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**No. 4**

Goodbye, Old Man!

# THE FIELD ARTILLERY JOURNAL

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## THE FIELD ARTILLERY SONG

**"The Caissons"**

BY MAJOR EDMUND L. GRUBER, F.A.

OVER hill, over dale, we have hit the dusty trail, And those caissons go rolling along.
"Countermarch, Right about," hear those wagon soldiers shout, While those caissons go rolling along.

CHORUS

For it's Hi-yi-yee! In the Field Artillery,
Let us call off our numbers loud and strong
(Spoken: Call off!)
And where e'er we go, everybody shall know,
That those caissons are rolling along.
(Spoken: Keep 'em rolling!)
That those caissons are rolling along.

To the front, day and night, where the dough-boys dig and fight,
And those caissons go rolling along,
Our barrage will be there, fired on the rocket's flare,
While those caissons go rolling along.

With the cavalry, boot to boot, we will join in the pursuit,
And those caissons go rolling along,
Action front, at a trot; volley fire with shell and shot,
While those caissons go rolling along.

Should the foe penetrate, every gunner lies in wait,
And those caissons go rolling along.
Fire at will, lay 'em low, never stop for any foe,
While those caissons go rolling along.

But if fate me should call, and in action I should fall,
Keep those caissons a'rolling along.
Then in peace I'll abide when I take my final ride
On a caisson that's rolling along.

(After Last Chorus)

Bat'—try, Hal—t!

# THE WAR DEPARTMENT GENERAL STAFF

BY COLONEL C. D. HERRON. 1ST F.A.

NEXT to yelling "Kill the umpire," perhaps the most popular American sport is decrying our rulers, be they civil or military. The day when it was perfectly apparent to me that there ought to be a bounty on Colonels is well within my recollection! Recently the General Staff has been bitterly attacked. That it has come through the attack with its prestige undimmed and usefulness undiminished, is in no wise due to any aid that it has received from the Line of the Army.

It has seemed to me that this practical abandonment of the General Staff to its fate can only be due to a lack of comprehension of the fact that its members are our own people and that only through them are we effectively heard in the councils that decide our destinies. Of course staffs, like umpires, neither talk nor strike back and will always be popular targets of abuse, but that is not so serious as non-support in crises.

To arrive at a full comprehension of just what the General Staff means to the Line, one must understand that the members of the General Staff and the Chiefs of Branches are the War Department advisors of the Secretary of War. Prior to 1903, the Line was supposed to be heard through a so-called "Commanding General of the Army," assisted by an Adjutant-General and two aides. There was no General Staff and the really potent advisors of the Secretary of War were the chiefs of the *non*-combatant branches, whose interests naturally ran to property and paper work.

Each of these chiefs of the non-combatant branches reported directly to the Secretary of War and advised him concerning his own branch—and as much else as possible! The position of the Commanding General of the Army was peculiar—almost impossible. In theory, both the Secretary of War and the Commanding General commanded the Army. Of course, it is impossible for each of two men, one of whom is the immediate subordinate of the other, to command anything, least of all an Army. In practice, it was something like the story of the man and his wife who agreed that he should make the important decisions and she the unimportant ones. After many years he discovered that there seemed to be no important decisions!

Great names and great abilities these Commanding Generals of the Army brought to the office—Grant, Sherman, Sheridan, Schofield, Miles—names that epitomize a titanic struggle for the

existence of a great republic, but only one of them, General Schofield, ever evolved any practicable scheme for the conduct of his office and he, to use his own words, abandoned "all pretense of being the commanding general" and contented himself "with acting as the Chief of Staff of the Army." General Sherman became so disgusted with the futility of his office that he withdrew to St. Louis and remained there until his retirement. The result of the system was that the Secretary, needing advice, usually took it from the most astute and influential of the chiefs of the non-combatant branches and the power came to reside in this unofficial "kitchen cabinet"—power without responsibility—a sinister and demoralizing thing, but not without precedent in the City of Intrigue and of Whispering.

In 1898 the Spanish War came on. American soldiers went to Cuba and "caught the Spaniards with their bare hands," while the War Department crept and creaked and groaned in every joint. The pathetic mismanagement during and after the war is a matter of history. Public clamor fixed upon the Secretary of War as the guilty party and he was consigned to the outer darkness. As a matter of fact, though he himself may not have realized it, no man, however great, could have steered and controlled the Army in war with the inadequate steering gear that the War Department then afforded.

In 1899, the God of War took the little American Army upon his knees and sent to the War Department a great man, Mr. Elihu Root, the possessor of an intellect that illumines every problem upon which it shines. He saw the impossible position of the Commanding General of the Army. He saw that except for the futile struggles of the Commanding General, the fighting branches were practically without representation in the War Department councils. He saw that in an army whose only excuse for being was the waging of war, no one had the specific duty of the preparation of war plans. He saw that the giving of advice and the rendering of professional assistance to the civilian Secretary of War was a duty of great importance; that this advice and aid should be a prescribed and regulated and safe-guarded duty of highly trained officers, and that the informal, unregulated and unresponsible giving of advice must be eliminated.

His solution was embodied in the General Staff legislation of 1903, abolishing the office of Commanding General of the Army and establishing the General Staff. The revolutionary idea in this General Staff was that the principal advisors of the head of a fighting army should be fighting men. The General Staff, as established by Mr. Root, and modified by General Pershing after the World War, consists of six generals and eighty-eight other officers from the line of the Regular Army, the National Guard and the Organized

Reserve, to whom are added not more than two representatives from each of the non-combatant branches. After a term of not more than four years all return to their organizations.

An officer of the line arrives at the War Department General Staff only after a long period of arduous labor, training, and selection, beginning with his garrison schools, and leading through the special schools of his arm, and the Command and Staff School at Fort Leavenworth, to the Army War College. If his record from the day of his entry into the Service, in these schools and with his commands, has been of high character, and he is thought to possess the many requisites of a good staff officer, he may then be selected for the War Department General Staff.

In the garrison and special schools, a young officer attains proficiency in *his own* branch of the service; at Fort Leavenworth his horizon widens to include combat of the combined arms, with the attendant staff work; at the War College, there is further enlargement to include the strategy of armies and of nations. Each year perhaps four hundred young officers begin with the garrison schools their long course of training; about twenty years later, fifty survivors issue from the War College and from the fifty, about twenty-five will be chosen for the War Department General Staff.

As a matter of fact, the training in all these schools is primarily for command, and general staff training comes second. A general staff officer is a General's Assistant and both must necessarily have much the same training. It is not for a place in the white light that beats about a throne that the average line officer covets a detail on the War Department General Staff. It is that he may be assured of War Department approval of his long effort to make of himself a highly qualified officer and that he may infer progress on the way to his real goal—the command of combat troops in war.

The duties of the War Department General Staff, as prescribed by law, are to prepare plans for national defense and to "render professional aid and assistance to the Secretary of War." The making of war plans goes on quietly and steadily and occasions little comment or controversy. The real controversy in regard to the General Staff arises from the "professional aid and assistance" part of their duties. No one is so poor as a man who has once had money and lost it, and it is not to be wondered at that those who have lost power through Mr. Root's and General Pershing's new system should resent the loss and deplore the change.

The General Staff was not created to run the Army, nor does it do so. That involves giving orders. While the Secretary of War has decentralized to the extent of giving to the Chief of Staff, the Deputy Chief of Staff and the five heads of the five divisions of the General Staff the power to make decisions along certain definite

lines, no other officer of the General Staff has any power beyond that of investigation, planning and recommendation. His recommendations are presented in writing and remain of record, to arise again against him should his advice be bad. He presents with his opinion an epitome, not only of the facts involved, but of the opinions of all the responsible authorities. A General Staff Officer is not supposed to be a technicist. He is supposed to bring to the problem involved the point of view of a commander of troops. He is specifically charged with obtaining and presenting in all technical matters the point of view of those who are charged with technical knowledge, for instance, the bureau chiefs.

Young men of the fighting troops whose new schemes to enhance the national defense—and possibly themselves—happen to be rejected, naturally feel that their plans must have been poorly presented, or the Secretary surely would have approved and not rejected! Some of the more vocal make known their pain so vigorously and loudly that kind-hearted and nervous people become sincerely disturbed as to the state of the Army.

Sometimes a bureau chief believes that his finest and most scientific plans have been mutilated and wrecked at the hands of young officers of the General Staff who had better be back with their troops, batteries or companies. Perhaps the bureau chief is right, but he always has the right of appeal to the Secretary, and it is safe to say that no bureau chief is ever refused a personal hearing on any subject. And it is the incurable affliction of all staff departments that their efforts must be bent to the successful waging of war, and that coördination will be by some "fit leader of a brutal and licentious soldiery." The General Staff Officer of the War Department today is the Commander in the war of tomorrow.

If coördination and supervision amounted to nothing more than keeping the many sub-divisions of the War Department from getting in each other's way and stepping on each other's toes, an enormous amount of labor would still be involved. But it amounts to much more than that. Within any organization there are conflicting interests and ideas, and when the conflict is between important chiefs, it must be investigated and threshed out with the greatest care.

Chiefs of bureaus sometimes recommend that their particular bureaus be exempted from coördination by the General Staff. The practical result of such a move would be that the inevitable coördination for that bureau must be attempted personally by the Secretary of War. But no Secretary has the time or the strength to add such a task to his already heavy duties and the practical result would be to free that bureau from all coördination. It would be just as practicable for Mr. Ford to reserve for his own personal management

some vital part of his great factory, leaving the rest under the factory executive. Great is Mr. Ford, but the production of flivvers would soon fall off.

It is to be noted that eligibility to the War Department General Staff is strictly regulated by an Act of Congress of 1920, which states that "no officer of the General Staff Corps, except the Chief of Staff, shall be assigned as a member of the War Department General Staff, unless he is a graduate of the General Staff College or his name is borne on the initial eligible list." The "initial eligible list" was a list of those who had qualified for General Staff duty prior to 1920 and included about 300 names. What was then the General Staff College is now the Army War College.

Certain branches have qualified relatively few officers for War Department General Staff duty. For instance, on January 1, 1925, out of about 400 officers qualified for the War Department General Staff, the Air Service had qualified only eight. This led to the Air Board's recommendation that General Staff requirements be relaxed for the present in favor of the Air Service. With the consent of Congress, this can be done, but legislation is powerless to qualify for General Staff duty an officer who knows one branch only of the fighting forces, no matter how competent he be in that one branch. An Army is necessarily divided into branches or arms—Infantry, Cavalry, Field Artillery, Air Service, etc. Officers are usually as partisan to their own arm as most people are to their own countries, and those who know only one arm are necessarily so. But this partisanship is just as much a handicap to General Staff duty as is Nationalism to the League of Nations. Through the general schools where all branches work together, this partisanship is eliminated or reduced in favor of the General Staff point of view.

No soldier regards a military organization as a democracy, or as anything else than a one-man command. No one can have responsibility without command. And the man who is held responsible for the Army by the Commander-in-Chief of the Army and the Navy, is a civilian—the Secretary of War. The machinery through which he controls and commands is the General Staff. The army is a great and ponderous instrument, but its steering gear is adequate. If the Secretary does not control, he has only himself to blame. The control of the military by the civil is the very foundation stone of the education of a General Staff Officer and he is never so ignorant as to believe that an efficient military machine can be run by a staff. Immemorable experience has proven that one Will must control an Army.

The requisites for a civilian head of the Army are: courage, intelligence, fair dealing and open mindedness. (The courage is for use in dealing with the politicians—not the General Staff!) In

obtaining men of these qualifications the Army has been singularly fortunate. From Mr. Root onward, all of the War Secretaries have been men of exceptional ability, and a number of them really great men. No other department of the Government, not even the State Department, has been so fortunate. The Great War brought a great war Secretary—Mr. Newton D. Baker.

It has been intimated that the General Staff may hoodwink or even dominate the Secretary. Fortunately, we have had no Secretaries of War who could be so hoodwinked or dominated, even if officers so disloyal and foolish as to try ever reached the General Staff. I think that no Secretary of War has ever failed to pay tribute to the loyalty and devotion of the General Staff officers with whom he was associated.

The General Staff makes mistakes. In its earlier years, uncertain as to its real domain, it was often diverted to trifling projects. In 1917, when the Great War came on, many officers were detailed to the General Staff from the Army and from civil life who had no conception of general staff duties, and no way to find out what these duties were. Young men of the supply bureaus were detailed into the General Staff and immediately felt themselves called upon to take over functions wisely and properly entrusted by law and regulation to the chiefs of those branches. The rage of the bureau chiefs was real and often justified.

The political ineptitude of General Staff members is just what is to be expected of men chosen primarily for their soldierly qualifications and between 1903 and 1917 its enemies in the War Department and in Congress prevailed and successfully abridged its powers. In 1912 the wings of the General Staff were clipped by Congress and in 1917 nothing but the outbreak of war saved its few remaining tail feathers from further legislative plucking. But the war demonstrated the absolute necessity of a strong general staff and so it soon became in fact and so it still remains.

The General Staff has, now and always will, have bitter enemies in the Army and in Congress. Strong and ambitious men usually believe themselves to be in the right, and do not remain passive in the face of obstacles. Officers of the Line who think that some one weapon or arm will win the war; bureau chiefs who feel that money and property are after all of paramount importance; members of the military committees who believe that they have been designated by Congress to run the Army—all these feel that the Secretary might be a bit more amenable if the General Staff were out of the way.

In the winters from 1914 to 1918, when the wind was bitter and the future dark, men jested at death itself to drive back sinister doubts that lurked in every shadow. A jest that made the rounds each winter was the tale of the German general order that promised

to any soldier who killed an allied soldier, a week's furlough; to one who killed an officer, a month's furlough; but to him who killed an allied general staff officer, execution at dawn!

The war is over, but the wind can still blow bitter and the future of the army is sometimes dark.

When we go to duty in a city on National Guard or Reserve duty and try to figure out how to live on twice our salary, or in a post where the rain beats through the paper roof of a squalid shack and ruins our few personal possessions, we still jest at those who are probably our betters. The General Staff gets about as much shrift from the crowd as does a great ball player who has an off day in his home town. But we know in our hearts that most of our troubles are in spite of the General Staff and not on account of it, and that a General Staff is a necessity for war and for peace.

We do not want a General Staff that is swayed by every wind of doctrine that blows in at the open door, or is unsettled by our military patent medicine men or loud speakers. There are too many of both kinds. Of course, this means a conservative General Staff and no conservative institution is popular in these modern days and times. But the best opinion in the Army is that its General Staff is neither reactionary nor radical and that when the time again comes that nations decide to continue their policies by force of arms, our General Staff will again justify the confidence of the Army and the Country. In the meantime, the War Department General Staff, together with the Chiefs of the Combatant Branches, is the representative of the Line in the War Department and as such, is entitled to the full support of us all.

# FORAGE AND FORAGE INSPECTION

BY LIEUTENANT-COLONEL WILLIAM K. MOORE, 76TH P.A.

THIS subject will be discussed in this paper from the point of view of the artilleryman. A more technical thesis would involve the details of War Department specifications and the functions of the purchasing quartermaster and his agents which are not necessary here.

All authorities agree that the standard forage ration for horses which has no peer is good timothy hay and oats. But the military man and his horse must in innumerable cases make the best of what he can get, which may be oats in an oat-growing community, barley at another place or *palay*—unthrashed rice—in the Philippines. It is my purpose here to show what can be safely used when occasion demands.

The hay component of the forage ration is known among horsemen in different localities by various terms, such as long forage, roughage, fodder, and hay.

No animal will do hard work for a prolonged period unless given a ration of the right kind of food in such quantities as to make approximately what is termed a balanced ration. This question must always be carefully considered. No article of hay or grain is by itself a balanced ration. Good first-class alfalfa with a fine stem comes the nearest to filling the bill among hay products, and among the grains, oats weighing about thirty pounds to the bushel is best. A balanced ration must have a certain proportion of the proper chemical elements present in a digestible form combined with proper amount of bulk. Certain other elements, called "vitamines," must also be present if the animal is to be kept in good health and condition.

Recent researches have determined the presence of vitamines to a large extent in green grass and well cured, good quality hay. Poor hay, badly cured or poorly kept, has fewer, if any, of these elements. Hence it is always desirable to give the horse some green food when possible.

Experiments and experience have shown that the balanced ration for a horse consists of from a 1:5 to a 1:10 ratio of protein to fats, starches, and sugars. This is called the "nitrogenous ratio."

The horse's digestive system is so constituted that for proper functioning the presence of bulk in his food is essential. Tests have shown that withdrawing all roughage from his ration causes him to lose his appetite and in from four to ten days he refuses to

eat grain, even though fed on good oats with their straw-like hulls. The horse can live on hay alone, but he cannot do fast, hard work for any length of time on a strictly hay diet, regardless of the quality. A good rule, which has been proved by experience, is to feed a hard-working horse one pound of grain and one pound of hay per day for each one hundred pounds of his weight. If his work is reduced, one should diminish the amount of grain in proportion to the reduction, until the limit of one-half pound per each one hundred pounds of the horse's weight is reached.

However, these rules are to be taken as a guide only, being in no sense iron clad. The experienced horseman can judge by the appearance and actions of his animal what amounts to feed and what special care each individual animal needs. The various conditions found in field service must be met by the soldier in the most practical manner. He should know his horse's small stomach limits the amount which may be given at one feeding, hence he must apply the rule to feed often and in small quantities at a time. He knows his horse will eat many different kinds of grain and hay, but these must be fed with intelligence, as there is an element of danger in making too many changes in the horse's diet.

**GRAIN**

The animal does well on a grain ration of either oats, Indian corn, barley, kaffi corn, wheat, *palay*, or possibly other grains. However, he must become accustomed to the grain, as a sudden change, say from oats to barley, is liable to cause colic or, if the amount of grain fed is not closely watched, founder may follow. Any of these grains will give good results if the change from one to the other is made gradually. Often mixing the grains is a good scheme. If this cannot be done, one should give a half feed of the new grain for a few days, then gradually increase the amount of the new grain and diminish the other until a full ration of new grain is fed at the end of about a two-weeks period. Hard grains, like flint varieties of Indian corn, wheat, and barley must be crushed or cracked, or, if this is not possible, soaked for a period of twelve hours before feeding. The horse's teeth will not crack these grains, hence, he cannot digest them.

All grain must be fresh and free from mould, mustiness, or any evidence of fermentation. These can always be detected by their smell. The quality of the grain can be judged by its weight. Each state has a standard that grains should weigh in a measured bushel. The average for oats is thirty-two pounds per bushel, shelled corn fifty-six pounds, and wheat sixty pounds. Knowing these,

simply weighing a carefully measured quantity gives us a good idea of the quality of the grain. Of course, one must make allowances for the moisture content due to the season of the year, or any foreign matter that may be in the grain. A safe rule is one that requires the grain to be perfectly dry with a small per cent. of foreign matter, such as weed seeds, chaff, or other objectionable or worthless matter, having no musty or muddy smell, and with a weight close to the legal standard.

### HAY

The hay or roughage component of the horse ration in many ways gives the most difficult problems to solve. In the field it is a most bulky item of freight and so many times when it is needed it is not on hand. At such times the officer's ingenuity and knowledge of what may be fed and when to feed it comes to the foreground if proper training methods have been followed. In the field and on practice marches every line officer may expect to be called upon to purchase or requisition his hay requirements from local sources. Hence, it is necessary for him to have a rather comprehensive knowledge of the subject.

Hay is now one of the major field crops of the United States. In many states it is the leading crop in total farm value. Notwithstanding its ranking position, it has received less attention with respect to standardization of the product and marketing methods than other crops of major importance, such as corn, wheat, oats, etc.

The hay markets of the United States are now beginning to recognize uniform standards of quality or grades for many of the hay crops. Such terms as No. 1 timothy or alfalfa are familiar to many people, but the meaning of the term is clear to few. They do not mean at all the same thing in the Kansas City hay market that they might in the Texas or New York market. This accounts, in a measure, for the great difference in the quality of hay furnished us at different posts throughout the country, even though it is presumably supplied under War Department specifications. The National Hay Association and other trade and state organizations have been making great progress of late in the line of getting uniform regulations on this subject.

The problem of measuring hay quality is by no means simple in solution. No mechanical means or methods can be adopted such as are employed in the grain trade. It is a subject which must be learned and understood by the inspector, that is, he must know what the characteristics of good hay are.

The Bureau of Agricultural Economics, United States Department of Agriculture, has made detailed investigations with respect

to color and foreign material as hay-grading factors and also other factors effecting the quality of good hay. These have been put in such form that anyone interested can learn just what the requirements are for good hay. These "United States Grades" for hay have been adopted by most of the big hay merchants throughout the United States. They are also being used by the War Department and bid fair to become the recognized standard. At any rate, anyone having a good working knowledge of them cannot go wrong in passing on any sample of hay brought before him.

To become versed in the various qualities of different grades of hay one must become observant of the following:

Color.

Texture.

Odor.

Foreign material.

The element of color is one of the most important in determining the quality of hay.

(*a*) The choice grade should show samples of seventy per cent. green and not exceeding five per cent. foreign material.

(*b*) The second grade should show samples of fifty per cent. green to greenish-brown with not more than ten per cent. foreign material.

(*c*) The third grade should show all samples of thirty per cent. green and greenish-brown to brown with not more than fifteen per cent. foreign material.

(*d*) Lastly, the fourth grade, which should be the lowest allowed under ordinary peace-time conditions for government animals, and then in emergencies only, may have less than thirty per cent. green, and if clover the color may be a dark brown and it must not have more than twenty per cent. of foreign material. In general, good hay varies from green to greenish or light brown, it must not be yellow or the stems spotted by blight.

*Texture*.—By this term is meant the condition of the hay as to coarseness and leafiness of the stems. If the leaves and finer parts of the hay are shattered off and only the hard and coarse stems left, the hay should be condemned. The feel when handled should be crisp and firm and not too woody. The grass and grain varieties of hay should be between flower and seed and well grown specimens of the plant when harvested.

*Odor*.—Good hay must have no taint of musty or mouldy smell. It should have a clean sweet odor varying somewhat as the hay becomes older and also depending on the plant from which the hay is produced.

*Foreign Material*.—These items are in general such obnoxious

plants as weeds, wild barley, fox tail, sand burrs and various plants which are injurious to horses when fed in large quantities.

In general, any hay or fodder which contains over twenty per cent. foreign matter or any injurious foreign material, or which has an objectionable odor, is heating, wet, mouldy, musty or caked, should be rejected.

It is believed that the above specifications, which have been made as brief and concise as is deemed advisable, may be used as a safe guide in deciding on the practicability of using any forage ration which may be offered under field conditions.

# RECOLLECTIONS OF CAMOUFLAGE

BY LIEUTENANT BURTON HARRISON. SPEC.-RES.

A FLEA-BITTEN mule from Missouri and a well-meaning engineer captain are the principle actors in my anecdotal recollections of camouflage during the war; they are, we might say, landmarks of disillusionment.

It was February, 1918. Battery A, 103rd Field Artillery, was going in. The survivors of the carrot soup era were insinuating themselves with strange inoffensiveness into the Chemin des Dames sector, gratefully proceeding under the protection of one of those pitch-black nights, out of which solemn and disconsolate ruins successively loomed up and receded. In this land of the dark unknown, the musical grinding of the heavily laden park wagons and guns was the sole comfort to senses, assailed otherwise by the dank smells of desolation.

We awoke next morning amid the chaos usually arising out of night encampments to find ourselves in the fifteen-house village of Bucy-le-long, snuggled close to the lee side of the plateau north of Soissons, over which Nivelle had the year before vainly pursued elusive victory. The firing battery was the same day cozily emplaced at Banc Pierre while the echelon took up the routine of the horse lines.

