices of the unfolding modern world up to a period later than the middle of the nineteenth century. Now on every hand we are confronted with the growing ascendency of collectivism over individualism. A man's house is no longer his castle. Our forefathers would have resented as a tyrannical intrusion upon their liberties the building restrictions, sanitary inspections and ban on backyard pigs and chickens which we accede to nowadays. The fathers of our democracy would have been horrified at the invasion of private property rights involved in the inheritance taxes to which we yield. It took an amendment to the Constitution to render possible the levying of an income tax.

So, in a modern world of overturn and inevitable radicalism, it is, after all, a simple change in viewpoint for the army to cast aside its traditional prejudices and jealousies, its narrow loyalties to the interests of any one arm, in place thereof seizing upon a new, earnest devotion to the Army and a spirit which will jump to the support of any branch of the services.

The Army must awake, face the new direction, and take this new step. The past must be buried. Bygones must be bygones. The Army must get together, stand together, and then hold the positive spirit of accomplishment—"Let's go!"

To do this, elements of friction, inequality and injustice must be eliminated. It is futile to say we will have no friction in future and at the same time to harbor the seeds of friction.

Unity must include *all branches* of the service. No arm may be overlooked or conspired against without surely wrecking the strength of the whole. If there be one branch of the service, even though it be small and an auxiliary arm of limited scope, which yet is denied its just prestige and recognition, and by combination among other arms is subjected to discrimination and repression, such an arm will be a humanly inevitable source of poison. Too generally officers in one branch of the service lack specific acquaintance with the problems and technic of other arms of the service. It is then so easy to jump from

ignorance of the other fellow's work to the conclusion that the other fellow's work is not worth while. There is this much to remember—the more earnestly do all arms and corps devote themselves each to the development of their own fields of effort, the more highly specialized will become the technic of each arm of the services, and hence the more unlikely that each will keep in touch with the work of the other. Therefore, though it be desirable that every officer should be reasonably familiar with the work of all arms of the service, yet to practice this condition will become increasingly impossible. Nevertheless, in the interest of mutual confidence, it is imperative that every officer, lacking specific knowledge of another's work, should assume that the other's work is as important and worth while as his own.

Again, there will recur in the future, as in the past, through the concurrence of circumstances, opportunities for officers in one service to seize a political or other advantage in which the Army as a whole will not share. In the development of the spirit of solidarity which is now foreshadowed, there must be a general acceptance of disdain for the advantage to be attained by any such means. Even if there remain individual officers who would not scorn to further their arm at the expense of the Army, the public opinion within each arm must spurn the acceptance of the advantage. Every arm of the services to varying extents, has pursued selfish practices in the past. It may not be possible to wipe out all inequalities which the past has created. But every effort to do so must be made, and the record of the future kept clean.

Every arm of the services stands at the threshold of a new opportunity, which simultaneously has confronted the appreciation of each. The reactionaries will curl the cynical lip of doubt and will drag out all the old bogies of distrust and animosity. Of course, with no impulsion but doubt and distrust, neither this nor any other new spirit will go. What is needed is the pouring forth of the same flood of fresh courage and confidence which made our armies in France invincible, the union of all officers whose spirit says—"Can do!"—and—"Let's go!"

Get Together!

EVERY year, the boys from one end of the country to the other, prep. school boys, high school boys, college boys, get together and furnish their elders with an illuminating example in good citizenship and concerted effort for the common good.

They turn out by hundreds for the serious business of football—which, by the way, is a wonderful game, typifying vividly many things which all of us, statesmen, professional men, Army men, business men, and average citizens, might study with profit to the country and to ourselves. In each school they turn out voluntarily in bunches to work for places on the team. Under the sweater of each is a budding ambition, the hope of making this or that place on the varsity team.

For weeks they undergo the gruelling monotony of training, gladly, eagerly doing their level best to make good. Finally things begin to take shape and, from the bunch of aspirants, a team emerges. For every successful contestant there are half a dozen disappointed youngsters who must content themselves with the comparative background of the scrubs or who, perhaps, have to retire from the game. Some way they manage to drown their disappointment in their hopes for the team. They know that there can be only one centre, one quarter, one captain, two halves, two ends, and so on, and that's all there is to it.

When the team gets down to business, everybody turns to and roots for it. The team has a mission—it must uphold the honor of the school. Nothing but perfect teamwork, in the varsity, in the scrubs, and on the bleachers, can make a winning team. The season begins. There are plenty of hard knocks, plenty of disappointments, individual and collective. Players pull boneheads and lose their places. The management sags and has to be bolstered up. Old fellows are called back and do what they can to patch up weak spots, and in one way or another the team pulls through the season. Comes the period of reckoning when everybody, management, teams, rooters, all sit down to figure out some good reason for being proud of the team's showing, some good excuse for each failure. As a rule,

when they talk over the season's work, they dwell on their successes—not their failures. They invariably end each discussion with a resolve to do better next season.

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Some years ago, the Army slipped quietly over into the field of sport and appropriated from the youngsters a word, a fine, virile word, and incorporated it in the military vocabulary. That word was Teamwork. In the operation, they overlooked one thing—in their haste to appropriate the word, they failed to take the spirit along with it. They have cherished that word in the Army, have conjured with it, have had great hopes for it, but all to little purpose, because the spirit of the word is the whole essence.