The interrupting and menacing growl of the Paris-raiding Gothas was the main invasion of otherwise peaceful days in which the recreations of the agricultural village were fully enjoyed, until the Gothas began to infringe on one's peace of mind more and more. Just as small boys, turning a bend in a dark cave listened, with whistling courage, to the growls of unseen animals, so we listened to the gentlemen riding on high and speculated on ways and means of escaping unwelcome attention. When one petulant pilot let loose a "torpille" on Crouy, a nearby town, our speculations became active investigations of suitable and quickly attainable abris and our efforts turned towards more effective concealment, in the course of which effort we covered one fifty-foot stretch of trench with some salvaged chicken wire camouflage netting (though, to be honest, the real purpose was to avoid lugging the clumsy roll out of the Chateau grounds which served for our horse lines).

Here enters the mule from Missouri (from left back stage) who examined the apparently succulent green strip with the calculating eye so well developed in Missouri mules. For once green grass was not only *not* green grass, but it likewise gave way beneath in a most

distressing manner, precipitating the mule from Missouri into the trench, whence twelve sweating and profane soldiers finally extricated him after several hours' hard labor. This concrete example of what camouflage could do to such a wise American mule, determined then and there in our minds that we had found one capable weapon for foxing the gentlemen from Berlin and suburbs.

Another day and another picture. Disillusionment for ourselves. The mule having long since passed away. A hot day close by the Ferme de Paris in July. Ammunition trucks scurrying rearward with immense loads and, perversely enough, scurrying right back with the same loads. German spies, talk of resistance at B-B′ line, and a growing, rumbling roar along our right flank.

A sixth sense warned us that, however noncommittal Regimental Headquarters, we were about to engage in something not altogether conducive to staid and stable warfare. And in the midst of this confusion of action and mind arrived an engineer officer, very newly commissioned, and very full of theory about camouflage.

It is but a waste of effort to report the charting and the planning and the gathering together of material which preceded the construction of two folding trees which were to embellish the perfectly effective camouflage system left us by "A" of the 17th.

Suffice to say that the trees were put up, blown to Kingdom Come within an hour, while the hectic, jerky march toward the Rhine commenced and the engineer artist disappeared never to be seen again.

Now this may be rather unfair to the engineer officer. Probably is unfair, but then the times and circumstances were not such as to lend themselves to reflective laboratory experiment—and the quite unscientific gunners probably meant to blow the trees down to avoid the additional labor of hooking and unhooking them. I am merely reflecting their attitude and not attempting to pass judgment.

I have just selected these two highlights to indicate that we readily accepted this new accessory to modern warfare, but that we were impatient with what then seemed to us unnecessary stagecraft where other and more simple means were getting results. There is some merit in repeating that soldiers in the artillery and in the confusion of action will seldom submit to or accept complicated measures to get a result which can be just as readily obtained by a simple method. And there, I think, is where the latest Training Regulations on camouflage are very practical and sensible recognition of actualities, particularly in view of the fact that the majority of artillery positions are very liable to be temporary.

For example, Battery A, out of a total of twenty-two positions occupied from February, 1918, to November, 1918, took up but three positions in which fish nets had to be used, relied on woods, shrubs, bushes, etc., for fourteen positions, occupied but three "permanent" positions and used no camouflage in two positions.

Most of our instruction in camouflage being based on the assumption that trench warfare was to continue forever, we were forced to improvise and work out rule-of-thumb methods when the war of movement began. I fear that those who expected intricate and mysterious performances were disappointed. The rules for each position were: Find cover, do it quick, and camouflage in the obvious way. Cannoneers in action quickly enough caught the idea, and it needed only a reminder most of the time for them to camouflage the position correctly and quickly.

Usually we would take a position where there was little enough to be done, thanks to the battery commander, Harold Barker, bend over a few saplings with fish net guy ropes, take care of potential flash marks, check up a reserve position, and keep a critical eye on the advance picket line and drivers who were the worst offenders in any phase of camouflage. It seems to be just as instinctive for drivers to disregard camouflage and camouflage discipline as it is for cannoneers to observe these things. I recall that there was almost constant warfare going on between drivers and cannoneers on the point of camouflage which is summed up in the expression of one disgusted cannoneer who hurled after a looping and mercury-like park wagon, "Aw you guys just want to get in and get out quick. To hell with how many tracks you make."

As to the fish nets, every artilleryman will be glad that these have been improved. The first occasion we ever had to use the fish net was on an advance piece at Ferme de Paris. We had placed the gun alongside a narrow tall hedge, firing across a road and were supposed to fire shortly. For the first time, we untangled the net and an unholy mix-up of guy ropes and poles, trying to follow the rule of "get cover and do it quick." How many who did this the first time, between dives into a trench to escape shrapnel bursts which looked close, found that the poles would not get the net above the top of the gun shield? We compromised on this occasion by building the hedge out far enough to encompass the gun and shortly after slashed the fish nets into more convenient sections to be used in conjunction with such aid as nature furnished.

The most unusual use of camouflage I saw reminded one of Shakespeare's Birnham Wood. The battery was crossing open fields to a position near Courpoil under observation. We were passing the second line, digging in, and were just about to hit the fields,

coming out from the shelter of a protecting fringe of woods when the column was halted and every cannoneer furnished with a large leafy bow which each carried in such a way as to effectively screen whatever was on the other side. I will never forget the looks on the faces of the 28th Division doughboys who were plying the trench shovels with enthusiasm as we passed. This stunt is, by the way, mentioned in Hevrey Allen's new book, "Towards the Flame."

We have all paid a great deal of attention to the protection of our own positions against hostile observation. It seems to me, from some experiences, it might be in point to say that assured control of the air by our own forces is one of the essentials of successful camouflage work. At least twice, camouflage was utterly useless because the battery went into position under observation of enemy planes. This was particularly true during the last few weeks of the war.

With any sufficiently large introduction of artillery into a sector would it not be well to demand thorough protection from our own air forces, at least until it is possible to satisfactorily camouflage the positions?

I have nowhere seen described the duties of the field camouflage man attached to a battery. Certainly camouflage is sufficiently important to deserve the inclusion of a specialist thoroughly instructed as a part of the special detail. This noncommissioned officer would serve to insure continual attention being paid to camouflage and camouflage discipline.

In refreshing my memory for this paper, I had occasion to read over some notes which were written and collated following the Armistice. The notes include some things which would have been better omitted. I am merely submitting them for the purpose of showing that the new Training Regulations and the natural selection of camouflage practices under active war conditions coincide. Here are the notes:

The principal materials used in the formation of artillery cover are burlap, raffia, and canvas, attached to either chicken-wire rolls or cord nets. Raffia and burlap can be used interchangeably. The former is better adapted to the open field, while the latter finds its best location in woods. The nets are usually erected for temporary use and carried on the gun trail. The permanent work is done with chicken-wire rolls, placed over framework, erected to follow the contours of the terrain, and pieced together so as to form a continuous design.

The practical erection work is the least interesting in camouflage and involves much hard labor. A site is first picked by an artillery

officer who more often chooses his position for flash defilade than for the overhead defilade or camouflage. The site is then plotted, and a position designed. With the plotted design, the camouflage officer views the chosen site with a particular eye to field lines and contour. Field lines are made by the plowing and consequent mounding of the soil for drainage. On aerial photographs, such fields appear as gray rectangles outlined in black. He also views closely the surrounding foliage and herbage, sometimes sketching them in water color. The drawing is then turned over to the men in the rear, who run the camouflage factory. With the drawing is a complete description of the country, contours, location of surrounding woods, colors of the grass, earth, and rock, relation of the position to East and West, and even such details as the height of grass and nature of the weather. All these play an important part in the production of the final finished design. The camouflage factory is then responsible for the selection of the best material to conform with furnished information; for example, the selection of raffia for a position to be located in tall, brownish grasses. Tall grass throws a deep shadow and photographs an absolute black. Thinly strung raffia produces the same result, at the same time satisfying the eye.

Meanwhile, the field men, as the camouflage men who work on the front are called, commence work on the foundation. Posts, usually six feet in height, are staked around the position and at intervals within. Heavy, malleable wire is then run across the top of the stakes and stretched tight enough to hum when touched. The tight wiring is necessary in order to prevent sagging, which destroys the entire value of a flat top, giving the appearance of a depression where in reality exists a mound or level ground. This work completed, the position is covered by the battery, usually at night under the direction of a camouflage man. Each roll is numbered consecutively and put on separately, forming a complete design. The rolls are for the moment joined loosely, and later tied at one-foot intervals, the work of tying and stretching being completed beneath the camouflage. The construction of the position proper, gun-pits and dugouts is then carried on, care being taken to conceal all debris. As a rule, the cover is made sufficiently large to hide all the debris and dirt resulting from the construction work. For every position thus made there is another made in reserve near by. These are but a foot or two above ground, and when it becomes necessary to use the reserve position, it is only the matter of a few hours to raise it to the required height. For some obscure reason, these are called "gas positions." The position covered and completed, doors or embrasures are installed, which are kept closed except when the guns are firing. The majority of embrasures are swinging, sliding, or counterbalanced.

In some cases, as in guns with a high angle of fire, the embrasures form a part of the roof work.

Camouflage is chiefly a defense against indirect observation or the photographic check by aeroplane. Consequently, it is necessary to know just what the camera detects and how it may be deceived into making a false record. A complete camera record is kept of the entire front, each sector being continually rephotographed day by day, and the resulting negatives being closely studied for the most minute changes. There are but two shades in a photograph, black and white, and all other tones being graduations. This considerably simplifies the problem of deceiving the camera. It remains only to produce the proper tones of black and white by the proper use of camouflage and to conform to the contours and field lines. This being done, a position is safe from detection.

It will render the understanding clearer if the photographic tone values of the following things are remembered: Roads, paths and flash marks appear light gray, the more worn, the nearer white. Roads and wagon tracks made in soft earth appear as a series of black lines outlined in white. Water in shell-holes and the tops of extremely high objects are white. Water in large bodies, ponds, lakes, are deep black, there being no reflection. Tall grasses, wheat-fields, etc., are nearer black. Woods appear dappled, white, gray, and black, and are further determined by an outline shadow. Trenches, ditches and holes are black. Houses, barracks and piles of material appear outlined by their shadow. Hills, contours, etc., are plainly shown by graduated lights and shadows. The method by which camouflage is made to reproduce exactly the tone of the ground it covers, is known as "thinning out." Solid burlap or canvas would reflect white.

The remedy is found in slashing or cutting out pieces of the stock, thus allowing the sun's rays to pass through to the ground at these points. In this way, the number of rays that would reflect in such a way as to affect the sensitized plate of the camera are reduced. It follows that the more the camouflage is thinned out, the darker the shade reproduced on the plate. For nearly bare ground, camouflage is thinned but little; for tall, grassy locations, it is thinned considerably. Experience teaches the necessary amount of thinning out, but always the work is checked by "Before and after" photographs taken by Allied aviators at varying altitudes. Often one must thin a bit more here and add a little there. The East and West edges of the flat top are always thinned almost to bareness to obliterate the shadows cast by the sun in these directions. If this were neglected, the position would be outlined by a telltale shadow.

The French take care of the edges by making a gradual slope to the ground, thinning increasingly with the descent. The Americans combined the British and French systems, descent at the edge being treated by building successive steps on the same plane, each thinner than the preceding. This method has the advantage of maintaining the same plane throughout, reducing the possibility of detection by any shadow thrown by the slope. Ditches and creeks running through the position are imitated by cutting away all burlap from the wire, following the course of the ditch. A path may be continued over the position by running a solid canvas strip across the top.

Once a position is finished and turned over to a battery, its value will be soon lost if the strictest care is not exercised by the men around the position. Camouflage discipline now comes into play, and it is this that destroys whatever traces of affection the cannoneer may have for camouflage. The cannoneer must watch not only his own proper work, but also guard against the carelessness of the drivers, who seldom regard the simplest rules necessary for the preservation of the position. There are five vulnerable points in the camouflage defense—the formation of new paths, flash marks, the starring of a position, the misuse of established paths and roads, and the outlining of a position by wheel marks and paths. A number of new paths, all leading to a point detected in photographs, quickly give rise to suspicion, the area around that point being more carefully observed than it would be otherwise. Flash marks are caused by the flash of guns burning away the foliage and grass, leaving a bare spot. This may be corrected by a very low flat top or the application of twigs and brush. Should this be neglected, the photo will show four white spots, their regularity taken in conjunction with the converging paths, establishing beyond possibilities of doubt, the existence of a position. Starring a position is the forming of a target, with the position as a bull's-eye. This fault is committed mostly by inexperienced artillery units. It consists in forming paths from several outlying points of the compass to a centre, the position. The outlying points are, for example, a well, a canteen, a house, a village, or some place of attraction for the bored cannoneers, who soon form well-defined paths from these points to the position. The German Intelligence Service, of course, possessed a sufficient amount of gray matter to figure that paths do not run into the centre of an apparently harmless field. Often when the entrance to a position is not readily accessible from the road, the incoming caissons and ration wagons skirt the outer edges of the camouflage, thus outlining the position—another target. Roads joining two main branches may be made, even across lots, without

showing the exact location of the artillery positions on that road, unless the drivers, instead of continuing on by the position to the other main road for their return trip to the echelon, turn around at the position. Then portions of the road are used and worn down, while other parts are left to grow weeds. This misuse of cross-lot roads shows up distinctly in an aerial photograph.

Camouflage will endure the weather for approximately seven months, when it becomes necessary to either re-cover the position or spray the camouflage and patch, neither of which tasks is large.

In open warfare, nature furnishes the best camouflage in the form of woods and bushes. Photographic work is largely dispensed with, and observation is made for circulation only. The main duties of camouflage then consist in keeping circulation and formation of crowds to the minimum.

# BACK TO THE BATTLEFIELDS

BY FAIRFAX DOWNEY

"DO YOU know your way around the battlefields?" I inquired in my best French of the chauffeur of the 1492-model limousine.

He smiled faintly as Frenchmen will at my best French.

"Certainly, sir," he answered.

"Good! He speaks English," the wife exclaimed unkindly. "Now we'll understand something about this."

I said I would not need any information from him anyway and refused to be gloomed. A field artilleryman who is realizing his long-cherished dream of returning to the old shooting grounds, is in too roseate a haze to be bothered by minor disturbances.

Joseph, the ex-poilu chauffeur, and I agreed on a price and we rattled off through the old city of Verdun beneath an ancient castellated gate of oddly familiar appearance.

"From that gate," Joseph declaimed, "came the symbol of your American Engineer Corps."

"Good troops, the Engineers," I remarked generously. "On to Sommedieu, Joe."

Before very long we slid down into that little town. I glowed with recognition.

"Maybe I don't know these crossroads cold," I declared happily. "About eight years ago today lacking two months I brought the firing battery of 'B' of the 12th through here, going up on the line for the first time. Just that morning the Battery Commander had ordered, 'Lieutenant, you will ride back to Camp Cinq Freres and bring the guns up tonight as soon as it's dark. I'll be waiting here at the position.' Well, that night we swung right up this road here. Gosh, how it all comes back! The thudding of the horses' hoofs, the dull rumbling of the wheels of the guns and caissons, the cannoneers whispering on the limbre seats as if the Germans were just around the corner and the hearts of the whole outfit thumping away scandalous. Now it's no snap finding your way through a black night over several kilometres of road that you've only been over in the daytime, but we pushed ahead, me telling the lead drivers of the first piece to walk 'em out and loosening my automatic in its holster in case we might meet up with a spy. Well, we——"

I raved on and the wife listened with unusual patience to this more than twice-told tale. Here on the ground it was beginning to take on for her a certain reality it must have lacked before. When I got home, I would recommend that all under-credited veterans take their wives on a similar tour.

"*En avant!*" I encouraged Joseph who was commencing to look bored.

As we drove on, I virtually called features of the landscape by their first names. Shell holes which still gaped and dead trees still thrusting up to the sky their stark and shattered tops, gave my narrative its background as I fitted to the pace of the antique limousine the epic progress of Battery "B" to the front.

"Which way, sir?" Joseph's voice broke through. We had come to another crossroad.

For just a second I hesitated.

"To the right!" I trumpeted, giving an appropriate arm signal. "It was black as the ace of spades here that night. I pretty near lost my way right here."

To the right we went and my face grew blanker. There were plenty of shell holes, emplacements and dugouts to be seen, but none registered. Finally I called a halt. "That's our first position, I think," I announced and prepared to dismount.

"I wish you'd brought my boots," I said, regarding the mud. The wife awarded me a frozen silence.

I explored and returned muddily, admitting failure. I said I wished my maps had been packed and I received a dirty look.

Why dwell on the painful features of that afternoon? I recognized landmarks but not one of the outfit's old gun positions could I find. Considerable war had been fought around those parts after I had departed for other fields. And eight years had done some effacing in that terrain and in my memory. For Pete's sake, all ye who follow that trail take a pair of field glasses, the old coördinated maps and a plotting board! It will save much futile ranging. I never did go into fire for effect. At last we drove back in silence.

Back in Verdun, Joseph charged me one and a half times more than we had agreed. When I protested, he shrugged:

"But monsieur did not go where he said he was going to go."

Too true.

"Well, that cost money," the wife remarked, as our train pulled out for Paris. "And you didn't find where your battery was either, did you?"

"Perhaps," I said, "you'll have better luck tomorrow looking for that lingerie you want."

And she did.

# A STUDY OF THE COMPOSITION AND DUTIES OF THE FIELD ARTILLERY BATTALION STAFF

BY MAJOR S. LEROY IRWIN. F.A.

WITH the increasing complexity of modern warfare, together with the large size of units and the time and space factors in the tactical handling of troops, the necessity of staff assistance for commanders of all units becomes obvious.

In the case of the battalion of field artillery, not only its size, but the difficulties involved in communication, the needs in fire direction, liaison with supported troops, and many other factors manifestly call for a staff of some size for the assistance of the battalion commander. In order to determine on a practical composition of that staff, and to outline an assignment of duties to its members, it is advisable to consider the various responsibilities of the battalion commander and the missions to be expected of the battalion staff. Based on the above requirements, a study will be made to determine the proper size of staff required to properly function under all conditions, with a discussion of a possible modification of, or at least a reallotment of duties to the staff as now prescribed in tables of organization. It is realized that these subjects are already covered in some detail in training regulations, but it is also felt that our present organization is in a state of flux, and always subject to such changes as may become vitally necessary, and this study is designed merely to determine, from a purely personal viewpoint, in what respects the present composition and assignment of duties of the Field Artillery Battalion Staff, could be changed to advantage.

During the period of active operations, the missions of the battalion, which may be the concern of the staff, include those enumerated as under normal peace conditions, together with the following, which do not fully cover all activities, but serve to illustrate the principal needs for assistance by the battalion commander.

### PREPARATION OF ORDERS

Presupposes a good knowledge of the technique of orders. Requires knowledge of the existing situation, both for hostile and friendly troops, and of the mission and plan of the higher commanders. Requires, also, a tactical decision to carry out the plan of the higher command, together with instructions for the execution, by the battalion, of this decision. It is obvious that, given all the

information requisite, a competent officer can make the necessary decision, but considering all situations, in the average, it is apparent that need for haste, inability to neglect the other important duties, and physical inability to attend to all details at once, will necessitate aid for the battalion commander in the preparation of orders, whether verbal or written.

### RECONNAISSANCE AND SELECTION OF POSITION

In the performance of this important function, requiring, as it does, continued absence from the organization for considerable periods, often at times when such absences interfere seriously with the proper performance of the battalion, there is obviously a great field for staff work, to assist the battalion commander. It is true that this particular mission is generally considered so important, and the battalion commander's responsibility so great, that it cannot properly be delegated. The responsibility can never be delegated, but it is also obviously true that the battalion commander cannot in person, and alone, always make this reconnaissance. Under his supervision, it can often be performed in an absolutely satisfactory manner by properly trained staff officers and provision must be made for such assistance in planning a staff.

### FIRE DIRECTION

This mission, whose importance is obvious, has never received the attention it deserves, and it is only recently that any practical methods have been formulated and studied. It is a matter for the personal attention of the battalion commander whenever it is possible, but he should have such assistance as will permit him to confine his attention to the progress of the action, selection of targets of the most immediate concern, and general technical supervision of the fire of his batteries. His staff should be prepared to assign the missions to available batteries, and also to know at any time, what batteries are available; to know such conditions of visibility and dead space as are necessary for proper selection of batteries for missions; to know the state of the ammunition supply at any time, and be ready to notify the battalion commander if his orders require an excessive expenditure of ammunition; to keep in touch with the supported infantry and their demands for assistance, and to employ such technical and topographical means as will render the best assistance to battery commanders in their delivery of the desired fires. It can be readily seen from the above that a staff must be carefully organized and trained for the performance of this mission, and that several officers will be needed for these duties.

### COMMUNICATIONS

Probably one of the most vital factors in the success or failure of field artillery in warfare, this is more a technical than a tactical matter. Requiring the most careful supervision in both installation and maintenance, this mission is obviously one for a field artillery man who has received additional special training. The battalion commander can be expected to give only such instructions and orders as will cover the results in communication that he desires, and the technical operations to carry out the orders given should be executed by the staff.

### LIAISON

This is another matter, about which there is considerable latitude in opinion. All field artillery men admit its vital importance, but, to date, no really satisfactory methods have been evolved, the difficulties of continuous communication with advanced troops proving the chief obstacle to a solution.

As a battalion of divisional artillery will generally support a regiment of infantry, with two battalions in assault, in many cases, provision should be made for establishing liaison with both battalions. Additional personnel is necessary in any case, to provide reliefs, or to replace casualties.

### INTELLIGENCE AND THE ARTILLERY INFORMATION SERVICE

The present instructions, and methods prescribed for the artillery intelligence personnel, cover the matter satisfactorily. There is a tendency, in practice, however, to divert the activities of the officer personnel of this section to other duties. When the battalion is acting alone this may be justifiable, but certainly not otherwise, as such an action is unfair to the higher command, whose chief source of intelligence is through the intelligence personnel of subordinate units.

As the artillery information service obtains the greater part of its information from lower units, every effort must be made to collect all available data and forward it through proper channels, and staff personnel must be available for this duty.

### MUNITIONS

The battalion, except when acting independently, is not an administrative unit, and its supply is a comparatively simple affair. The matter of ammunition supply is more important, for, with its combat train, the battalion is in a position to handle its own munitions, and there should be a staff officer responsible for munitions, and for keeping a close touch with the ammunition situation, so as to

anticipate any additional supplies needed, and to avoid any possibility of failure of supply interfering with the accomplishment of missions.

From the foregoing, it is evident that the following division of the staff into sections is applicable:

Executive.
Administration and Personnel.
Intelligence.
Operations (Plans and Training).
Supply.
Munitions.
Liaison.
Communications.
Reconnaissance.

This is the division already prescribed in training regulations and is generally accepted as satisfactory and workable. Based on the above, there follows a discussion of the duties of the different staff sections with the number of officers considered necessary for each section.

*Executive:* (1 Captain). Supervises work of staff, and acts as understudy to battalion commander.

*Administration and Personnel:* (1 Lieutenant). For general charge of all administrative work; billeting officer.

*Intelligence:* (1 Lieutenant). Performs routine intelligence duties; acts as agent for the Artillery Information Service; keeps enemy information maps; prepares dead space and visibility charts; organizes and maintains battalion observation post; pays particular attention to locations and nature of probable targets for the battalion, to aid the Plans and Training Officer in assigning fire missions.

*Plans and Training:* (2 Lieutenants). Prepares written orders, with the assistance of the Intelligence Officer, under the supervision of the battalion commander; keeps informed at all times as to batteries that are firing, and which batteries are available for missions desired; on receiving missions from battalion commander, assigns them to available batteries, selecting the battery that can most efficiently perform the particular mission; assists the battalion commander in designating targets to batteries by keeping a record of targets by number, with such topographical or other data as will facilitate such identification; keeps record of missions assigned, including results of firing as reported by observers; keeps up situation map; in charge of the command

post; when the battalion commander and his party have gone forward in reconnaissance, normally commands detail and conducts the march of the battalion; frequently consults with the munitions officer so as to the status of the ammunition supply, with reference to demands for probable missions, and notifies him, in advance, of any particular needs.

*Munitions:* (1 Captain. Combat Train Commander). Prepares reports; keeps a constant check on supplies of ammunition at battery positions; confers with Plans and Training Officer to determine in advance if there is any probability of future extra expenditures, or need for special types of ammunition; directs resupply of ammunition.