What is that spirit?

Briefly, it is getting together, spiritually as well as physically, getting down to heart-breaking, shoulder-to-shoulder, self-sacrificing effort for the common good, effort in which the individual is glad to lose his identity in the team of which he forms a part.

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We had a war. We were not ready for it. Who was to blame for that is beside the question. We were up against it. We had to get down to business, throw together some sort of a fighting force and do the best we could. In throwing together this force everybody who could do so took a hand. Some of those who took part in the operation knew quite a little about the job; some knew a little; some knew nothing whatever, but were willing to learn.

The result? We got together an army of sorts, a team which required a lot of careful nursing, a lot of pushing and pulling and hauling, but which in the end accomplished our purpose—not economically nor in workman-like fashion, but substantially. We may as well admit that we muddled, but we muddled through, which was as much as anyone had a right to hope for.

The Regular Army, the National Guard, and a good part of the country at large had a hand in the job. What part each

played is neither here nor there. Each undoubtedly did his best according to his lights. A great many of each made good, did wonders considering the circumstances. Some of each were rank failures, which was not surprising, since we humans fail in everything about as often as we succeed and, after all, war is only one kind of business. Statistics would probably show that the percentage of failure throughout was about even.

Now, in reviewing the season's work, do we thank our lucky stars that we got off as easily as we did? Do we congratulate the country and ourselves that we did no worse in the face of our handicaps? Do we decide to let bygones be bygones and resolve to profit in future by our obvious mistakes?

It does not appear that we do.

Congratulations are drowned in the sound of knocking, knocking from all sides, among the members of the team, from among the old-timers and the new-comers alike, from the bleachers and from the bystanders. Instead of getting together and trying to hearten up things a little with a view to doing better in the future, the team is splitting up into bunches and passing the blame. And the rooters and the bystanders—without knowing much about the game except the spectacular part—are finding fault with this or that player, criticizing the running of the team in general, pointing out where mistakes were made, and how, and by whom and how it should have been done, and so on down through the whole gamut of hostile criticism.

And nobody appears to be giving a thought to next season.

Of course, the fault lies with the players. They bungled because they had never had a chance at team play. They had no chance at team play because we had no team. We had no team because no one took any particular interest in getting up one. And that's the crux of the matter.

We are all grown-up men. Let's get together and play the game the way the boys do—but don't let them know it and have the laugh on us.

Roll of Honor

PRO PATRIÂ

HUTTER.—Died, January 16, 1919, Second Lieutenant Harold Hames Hutter (of Warren, Pennsylvania), Field Artillery Officers' Reserve Corps.

HINES.—Died, of hepatitis, acute, at Hot Springs, Arkansas, August 22, 1919, First Lieutenant John T. Hines, Field Artillery.

BRYSON.—Died, result of gunshot wound, at Camp Jackson, South Carolina, October 10, 1919, Major Harold L. Bryson, Field Artillery

BOOK REVIEWS

MANUAL OF MILITARY TRAINING. By Edward S. Farrow, late Assistant Instructor of Tactics at the United States Military Academy, West Point, New York. Author of "Farrow's Military Encyclopedia," "American Small Arms," "Farrow's Dictionary of Military Terms, Riots and Riot Duty," Etc. Published by the Scientific American Publishing Co., New York City. 1034 pages, illustrated, printed on Bible paper, and bound in flexible fabrikoid, pocketbook style $4\frac{1}{4}$ × 7 inches. Price $4.00; by mail $4.10.

This book may best be described as a military "Trautwine," which publication is too well known to require further comment. It is a compilation of extracts from a number of service manuals, together with a considerable amount of other valuable military information. In the closing paragraph of his preface the author states:

"I have endeavored to cover the whole field of military knowledge and action in the great final war, marking the passage from the Fourth to the Fifth (and last) of the World's great Empires. I have recorded recognized rules and methods of instruction, and acknowledge with sincere thanks assistance of Government officials and the use of the libraries of the War Department, War College, and Army Service Schools."

The book is recommended as a ready reference to the Military Service, Military Schools, Military Writers, Student Members of the Reserve Officers' Corps, and College Reserve Officers' Training Corps.

THE CADENCE SYSTEM OF CLOSE ORDER DRILL. By Lieutenant Colonel Bernard Lentz, General Staff, U. S. Army. The George Banta Publishing Company, Menasha, Wisconsin, 1919.

The method described in this handy volume is intended, as the author states in his Foreword, "to be a means to an end—the end sought being perfect close order drill."

We have heard the method highly praised by those who have had occasion to use it.

The book is copiously illustrated with plates explaining the different commands, and contains, in addition, an appendix of paragraphs in the Infantry Drill Regulations which concern close order drill.

Index to Current Field Artillery Literature

Compiled from monthly list of military information carded from books, periodicals and other sources furnished by the War College Division, General Staff.

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France.—Ministère de la guerre. "Drill Regulations for Anti-Aircraft Cannon Automobile Mount." Paris, Impr. Nationale, 1917. 119 p. UF 408. F 8.A 33-a.