*Liaison:* (2 Lieutenants). Act as liaison officers with assault echelons of supported units. When only one is necessary, the other will act as a relief liaison officer.

*Communications:* (1 Lieutenant). Operates message centre; installs and maintains all communications of any type within the battalion.

*Reconnaissance:* (2 Lieutenants). Assistants to the battalion commander in reconnaissance and selection of position; perform topographical operations for the battalion; assist the battalion commander in the location and designation of targets, performing the topographical or other operations necessary for the identification to batteries; command any security attachments required by the battalion; supervise the work of scouts and observers; assist the Intelligence Officer in his duties.

*Supply:* This is normally a function of the service battery of the regiment. On those rare occasions when a battalion is acting independently, the Supply Officer is the lieutenant commanding the battalion section of the service battery.

*In General:* The first four sections listed keep such reports, records and files as are routine, and are required by regulation.

For the foregoing composition of the staff, the following changes from present organization will be noted.

1 extra lieutenant, as assistant Plans and Training Officer.
1 extra lieutenant, as Liaison Officer.
1 extra lieutenant, as Reconnaissance Officer.

The heavy duties of the Plans and Training Officer, together with the need for a relief in that position would appear to justify this increase.

The need for two liaison officers has long been apparent, and there should be little need for justification for this. In addition,

this will avoid the necessity of detaching the Intelligence Officer from his proper duties to act as an additional liaison officer.

The justification for the additional lieutenant as reconnaissance officer, may not be so obvious. The reasons for this are as follows:

It would provide for an assistant and a relief for the intelligence officer during very active periods.

During quickly moving situations, it would give the battalion commander a technically qualified officer to assist him at his observation post, leaving the plans and training, and intelligence officers free to perform their proper duties, and would leave one officer free to keep up reconnaissance during the action. As it is now, the reconnaissance officer is manifestly unable to perform both topographical work, and reconnaissance, which often is very inconvenient, as the battalion commander needs an assistant in determining data for target designation, and similar duties, and at the same time, normally desires to continue reconnaissance.

If the above staff appears unwieldy, it must be remembered that it is designed to meet all situations in warfare, and for that purpose, it would probably prove no more than adequate, considering the need for reliefs, and replacements.

# BREEDING OF MILITARY TYPE HORSES AS FOSTERED BY VARIOUS GOVERNMENTS

BY LIEUTENANT E. Y. ARGO, F.A

IT WAS conclusively proven during the World War that the need of a standard military type horse for the Artillery and Cavalry is of the utmost necessity. As a consequence the various governments are making rapid progress in promoting breeding of good type horses, and it is not believed that the conditions that existed prior to the World War will ever exist again.

Practically all the governments were confronted with the same situation at the beginning of the war. A great supply of horses was needed. There were plenty of horses available, but only a small per cent. were of the type desired to fulfill the requirements necessary for the army horse. What was the result? Every government took the best it could get and made the best of it—which was by no means satisfactory. The large percentage of the horses that were of a poor type, proved very unsatisfactory and soon became unfit for further use, due to the hard work required and consequently many more replacements were necessary—whereas the few horses available that were of the proper military type carried on to a marked degree of success, with replacements greatly reduced.

What has been the result? The various governments have either organized or reorganized their plans to promote the breeding of better type horses.

Most of the governments are now confronted with the difficult task of obtaining a sufficient number of horses of the right type for cavalry and light artillery use. Such types have been scarce and are gradually becoming scarcer because motor-propelled vehicles have curtailed the demand for driving and delivery-wagon horses to such an extent that farmers have practically discontinued the breeding of light horses and instead have turned their attention to the production of heavy draft horses. As a result the heavy draft stock is improving and the light horse stock is deteriorating.

I will now take several of the various governments and attempt to show what progress is being made in the breeding of good type horses for military uses. It will be seen that some of the governments have organized extensive breeding systems and the breeding of the great number of scrubs as heretofore will soon be past history.

The following will give one an idea as to what several of the large governments are doing in the way of breeding.

## BREEDING OF MILITARY TYPE HORSES

### THE UNITED STATES

In our government, the Remount Service, Quartermaster Corps, has been given the mission of carrying out the plan for the encouragement of the breeding of better horses in this country, especially riding horses, as the draft horse supply in this country at present is not so acute. Our government Remount Service has the hearty coöperation of the American Remount Association.

The Army plan for the encouragement of breeding is very simple and is operated with a minimum of red tape. Its central feature is to place stallions of the proper cavalry type at the service of the farmers and breeders willing to raise riding horses of the required quality, and who are located in communities where suitable mares are available. This service is furnished at a nominal fee—stallions are delivered at government expense to local agents who arrange for service and collect fees therefor. Such agents are paid for their work and are given an allowance for upkeep of the stallions. A local horseman or farmer of good standing, interested in breeding, is usually selected as agent. A representative of the Remount Service makes periodical inspections of the stallions to see that they are given the proper care and that the agent is living up to his contract.

In addition to the above plan, the Army is breeding a large number of horses each year at its own Remount Stations. As stated before, draft horses in this country are plentiful and the supply is constantly replenished to meet agricultural and industrial needs. This is not so with the riding horse, however, the breeding of which in many parts of the country is negligible. The existing supply of riding horses, of a type fit for military service, is far short of the number that would be required by the Army in war. Therefore, the government is making every effort possible to bring the riding horse supply up to war-time needs. At the same time, interference with draft-horse breeding is scrupulously avoided. Light stallions are not placed in communities devoted to draft-horse breeding.

A great number of undesirable riding horses are now being raised in this country. These scrubs are not suited for the Army, are practically valueless commercially. It costs as much to raise them as it does to raise the horse desired by the army which, commercially, is a hunter or weight-carrying polo pony and an all-around utility animal of the light delivery type.

By raising good horses instead of scrubs, this country will have an available supply of riding horses for use in war, and also put an end to the great economic waste now occurring in the production of scrub animals.

The following principles are insisted on in all the breeding centres:

(*a*) Not necessarily more horses but better ones.

(*b*) Careful selection of mares as to type, soundness and disposition, violent crosses, such as on coarse draft mares, not being permitted.

(*c*) Elimination of mares that prove poor mothers, or that produce weedy colts, proving results from mating with other mares show that the stallion is not at fault.

(*d*) Good care and feeding of both mares and colts.

(*e*) Proper handling, gentling and breaking of colts from birth to maturity.

On January 1, 1926, the government had on hand 413 excellent stallions, which will be available for the use of the farmers and breeders of the nation for the 1926 breeding season:

RECAPITULATION BY BREEDS

| | | |
|---|---|---|
| Thoroughbreds | 352 or | 85.2% |
| Arabian | 28 or | 6.8% |
| Morgan | 26 or | 6.3% |
| Standard bred | 4 or | 1.0% |
| Saddle | 2 or | .5% |
| Hackney | 1 or | .25% |

In general, the type of horse that is mostly desired by the government is described briefly as follows:

THE RIDING HORSE

The big-bone, well-bred, docile, intelligent cavalry horse that is desired in the Army is commercially a hunter or weight-carrying polo pony, a good driving horse and an all-around utility animal of the light delivery type. *His good blood makes him active and intelligent,* and his proper conformation and endurance enables him to do more utility work and last longer than the scrub.

The following points, as regards conformation, are being stressed:

(*a*) Head and neck set on in such a manner that they will readily bend to the reins.

(*b*) Light forehand with long sloping shoulder blades. Does not show a good place for the collar.

(*c*) A short back with strong loin muscles.

(*d*) Strong hocks with a straight hind leg.

(*e*) Long flat bone with the back tendons running more or less parallel to the cannon bone.

(*f*) Sloping pasterns and good feet.

(*g*) Should weigh between 950 and 1200 pounds, depending on the height, which should be fifteen hands or better.

Such a horse of this type has easy gaits and free and prompt action at the walk, trot and gallop. He not only is a weight carrier but will travel long distances without undue fatigue and will be a good conditioner.

In order to stimulate breeding, prizes are offered, through the American Remount Association, at the State and County Fairs throughout the country, for the best exhibits of colts sired by the Remount stallions.

It is estimated that not less than 16,000 mares will be bred during the 1926 breeding season to the 413 Remount stallions, and the foal productions resulting from this breeding, judging by past standards, should be in excess of 9000, valued conservatively at $170 each at four years old, or an approximate total value of over a million and a half dollars. Thus the breeder is, in fact, being assisted in an economical manner in raising good horses in place of valueless scrubs, and at the same time the nation is creating a war reserve at an exceedingly reasonable cost in the only manner practicable.

## FRANCE

The government breeding system of France was first instituted in 1639, but for many years was in an unsettled and ill-defined position. It was finally established on its present basis by the law of 1874, shortly after the disastrous Franco-Prussian War, at a time when the Cavalry and Artillery units of the French Army were greatly enlarged, and the consequent supply of proper type animals, for these services, greatly increased.

The French Haras, a uniformed service, operating under the Department of Agriculture, has charge of all horse breeding in France. The French government recognized the fact that the need of the Army for horses was the basic reason for the existence of the Haras; it also took into account the fact that the needs of commerce were of primary importance, and the safeguarding of this interest would secure a proper supply of animals for the Army, and the Haras should, therefore, coördinate these two needs and guard the interest of both.

The control of the breeding of horses by the Haras has been highly successful. This is especially shown when one considers that the number and kind of animals required by the Army has lessened and changed, and that, due to the advent of the automobile, the need for the light driving horse (the horse at two ends) has practically disappeared.

The aim of the administration of the Haras is to place at the disposal of breeders for a nominal fee, the services of choice stallions, capable of improving the various French breeds of horses and also to direct the evolution of these breeds, by adopting them to the needs of the country.

It endeavors first of all to insure in the country a supply of good type horses necessary for the Army. The needs of the latter being limited in peace time, the efforts of the Haras are directed towards the production of a horse suitable for agricultural and commercial purposes, and constituting, as well, a war-time reserve from which the Army may draw to replenish its stock. In general, anything that effects the horse-breeding industry of France, is controlled by the administration of the Haras.

The Haras has about 3500 stallions at the disposal of the public. These stallions are kept in the Remount Depots and sent out to the breeding stations, under charge of the Haras personnel, during the breeding season from March 1st to the middle of July.

The following table shows the percentage of the different breeds used by the Haras:

| | |
|---|---|
| Draft breeds ..... | 38% |
| *Demi-Sang and Posties ..... | 52% |
| Thoroughbreds ..... | 10% |

The Haras is now experimenting with a new type of horse for light draft purposes, called the Artillery Cob. He is obtained by careful breeding of the Norman Carnossier with the best draft stock. It is desired that the Artillery Cob be between 15.2 and 16.0 hands and weigh around 1300 pounds, as it is believed that this is the best type of horse for the present-day artillery purposes.

For the Cavalry, the French government has three kinds of Cavalry—Hussar (light), Dragoon (middleweight) and Cuirassier (heavy), and therefore three different types of horses are necessary. It has been stated that the real reason France keeps three kinds of cavalry is to keep up the interest of the civilian population in horse breeding.

A rough geographical division of France shows that each section tends to breed a certain type of horse.

The southern part of France is devoted to the light saddle and harness horse, with Arab blood in his veins.

In central France, from the west coast to the Moselle Swiss, and Italian frontier (with the exception of the northern coast of Brittany)

* This is the light draft horse that is mostly used by the artillery.

you find the heavy and middleweight saddle horse, the trotter, the driving horse, and the light draft horse.

In the northwest and the strip on the northern coast of Brittany, there is the heavy draft horse.

From the above, it can be easily understood why the Haras does not encourage the breeding of a special type horse for all of France.

The Haras does not in any way try to interfere with the breeding of certain types of horses, but does control the breeding to such an extent that eventually each section of the country will be breeding good horses, and in the event of war the horse supply of France will be good and the proper number of the right type will be available.

The present horse population of France is about 2,900,000. Three million is considered as the number of animals that France can support. A maximum mobilization for an emergency will take about 25 per cent. of this number, so the standard must be high.

In order to further stimulate the breeding of better horses that will be suitable for the government, the Haras donates money prizes at the numerous and various kinds of shows, races, etc., to the breeders of successful animals. In order to compete for a prize the animal must be sired by a government stallion.

## JAPAN

Horse breeding in general in Japan is under the Horse Bureau of the War Department. The fact that it is a bureau of the War Department does not mean that it is concerned with military remounts alone; it is the governmental organ charged with the direction and encouragement of horse-breeding and horse-raising in general.

It has been a generally accepted idea that Japan is negligible as a horse-raising country. That was true in the past but is no longer so.

She has grappled with her problem in a very scientific manner and is in a fair way to achieve success.

The Horse Bureau maintains three breeding farms. Here imported stallions and mares and specially selected animals for breeding are assembled.

The stallions and mares are imported principally from England and France. Anglo-Arabs and Hackneys are imported from England, together with a few thoroughbreds; Anglo-Normals are imported from France. They import also what they call a Hungarian Anglo-Normal, a horse somewhat smaller than the French Anglo-Normal.

All stallions must pass a rigid examination and test before they are declared suitable for breeding purposes. Mares are kept for

breeding purposes if they are either a good artillery or cavalry type or if not deemed suitable are sold to civilians.

The "Stallion Training Depots" receive stallions from two sources: first, three-year-olds from the breeding farms; second, two-year-olds that are purchased from civilians. It is at these Training Depots where the stallion is inspected as to type and required to undergo certain tests to determine whether or not he will be used for breeding purposes. Only about 60 per cent. pass this examination.

After a stallion has passed the examination as to his conformation and type, he is required to undergo the following tests when he reaches four years of age.

The riding horses must be able to run a mile in 1:58 over a rather indifferent track. The light draft horses must do ten miles with an old-fashioned sulky in forty minutes over the same track. The heavy draft horses must go through prescribed tests in heavy pulling.

Those passing the test are sent out in the fall of their fourth year to horse-breeding depots, of which there are fifteen throughout the country, where they breed with mares belonging to civilians only. Each of these breeding depots has from seventy to 120 stallions, there being over 1300 government-owned stallions now in service. There is no charge made for a breeding fee. Civilians are under no bond or promise to sell the colt to the government. A careful list, however, is kept of all horses in the country, and they are subject to mobilization in case of war.

The Army obtains its supply of remounts by purchase from civilians and naturally as the Army uses a large number of horses each year, the civilian breeder is encouraged to breed good horses of a military type as there is, as a general rule, a ready market for his horses. As a rule, an attempt is made by the Government to buy two- and three-year-olds. This also encourages breeding as the civilian breeder does not have the expense of keeping the colt until he is four or five years as most breeders in other countries do.

The Cavalry and Artillery horse desired by Japan is of the same type as desired in this country.

A comparison of the military type horse of today with the horse of only a few years ago, shows the success of the Japanese effort at improving the breed. While the Japanese are not natural horse-loving people, they have attacked the problem with such interest and along such scientific lines that their success is not at all strange.

In a few years, the Japanese horse will be a far different animal from the bad-tempered pony seen on the streets of the treaty ports.

### ITALY

The Italian Government has not taken to a system of breeding military type horses as extensively as some of the other governments.

The horse-breeding operations in Italy are administered under the Minister of Agriculture. The scheme in general is to provide high-class government stallions, which stand at a nominal stud fee. Seven stallion depots are operated. At these depots there are about 100 government stallions.

During the breeding season these stallions are sent out for service at the different neighboring towns which agree to furnish suitable quarters for the stallions and attendants.

There seems to be a good supply of the cavalry type horse desired by the government, and it is at present making practically all of its efforts towards securing a supply of a good type artillery horse. This is an altogether different situation than most of the other governments are having to face as their greatest shortage is a good cavalry type horse.

To overcome the shortage of artillery horses of the proper type the Remount Service of Italy is keeping in the hands of farmers about 4000 brood mares of the artillery type. These mares are bred each year to a government stallion, but no option is taken on the colt. After eight years the mare becomes the unconditional property of the farmer.

A careful record is kept of all the mares bred, and in case of war, the government will be able to purchase from the farmers a good supply of good type artillery horses.

The military type horse desired by the Italian government is of the same specifications as those prescribed by our government.

### ENGLAND

I have not been able to obtain any information on the breeding of military type horses as fostered by the English government and will only discuss in general, as it may be of interest, the breeding system.

It is operated by the Department of Agriculture and the government owns practically no stallions, but offers premiums to a small number of selected stallions. All stallions must be examined and registered before being allowed to stand. Only pure-bred stallions are registered. A small national breeding stud is operated in Ireland to breed thoroughbred stallions.

It has been stated that the artillery horse desired by the English government is of the heavy type, of which there is a large supply throughout the world.

In conclusion it can be definitely stated that from the very inception of the breeding plans for better horses, and especially for good military type horses which are highly desired by the farmer as well as the Army, the horse breeders and farmers of the world, the jockey clubs and racing associations, and other similar organizations, as well as a large number of public-spirited men throughout the United States, have exhibited a keen interest therein and have assisted in every conceivable way to make them a success.

GERMAN FIELD ARTILLERY SCHOOL AT FUETERBOG

GERMAN FIELD ARTILLERY SCHOOL AT FUETERBOG

77-MM. GUNS.

MANOEUVRES OF THE REICHSWEHR, MECKLENBURG, 1925

MANOEUVRES OF THE REICHSWEHR, MECKLENBURG, 1925

IMMITATION GUN.

Photographs from Atlantic Photo Co., Berlin.

# THE FILIPINO AS A PACK ARTILLERYMAN

BY CAPTAIN C. A. EASTERBROOK, P.A.

GOING back to the days of the Philippine Insurrection we find that friendly natives of the Philippines were used both as mounted and dismounted scouts in that campaign. It was not until 1901, however, that Congress authorized the enlistment of natives of the Philippines as a permanent part of the personnel of our military forces, and their organization into companies of what has since been known as Philippine Scouts. This "company" organization continued until 1908 when it was increased and changed to a battalion organization of some twelve battalions of four companies each, each company having 100 men. This latter organization continued unchanged until the World War.

Up until 1917 the military utility of the Filipino was thought to be limited to that of a light infantryman. The World War, however, necessitated making available as much of the artillery of the regular army as could be spared for service in France, or for training purposes in the United States; so it was decided to try the Filipino in a new rôle—that of a pack artilleryman; with a view to relieving the 2nd Field Artillery, a pack regiment, which at that time was stationed at Camp Stotsenburg, P. I. Pursuant to this decision, the 11th Battalion of Philippine Scouts was, in May, 1917, ordered to Camp Stotsenburg, P. I., for temporary duty with the 2nd Field Artillery as an experiment to determine the suitability of the scouts as pack artillerymen. This duty covered a period of about six weeks, after which time the battalion was returned to its proper station, Camp McGrath, Batangas. In September, 1917, this same battalion was returned to Camp Stotsenburg for permanent station to relieve the 1st Battalion, 2nd Field Artillery, which had been ordered to the United States.

Upon arrival at Camp Stotsenburg the second time, the battalion was provisionally organized as a battalion of pack artillery and began a period of intensive training under the supervision of the officers of the 2nd Field Artillery. The scheme of instruction followed was productive of excellent results. Each scout battery was linked with a battery of the remaining battalion of the 2nd Field Artillery, and the battery commanders of the latter regiment made responsible for the tactical and technical instruction of both organizations. In addition, suitable noncommissioned officers and specialists were released from the 2nd Field Artillery to work in conjunction with the Filipino noncommissioned officers and specialists of the

new organization. Intensive training and instruction were the order of the day, every day, everywhere, and in every department. During the morning periods, just as soon as the batteries could be "packed out" short marches were taken, positions occupied and firing simulated. The afternoon period was given over to instruction of the firing battery in park, care and handling of animals, and equitation for enlisted men and instruction in the preparation and conduct of fire and equitation for scout officers.

Strange as it may seem, particularly so with the fact in mind that only men above the average in size were formerly recruited for our mountain artillery organizations, very little difficulty was experienced in teaching the Filipino to pack. His deficiency in stature did not seem to be as much of a drawback as was at first expected. Naturally the men were sized throughout the battalion and the larger ones assigned to the firing batteries and combat train. The most serious problem was, I think, the care and handling of animals for which the native has very little natural aptitude. The wily mule rather added to this handicap by seeming to be able to sense the timidity of his new master and lost no opportunity to express his disapproval of the new order of things by frequent practice of the many vices which have made him famous. It was not long, however, before confidence was established and the handling and care of animals became a matter of ordinary routine and was attended with as much zest and enthusiasm as any other phase of the training.

The personnel of the battery and battalion details were selected from men who spoke and understood English fairly well, who had a smattering of the three "R's," and who had previous experience as signalmen in their old organizations. Continuous daily training under experienced noncommissioned officers from the 2nd Field Artillery who occupied key positions in the details of that regiment soon brought about a very satisfactory state of efficiency. Instrument Sergeants were developed who could compute firing data and perform the various other duties devolving upon them with a degree of speed and accuracy that was extremely creditable.

The sketching and signalling ability of the scouts has always been a matter of considerable pride. Their records of competitive winnings in these two activities at department military meets would do credit to any organization, including those specially trained in these arts.

In February, 1918, the 2nd Battalion of the 2nd Field Artillery was ordered home and the 12th Battalion of Scouts ordered to Camp Stotsenburg for artillery training as a replacement. Upon the arrival of the 12th Battalion both battalions were organized into a provisional regiment known as the 1st Philippine Field Artillery, Provisional (Mountain). The scheme of training which was so

successful in the training of the 11th Battalion was put in effect in training the 12th Battalion, with results equally gratifying. During the ensuing six or seven months intensive field training was undertaken which continued through the wet season as well as the dry. Several marches and firing problems were conducted at night during the wet season under very trying weather conditions, yet the regiment met the demands imposed upon it in a highly satisfactory manner, and I do not recall a single instance where a failure of any kind was directly traceable to the inability or unsuitability of the Filipino.

During the latter part of 1918 authority was given for extra pay for gunner qualification corresponding to that given the scouts of the infantry organizations for marksmanship. No departure from the War Department special regulations for the conduct of gunners' examinations was granted and none was asked for. At first it appeared that only the noncommissioned officers could qualify as they were so much better fitted by their increased knowledge of English. A plan was hit upon, however, of allowing the noncommissioned officers who had been thoroughly instructed to teach other selected members of the organization in their native dialect. This plan worked out very well indeed, resulting in the qualifying of a very creditable number as gunners. The examination was given to all in English.

The interest taken by the scouts in this first gunners' examination was quite intense because it afforded the first real opportunity for competition between organizations. The desire uppermost in every battery was to have the greatest number of gunners. It was not an unusual sight to see a battery returning from afternoon stables with a mountain gun trailing behind to be taken apart and reassembled in the squad room for instruction in nomenclature and matériel after retreat. All this, of course, was voluntary. This enthusiasm was not confined to gunners' instruction. In the preparation for military events at field meets no opportunity was lost on the part of the individual or group to practice and prepare for the event. The "Section Contest" seemed to inspire the greatest enthusiasm, for the reason, perhaps, that it was the most spectacular. Rules for these contests had to be hard and fast, otherwise one might expect to see an entire section unpacked by the pulling of a single string; such was their cunning and eagerness to win. Competitive inspections of kitchens and stables on alternate weeks by the regimental commander were also extremely beneficial from the standpoint of instruction and training and furnished still another opportunity to do something better than some other battery. The Filipino needs no other inspiration. To excell is an obsession with him.

From the standpoint of discipline the Filipino is everything that could be desired. His attitude toward his officers is one of respect and admiration. He is dignified, loyal, respectful, and courteous and has few bad habits to detract from his utility as a soldier. His versatility is always a matter of surprise and favorable comment. In discussing the Filipino as a pack artilleryman with officers who have not served with the 24th Field Artillery, the first question usually is, "Isn't he too small?" It is a very natural question because we are inclined to associate packers and members of pack artillery organizations with men muscular and large of stature. On the other hand, we are also inclined to consider the Filipino soldier as being poorly developed physically because he is small. This, of course, is not the case. As a class their physical development is quite up to standard, and when one considers their many admirable qualities the matter of stature becomes unimportant in comparison.

Service with the 24th Field Artillery should be a period in every officer's career replete with pleasant memories. The battery commander will find a complete freedom from the ordinary routine annoyances. Battery punishments and trials by Courts Martial are very infrequent and drinking and kindred vices very rare occurrences. He will find his enlisted men thoughtful and solicitous for his comfort both in garrison and in the field to a degree which cannot be appreciated without the experience of service with them. Long being noted for his soldierly qualities, the Filipino came to us with an excellent reputation. In the 24th Field Artillery he has enhanced his reputation as a soldier and in addition has demonstrated his usefulness as a pack artilleryman in a manner that would seem to fully justify his selection for this duty.

# OUR NATIONAL DEFENSE POLICY

BY MAJOR HERBERT S. DUNCOMBE, JAG—RES.

(OF THE NEW YORK BAR)

(*Continued from last issue*)

IN considering the provisions of this Act, I would like to begin with my assertion and attempt to prove that in carrying out the certain provisions of the same in reference to training, that the money spent therefor, can be properly charged to Citizen Character Account, and carried as a character asset rather than as a strictly war insurance, and while the benefits accruing to the nation partake of both elements, I contend that we may eliminate its value from a military standpoint entirely, if we like, and still contend that the training would be worth more to the government than the money expended, solely from the improved morale of citizenship resulting from the training of those enrolled in the camps.

Section 47D of the Act, authorizes the Secretary of War to maintain, upon military reservations, or elsewhere, schools or camps for the military instruction and training of citizens, with a view to their appointment as reserve officers, or noncommissioned officers, and the camps are open to noncommissioned officers, warrant officers, and such enlisted men as may be selected upon their own application. This provision follows out our American principle of giving every man a chance. Previous sections of the Act have regulated conditions in which college men, and men from certain schools may acquire the training and knowledge necessary to fit them for the commissions in the Reserve Corps, but they may be considered the privileged few, who have special advantages in life, derived by the wise selection of a father. They are vitally important to national defense but in them I am not at present so much interested, but this provision is for the man who could not go to college or a pay school for enlisted men, warrant officers and civilians, and the effect upon those civilians is the phase of the situation I would like to call to your consideration.

It may be well to visualize what thirty days' military training means and the result upon a young civilian without any previous experience. The first requisite of a soldier is obedience and respect for constituted authority, or I should have stated that in the reverse order; respect for constituted authority and obedience, if he could visualize what it means. Respect for constituted authority is not very popular with certain of our young men, and obedience is defined to be, "doing what you don't want to do when you don't want to do it." These two factors in our duty to our government are not very

strongly impressed upon our young men of today. They are fully aware of their "rights," but the word "duty" and its meaning is almost unknown to them. Even the men who have enjoyed the advantage of good homes and education. But what of the great army of young men in our large industrial and financial centres, first generation of Americans of divers races, creeds and environment. They have lived under the rule of the creed of their fathers, who probably have settled in little communities of their own, and followed largely the life of their native land, but when the boy grows up he attends the public or parochial school. Even there he begins to realize his parent is not living the normal American life. He goes out into the world, in business, breaks away from the traditional authority of his race or creed, to what? From the authority of his fathers which meant restraint to him, to license, which means freedom, and he cannot be expected to understand that this is a government by and with the consent of the governed, and that he must play the game according to rule. His idea of life is to "get by," win, no matter how, but win! Be first in the subway, irrespective of results! Keep one eye on the motor cop and beat it! It's clever to outwit, to evade the law that protects him. He has no chance to learn. He is debarred association with men who have learned, and so he goes on from evasion to commission, without ever getting a glimmer by training or association, of the fact that when he salutes the flag, it is his flag, and when he addresses his superior as "Sir," it is his representative, and he is paying homage to an authority of which he is an integral part.

If these training camps could be filled each year by men from such environment, and in a short space of thirty days they could be taught by education or association with those who had learned, the faintest appreciation of our ideals of government, by realization that respect and obedience were not subservient attitudes, but attitudes of dignity, that they are a part of this government and are responsible for its endurance, that they must play the game by rule, and that the rule is the rule of the sportsman, and that there is no glory to win unless these rules are observed; in short, if for a brief thirty days they could be taken out of their environment of license, and given the faintest visualization of liberty within the law, it would be worth all the government spent on the maintenance of an army. Yes, it could be done elsewhere. It ought to be done at home and at school, but we have evidence that it is not. The result obtained from these camps is to impress the students with an appreciation of the duties and rights of citizenship. Are we to have an American race, we are apt to lose sight of that grave distinction between "race" and "nationality." Race is fundamental, basic,

the result of human evolution. It intensifies with time, changes only by extermination or amalgamation, and slightly by modification, but it takes centuries to bring these conditions about, time longer than we can appreciate, while nations come after races and are the result of economic and political development of a people within a geographical division. Nations rise and fall due to political conditions. We are a nation of great diversified races. We must have some common ground, some simple definite understanding of our aims, ideals and duties from which we may all start.

The advanced military training a man can get in thirty days will not start him on his dangerous path as a swashbuckling military bully. He learns the first principals of military hygiene, foot, squad and company movements, but they see the officer of the highest grade, the college man, doing exactly what they are expected to do, the same respect for the flag, the same obedience to orders. No favors, no advantage. For the first time in his life possibly, he finds himself at no disadvantage. He is in the line with them, all man to man their equal.

President Wilson approved the Bill in 1920, establishing the Citizens' Training Camps. President Coolidge stated that these camps promote obedience to law and respect for the institutions of a well ordered society.

The National Defense Act has as its foundation Article 12 of Section 8 of the Constitution of the United States, under which authority the National Defense Act was passed. This act divides the component parts of our army into three parts, the Regular Army, the National Guard and the Reserve. The Regular Army is the base for the expansion of our forces; it provides the officers for training the Reserves and National Guard, and carries on the development and experiments of military science for the quick and effective raising of an army; it provides the necessary army for military operations.

The National Guard provides an adequate force available in minor emergencies within the limits of the States under which they are enlisted, or when mustered into the service of the United States when an emergency occurs which necessitates the use of troops in excess of the regular army and Congress authorizes their use. It is a necessary component of our Army as a whole, in that it supports the Regular Army in emergencies within the States in which they occur and when Congress authorizes their use in all of the States or overseas.

The third unit, the Organized Reserve, provides a trained organized army of citizens which supplement the Regular Army and the

National Guard when mustered into service of the United States and enables a trained citizen force to be ready to meet an emergency where it is necessary to employ a larger body of troops than available from the Regular Army and the National Guard. If the intent of the act were properly carried out and an emergency exists and is so declared by act of Congress, the three component elements, that is, the Regular Army, National Guard and the Reserve, each have their proper place and function so that they form a trained army ready for action. For the purpose of providing an effective method of training in small units in time of peace, and known and convenient mobilization headquarters in time of war, nine war corps areas have been created dividing the country into arbitrary geographical divisions, the intention being to develop within each of these corps area a complete unit or army corps trained, equipped, organized, the skeleton organization at least consisting of officers and noncommissioned officers, graduates of the military training camps or colleges authorized in the act, the troops equipped with the facilities for a speedy organization and mobilization so that in time of war men enrolled or enlisted in each corps area could be sent to the corps area mobilization town nearest their town of enlistment, and noncommissioned officers and officers ready to train them, and at the proper time each army corps could move forward for convenient mobilization from its centre to the point desired without unnecessary confusion, useless travel of men, waste of time or money.

In order to carry out the intent of this act Congress places the defense of the country in the hands of its citizens and without compulsion offers them an opportunity to avail themselves of military training in time of peace which would prove of incalculable value to the nation in war, save many lives needlessly sacrificed for lack of such knowledge as they obtain from such training, and work as insurance against future wars.

The Regular Army consists of 118,000 enlisted men and 12,000 officers, or one professional soldier for every 1000 people. The Regular Army has two functions in peace. It is to be used as an army and it furnishes teachers for the National Guard and Organized Reserve. Since the passage of the National Defense Act the duties and importance of the Regular Army Officer in peace have been very much enhanced. Before the World War his duties consisted largely in garrison and overseas service and general army administration, coupled with preparation against the next general conflict, but now he has a very important additional duty to perform which cannot help but have a very broadening influence on his life. He is an educator, a trainer and teacher of the citizens' army, and as such must at all times be at the highest point of military efficiency

and must be able to impart his knowledge to his volunteer pupils, and with his increased responsibility we should recognize that there should be an increased appreciation so that the Regular service will attract men of the highest type and calibre. The National Guard of each State are the soldiers of that state; they cannot be ordered out of the state except as hereinafter mentioned. Officers are commissioned by the Governors of their respective states; their training is prescribed by the Regular Army under the Articles of War and they are regularly inspected by Regular Army officers assigned for that purpose. The time devoted to study and drill by the commissioned and enlisted personnel of the National Guard is largely voluntary, and while the young men who devote themselves to this work deserve great credit, the efficiency of the National Guard regiments naturally suffer in comparison with the Regular establishment. It cannot be expected that they could attain that efficiency in the service from devoting one evening a week that men do who devote their lives to the work, but they at least get the fundamentals.

The National Guard of one state may be called by the President to suppress an insurrection in any other state on application of the Legislature of such state calling for assistance. Or, if the Legislature of such state cannot be convened such request may be made of the Governor. The effect of this is that where a state finds itself unable to cope with a situation which the statue defines as an insurrection, by reason of the overpowering number of its insurgents, or the disaffection of its own military forces, it may through its legislature or Governor apply to the President, who is empowered to call out the National Guard of any other state or states in such numbers as he deems sufficient to maintain the sovereignty of the state so requesting such action.

The last duty of the National Guard is in an emergency declared by Congress. They then become a component part of the Army of the United States. It will be seen that the National Guard is a state institution, charged with the duty of preserving the peace of its own state and any state under the conditions above outlined when ordered by the President, and finally when Congress calls it to the defense of the Union. The Act provides a uniform training for the National Guard officers, and declares that persons commissioned as National Guard officers as such after the passage of the Act shall not be recognized as such under any of the provisions of the National Defense Act unless they are selected from certain classes enumerated in the Act, including schools, colleges and training camps where they have received military instruction under the supervision of an officer of the Regular Army who certifies their fitness for appointment as commissioned officers. It will be seen that the last evil of

the past is thus swept away. A Governor may commission, but when his appointee seeks recognition as a Federal officer, unless he has received the military training prescribed by the Regular Army for officers of his grade and obtains the certificate thereof, he is denied recognition. The effect of this is that all officers receive a certain definite and uniform training before they may act, and when and if called into service they present an even standard of military education.

All policies and regulations affecting the organization and distribution of the National Guard and Reserve forces are protected by a representation upon the committee provided for by the Act and charged by the Act with the preparation of plans for national defense and mobilization of the land forces of the country, which is composed of an equal number of Regular Army officers and National Guard officers who hold commissions in the Organized Reserve, and Reserve officers. Other specific and comprehensive details provide for the commissioning of graduates from colleges and certain schools and define the duties, promotions, etc., of the National Guard and Reserve, commissioned and enlisted personnel, all designed to produce an effective military organization working in harmony with the Regular Army.

The training camps referred to are, of course, primarily designed to fit men to hold commissions in the Reserves and the provisions respecting them are entirely in accord with our ideals. Under the provisions of the Act in addition to training camps for citizens herein referred to, noncommissioned officers, warrant officers and enlisted men may be selected for training, thus giving to every man an opportunity to receive a commission in the Reserve, or a warrant as noncommissioned officer, providing he makes the grade. The President is also authorized to establish and maintain in civil educational institutions, Reserve Officers Training Corps, thus enabling college men to acquire with their academic or technical education a military education sufficient to enable them to hold commissions of second lieutenants in the Organized Reserve. Some colleges make this course compulsory, others voluntary. I noted a protest recently on the part of a dignified freshman of a college situated in the City of New York, wherein the young man asserted that the course was against his principles, and the impression was obtained from his forcibly expressed opinion that the Regular Army officer was attempting to make him a ferocious youth and teaching him that the casual play of the soldier consisted of plunging a bayonet into the body of an imaginary foe. This young man was a long way from that point. He had to learn first to obey orders, submit to constituted authority and the rules of hygiene and sanitation. Without

knowing all the facts, I would venture an opinion that what the young man generally objected to was the discipline imposed, which doubtless interfered with the free will life of the open campus.

Too much consideration should not be given to the opinions of these young people in respect to their education. I remember about twenty years ago some bright mind conceived the idea that it was wrong to insist upon children acquiring a conventional education, that it interfered with their development along natural lines, and that if they found arithmetic and spelling irksome, it was a sign that they doubtless were artistic, and so, planning colors and rolling balls of varied hues was substituted. It was remarkable how many embryo artists were immediately developed, and likewise how few college entry examinations were passed. I imagine it will not harm our fortunate young men in college to subject themselves to discipline and learn that control of others must be founded on a control of one's self.

It will be seen that this opportunity is open for every man, college or non-college, enlisted and civilian, to take exactly the same course and obtain exactly the same reward.

If they are commissioned in the Reserve, they become members of the Reserve Corps, which is created "to provide a reserve of officers amenable for military service when needed" holding their commissions for five years unless they are sooner terminated by the President. These men are assigned to the different branches of the service according to their specialized ability, and again, to organizations for training purposes, which is accomplished by means of instruction similar to that employed by so-called correspondence schools, by actual service in the field and in training camps. A Reserve officer may be ordered on duty for training purposes for fifteen days each year and not longer without his consent. Officers, noncommissioned officers, men enlisted in the specialized personnel, may be ordered to these training camps established in the colleges and in the field for the purpose of acting as instructors. This duty is performed principally by the Regular Army officers, and requires more officers and men of the highest mental attainments and moral character; their added duty as instructors is a very important one and in dealing with the Regular establishment that fact should be considered and the morale of the Regular Service should be maintained at the highest peak.

Thus the education of our Citizen Army is provided for. The Reserve Forces are not subject to a call for duty by the Governor of their respective states or by the President except for fifteen days' annual training as stated, but only when Congress declares a national emergency exists may a Reservist be ordered to active duty

by the President. The Reservist, therefore, is a citizen until Congress calls him to duty, and the reverse is also true, in a measure, and should not be overlooked by the Reservist; they, by their suffrage, call our Congressmen from private life to the Halls of Congress. Congress, as the direct representative of the people, has complete authority and direct responsibility over the nation's Volunteer Army, it calls the army into action by finding that a national emergency exists for its use, and it furnishes the means by which sufficient training may be acquired to make it an effective force when and if that emergency arises.

The citizen who enrolls in this component part of his country's army is actuated solely by a spirit of patriotism. The spirit is commendable; the sacrifice of time from business or pleasure should be encouraged. On the other hand, he is rewarded by the knowledge that in him is placed the responsibility of the ultimate defense of his country.

Judging from the number of ex-soldiers and young men who have reached the age of qualification since the war who have enrolled in the Reserve, and the enthusiasm shown by them in pursuing their work allotted to them, this responsibility is being eagerly accepted.

The spirit and construction of the Act is in accordance with our ideals and aims of national life. Our defense is placed in the hands of the people themselves, their use in the power of their direct representatives. Surely no misuse of such an organization can be made. It is a structure built on our theory of government by and with the consent of the people. The use of the Reserve relates back to its members too directly to permit of its abuse, and its support or nonsupport reflects too strongly on Congress to permit it to die for lack of appropriations.

Unless we can authoritatively conclude that we will never be engaged in another war, it is imperative that this machine for national defense be kept in motion by sufficient appropriations to permit it to function. To allow it to die or dry up would be to repudiate the intention of the Act without repealing it, and would be contrary to our declared policy of national defense and a reversion to a condition which has no intelligence for a basis.

That the thoughtful men are beginning to realize that our treatment of this subject is not wise, is indicated by an editorial in the *New York Times* of December 7, 1925, as follows:

> "The annual report of Secretary Davis of the War Department is none too optimistic over the present condition of the country's regular military establishment. In the Secretary's opinion economies in appropriations have been so rigid that the Army has been reduced below minimum requirements for safety

and far below the strength in men and equipment contemplated by the National Defense Act of 1920.

"The Defense Act was framed with full regard for the country's comparative isolation from danger of land attack and to its traditional reliance upon a soldiery of citizens rather than upon a soldiery of professionals. Its basic idea was the maintenance of a standing army sufficient to repel an immediate assault until the whole army of the nation could be mobilized, officered, equipped and put into the field.

"For this a regular force of 17,000 officers and 280,000 men was deemed necessary. That body should supply instructors for peace-time training of civilians, coöperate with the National Guard and assist in the work of the Reserve Officers' Training Corps. The theory was that a skeleton organization of militiamen could be maintained, so that in an emergency the bringing of America's man-power into action would not be attended by the days and confusion of the early months of the World War.

"Economies have compelled sharp reductions in the regular force. Military experts are agreed, says Mr. Davis, that a minimum force of 703 officers and 13,754 men is necessary to protect the Panama Canal from any possible military aggression, but the force of the Canal Zone on June 30 numbered only 474 officers and 8628 men. Similarly, it is agreed that 980 officers and 19,377 men are necessary to protect Hawaii from attack, but on the same date there were at Oahu only 769 officers and 13,708 men. Within the continental limits of the United States the army numbered only 9707 officers and 85,625 men.

"All War Department appropriations available for the year 1925 amounted to $256,515,279 a sum which seems large enough for an American army in peace times. Yet Mr. Davis shows that less than half of this was for the actual support of the Regular Army. Almost a fourth of it—23 per cent. is the Secretary's calculation—went for nonmilitary purposes, such as the development of rivers and harbors, flood control, work at Muscle Shoals, support of the Soldiers' Home and administrative expenses in Panama.

"Almost a fifth of the whole amount went into the expenses of training civilians and about 13 per cent. was properly chargeable, not to the Regular Army, but to the whole military force of the country. Reduced to figures, this means that the Regular Army actually had 44.2 per cent. of the whole to spend on itself, or $113,379,753.32.

> "Mr. Davis asserts that economies have begun to affect the morale of men who are compelled to live in inadequate and obsolete barracks, which are firetraps as well as being uncomfortable and unsanitary. Reserves of ammunition and supplies have been greatly reduced to the point of inadequacy. He insists that a standing army of not less than 150,000 men is required. He recommends expansion of the National Guard and the Reserve Officers' Training Corps and ten-year continuing programs of development."

And from a speech delivered by Senator J. W. Wadsworth, Jr., Chairman of the Senate Military Affairs Committee, at the dedication of the New York State Monument at Gettysburg, September 9, 1925, where he said in part:

> "Frankly, I cannot see where any substantial cut can be made unless we are content to reduce the National Guard or the Reserve, or both, or discharge some thousands of men from the Regular Army. In contemplation of this last alternative we must remember that the National Guard and the Reserve cannot possibly continue in a reasonable state of efficiency unless the Regulars are able to supervise their training. If the Regular establishment, already stretched to the breaking point, can't perform its function, the whole scheme must fail in a short time. Go to any army post or training camp today and you will find the regular units just hanging together, mere skeletons, so greatly have they been reduced in strength. You will find that the horses of the cavalry and field artillery average fifteen years of age and that hundreds of them are twenty years old or more. You will learn that there are fewer civilian employees under the War Department than there were in 1913—in spite of the fact that the administrative and clerical work of the Department has grown tremendously since that time. You will find also that 40,000 men of the Regular Army are today living in rickety, wooden, war-time cantonments with leaky roofs and sagging floors, because we have made no appropriation for permanent barracks. You will find that there are not anywhere near enough modern gas-masks on hand to equip the Regular Army and that there are none at all for the National Guard or the Reserve. We are fearfully short of modern airplanes. The aircraft inquiry has brought out that tragic fact. Go to Panama or to Hawaii, and any intelligent staff officer can point out to you the need of weapons and facilities vitally necessary for the defense of the Panama Canal and our Naval Base at Honolulu. Many of the surplus supplies left over from the war are nearly exhausted. The Army cannot live on its

fat much longer. The fact is that the Bureau of the Budget and the Congress itself have been terribly severe in their treatment of the Army. If this severity is increased in the form of further reduction in personnel or the continued denial of supplies and facilities, the whole machine, creaking and groaning as it is today, will break down.

"I am not preaching war. I do not fear an attack upon the United States tomorrow. At least there are no signs of such a thing upon the horizon. But no one of us can tell what will happen a generation or two generations hence. No sensible person dare assert that our descendants will never be called upon to defend this nation by force of arms. I am well aware that the pacifist contends that the best way for America to assure peace in this world is by disarming herself. I wish I had sufficient faith in human nature to accept that doctrine. So long as human nature remains as it is and as it has been for thousands of years, there can be no assurance that men and nations will never attack each other again. And I hold to the opinion that the nation best prepared to defend itself is the least liable to attack. That's all we Americans should insist upon in this matter—the opportunity to prepare and maintain our defense as contemplated in the preamble of the Constitution of the United States. Safe behind such a defense, respected by the rest of the world, we shall be free to help others, to encourage the love of peace with honor, to spread our conception of ordered liberty, and to perfect those great institutions which, saved by the citizen soldiers of '61, are sheltering us today and must shelter those who come after us."

The American people are devoted to peace. The writer of this monograph holds the insuperable conviction that the only formula for positive assurance of "Peace on Earth" is the formula of "Good will towards men." And as a nation we have that "Good will" now as always and, while such a spirit has been a bar to any war of aggression upon our part, and will always be a ban to what is known as "militarism," it has not preserved us from war simply because other nations have not been thus actuated by the same spirit.

The very fact that we are a people devoted to peace has undoubtedly in the past as well as in the present made it difficult for us to vision any other peoples as not actuated by "Good will" towards us and thus our very friendliness has operated as a deterrent against properly insuring our safety and prosperity by taking such reasonable measures as would make a war upon us by any country a very unattractive and uninviting proposition.

If our institutions, safety, rights, and liberties are worth preservation,

if our material wealth is worth safeguarding, if our peace, the lives of our people and our treasure are worth insuring against the chaos, waste, losses and suffering of war, shall we carry an insurance commensurate with the blessings we would protect? Or shall we be content to disregard the lessons of the past and carry an insurance which in fact does not adequately insure? Common sense, common prudence, and self-interest dictate but one answer.

But when that answer is made as it was made in the National Defense Act of 1916–1920, which might have been designated "National Insurance Act," voices are raised, and phantoms of fear are fabricated, portraying the United States as embarking upon a policy of militarism. It requires a mind of only limited intelligence and slight insight to recognize the fact that the cry of militarism proceeds from those who are either ignorant of our institutions or hostile to them. The complete answer to such a charge of militarism is that in this country the control of our defense forces is not in the power of any committee, king or potentate; that Congress alone can declare war, and that no war can be carried on unless money is voted for the purpose and that Congress elected by, representative of, and amenable to the people of the United States, holds the purse strings and alone can furnish the money without which war cannot be carried on.

But still other voices clamor against the United States purchasing a policy of adequate insurance and their protest is that of cost. It is true that such a policy costs money, anything worth while that the race has attained has been paid for and will always be paid for. Our ability to walk erect, to think, to speak freely, has cost supreme effort. Our freedom has been purchased by suffering and heroic effort. What if our ancestors since the beginning of time had been unwilling to pay the price? What if our Neantheral Brother had been unwilling to pay the price of constant vigilance and heroic effort necessary to protect his offspring from the brute forces that surrounded him, or had been unwilling to make the terrific effort necessary to acquire dominion over the earth? So it is true a policy of adequate insurance costs money just as our present policy of inadequate insurance policy costs money, and no insurance inevitably would cost us untold amounts of treasure. The difference, however, between the cost of our present inadequate insurance and an adequate insurance is very small and shrinks into insignificance when compared with the blessings, liberties, and prosperity we would safeguard, or when considered in the light of the terrific costs we must pay if our insurance be inadequate. Economy is very attractive, and economy in government bureaus and agencies charged with expending wisely the money of the people is particularly commendable.

The Federal Government has established a remarkable record of achievement in economy in eliminating waste and curtailing the lavish expenditures that characterized our feverish, haphazard expenditures necessitated by a war against which no preparation had been made, yet the remarkable example furnished by the Federal Government seems to have furnished but little incentive to our people at large to go and do likewise. Our people continue to be lavish in their entertainments. There is unlimited money for automobiles, for jewels, for extravagant raiment, for priceless rugs, and paintings, for European travel, yet no money to pay for adequate insurance of our peace upon the continuance of which depends the enjoyment of these laudable delights and pleasures. We have ample funds to lend to various countries of Europe at the very moment when those same countries are protesting their inability to repay the sums which they borrowed during the war unless we make our interest charges so low as to amount in practice to a remission of part of the debt—and such remission has the full approval of our people, whose representatives at the same time feel that we are too poor to pay for adequate protection of the peace we now enjoy. We expect and require our soldiers to live in quarters in such disrepair and dilapidation as would not be tolerated if these same quarters were used to house our convicted criminals; we expect and require our officers to live in unsuitable quarters, and on pay utterly inadequate to the education of their children, the support of their families upon a plane of living which their mission and the duties absolutely demand. We expect our army and navy to be efficient and yet we curtail the personnel, both commissioned and enlisted, to a point where it is impossible for them to perform the duties imposed upon them by law and withhold the necessary supplies and material required to function effectively.

There comes a point where economy in name becomes foolhardiness and waste in fact. Let a man curtail his food expenditures below the safety point and he will inevitably incur a large doctor's bill, and probably an undertaker's bill at the end; let a man curtail on the oil expenditures for his motor below the safety point and his expensive motor will be ruined. The City of New York maintains a police force of over 15,000 men, costing many millions of dollars annually, and New York City might decide to economize as to these millions by abolishing the police force or reducing it so materially as to render it ineffective for the purpose for which it is created, *i.e.*, protection. It is difficult to imagine the terrific cost of such an economy measure, were it to be undertaken.

"The history of the world is the judgment of the world," and we need delve no further than our own history to behold what

judgment has been decreed against us. From the beginning of our national existence to the present time, we have paid blindly, but necessarily, in horrible measures of life, blood and suffering, and in sacrificial and spendthrift measures of national treasure; for our defense by reason of our failure to pay the moderate costs of an adequate insurance for peace and against war. "Where there is no vision, the people perish"—that has been true in the past, is true today, and will continue to be true tomorrow. It is the inimitable law, and there is no trick metaphysical, theological, or economic whereby a nation or an individual can escape the penalty of violating this law. The American people have a sacred right and duty, however, to require of their chosen representatives that the profound truths learned at terrific sacrifice and costs shall not be forgotten or cast aside, and that the peace and liberties and blessings which we here now enjoy shall be adequately insured.

# LATERAL BRACKET ADJUSTMENT

BY CAPTAIN OSCAR L. GRUHN, F.A.

IT IS not the object of this paper to discuss all of lateral observation, but only the procedure pertaining to time and percussion bracket adjustments, and this on the assumption, that the principles underlying percussion precision lateral are thoroughly understood.

Lateral bracket adjustment consists of inclosing the target between two deflections and two ranges in the least possible time. In time bracket adjustment the most effective height of burst must also be obtained. The size of the deflection bracket and the range bracket is entirely dependent on the type of target, tactical considerations, and the conditions of observation.

To obtain this adjustment on targets of opportunity (which are the usual type of targets for bracket adjustment), where time is of the utmost importance, the officer conducting the fire must act quickly and boldly on every bit of information received from the observations made. He must visualize his particular set up so that when information is available from drifting smoke, dust, shadow, effect, etc., he will be able to take it. The exact computations and deliberateness generally associated with the precision methods must be dispensed with. He must constantly keep in mind that to obtain the most information from any round, the burst should be kept in line with the target, and every change in data made should be with that end in view.

The determination of the initial data is usually very difficult, so every effort must be made to get the first round as near the target as time will permit. The data may be prepared by any of the methods used for determining the deflection (parallel method, prismatic compass, etc.) or by plotting. Plotting the distances and angles to the gun, aiming point and target as seen from the observation post, will in general give the best results. However the last method takes more or less time, so the officer conducting the fire must weigh carefully and decide whether he believes the *total time* in accomplishing the mission will be less with this carefully prepared data, than with approximate data. Time may be saved in getting a round on the way, by the latter method, but time may also be lost, by having a large initial range or deflection error, or both, which makes the adjustment more difficult.

Since the initial data is generally in error, fire is opened with one gun, one round, a corrector setting estimated to give a "o" burst, and with the use of the range scale. It is not believed the accuracy gained at the expense of the time lost in setting the quadrant and

laying with it and setting the fuse range (in case of time fire) warrants the use of the quadrant in this type of fire.

Observations are made with reference to air or graze, range and deflection. No attempt is made to sense the actual height of burst, or the deviations from the observing line. When firing platoon or battery salvos, generally one deflection sensing is made for the salvo as a whole, unless each gun can be definitely sensed with reference to *its* portion of the target.

Assuming the first round fired is observed off the observing line, bring it to the line by making a range change, regardless of the magnitude of the observer displacement, except when it is seen that the deflection is in error, in which case the deflection should be sensed and a change made to correct that element, or when the change in range would endanger friendly troops, then an initial deflection change should be made. Always making a range change is a departure from the rules of precision fire, as now laid down, but it is believed advisable to have but one method of getting on the observing line. The arguments for the deflection change, to place the bursts on the observing line when the observer displacement is small, is that it requires a relatively small deflection change to get on the line, whereas it may require a larger comparative range change. Range changes are not difficult to set off—whereas changes in deflection may require shifting of trails, resulting in delay. In addition, changes in deflection to place a round on the observing line, does make the computation of the deflection bracket more difficult. Problems where the observer displacement is small, should be fired as axial problems, being careful to allow for obliquity when increasing or decreasing the range.

In making a range change to place the burst on the observing line, the total observed displacement for the change made should be noted, not in mils, but rather in a comparative amount. For example, consider whether the change asked for, gave half that desired or twice that desired; whether the first round burst as far to the right of the observing line as the succeeding one did to the left, and from these approximate amounts, determine the factor to be used then and in the future to get the burst on the observing line.

In addition to merely changing the range, the corrector should be changed to get an approximate corrector adjustment. Here it must be remembered, raising and lowering the corrector, decreases or increases the burst range, respectively. For example, if a high burst is observed directly above the observing line, and it is desired to place a graze or low burst on the line, the range must be shortened a proportionate amount to the corrector change to accomplish this result. Using one gun, no attempt should be made to obtain a final corrector adjustment, but a height of burst should be used that will

give the best observations, and in general low bursts give more information than graze bursts. The final determination of the proper corrector adjustment must be based on the proportion of airs and grazes when using the battery.

With air bursts, the pattern must be observed very closely, for it will often give effect across the observing line, giving a deflection sensing, even though no range sensing is available. Realizing that the shrapnel projects its pattern forward, it is best to keep the point of burst on or short of the observing line, in order to get the benefit of this projection.

The burst having been placed on or near the observing line and a deflection sensing obtained, the next step is to obtain a deflection bracket. This is done as in precision fire, by making a deflection change with a corresponding range change. This deflection change should always be *bold*. The approximate amount must be governed by conditions. In some cases a 50 mil change in deflection may be bold, whereas in other cases a 150 mil change may be timid. The change is entirely dependent upon the type of target, magnitude of the observer displacement, the range gun target, and the type of data.

The determination of the observer displacement is best done by plotting and the angle measured with a protractor, but when time is not available for plotting, a determination of its magnitude should still be made. The observer displacement is in amount equal to the target offset if a deflection were computed, therefore any means used for determining the target offset for deflection may be used for computing the observer displacement. However, since the observer displacement may become large, and the actual mil relationship does not hold for angles above 300 mils, it must be remembered that the actual angle is less than the computed tangential angle.

Having determined the observer displacement, to determine the deflection change corresponding to a 100 yard or 100 metre range change, divide one-tenth of the observer displacement angle by the range gun-target in thousandths of yards or metres. Example: Observer displacement 600 mils; range gun-target, 5000 yards; the deflection change corresponding to a 100 yard change equals 60 divided by 5 or 12 mils. This rule works very well up to an observer displacement of 800 mils and is approximate even for greater angles. Another approximate relationship, depending on the observer displacement alone is as follows:

| Observer displacement in mils. | Deflection change for a 100 yard range change. |
|---|---|
| 100–200 | 5 mils |
| 200–300 | 10 mils |
| 300–800 | 15 mils |
| 800–1300 | 30 mils |

This approximation is not as good as the first, as it does not take into consideration the range gun-target.

With these values of a deflection change relative to a 100-yard or metre range change (which, of course, is not exact, but better than a guess), we can discuss the size of a total deflection change desirable. First and always the deflection change should be bold, but consistent with other conditions. To ask for a deflection change, after being on the observing line, that would demand a ten or twelve-fork (1000 or 1200 yard) range change to keep the burst on the observing line, when the range did not appear abnormally in error, would seem too much. However, the tendency must not be to let the range control, but to use the maximum deflection change consistent with a reasonable range change for each situation. In general the deflection changes, when the observer displacement is small, are smaller than when the observer displacement is large. In the first case approximately 30–60 mils will often be the proper command, whereas in the latter case 60–120 mils.

The deflection and range change computed to keep the round on the observing line is made, and the next round fired with this data. The burst will in all probability fail to remain on the observing line, but it should be nearer that line than if no attempt were made to determine the relationship. If no sensing for deflection is obtained, bring the round to the observing line, by making a range change, using the factor previously determined by firing. Assuming this change gave a deflection sensing, if it establishes a deflection bracket, the procedure is to split both the deflection and the range bracket until the desired bracket is obtained. If the deflection sensing is in the same sense as the previous one, make another change in deflection and range, proportionate to the one last made, corrected by the range change which was necessary to put the burst on the line, until a deflection bracket is obtained. In splitting the deflection bracket, the nearest 5 mils is sufficient; or in case you observe one deflection limit nearer than the other, make the change to take advantage of your observations.

As stated before the determination of the deflection bracket is usually accomplished with one gun, this, however, is not invariable. The battery may be brought in when the additional rounds may be expected to give much more information; when the effect is urgently desired; when observation is extremely difficult and single rounds differing by 100 yards, gives bursts on opposite sides of the line and not sensible, the additional distribution and dispersion may be expected to assist in getting observations; and when it is apparent the deflection is close or not more than the approximate width of the sheaf in error. It may also be used throughout the entire problem if it is certain the initial data is fairly accurate and the

tactical nature of the target warrants its use. The battery should always be brought in when the deflection bracket has been narrowed down to twice the width of the sheaf desired for fire for effect.

When the battery is brought in, it should have uniform distribution, width of sheaf, that with which it is desired to adjust. In general a parallel sheaf is best adaptable to all types of fire. The sheaf is usually adjusted for parallel fire by the executive, or in case time is not available for this adjustment, a deflection difference must be given computed to give parallel fire. Alterations of the sheaf should be made only by opening and closing to obtain the proper width. No attempt should ever be made to adjust the distribution, as all the range dispersion appears as distribution irregularities from a lateral observation post. In exceptional cases a large individual error (50–100 mils) may be observed on one gun, in this case it is better to give this gun "cease firing" than attempt to check deflection or lose time adjusting it.

Against targets of narrow definition the sheaf should be slightly converged from parallel fire to assist in getting observations. It should never be absolutely converged until it is certain the deflection is correct, and you wish converged fire, for to do so is throwing away opportunities for obtaining sensings. In percussion fire a slightly narrower sheaf, than with time fire, may be used, for the bursts must be kept nearer the observing line to obtain sensings. The width of the adjusting point and the width of the actual target must be kept in mind, and the sheaf formed to cover the front desired.

When using the battery the method of fire must be kept in mind, for individual guns may give very definite information on definite portions of the target; as No. 2 gun short for deflection on No. 1 gun's target and No. 3 gun over for deflection on the same target (observer on the right) not only shows that the sheaf is to the right, but also the approximate amount it is to the right, that is about half the sheaf; again, No. 4 gun short for deflection on No. 1 gun's target, shows the entire sheaf is to the right.

The range bracket is secondary to the deflection bracket, but all sensings for range should be made when available. It often occurs that a range bracket is obtained before the proper deflection bracket for effect is obtained. In this case, proceed with the determination of the deflection bracket by keeping the burst on the observing line, regardless of whether the range required to do so is over or short of a range already definitely established as over or short. In case a deflection bracket sufficient for fire for effect has been obtained without a proper range bracket, proceed with the range adjustment without attempting to remain on the line. Great care must be exercised in this type of fire not to be misled by bursts a considerable

distance off the observing line being sensed for range when no knowledge is had of the deflection. On the contrary, however, when the deflection of a particular gun is known to be approximately correct, range sensing may be made by applying the rules of precision fire to this particular gun.

Fire for effect may be begun when the proper brackets have been obtained: For deflection—when the deflection is approximately correct; when a deflection bracket twice the width of the sheaf desired for effect has been split; and when it is certain at least half your sheaf is on the target. For range—when the bracket appropriate for the type of target has been established. The fire for effect should be observed very carefully and every opportunity taken to make the fire conform to the type of target, to improve the deflection, height of burst and the range. Waste no time, put your fire on the target.

# ADAPTATION OF THE PANORAMIC SIGHT TO FRENCH MATERIEL

BY LIEUTENANT WM. M. WRIGHT, JR., F.A.

DURING the winter of 1923, the question of the adaptation of the panoramic sight to the 75-mm. French gun was taken up by the War Department General Staff. It is believed that this problem was considered at the request of the Chief of Field Artillery as part of the program for the improvement and standardization of equipment throughout the service. Adaptation of the panoramic sight as standard-combat equipment on the French 75 involved several problems: The question of an adequate bracket which would fulfill the technical requirements; cost of manufacture, and simplicity of adaptability to the present matériel were the primary considerations. When the tests were originally inaugurated it was known that the panoramic sight was favored, and that once a satisfactory solution to its adaptation was found, the artillery would request that all French matériel be equipped to mount the United States panoramic sight.

There have developed, since the war, two schools of thought on sights. One believes that all adjustments should be made within the battery, while the other is of the opinion that sight adjustment is a function of the ordnance. The one naturally favors the United States panoramic sight because of its simplicity and accuracy of adjustment, the other the French sight, believing that adjustment is rarely necessary, and when required should be done by an expert. Cheapness of manufacture and simplicity is the idea incorporated in the French sight, while accuracy under all conditions and speed typifies the United States panoramic sight.

In his annual report for 1923–1924 the Chief of Field Artillery stated that while the French sight was sufficiently accurate for precision fire under certain conditions it was not suited for firing under open warfare conditions in unmapped territory. It is believed the reason behind this statement is that in fighting over unmapped territory the usual set-up for a battery going into action will be behind a mask, thus preventing the use of aiming points to the front, and aiming points to the flank or rear slow up the setting of the initial data considerably, due to the necessity of using the sight extension bar, and of referring the pieces to aiming stakes. As speed is the prime requisite in moving situations, this shortcoming of the French sight is readily appreciated.

In considering the merits of the two sights, a tabulation of some of the requirements of an ideal sight will serve to illustrate the advantages and disadvantages of the two sighting mechanisms:

1. It should be equally accurate for aiming points distant from and close to the piece.
2. It should be so constructed that aiming points both to the front and rear may be used with equal facility.
3. Ease and accuracy of adjustment within the organization is essential under field conditions.
4. Its mechanism should eliminate, as far as possible, the human equation.
5. It should be equally easy to operate for both direct and indirect laying.
6. It must have the ability to be adequately illuminated for night firing.
7. It must be rugged.

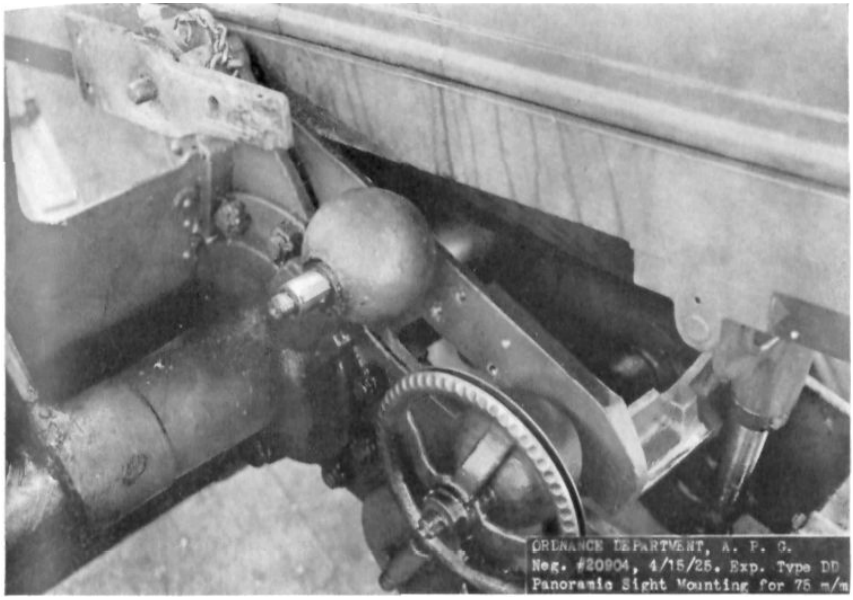
As the panoramic sight is the eventual sight for field artillery, let us determine whether or not it meets the above requirements:

1. Its accuracy is known to be finer than the French.
2. Aiming points to the front or rear can be used with equal rapidity of fire.
3. There is but one adjustment for direction on the sight for errors of less than 100 mils.
4. The sight eliminates the necessity for any mental calculations on the part of the gunner, and errors made can be automatically checked.
5. Because of its optical power, it is equally efficient for direct and indirect laying.
6. It contains a neat device for night lighting.
7. It is not as rugged as the French sight, but it is believed that the other considerations outweigh this one.

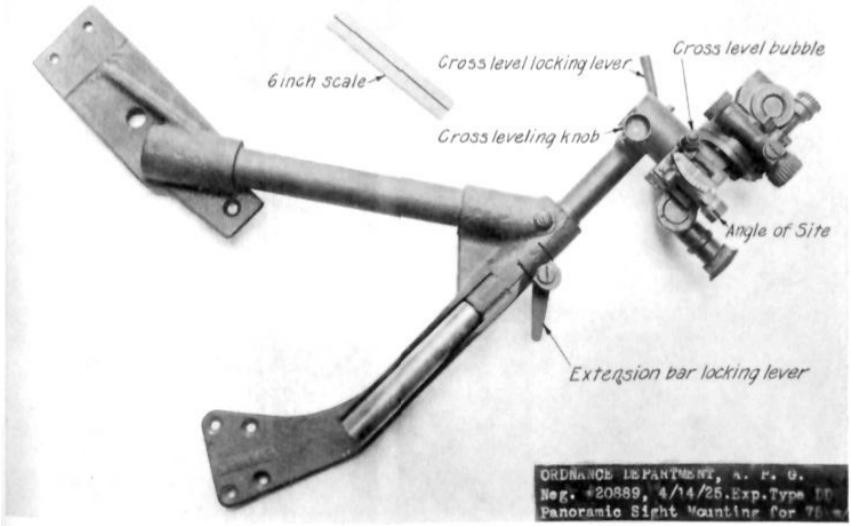
During the winter of 1923 the ordnance was instructed to study the problem of evolving a satisfactory bracket for the adaptation of the panoramic sight to the French gun, and some time later two types of brackets constructed at Frankford Arsenal were shipped to the Field Artillery Board at Fort Bragg to undergo rigid tests on matériel actually in service in the field. Two of each type were put on the matériel of Battery "C," Second Field Artillery, and remained in experiment for approximately six months. Type "B" or the "flat type" consisted of two strips of 1½ × ¼ inch steel. The front arm was bolted to the trunion, and the rear arm to the rocker. The two strips were riveted together at their other extremities and a seat for the sight welded on this joint. The angle of site mechanism was mounted on the rear steel arm about 2 inches below the sight socket.

Type "C" was of similar construction except the matériel used was one-inch steel tubing.

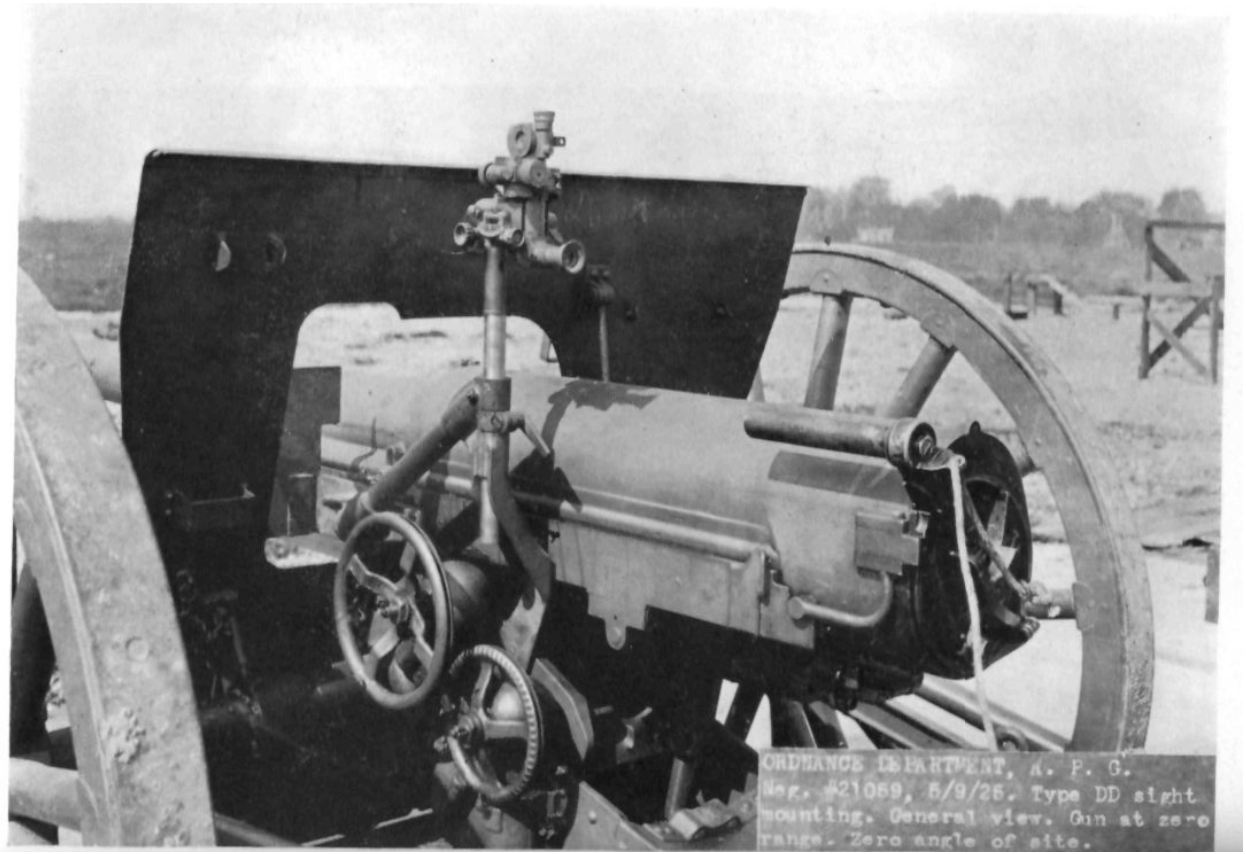
A critical test of the two brackets revealed the following: The




FRENCH 75-MM. GUN PREPARED FOR TYPE DD SIGHT MOUNTING




DETAILS OF TYPE DD SIGHT MOUNTING WITH PANORAMIC SIGHT




FRENCH 75-MM. GUN WITH TYPE DD SIGHT MOUNTING AND PANORAMIC SIGHT

attachment of the brackets to the carriage was simple and secure. The sight was held at the proper distance from the gunner's eye, but no adjustment in elevation was provided, and the eye-piece was about 3 inches too high for the man of average height (5 feet, 7 inches) when seated. The top of the sight mountings extended about 3½ inches above a line across the top of the wheels, and about 1¾ inches above the fixed shield. When the carriages were turned over, it was found that the bracket was seriously damaged, and it was practically impossible to adjust the bracket so that it would again fit true.

Carriage and wheel interference on these brackets was practically negligible, but it was found that the complete depression of the piece was prevented with Type "C" (tubular) due to the sight-seating device coming into contact with the stiffening angle on the gun shield at about 140 mils angle of site, and obtained for lower angles.

Both type "B" and type "C" were held to be unsatisfactory in their present form due to the height of the bracket, and the fact that they contained no device for altering the level of the eyepiece to fit the differences in the eye level of different gunners.

As a result of these tests another type known as type "E" was forwarded for experiment, and placed on one piece. It consisted of a "S" iron which was thrust into the sight socket of the French sight bracket. A seat and lock screw was provided for the panoramic sight.

The attachment of this sight was found to be unsatisfactory for a number of reasons: In the first place, the sight latch on the French bracket was not powerful enough to hold this bracket rigidly on its seat, with the result that lateral play could be detected for approximately 16 mils either side of dead centre. In order to use the sight without the extension bar (the same bar as used on the 155-mm. was used here), it was necessary to cut away a portion of the shield, thus further exposing the gunner. Without using the sight extension bar, at certain ranges, aiming points to the right front were obscured by the tube, and aiming points to the flank were, in most cases obliterated by the wheels. The application of the sight extension bar was not convenient, and a sudden necessity for its use caused a delay in firing. The particular height of the bracket placed the eye level at a point quite uncomfortable for the man of average height, and no device was provided for altering this to fit the individual.

On both type "B" (flat) and type "C" (tubular) the angle of site bubbles were very small, and being at the apex of so large an angle as that formed by the bracket, made accurate levelling of the bubble extremely difficult, and very slow. The angle of site with type "E" was, of course, the French angle of site instrument.

The "DD" type is now under test and appears to be preferable to those previously mentioned. In general it is similar in construction to both types "B" and "C." It consists of a front tubular arm, and a rear member partly tubular, and partly angle iron, in the form of a shoulder, fitting fairly closely to the cradle of the piece. The improvement over earlier models is that the rear member is vertical, and contains an extension column for adjusting the level of the eyepiece.

The bracket is bolted to the trunion, and to the rocker arm as shown in the illustrations. At its normal position, that is with the sight lens just clearing the shield, the eye level is about right for the man of average height. In this type the uppermost portion of the sight mounting has been lowered approximately 2½ inches below the top of the wheels. The extension slides within the casting and can be clamped in any position by means of a knob. The cross level bubble, and the angle of site mechanism is attached directly to the sight socket.

The beauty of this mounting lies in the fact that no separate extension bar is necessary, and that there is a field of view of practically 360 degrees regardless of the elevation of the gun. At either the maximum angle of site elevation, or the maximum depression, the bracket can be so adjusted in height, that there is a clear field of view with the exception of the negligible dead angle caused by the tube at very high elevations. When not in use the entire bracket is enclosed in a canvas sack, and it is unnecessary to remove any part of the bracket for travelling.

Several schemes for the carrying of the sight were tried. Originally the sight box was riveted on the rear face of the right gun shield, and the packing and unpacking of the sight became the duty of No. 1. This was found to be unsatisfactory, as it caused considerable lost motion in the preliminary duties of the gun squad. The sight box is now carried on the left gun shield, and becomes the sole responsibility of the gunner.

It is believed that the bracket type "DD" has so far proven to be the most satisfactory of the various types developed, and with a few minor alterations seems destined to be the one adopted for general use with the French 75's throughout the service.

# EXPERIENCES IN USE OF CAPTURED MATÉRIEL

BY CAPTAIN PARKER G. TENNEY, F.A.

THE need for re-building the roads across No-Man's Land held up the advance of the 4th Division Artillery for about twenty-four hours. Our position had been about midway between the famous Dead Man's and 304 Hills—near the town of Esnes. Probably no other single area had received so many of the scars of war. Along the sides of these hills and in the area between the outpost lines in front, there was not a square yard that had not, at some time or other, been chewed up by H. E. Chewed up and but partially digested was the town of Bethancourt, its highest building a ruin of five feet—the stones of its cemetery thrown onto the road to furnish footing for the advancing Americans. The only road which was feasible for our advance was hopelessly jammed with our own troops and those of another division—the latter having apparently strayed from their appointed course, seemed to do everything in their power to hinder the advance of the rest of us.

Our battalion bivouacked just north of Malancourt on the night of the 26th, and did not reach its position near Cuisy until 5 P.M. the night of the 27th of September.

Almost as soon as we were in our new position near Septsarges we got the good news that the doughboys had captured some enemy artillery—and in a few days the regimental commander directed that I take charge of a battery of German 77's, organize it, and prepare to take a part in the artillery fire of the division. This battery was soon called Battery "Q." It was given me on the 3rd of October as the division faced the Hindenburg line.

After receiving these orders, I went directly to brigade headquarters. Brigade headquarters told me where the guns were to be found, and much to my surprise, for it was then after dark, showed me the mornings' attack order, with Battery "Q" given almost as much space as any of the regiments. The guns were soon found, and in the light of a lantern, which could not be used for long, appeared to be in good condition. And then the troubles started—for the pintles of the French limbers which I had brought with me, could not be persuaded to couple with the German lunettes. Until then, I never realized the scarcity of rope. Finally some was salvaged from an overturned truck, the limber and the gun tied together, and with horses tired with overmuch work, and weak from scanty food, we hauled our 77's into position.

The personnel of "Q" battery came from batteries B and C of the 77th Field Artillery, and consisted of one noncommissioned officer for the entire battery and three men each for the guns. One officer was given me after we had been in position a few days—a first lieutenant whose stories in the *Saturday Evening Post* and in other magazines now interest so many people—J. P. Marquand. These men, of course, had been serving the French 75 for some time. They were excellent cannoneers. Although they had never seen a 77 before, upon being shown the guns, they knew instinctively how they were operated, and before they had finished giving them a thorough cleaning, seemed to know as much about them as had the German cannoneers. They never came to like them as well as the 75, but towards the end of their service with them could serve them more rapidly than they had ever been able to serve the French gun.

That service with Battery "Q" was popular, goes without saying. Everyone likes novelty—and the detail to a captured German battery had all the elements of romance and adventure that the men had been led to expect was the counterpart of war. But the chief reason that the 77's were so popular was that we did our own cooking. By the time this battery was given us, the men were pretty well "fed up" with army cooking and wanted a change. They had often been heard saying that they wished they could do their own cooking, and now they had a chance. The batteries from which we had drawn our men had no cooks and no cooking equipment to spare, so each man had to be his own cook. The rations given us always seemed to be enough for a full-size battery, and each man his own mess sergeant, would draw what he wanted each day. Some clubbed together and took turns cooking, but most of the men prepared their own food and if it was not done to a turn had no one to blame but themselves.

On taking command I had been worried about the messing arrangements and had thought that a great deal of discontent would arise from the lack of culinary skill on the part of the individual. But the men liked it greatly, and I do not believe that it took any more, if as much, time as the usual system does.

My own battalion munitions officer was given the additional duty of collecting ammunition for "Q," and on the morning subsequent to our original occupation of the position had about 2000 rounds of everything from blue cross gas to a square-nosed antitank shell at our guns. The Germans had a vast reserve in the area, and while the munitions officer used to intimate that he had had enough to do before he had been told to take care of us, he always seemed to have enough of everything on hand when we wanted it. I have often wondered what the Germans used to think as they saw our

square-nosed anti-tank shells rolling down the streets of Brieulles. They could not have done a great deal of damage, but without a doubt they added to Heinie's bewilderment, and without a doubt led him to confirm his suspicions that the Americans were most certainly crazy.

We were ready to fire that morning and did—taking care to elevate our guns to the maximum—that no shells might fall on our infantry, for no firing tables had been given us with the guns. Later on we did have a few sheets of paper which purported to be firing tables, but in which we could find little information about the shells we had. They were fragmentary in the extreme, and were without a doubt of some ancient vintage. Some of the shells at the battery were not mentioned—some were evidently given the wrong name—others were mentioned but the information concerning them seemed inexact. Consequently, it was necessary that we prepare our own firing tables, and using a forward observation post we obtained fairly accurate data on the medium and long ranges. We at least took care that any of our errors most certainly would be in the direction of Berlin and not of Paris. All of our safety factors were made large enough to satisfy even the most timid infantryman. The only time that I think our fire was inaccurate was when a French officer insisted on laying the guns. For some reason or other I wanted to re-lay the battery. There was no goniometer, and so I asked a French captain who had a battery nearby if he would lend me his. He would be glad to, and insisted that he lay the guns also. We wanted to fire on Brieulles, from which German troop trains were departing, but on checking the laying the next morning, I found that we were laid 200 mils outside of the outermost street. Whether the French artilleryman made a mistake, or whether not, I was never able to discover.

But the time came when the 77th Field Artillery received orders to displace forward, and although there were many more shells of German manufacture to be obtained, the division was collecting its captured matériel in the rear areas, and much to our surprise and regret, we were given orders to turn over our prized "whizz-bangs" to a collecting detail.

I have gone briefly into the events leading up to our taking over of the guns—our handling them—and our surrender of them, in order to preface a few remarks on how it could and should have been done had we been organized for it.

The *History of the Fourth Division*, on page 175, states, "Fortunately an extra battery of German 77's had been added to the division artillery." And again, on page 165, "Up to this time (9:30 A.M., the 27th) the 7th Brigade had captured about 1700 prisoners and

more than 40 guns of 77 and 150-mm. calibre. . . ." Evidently the only battery utilized out of the ten available was well thought of. Why was it not kept in action longer and why were not some of the others used?

We took our guns without knowing anything about them, other than they had always shot well in German hands. It would seem that a brochure of some length should have been prepared on each of the various types that the enemy was using, and that upon taking command of this battery a copy should have been given the battery commander. The preparation of this brochure would, of course, be a staff function, and would properly fall to G2. G2 could well prepare something of this sort on all prospective enemy nations in time of peace, so that there would be something to go on in the first days of war. In addition to this pamphlet a set of firing tables should have been given us which should have been up-to-date and which should have included information about all the shells the enemy was using. It would seem that all the material necessary for the preparation of these pamphlets must have been in American hands prior to the 26th of September, and that it only lacked coördination and distribution.

Again, there should have been in every corps, at least, extra instruments which could be issued to a captured battery, and, above all, a little extra transportation. On the offensive, when our infantry is capturing battery after battery, it is sheer wastefulness not to use them. Every battalion could, and every regiment should, be ready to absorb a captured battery. In order to make these captured batteries of value, it certainly requires that transportation be provided. If none is provided, the battery fires from one or two positions only, and then, regardless of the amount of ammunition on hand, is abandoned. In the hands of the enemy these captured batteries were certainly of great value—why could they not be of great value to us?

Battery "Q" stopped firing, not from any lack of ammunition. Had we been able to get permission, and some transportation, we could have fired many days longer.

In this case a definite plan and definite preparation for the use of captured matériel, was evidently lacking. Such a plan is undoubtedly necessary for the next war, if we are to take advantage of all of our opportunities, and who knows but that in the next war this may be imperative?

# WAR EXPERIENCES WITH THE 155-MM. HOWITZER

BY CAPTAIN G. J. DOWNING. F.A.

THE writer commanded Battery "E" and the 3rd Battalion, 21st Field Artillery, at various times while the regiment was on the front.

The advance school detachment of the regiment arrived at Valdahom, France, in March, 1918.

Instruction there in gunnery and matériel was very good. It was, naturally, entirely in accord with the ideas of the French army. In gunnery, emphasis was laid on firing by map, transfer of fire from points on which you had adjusted and in the use of corrections of the moment. Our service practice was entirely of the percussion precision type with one gun at a time. Economy of ammunition with the 155-howitzer was emphasized.

Instruction in communications consisted entirely in a study of the telephone. We had excellent instruction in camouflage and selection of 155-howitzer positions, but no instruction in mobility under combat conditions.

## MOBILITY

The regiment had great difficulty in mobility. This was, by far, its weakest point. I believe that the causes of this were as follows:

The horses issued to the regiment had just been purchased from various sources. Some of them were in poor flesh and none of them were hardened or conditioned so as to withstand combat service of the severe type to which they were subjected. No time for this conditioning was available.

The all-night marches, during many of which a cold rain fell, were very hard on the horses.

The supply system fell down on the march. The horses received but a part of their ration, whereas the work was so severe that they should have received all the oats they could eat.

The system of hauling the guns off the roads into the woods before daylight was very hard on the horses. The ground was often wet, the guns would get stuck and the resulting draft was very severe.

The horses had no protection from the weather on the marches. After being in draft all night, they stood in the woods all day. On cold, rainy days, this was bad. There was considerable mange among the animals.

As a result of the above, the losses in horses were large, and the loss of weight and appearance was alarming. It was almost true that the regiment could at times be followed by the dead and exhausted horses left along the road. After St. Mihiel, the regiment was unable to march without leaving a considerable percentage of their vehicles behind.

I believe that this condition would not have resulted had the horses received full rations. I remember making many protests about this.

There was a great tendency among staff officers to lay the greater portion of the blame on the officers and men—stating they did not properly care for the animals. I believe that this was a minor cause of the trouble. Our animals in the United States were in excellent condition. Most of the drivers had had considerable training in care and handling of horses.

### MATÉRIEL

It was the belief of the officers that the 155-mm. Schneider is an excellent howitzer. We experienced the following difficulties:

The elevating screw housing would break quite often. We were told that this would occur when fired with a heavy base charge and a low angle of elevation. However, the writer had two breaks with a heavy base charge and a high angle of elevation. This difficulty was quite common to this gun. I often thought that the nature of the matériel behind the spade might have something to do with it. It was customary to place logs behind the spade in muddy ground.

A breech block blew off one howitzer of "E" battery while in position in the Bois de Heiche near Thiaucourt. The battery was firing rapidly about 2:00 A.M. The shell left the gun—the breech block apparently unscrewed before blowing off and then tore loose from the hinge. Investigation showed that this gun with the old French type of primer latch could be fired slightly before the block is completely screwed into the breech recess—before the block handle is latched. Perhaps the gun was fired with the block in this position and the pressure of the base charge unscrewed the block from its threaded recess. However, I never felt satisfied that this was the real cause of the accident.

The draft demanded by this gun on soft, wet, unimproved roads is so great that it is very questionable whether they should be taken in such places. The use of tractors in place of horses is, I believe, very wise. However, they will likewise stick tractors under such bad conditions. I saw as many as thirty pairs of horses on one gun trying to pull up a muddy hill.

Some of the fire must have been very inaccurate. The system of taking up a new position at night, determining the coördinates of the battery by nearby terrain features, laying the battery by compass with a French aiming circle in the darkness, figuring the data from the map, using the corrections of the moment and then opening fire at the correct time, must have been far from accurate at times. I have often wondered how far from the target we usually hit. The system was undoubtedly the correct one from the tactical standpoint (adjusting a large number of batteries would have notified the enemy of the impending attack), but from the gunnery standpoint, I now think that we did not sweep or use zone fire enough. We had the tendency of figuring the data and leaving the guns laid with that data for each target.

On the other hand, transfers of fire by map from a point on which you had adjusted, were, I believe, quite accurate.

I believe that at least 90 per cent. of the 155-howitzer fire was unobserved. When you consider that all of the following fire was unobserved, I believe the total easily reaches 90 per cent.

1. All the night firing.
2. Firing on days of poor visibility.
3. Firing on targets in space invisible from observation points.
4. Firing on targets which might have been observed but were not.

Of course, 3 (above) is a very common type of procedure for howitzers as the enemy puts everything he can on reverse slopes.

This system of map firing was obviously the correct way to fire—the fact that you could fire on any target at any time irrespective of darkness or poor visibility, far overweighed its disadvantages. It must certainly be used in future wars. But the following disadvantages were very obvious:

It created a tendency among some officers to make little attempt to adjust, or, perhaps I should say, not to make the maximum attempt to adjust on as many points as possible within their sector.

After being assigned a target, it took considerable time to figure the data due to the correctness of the moment data that must be applied. This time could be (and was) greatly reduced by different systems that were worked out by various artillery officers.

Compared with observed fire, this sort of fire is, of course, inaccurate and hence wasted ammunition. However, the degree of accuracy varied greatly, I am sure. We had much difficulty with lots of powder—getting a comparatively few rounds only of each lot. I believe this was the leading cause of the inaccuracy that we had. But with the same powder lot, by careful adjustment on a considerable number of points in various parts of the sector and careful

calculation of the data, I believe this system can be made accurate. Observation of targets (upon which we had fired) after the armistice, leads me to this belief. Battery "E" hit a German narrowgauge railway train with unobserved fire.

### NOTES ON CALCULATION OF DATA FROM MAP

I question the habit of measuring angles and ranges from the maps. Under combat conditions, maps are liable to stretch or become otherwise inaccurate. It is a short operation to figure the Y azimuth of the gun-target line by natural or logarithmic tangents from the two sides of the right-angled triangle (subtracting the coördinates to get the two sides of the triangle). Similarly, the operation of calculating the range is a short one—either by taking the square root of the sum of the squares of the two sides of the triangle, or by dividing the appropriate side of the triangle by the sine of the Y azimuth. This system has the additional advantage that two men can figure together and check each other without loss of time and the accuracy is very high.

To decrease the time between being assigned a target to fire upon and opening fire, I found the following system advantageous: Assume that you have adjusted upon at least four points in different parts of your sector. Every time new meteorological data comes in, figure the corrections to be applied for range and deflection for each of these points. When a target is assigned, interpolate between these points for the proper corrections of the moment to be applied. Unless very unusual weather conditions prevail, the error is negligible. This should speed up the opening of fire by ten minutes.

### ADJUSTMENTS

We spent considerable time in attempting to adjust with the aid of airplanes and balloons, especially planes. I do not remember a single good adjustment with either. The obstacles seemed to be various and insurmountable. Among other reasons for no success with airplanes, I remember such things as "poor visibility" (very common), "enemy planes driving us down," "cannot spot your shots," "target poorly defined." I believe that the system was wrong—use of panels, etc. It took too much time. I once arranged an adjustment with an air service officer whereby everything was prearranged; our watches synchronized and at an agreed time, we fired ten rounds from one gun with the same laying as rapidly as possible. He was to give us the location of the centre of impact with respect to the target and, if nothing interfered, we were to fire ten more rounds after making the corrections. But the visibility was poor, the plane reported. I still believe that this is the proper system. I was told that this system was used by the French. Airplane adjustments in actual warfare, must, above all, be rapid.

I have forgotten the details of our troubles with the balloons other than poor visibility and enemy planes. I remember working with a balloon one morning when it, with two others, were set on fire by one enemy plane.

In contrast to our experiences with the air service was that with the French and American flash and sound-ranging sections. We obtained many excellent adjustments with their aid—they seldom failed. No object to adjust upon was necessary—they would adjust us in the centre of a vacant field or anywhere by their system of three or more observers. When enemy planes were bad, we used the system of firing ten rounds per gun rapidly with the same laying—they would give us the coördinates of the centre of impact. This worked beautifully—it was fast, accurate and saving of ammunition. From these adjustments, we made some transfers of fire that were apparently very accurate.

The most discouraging feature of making good adjustments was the different lots of powder. We found adjustments with one lot of powder to be of little value with other lots, the range varying sufficiently to make your fire of little accuracy.

Incidentally, the longer we were on the front, the more careful we became about firing when enemy planes could locate us. I ran a telephone wire to anti-aircraft batteries if one was nearby. We had trouble in determining enemy planes from friendly ones if they were far away. A battery located may not be a battery lost, but it is one which stands an excellent chance of having something dropped on it. Camouflage was very important as was also the roving gun.

### MISCELLANEOUS

Obviously, the howitzer has a very great advantage in choosing battery positions in that they can be close up to steep, protecting slopes. In heavily shelled sectors, this is a great advantage. The trenches which each crew dug at the side of the gun were found to be a great protection. Battery "F" received a direct hit on one howitzer from a six-inch shell—a fragment of the shell passing clear through the gun tube. Three men were in the trench beside the gun hit—they could not have been more than ten feet away. Outside of shock, they were unhurt.

Positions any considerable distance from good roads were found very undesirable in wet weather. Getting ammunition in was very hard on morale.

About September 18th in the St. Mihiel sector, my battalion, (3rd Battalion, 21st Field Artillery) was placed under command of a major of the French army who commanded a groupment of French artillery in that sector. Enemy shelling was very bad. Battery "F" had been very heavily and very accurately shelled by

German six-inch howitzers—one gun received a direct hit and another was damaged. The major ordered me to change battery positions, get up plenty of ammunition and to do no firing. For three or four days during which heavy enemy shelling continued, his entire groupment did no firing. During this time, he was making every effort to accurately locate the enemy batteries. We then received orders one afternoon to adjust and that evening received a list of enemy battery positions—we were to transfer fire from adjusting points and to fire a battery or battalion volley on the enemy batteries for the first fire. The entire groupment fired all night. Enemy shelling was greatly reduced the next day and the sector rapidly quieted down. (This was due also to the opening of the American attack in the Argonne on the 26th, of course.) The French major told me that a considerable number of enemy batteries were damaged that night. The tactics impressed me as being excellent.

Our experience tended toward the belief that German artillery was far from inefficient. One evening about 6 o'clock, we observed a German three-inch battery adjust on a pill box about 300 yards to the flank of my battalion command post—an old German dugout in a sunken road. This battery then transferred fire to the command post and fired but one volley of shrapnel. This volley killed or wounded seven men—every man standing in front of the command post.

The American habit of using old German dugouts for command posts was regrettable and inexcusable. We were told repeatedly by the French not to do it. Obviously, they were in the worst possible location—on the wrong side of the hill and located with great accuracy by the enemy who had lived in them so long.

Practically no effort was made to use communications other than telephone and radio. Casualties among the men repairing telephone wire were the heaviest of any group in the battalion. The battalion headquarters telephone men suffered especially heavy casualties.

# OPERATION OF THE REMOUNT HORSE BREEDING PLAN

COURTESY OF THE AMERICAN REMOUNT ASSOCIATION

THE progress made in the operation of the Remount Horse Breeding Plan during the year 1925 was relatively greater than during any previous year since the inauguration of the plan in 1921. Stallion agents are coöperating in every way, and stallions are becoming settled down in the best horse communities in the United States.

The following tabulation gives a summary of the breeding operations during the years 1921 to 1925, inclusive:

| Year | No. stallions employed | No. mares bred | Average No. of mares per stallion |
|---|---|---|---|
| 1921 | 159 | 4129 | 25.9 |
| 1922 | 219 | 6799 | 31.0 |
| 1923 | 236 | 7505 | 31.8 |
| 1924 | 277 | 8654 | 31.2 |
| 1925 | 308 | 9906 | 32.1 |

It will be noted from an examination of the foregoing tabulation that 36,993 mares were bred to Remount stallions in the past five years, or an average of approximately 7400 mares per year for the five-year period. It is most difficult to induce all mare owners to report the foals secured, but a number of inspections by Remount personnel and by members of the American Remount Association, added to the reports actually made by owners of mares, would indicate that the foal production has been very close to 65 per cent. This means that the total number of colts secured out of 36,993 mares bred is about 25,000.

The class of colts obtained is a great improvement over what has been produced by the "hit or miss" methods previously followed in communities where Remount stallions are now placed. Inspections in the past have shown that about one out of ten horses presented for sale to the Government is accepted as up to Government specifications where they are gathered together from all sources and from all kinds of sires. Careful inspections of colts by Remount stallions out of the proper type of mares show that fully 80 per cent. of them are up to Government specifications and that fully 25 per cent. would bring prices greatly in excess of any prices that the Government pays.

Officers of the Remount Service, Quartermaster Corps, Officers of the Army Veterinary Corps, Mr. G. A. Bell, the consulting specialist in horse breeding in the Remount Service, and a number of experienced horsemen, members of the American Remount Association,

are closely supervising the breeding work throughout the country, and special attention is being devoted to the following points:

Stallions of proper type, free from transmissible defects only are being placed in breeding centres. They are thoroughly tested for all equine diseases and for fertility before being sent out, and are never shifted from one community to another without again being tested to prevent the possibility of spreading diseases. All colts possible are inspected yearly, and any stallion producing inferior colts is removed from the stud. In the year 1925, four stallions were destroyed on account of incurable diseases; ten on account of being unsuitable sires; and two were castrated as unsuitable. The loss from death and old age was twenty-one. In other words, a 10 per cent. loss from all causes can be anticipated yearly in stallions.

Selection of breeding localities is being carefully made on the basis—(1) of suitable agents who will handle the stallions properly; (2) mares of proper type for breeding; (3) general local interest in breeding riding horses of proper type. In the year 1925 about 50 stallions were shifted from localities where these essential points were lacking to better and more suitable communities, and at the present date all stallions now out are assigned to better advantage than at any time in the past.

To prevent inbreeding, stallions are shifted from one community or one State to another as soon as the fillies in the community in which the horses are standing are old enough to require other stallion for breeding.

The selection of proper mares for service to Remount stallions is being specially stressed. In many instances at the inauguration of the breeding plan it was found that some breeders labored under the misapprehension that a good stallion would produce a good colt regardless of the quality of the mare to which he was bred. The practice also existed of selling all fillies that were of high type or salable, retaining only the worthless, unsound ones for breeding purposes. The disastrous results obtained from such practices are being emphasized and breeders are gradually realizing the fact that the brood-mare is as important as the stallion, and that the stallion should not be expected to correct all defects in the mare. Violent crosses on draft mares, etc., are being discouraged.

The necessity for proper care and feeding of the colts is being pointed out to breeders with very satisfactory results. It has been found that proper attention and feed just prior to weaning time and up to the time that the colt goes out to grass as a yearling is the most important stage of the colt's development. Proper care, handling, and feeding at this period assure good horses. Neglect and short rations result in almost certain failure. A youngster handled, gentled and halter broken at this time never forgets his training, and

at the proper time in the future can be saddled, broken and ridden with the greatest ease. No roping or rough handling is necessary, and the value of such a colt in the horse market is greatly increased.

Repeatedly in the columns of *The Remount*, the journal of the American Remount Association, and through other means, breeders have been urged, as a matter of self-interest, to register their half-bred colts in the Half-bred Stud Book maintained by the Genesee Valley Breeders Association, Avon, N. Y., under authority of The Jockey Club.

It is a pleasure to be able to report that, according to information received from the Registrar of the Half-bred Registration, the suggestions above referred to appear to have been followed by breeders to a considerable extent.

In placing stallions with an agent great care is exercised to ascertain what the breeders in his locality desire, and stallions of various breeds and types are placed according to popular demand. Should a stallion, upon being assigned, prove unsatisfactory, he is removed. It is, therefore, definitely known that the stallions now in the stud are rendering satisfactory service. Applicants for additional stallions throughout the country number approximately 1500. This is concrete evidence that breeders are coming to a realization of the fact that a well-bred horse, properly cared for and intelligently handled, has a ready and profitable market.

There still exist in the United States thousands of scrub horses that have no salable value. Many horses throughout the northwest are today being sold for $2.50 to $5.00 per head for canning or fertilizer purposes. Such horses are the results of violent crossbreeding, inbreeding, and neglect. They have all the bad points known to the equine family and none of the good points; they are an enormous economic waste. Familiarity with such conditions and with the production of such misfits justifies the motto of the American Remount Association, "Not more horses, but BETTER horses."

At the inception of the breeding plan in 1921 the failure of the undertaking was frequently predicted because of supposed lack of interest among horsemen as a whole in the riding horse. It was constantly asserted with considerable vehemence that no interest in the breeding of light horses existed in the United States, and that the only way to obtain the necessary interest was to pay liberally for it. At that time it was estimated that it would cost $1000 per year to operate a stallion, in addition to the purchase price. Two hundred and fifty thousand dollars were secured from Congress, with the hope that 250 stallions could be procured and kept in operation.

Compare this estimate with the results accomplished in the year 1925. There were $150,000 appropriated by Congress for that

year and $40,000 was turned in to the Treasury of the United States for stud fees collected. The cost to the Government for this year was, therefore, $110,000. On December 31, 1925, there were 400 stallions on hand, so that we can readily see by dividing $110,000 by 400 that the cost of operation of each stallion, including purchase price of replacements, cost of shipment in distribution, care, maintenance, etc., was actually only $275.

This remarkably low maintenance cost over the estimated cost is due to one factor entirely, *i.e.*, the material support given by the horsemen of the United States in every section of the country, from all walks of life, on all occasions, which has been wholehearted and generous in the extreme.

To fully appreciate the material assistance rendered by the horsemen of the Nation and to show how little really could have been accomplished without their support, grateful acknowledgment is hereby made of the following outstanding donations of money for prizes at Horse Shows and Fairs, services to outstanding stallions, loans of mares to enable acceptance of such services, and donations of stallions, brood-mares and colts:

*Money for Prizes*.—During the period 1921–1925, inclusive, approximately $25,000 were contributed by The Jockey Club and by the several Jockey Clubs, Racing and Breeding Associations of Kentucky, Maryland and New York, to enable the American Remount Association to donate prizes at Horse Shows and Fairs to encourage breeding. This money has been distributed yearly, during the five-year period above referred to, to approximately forty separate Shows and Fairs throughout the country, and these donations have been of inestimable value in establishing type and in educating the general public to the value of WELL-BRED HORSES.

*Services to Stallions and Loans of Mares*.—In 1922, a service to "Man of War" by Mr. S. D. Riddle, Glen Riddle, Pa., for which Mr. A. B. Hancock, Paris, Ky., loaned the mare "Star Puss." The filly "Siren" was obtained as a result of these donations and sold as a yearling at Saratoga, N. Y., in 1923 for $8000. These funds are being used by the American Remount Association in furtherance of the breeding work.

In 1924, a service to "Light Brigade" by Hon. J. N. Camden, Versailles, Ky., for which Colonel E. B. Bradley, Lexington, Ky., loaned the mare "Morning Call." A fine colt resulting from these donations was foaled on February 6, 1926.

In 1925, a service to "Wildair" by Mr. H. P. Whitney, Lexington, Ky., for which Colonel H. C. Whitehead has loaned the mare "Miss Charcot."

In 1926, a service to "Oceanic" by Mr. S. D. Riddle.

It will, therefore, be observed that stallion and mare owners are

generous in their donations of services to outstanding stallions and in the loan of their mares. The difficulty has been in securing acceptable brood-mares. The Association recently acquired the thoroughbred mare "Octuria" by "Octagon." Unfortunately this mare died on March 31, 1926, from pneumonia. We hope, however, that other brood-mares may be obtained shortly so that we may take advantage of several offers of services to well-known stallions that it has been impossible so far to accept for lack of suitable mares.

*Stallions, Brood-mares and Colts*.—A total of 154 stallions, 26 brood-mares and 10 thoroughbred colts have been donated in furtherance of the breeding plan since 1921. Among these donations are some of the best stallions now in service. The value of donations of stallions alone is estimated at $300,000.

The production since 1921 of approximately 25,000 colts, valued conservatively at $170 each, has placed in the United States a War Reserve of riding horses of a total value of $4,250,000 and, in addition, has enabled many breeders and farmers to raise good horses for sale at a fair profit instead of a $2.50 or $25.00 scrub. A continued liberal support on the part of the public, coupled with a continuity of policy by the Government will, without doubt, result in constant improvement in the riding horse conditions throughout the United States, and this improvement will be not only of benefit to the breeder, but also an important contribution to National Defense.

# FOREIGN MILITARY JOURNALS A CURRENT RÉSUMÉ

**ENGLAND**

**The Journal of the Royal Artillery, April-June, 1926.**

THE first article in this issue of the *Journal of the Royal Artillery*, is a lecture by Colonel J. E. S. Brind, on **"The Strategical and Tactical Aspects of Coast Defense in the Future."**

Colonel Brind first touches on what may be called the Imperial aspect of his subject, that is, he shows that the British Empire is dependent on the navy for control of the seas and therefore of Imperial communications, and the navy is in turn, dependent on secure bases from which it can operate. The army is still responsible for the security of those bases. Incidentally, the author points out later in his lecture that the British have definitely accepted the high-water mark as the dividing line between the responsibility of the navy and army. This may be of interest to Americans, in view of some discussion of the matter, as regards our forces, in our own press.

Some paragraphs from this article, touching on the proper armament for coast defense, are deemed worthy of quoting as showing the British attitude toward a recently mooted question in America. The author states:

"There was considerable doubt after the war whether the old method of fixed gun defence was still the most suitable for coast defence, or whether, in view of modern developments, the time had not come to readjust our views and to replace or supplement our guns by other weapons. The subject was gone into in great detail by the Committee of Imperial Defence and the Staffs of the three services, with the result that the conclusion was arrived at that though considerable modifications might be advisable, the time had not yet come for any drastic change in policy and that the gun must still remain the primary means of defense.

"It had been suggested that the submarine and aircraft might form better deterrents to hostile fleets than fixed defences. As regards submarines, the Naval Staff maintained that they were mobile forces belonging to the fleet, which must be free to operate with the fleet, and cannot be tied down to the task of defending some particular fortress or base. Furthermore, they were of the opinion that submarines, by themselves, would not form an adequate deterrent, though, if present, they would form a very valuable addition to the defence; that they had considerable limitations at night, and that the advance of anti-submarine measures was rapidly

lessening the power of the submarine as a menace to a hostile fleet provided with adequate means of protection.

"As regards aircraft the same argument against the locking up of mobile forces applied. Furthermore the installation of aerodromes, workshops, etc., in all our scattered fortresses throughout the Empire would involve very considerable expenditure. Finally, in their present state of development—one cannot say what might happen in the future—it was quite clear that aircraft, except in prohibitive numbers, could neither compete in accuracy or maintenance of a rate of fire with the guns, that they were far more vulnerable and had no means of correcting their errors. This applies only to the present state of development of aircraft. If they can add extreme accuracy to the undeniable advantage they now have in range, there may be very considerable modifications in the views now held, and the decisions hitherto arrived at.

"Broadly speaking, then, the conclusion was arrived at that no revolutionary change in the system of coast defence was yet possible. Just as in the past, history shows that no new weapon or invention has ever caused sudden revolutions in the art of war, so in the present time must the new weapons or arms take their place in the first instance side by side with the older weapons, until either they produce their own antidotes, or in the process of development they absorb the functions of their predecessors.

"With regard to the gun itself, it was argued that the majority of our coast defence guns never fired a shot in the war, but this is certainly not a proof of their failure, it is rather a proof of their success as a deterrent. The primary object of coast defence artillery is to deter enemy ships from bombarding or attacking the vulnerable points it is designed to protect, in fact to make the game not worth the candle, and the existence of the defences is fully justified if the enemy is prevented from even attempting to damage the ports and bases they are there to defend. The German fleet, in its occasional hasty raids on our coasts, avoided any but the most lightly armored defences. Their cruisers and raiders all over the world fought shy of all defended ports. In our own attacks on the somewhat out-of-date Turkish defences of the Dardanelles, we did but little harm to those defences and suffered considerable damage to several of our older battleships and cruisers."

The article concerns itself largely with strategical problems of the British Empire and the resultant problems in location of defended ports and bases.

**"The Development of Artillery Matériel"** is a lecture by Colonel S. W. H. Rawlins. Colonel Rawlins mentions the desirable characteristics of any field piece, *i.e.*, range, shell power, and mobility,—granting

accuracy as always indispensable. He finds no solution in which any one of these characteristics may be improved without some sacrifice in one of the others, except that range may possibly be increased by better projectile shapes.

The author's comments on weight are interesting. Formerly *weight behind the team* was the limiting factor and was about reached by the British 18-pounder in light artillery. Tractors removed the *weight behind the team* limit, but, peculiarly enough, we find another determining limit for light artillery, about the same in amount, which has not been restrictive heretofore,—that is the *weight in action*. In other words, the light artillery gun must permit man-handling in position, and the old *weight behind the team* limit corresponds closely to the limiting *weight in action*.

The author favors the split-trail system for light guns, to secure quick traverse. While a split-trail model is being designed in England for trial for a medium carriage, he prefers a platform and central pivot for both medium and heavy calibres.

The common carriage for gun and howitzer has, apparently, met with no success in England.

With regard to range, the English, in common with all the powers since the war, are seeking longer range in their new designs. At present it seems that this increased range in the division artillery must be secured by improved shell design and some sacrifice of the shell power of the 18-pounder used during the war.

No satisfactory anti-tank or close support weapons have been adopted in England. The author favors the idea of a machine gun with a special bullet as an anti-tank weapon.

The author offers an excellent analysis of the close-support (accompanying gun) problem. Some quotations from this part of the lecture are interesting:

"* * * If our divisional artillery could be sufficiently numerous, if we could spread forward observation officers all over the country, if wireless telephony was a widespread fool-proof, enemy-proof certainty, then I argue that the demand for a special close-support weapon would disappear.

"But we have not reached the happy standards mentioned and, therefore, it may be that the demand for a special close-support weapon is justifiable today."

Turning to the solution of the problem:—

"The first and greatest point is that we have got to organize some form of close-support fire that shall, within reasonable expectation, be able to move and live in fairly close proximity to the leading infantry at the critical period of the attack. This implies, to my mind, ability to move and fire at short ranges where no horse—or even mule—conveyed artillery can hope to function efficiently. Can

you honestly imagine artillery of that nature being able to move about and give effective support to infantry at ranges where the infantry themselves are tied to the ground by the intensive machine-gun and rifle fire of the defense? Personally, I cannot; and so I arrive at the desiderata of a close-support weapon, if our existing artillery cannot do the work. * * *

"A specific close-support weapon must:—

(*a*) Be able to move with reasonable immunity fairly close behind the leading infantry. A low track transporter, with a bullet-proof shield, is therefore indicated.

(*b*) Even so, a stage may arrive when the track-transporter may no longer be able to advance. The weapon must therefore be capable of being removed from the transporter and of being man-handled in some way or other, from that point onwards. That is to say, the equipment must be divisible into 50-lbs. loads or less.

(*c*) Ammunition supply must in any case be almost a decisive factor. We must have a reasonably effective shell and at the same time remember the ultimate factor of manporterage. An H. E. shell of about 10–15 lbs. should fulfil the first condition and one man should be able to carry 6–4 such shell as a last resort.

(*d*) A high-angle fire weapon is essential, in order that the best use may be made of any natural cover.

(*e*) A special weapon is in view, and we should therefore observe the principle advanced early in my lecture that we should endeavor to produce a weapon that will not tax the capacity of our regular armament firms.

"What, then, should be our line of investigation?

"I urge that our best course is to seek to design a simple mortar, which can be conveyed and if necessary fired from a transporter and ultimately be man-handled in close support of the infantry. It should have a shell of between 10 and 15 lbs. and must of course afford adequate accuracy of fire."

While the author thinks any special weapon for close-support might also serve anti-tank purposes, he does not think it should also be expected to take part in the so-called normal divisional artillery tasks.

In **"The Future of the Regiment"** (*i.e.*, the British Artillery) Colonel H. Rowan-Robinson paints with very evident assurance, a surprising picture of warfare in the near future. He says: "Progressing on the lines of our existing policy and in the absence of war, we shall, say, in fifteen years' time, have mechanized the whole of our horse, field, and medium artillery, that is the guns of all these

branches will be dragon-drawn." (The dragon is the new British tractor.) That statement alone may give food for thought, but the author goes on to say: "During that time the mechanization of the rest of the army will have proceeded apace. Neither bayonet nor sabre will then be decisive weapons; they will have been supplanted by the slow-moving tank and the fast-moving tank. Infantry and cavalry will still exist but only as auxiliary services * * *." Only ten per cent. of present-day artillery will be retained. The other ninety per cent. will disappear or be changed to light cannon *inside* tanks.

The author reaches his conclusions by analytical methods and his predictions are interesting.

In **"Lessons of the Great War,"** Captain O. G. Body makes a strong plea for concentrations on selected targets as opposed to the use of barrages. He characterizes the latter as "ponderous and heavy methods," while the former corresponds to the enterprise, initiative and "opportunist tactics" of present-day infantry doctrine.

Major R. A. E. Voysey, in **"The Mechanilisation of Territorial Field Artillery,"** advocates the motorization of that part of the British Artillery corresponding to our National Guard Field Artillery. His arguments are based on equal mobility, economy in personnel, economy in time, and economy in money. (His use of a certain word has a peculiarly familiar sound to us Americans!) His strongest point seems to be economy of time in training motor personnel as compared to the time required to train horsemen. However, he predicates the change to motors, on further experiments to show whether certain technical difficulties experienced with the latter can be remedied.

Major A. F. Brooke presents in this number his fifth article on **"The Evolution of Artillery in the Great War."** This issue deals with the evolution of artillery tactics. The author traces three steps in the war, namely, the period of growth, the period of destruction, and the period of neutralization. The period of growth includes the first battles and covers the time in which the necessary matériel and ammunition were manufactured, and the organization perfected. Following this period, the results of the first real offensives were misinterpreted. The successes, so far as the artillery was concerned, were attributed to the destruction of the enemy works and matériel. This led to further efforts in this same line, until sounder principles were evolved when it was found that neutralization, properly exploited, produced success, without attempting the costly and often impossible task of destruction.

**FRANCE**

**"Revue Militaire Française," March and April, 1926.**

In his article **"Reflections Suggested by Six Months of Campaign in Morocco,"** General Dosse describes the methods of warfare employed by the Riffs and also the offensive and defensive tactics adopted by the various French arms as a result of several months of fighting during 1925.

The Riffs are more mobile than the French since they have no need of supply trains. Having practically no artillery, they are concerned with only the supply of infantry ammunition. Contrasted to the heavy French columns, their mobility is surprising. The Riffs are good marksmen, and frequently force the French battalions to deploy at long range. They are very prudent though tenacious fighters. Their aim seems to be to gain time and wear out the French. Against such an enemy, which never acts in mass, the French must fight a series of local engagements, conquering the natives tribe by tribe.

The Riffs defend their positions stubbornly but rarely wish to engage in a hand-to-hand fight. They prefer to withdraw before a vigorous offensive and launch a counter-attack. An attacking force which hesitates or tries to withdraw is lost. In such a case even artillery fire will not halt the counter-attacking Riffs. The Riffs fear the tanks, but have learned to choose positions inaccessible to a tank attack. They are very much frightened by airplane bombs.

An attack against the Riffs must be carefully planned and carried out vigorously. It is desirable to select some commanding elevation as the principal objective. The flanks during the attack must be guarded by fixed flank guards. That is, as the attack progresses, successive detachments entrench on the flanks mutually protecting each other as well as the flanks of the advancing troops and the line of communications.

In describing the action of the various arms, the author states that the infantry should be careful not to deploy too great a force for the attack. To use several battalions against 100 Riffs would merely offer a larger target to the tribesmen.

In this mountainous country, the artillery cannot use map fire, due to the rapidly moving targets and also to the lack of accurate maps. The pieces must frequently be pulled by hand to very advanced positions to be effective against the targets offered. It has been found that 100 men can pull a 75 or a 155 to almost any position. Volley fire frequently is found to be necessary as the natives take cover after the first round. Night firing is very fruitful especially against villages and back areas.

The cavalry plays a very important part in both reconnaissance

and flanking attacks. A unit larger than a squadron should not be used as it presents too vulnerable a target.

The aviation terrorizes the enemy by bombardments. The presence of airplanes also gives confidence and hope to the troops they are accompanying. Regulation of artillery fire is very valuable, especially in such rough terrain where terrestrial observation is at times difficult. Apparently the artillery is not well equipped with radio-receiving sets or with radio personnel, as the author complains of the frequent necessity of dropping written messages in reporting observations. This gives the human target time to disappear.

Tanks supported by infantry are very effective, particularly upon the morale of the Riffs. They cannot be used in night attacks as their noise is heard at a distance of three or four kilometres.

General Camon proposes the replacement of the cavalry division by **"The Light Automobile Division."** In the advance and in the pursuit, the mission of such a division would be: to reconnoitre for the army which follows, to act as a strategical and tactical advance guard, to gain rapid possession of the bridges, railroad centres, and store houses before the enemy has time to destroy them and to repair any bridges which have been destroyed, before the arrival of the main body.

Corresponding to the original organization of the Cavalry corps by Napoleon, the author proposes that this motorized division be organized into three brigades: a light brigade, a brigade of the line, and a heavy brigade. The light cavalry, as originally formed by Napoleon, was made up of the chasseurs and the hussards: the line cavalry was composed of dragoons, and the heavy cavalry of cuirassiers. The mission of the light motorized brigade will be one of reconnaissance. It will be very mobile. The author suggests the motorcycle for its speed, and fixes the number at 400. Light automobiles to carry radio equipment, machine-gun sections, 37-mm. anti-tank guns, explosives, and canvas boats will comprise the balance of the brigade transportation. No artillery will move with the light brigade. The brigade of the line will include two regiments of 1000 men each on trucks and some artillery. The artillery, being motorized, can be heavier than the 75. Radio sections, engineer troops, ambulances, combat and supply trains will move with this brigade. The third or heavy brigade will be the division reserve. It will contain one regiment of 1000 men on trucks, engineer troops, pontoon bridge matériel, radio trucks, trucks carrying ammunition and gasoline, etc.

The strength of such a division would be 3400 rifles.

**"Reflections on the Riff Campaign,"** by Commandant X, is concluded in the March issue. After a study of the 1925 campaign the author examines the organization of troops best suited to this special type of warfare.

General Lyantey adopted a "regional" system, dividing the front into a number of regions. At the head of each was a military chief given independent political administrative, and tactical control over his region, with instructions to call, in case of necessity, for reinforcements from other regions or from the general reserve.

The most effective organization was that which provided for "mobile groups." A group consisted usually of six battalions of Infantry, two squadrons of Cavalry, four or five batteries of Artillery, aviation, and a supplementary force furnished by friendly tribes. This system made the battalion the tactical unit and broke up the regimental organization. The colonels or lieutenant-colonels of the original regiments accompanied the mobile group and commanded various groups of battalions created as circumstances required.

Since July, 1925, with the arrival of reinforcements, this system of mobile groups has been undergoing a change. The high command has decided not to scatter the battalions into mobile groups which would break up the regimental brigade and divisional organization to which the units coming from France and the Rhine are accustomed.

The new organization provides for divisions, made up of two or three mixed brigades. The mixed brigade is quite similar to the old mobile group. It consists of two regiments of infantry, one of artillery, and one of cavalry. Unfortunately it is not planned to use the mixed brigade as mobile groups, but rather to hold them in the divisional organization, thereby diminishing their flexibility and capacity for manœuvre.

**"The Allied Debarkation of the Dardanelles,"** by Commandant Desmazes, is a detailed account of the Dardanelles expedition. In preparing this article the author made a study of matériel gathered by the historical section of the French general staff, the "Gallipoli Diary" of General Hamilton, General von Sanders' book, "Five Years of Turkey," and the Turkish General Staff history of the Dardanelles campaign.

**"Communications in Morocco"** is a study of the development of signal communication during the 1925 operations.

The infantry uses only visual signalling methods. It is provided with neither the telephone nor the telegraph. The cavalry also uses visual signalling for communication, but furnishes platoons to

operate radio stations which receive messages from the airplanes accompanying the moving columns. The artillery is equipped with radio telephone and also with radio receiving apparatus to permit regulation of fire by airplane. The aviation, in addition to its normal radio service in the air, maintains ground communication for the various headquarters.

The 41st battalion of engineers is charged with the signal communications in Morocco and furnishes signal specialists to the various commanders of territorial sub-divisions. This battalion reënforced by infantry auxiliaries assures the construction and maintenance of telephone and telegraph lines, and sends out mobile detachments of telephone and radio operators with the moving columns of line troops. All matériel is carried by pack mules.

The telephone matériel used is the same as that in France, except that for economy iron wire is used in place of copper. A single line of field wire is unrolled by an advancing column. A few hours later this wire is replaced by bare wire stretched on poles. The telegraph is used only in the rear.

Communication by radio from the airplane to the artillery has developed very little because of a lack of trained observers and artillery radio operators. The artillery fire is rarely regulated by airplane. Even with the moving columns the airplanes usually communicate by dropping written messages.

The fundamental means of communication in Morocco is visual signalling and excellent results have been obtained in this mountainous country. Carrier pigeons have given poor results. The pigeons become lost or are killed by other birds. Panels are very much used in marking the line and in signalling.

In the April issue, Commandant Block begins a study of the tactical employment of various types of combat gases.

Other articles in the March and April numbers are **"Verdun," "The Contact and the Engagement,"** and **"The Synthesis of Movement."**

REVUE D'ARTILLERIE

**"Motorization of the Army,"** by General Camon, November number, 1925. "The motorization of the army, in other words the replacement of the horse by the motor, is the most urgent reform that confronts our military organization." With this emphatic preamble General Camon begins his appeal for motor traction and transport. Against this radical change he sees only two arguments: first, financial cost of initial change, and second, lack of fuel resources in France. To meet the argument of the great expense of special military motor vehicles, he proposes that nothing but commercial types be employed in the army. The manufacturers are to be encouraged

to produce a tractor suitable for both military and agricultural purposes by the promise of the government to purchase each year a certain number for the army. Meanwhile a complete automobile census should be compiled and kept up to date for use in case of a mobilization. Motor busses would be listed for the transport of troops; heavy pleasure vehicles for the use of the various staffs; light pleasure cars and motor cycles for reconnaissance and liaison work; while trucks are to be classed according to their suitability for transporting artillery or for ammunition and supplies.

In order to insure ease of repair and upkeep, it is urged upon the manufacturers of France, as a patriotic duty, to adopt a standard for many parts of their products especially for bolts, nuts and other threaded parts.

While admitting that France has practically no natural sources of petroleum, it is claimed, that according to an inventory made in December, 1924, there was enough fuel in the country to operate constantly for a period of four months 300,000 motor vehicles. This figure is the number of vehicles which would be requisitioned upon mobilization, leaving a balance of 275,000 for civilian use under a rigid system of supervision. In 1925, through parliamentary action, headway was made towards the constitution of fuel reserves and to date there exist reservoirs having a total capacity of 1,900,000 cubic metres of oil. Thanks to improved harbor facilities and the construction of tankers, France is now in a position to import about 1,000,000 tons of oil per annum under its own flag. The various motor fuel substitutes such as alcohol, benzol, acetylene are touched upon and hopes are expressed that sufficient scientific progress will be made to eventually assure complete independence in the matter of carburants. In his conclusion General Camon once more warns against the demand for special vehicles, armored, and capable of passing everywhere. He shows that neither the cavalrymen nor his horse are armor plated and that no cavalry division is capable of crossing all kinds of country; yet these are the very things demanded by the opponents of motorization before they will be ready to accept the change.

**"Chemical Warfare,"** in the October and November, 1925, numbers, is a resume of a German work. It appears that in the great offensives of March, April and May, 1918, the Germans found that gas bombardments were more effective against the Allied artillery than against the infantry or machine guns. From July 12, 1917, to the end of the war, the British casualties from gas were 160,970, of whom 1859 died. The death rate from gas casualties in the British army fell from 6 per cent. in the summer of 1917 to 2.2 per cent. at the end of the war. To form a smoke screen the

Germans fired 50 to 60 rounds of 77-mm. smoke shell for each 100 metres and to maintain same would fire from 8 to 10 rounds per minute. Chemistry does not alter the basic principles of warfare. It is a new weapon, but success is still dependent on the offensive action of the troops. As to its employment, history offers no case of the discovery of a weapon and its subsequent abandonment except where replaced by one which is more effective.

**"Unilateral Observation,"** in the November, 1925, issue, is an article by two young officers who have found $\phi$ and $\omega$ rather difficult companions at the O.P. and desire to replace them by a method which though similar will probably find much favor with the novice, frightened by the Greek alphabet. The method as applied to cases where the angle i is over 300 mils, is given below.

Table I for the two arguments distance O.T. and angle i, gives the angle subtended at O by a distance of 100 m. along the line G.T. in the vicinity of the target.

TABLE I

| i / r | 300 mils | 400 mils | 500 mils | 600 mils | 700 mils | 800 mils |
|---|---|---|---|---|---|---|
| 1000 m | 25 | 35 | 46 | 57 | 64 | 70 |
| 1500 m | 17 | 23 | 28 | 37 | 43 | 48 |
| 2000 m | 14 | 18 | 22 | 25 | 30 | 35 |
| 2500 m | 12 | 15 | 18 | 21 | 24 | 27 |
| 3000 m | 9 | 13 | 15 | 18 | 20 | 22 |
| 3500 m | 8 | 11 | 14 | 16 | 18 | 20 |
| 4000 m | 7 | 9 | 12 | 14 | 16 | 18 |
| 4500 m | 6 | 8 | 10 | 12 | 14 | 16 |

Table II for the two arguments, gun range and angle i, gives the change in deflection in mils necessary to keep a shot on the O.T. line when the range is changed 100 m.

TABLE II

| i / R | 300 mils | 400 mils | 500 mils | 600 mils | 700 mils | 800 mils |
|---|---|---|---|---|---|---|
| 2000 m | 14 | 19 | 25 | 31 | 39 | 43 |
| 2500 m | 12 | 17 | 21 | 26 | 32 | 39 |
| 3000 m | 10 | 14 | 17 | 21 | 26 | 31 |
| 3500 m | 8 | 11 | 15 | 18 | 23 | 27 |
| 4000 m | 7 | 9 | 13 | 16 | 20 | 24 |
| 4500 m | 7 | 9 | 11 | 13 | 16 | 21 |

With a distance O.T. of 2500 metres, let us assume a range of 4000 metres and an angle i of 400 mils; that the first shot falls 9 mils to the right of the target. Looking at Table I we find for

the above data that 100 metres subtends an angle of 15 mils. Dividing 15 by 9 we obtain 1.7, which indicates that we should make a range change of 170 m. Assuming this is done and the next shot falls on the O.T. line, we now desire to make a range change of 200 m. and still stay on the line. Looking in Table II, we see that for a range bound of 100 m. with our data, it is necessary to make a deflection change of 13 mils, or for 200 m. we make a change of 26 mils in deflection to stay on the line.

In all other respects the American lateral observation methods are followed.

**"The Horse, the Rider and the Obstacle,"** by Major J. Heriard-Dubreuil, in the December, 1925, issue, is a short exposition on the art of jumping, treated as a phase of theoretical mechanics. Contrary to the present thought in America on this subject, the writer deprecates the extreme forward seat at the "take off" and also on the descent.

**"The Problem of Metals in Germany during the War,"** by Lieutenant-Colonel A. Gavard, is a continued article which is concluded in the December, 1925, number. Production and importation statistics are furnished on tin, nickel, chromium, manganese, tungsten, mercury and vanadium.

**"Fire on Fleeting Targets,"** by Major L. Camps, in the December, 1925, issue, is a rather intricate method of affecting a rapid transport of fire with appropriate meteorological corrections in cases of fleeting targets. Recourse is made to a series of graphical charts, the calculation of which would appear too involved for open warfare practice.

The following figures taken from the **"Foreign Notes Section"** of the December, 1925, number, give the appropriations in sterling made by the British War Office for Ordnance, Artillery, and Chemical research and experiment for the year 1925–1926:

| | |
|---|---|
| Ordnance Committee and Exterior Ballistics Establishment | 97,000 |
| Ordnance Research Department | 317,000 |
| Ordnance Design Department | 27,730 |
| Experimental Establishment of Shoeburyness | 133,760 |
| Royal Artillery Committee | 9,300 |
| Chemical Warfare Committee | 23,700 |
| Chemical Warfare Experimental Station | 133,780 |

**"Telephone Communications,"** by General Roger, January and February, 1926, numbers. Telephone communications within the divisional artillery was a subject of special study by the writer in 1918, from which he has designed a plan of communication and an organization for its instalment which he claims is dependable, effective, flexible, and cheap. It is stated that during the war 1,900,000 km. of wire were laid by the French troops in the zone of the army and that the methods were wasteful, slow, and a great hindrance whenever the war became one of movement. Due to the increase of axial and lateral lines each commander in the lower units installed a direct line to each of his neighbors and to every possible O.P. at the price of much labor and equipment.

The choice of lines stretched overhead, on the ground, or buried is discussed in detail, and the conclusion reached that except in some cases of stabilization, the most satisfactory method is to lay the line on the ground only elevating it where a roadway is crossed.

The plan developed in this thesis is based on the premises "that the battalion is the fighting unit; that batteries are rarely placed more than 500 metres from the battalion C.P.; that the establishment of O.P.'s is not a province of the battery; that lines are run from the lower unit to the higher; that a division supported only by its organic artillery seldom covers more than 4 km. of front."

The telephone detail of the headquarters of the divisional artillery consists of six sections, each section containing one noncommissioned officer, five telephonists, one mule driver on foot, and a two-wheel cart drawn by one mule. The cart carries four spools of twisted-pair which can all be unreeled at once, each spool containing about 2 km. of wire. In addition there are carried in the cart, phones, switchboards, pliers, etc.

When an engagement is foreseen a trunk line is started forward from the C.P. of the divisional artillery along the middle axis of the division's advance. The trunk consists of four circuits, spread about 20 metres apart by four of the telephonists who follow the cart on foot. At the end of 2 km. a central is established whereupon another cart takes up the march, and so on. If the attack is followed by a general advance, with a displacement of the C.P. of the divisional artillery, the carts behind the new location reel up their wire and then jump forward to the forward end of the trunk. Upon the establishment of a central, several messengers, either foot, mounted, or motor cycle, depending upon the country and proximity to the front, are attached to relay any messages to the next central should the trunk be cut.

Each battalion detail is endowed with two of the above telephone sections. This is sufficient as the only lines to be run by the battalion are two parallel circuits from its C.P. to the nearest central on

the divisional artillery trunk. In the battery only one telephone section is allotted which is sufficient to lay two lines from the gun position to the battalion C.P., a distance which seldom exceeds 500 metres. These are the only lines laid by the battery.

In the event that reënforcing artillery is attached to the division, it is customary to form divisional units called "groupements," each containing three or four battalions. Under these circumstances the groupement establishes a central which it connects to the nearest switchboard on the divisional artillery trunk by four separate circuits, and the battalions lay from their C.P. to the groupement central. Additional circuits must then be added to the artillery trunk.

The greatest innovation projected is in the matter of communications from the observation post. It is proposed to form an observation group for the divisional artillery, charged with the mission of intelligence and observation. This group would establish and maintain all O.P.'s, and would be directly under the artillery commander. An observation central located in the forward zone would have lines to all O.P.'s and would in turn have a number of circuits to the nearest central on the artillery trunk through which communication could be had with any battery in the division.

The above description is only a brief outline of the plan which provides for communications with the infantry, corps artillery, aviation, etc. Centralization and abolishment of individual lines are the salient points of the proposal.

In the January, February and March, 1926, numbers there appears an article bearing the title **"The 19th Division on the 21st and 22nd of August, 1914,"** or **"Arsimont."** The title is banal to the point of dulness, but seldom has the reviewer met with a more lifelike and seemingly accurate picture of war.

The story opens on the morning of the 20th of August, 1914, with the 19th Division marching gaily toward the Sambre between Charleroi and Namur.

"The soldier is in good humor. The bitter fatigue of the five days' march under a tropic sun is forgotten; the supply of rations is working smoothly and the Belgians are so hospitable. Never have the men drunk so much beer or smoked so many cigars. Every rifle and every bridle carries a flower. Never were the pre-war manœuvres such fun."

The advance guard reached the banks of the Sambre by noon, but orders from the Army restrained its crossing the river. The afternoon and night brought rumors of the enemy's advance, but none were seen by the troops.

During the early hours of the 21st, some of the artillery took up positions behind the ridge that overlooks the river. The batteries

have no aiming circles and the best that can be done in the morning fog is to point the guns in what is thought to be the direction of the bridges.

At 7 A.M. outposts on the river report German cyclist troops in the hills to the north and an hour later the first German bullets fall on the bridge at Auvelais.

The batteries are very close to the crest for no one has thought of using the forward slope of the ridge behind since there is only 500 yards of telephone wire. Through the fieldglasses some figures are seen crossing the fields on the north bank. Captain Bouhet of the 2nd Battery, 7th Field Artillery, tells the story of the first cannon shots of the battle of Charleroi:

"10:22 A.M. I bracket the target with two salvos 400 metres apart and walk through with shrapnel and a low corrector for about a minute. The smoke of the bursts takes some time to disappear. There are some black figures remaining on the ground; there are certainly others in the woods behind. Nothing else is seen."

Four hours later the Germans reply with their 150's on the above battery. Forty shells fall on the battery position but cause only two casualties, for all the fragments go straight up in the air. The afternoon sees the Germans across the Sambre and their infantry in Auvelais.

The account covers in detail the fighting of the next thirty hours following the fortunes of each battery and each company, often digressing to accompany an infantry platoon as it pushes through the gardens of Arsimont to take its place in a counter-attack.

The company commanders, and frequently the platoon and section leaders, are spoken of by name and the reader feels as if he knew the actors of this drama. The difficulties which the company officers must face, such as poor visibility, shortage of telephone wire, identification of targets, and confusion between units are all brought out in the story.

Too often, military history and studies in tactics appear to the novice as a mechanical game of chess bearing no relation to the difficulties he encounters while handling his company at manœuvres or in conducting the fire of a battery. For this reason Colonel Valarche's narrative cannot be too highly recommended as a military history of small units. It is both attractive and instructive reading and should be an admirable text for junior officers. A good map and a number of tracings accompany the article.

**"Gas Producers for Motor Trucks,"** by Major Sainctavit, March, 1925, issue. The subject of a substitute for gasoline as a motor car fuel has been under study by French engineers, urged by the military authorities, ever since the war. Everyone realizes that

there is no domestic source of petroleum, while the value of the motor car and tractor for military purposes increases every year.

To meet the need of a motor fuel from a non-petroleum base, several automobile manufacturers have devised gas producers which can be attached to a truck and used with the ordinary internal combustion engine. Last autumn a series of tests were held and pilot trucks were entered by Panhard, Berliet and Renault.

Charcoal is the basic fuel for the Panhard and Renault, while the Berliet uses wooden chips. The gas formed is a mixture of carbon monoxide and hydrogen.

The principal units in the producer are—a furnace so constructed that the fuel burns with an incomplete combustion, giving off carbon monoxide, a filter in which all dust and other solid particles are removed, and a mixing chamber where filtered air is admitted and which replaces the ordinary carburator.

The furnace is usually started with some waste dipped in gasoline and a draught created by a hand pump. After the motor is running the suction from the cylinders induces a sufficient current of air through the furnace. The motor itself can be started directly by gas from the furnace or if haste is required, by gasoline in the usual manner.

The Panhard four-ton truck, with a maximum speed of 35 km. per hour, used 49 kg. of charcoal per 100 km.

The Berliet four-ton truck covered 100 km. at a mean speed of 22 km. per hour with a fuel consumption of 105 kg. of wood.

The Renault five-ton truck consumed 90 kg. of charcoal per 100 km. at a mean speed of 15 km. per hour.

# CURRENT FIELD ARTILLERY NOTES

## The Accompanying Gun

FOR use as an accompanying gun, it is generally conceded that the 75-mm. divisional gun is unsatisfactory. The infantry howitzer was developed to replace or supplement the 37-mm. gun and the three-inch Stokes mortar as inherent infantry equipment. It is believed that the infantry howitzer is a useful weapon which, if exploited to its full capabilities, will fulfil many of the functions demanded of the accompanying gun in the World War, and which the divisional 75-mm. gun was, by its very construction, incapable of fulfilling.

In order to assure the success of assault battalions extraordinary and possibly unreasonable demands for fire from an advanced position will sometimes be made upon the Field Artillery. So far as practicable the Field Artillery should respond to every demand or request of the Infantry. To fire effectively from an accompanying position calls for a gun or howitzer intermediate in mobility between the infantry howitzer and the divisional 75-mm. gun or 105-mm. howitzer. Such a weapon would not be called for in every action but would be desirable when fire from an accompanying position is indicated.

The Field Artillery is faced with a heavy development program, many items of which are of greater importance than the accompanying gun. The ideal Field Artillery accompanying gun, should such a weapon be ultimately approved, would have many of the characteristics of the pack gun now being developed. It is therefore intended to postpone any development of a special accompanying gun until the latest pack howitzer has been supplied, proven satisfactory as pack artillery and tested as to suitability for accompanying purposes.

Frequently, when an accompanying gun is requested, Field Artillery officers feel that fire missions could be more effectively accomplished by accompanying observation and conduct of fire, than by the assignment of an accompanying gun. With improved communication and facilities for the conduct of fire from an advanced position, the justification of the accompanying gun from the standpoint of fire effect would be lessened. Assuming this improvement in communication, it would appear that as the supported troops become more familiar with Field Artillery technique, at least part of the psychological advantage of the accompanying gun might be provided by an efficient accompanying party.

**Standard Light Tractor**

The "Caterpillar Two Ton" has been adopted as to type and designated as standard for a light tractor. The light tractor is for use with the 75-mm. gun. Standardization of the "Caterpillar 30" and "Caterpillar 60" tractors as medium and heavy tractors respectively has previously been announced.

It is realized that it is impossible, in time of peace, to obtain the tractors that would be required for a major emergency, also that to construct a special type of tractor for military use, after the outbreak of war, would cause a prohibitive delay in equipping our forces.

The present policy is to place the chief reliance for the large amount of equipment, not of a strictly military nature, upon those concerns having a large manufacturing capacity, whose product already in commercial production has been proved by both the procurring and using branches to be well suited to military use. The many manufacturing problems are thus continuously under study. In coöperation with the War Department, tentative plans are made for the large production required in the event of war. Under this plan, in addition to the old five- and ten-ton tractors now on hand, there would at once be available upon an emergency, the capacity of those concerns, the efforts of the government being immediately directed toward obtaining the large additional plants required in accordance with previously made plans.

Such equipment as may be purchased, in time of peace, for other than experimental purposes is, in general, confined to that on the list of standards. These three tractors are the first to be listed as a standard in their respective classes. Other tractors are undergoing investigation and test.

It may be of interest to those familiar with the tractors now in the service, to know that the interests of the Best Company and the Holt Manufacturing Company have been merged under the name of Caterpillar Tractor Company, the present product bearing the trade name "Caterpillar." The standard light tractor was previously known as the "Holt T-35," the medium tractor as the "Best 30" and the heavy tractor as the "Best 60."

Two batteries of the 83rd Field Artillery are equipped with the standard light tractors. These tractors have in the past been used with both one- and two-axle loads. At present they are being used with two-axle loads.

**Concerning The Pacifist Movement**

"Ye Shall Know the Truth," by Fred R. Marvin, Editor-in-Chief of the *New York Commercial*. (Obtainable from the author, New York City. Twenty-five cents, special rates in quantities.)

Mr. Marvin believes that the movement recently evidenced against military preparedness, Citizens' Military Training Camp activities and military training in the schools and universities, is so widespread and of such a nature as to preclude its being due to other than a concerted and centrally directed movement.

Beginning with the organizations which during the war encouraged various obstructionist movements, defended service evaders and conscientious objectors, and the later organizations advocating extreme pacifistic views, "slacker oaths," etc., Mr. Marvin gives the names of those prominent in these movements and reaches the conclusion that by means analogous to interlocking directorates, the control of many organizations of apparent good standing now opposing military preparedness, is largely under the influence of either Communists or Socialists. While the professed ultimate aims of Communists and Socialists may be far apart, Mr. Marvin indicates a common interest so far as this particular subject is concerned.

Mr. Marvin admits that in these various pacifist movements there are without doubt a large number of well-meaning and sincere individuals who are carried away by the emotional appeal and by their abhorrence of war, and do not understand the real purpose of destroying national defense. That the organizations are not apparently radical and that the membership includes those who would indignantly deny radical tendencies, gives a standing to the movement that could not otherwise be obtained.

Many officers not on Reserve Officers' Training Corps duty do not realize the extent of the movement antagonistic to the compulsory basic Reserve Officers' Training Corps course in particular and to any military instruction in schools or colleges in general. A pamphlet by Winthrop D. Lane (obtainable from "Committee on Military Training," 387 Bible House, Astor Place, New York City. Ten cents per copy, reduction in quantities) has been generally circulated in furtherance of this movement.

Mr. Marvin devotes considerable space to those back of this pamphlet, presenting evidence to justify his conclusions that this is part of a movement directed by those whose past activities and present affiliations prove their intent to be the advancement of extreme radical aims, the actual but not apparent financial backing being the so-called "Garland Fund."

As bearing on the motive back of this movement, Mr. Marvin is quoted as follows:

> "It, therefore, is not difficult to find the reason the Lane booklet is being financed by these people. The theory upon which certain revolutionary forces are operating is, first, create a marked class-conscious feeling among the workers; cement

> and organize those with this feeling; engage in carefully planned strikes and turn these into mass movement to take over certain industries. Knowing full well that such a plan cannot be carried out if there is proper defensive force, the move now is, and for some years has been, to destroy all such defenses—what they term the defensives of the 'capitalist system.' If the Army and Navy can be disreputed; if the boys can be induced not to aid in any military movements; if loyalty to government and patriotism can be destroyed in the growing generation; if the young can be inoculated with the class-conscious feeling, then the plans as outlined by certain revolutionary groups can be made successful and this government can be destroyed."

Much of the earlier data given by Mr. Marvin is from the "Lusk Report," being a report of the Joint Legislative Committee Investigating Seditious Activities, filed April 24, 1920, in the Senate of the State of New York, entitled "Revolutionary Radicalism, Its History, Purpose and Tactics."

According to current press reports, "The Executive Committee of the American Legion at National Headquarters at Indianapolis voted to institute an active counter-attack against the agencies seeking to discredit the plan of acquainting young men with the rudiments of military training. Nation-wide distribution of a pamphlet has been planned, exposing the character of the propaganda against the Reserve Officers' Training Corps units and emphasizing the value of the training which they provide. The pamphlet is being prepared by a committee of which Brigadier General Gignilliat, Superintendent of the Culver Military Academy is chairman."

**The 1926 Knox Trophy Test**

Entries for the 1926 Knox Trophy contest are being selected in some units and final trials will soon be held at a few stations. The conditions for entry are similar to last year, that is, any station having a battalion or more of regular army field artillery may enter one battery. An exception to this is made in the Sixth and Seventh Corps Areas. In each of these two corps areas there is one battalion of field artillery, the Fourteenth Field Artillery and the Ninth Field Artillery, respectively, both of which units have their batteries scattered at separate posts. These two battalions will be permitted to enter a battery, provided the battalion commanders get the opportunity to visit their batteries so as to pick the representative one. In any case, the local selection of the battery to take the trial, is left entirely in the hands of the local artillery commander.

The terms of the test itself are prepared in the office of the

Chief of Field Artillery. They are along the same general line as last year, being altered in details so that nobody can hope to win by memorizing last year's test. Especial effort is made to avoid catch questions and unusual situations and to provide a test requiring what may be expected of a battery well trained along normal lines.

Local commanders have been cautioned not to favor the battery selected by assignment or attachment of desirable personnel, matériel, or animals, or by allowing it extra training time or other favorable conditions. The aim is to have the local battery truly representative of the local command under its normal conditions of service.

**Military Training of Youths in Japan**

The following information is furnished by the Military Intelligence Division, G. S.

One of the most important events that has taken place in Japan in recent years is the institution of military training of youths, not only those who are enrolled in schools but extended to include those who are not so fortunate as to have the advantage of higher intellectual education.

The military training recently made compulsory for all youths in middle schools and universities under the jurisdiction of the Department of Education is modeled along the general lines of our own Reserve Officers' Training Corps system. The original act provided that training in normal schools, all government and private middle schools, government and private technical schools, high schools, preparatory schools and colleges should be obligatory.

In all, there are 1164 schools where military training is given, and, to date, all but thirty of these schools have been provided with active army officers as instructors. The total number of students now undergoing military training may be taken as 475,000.

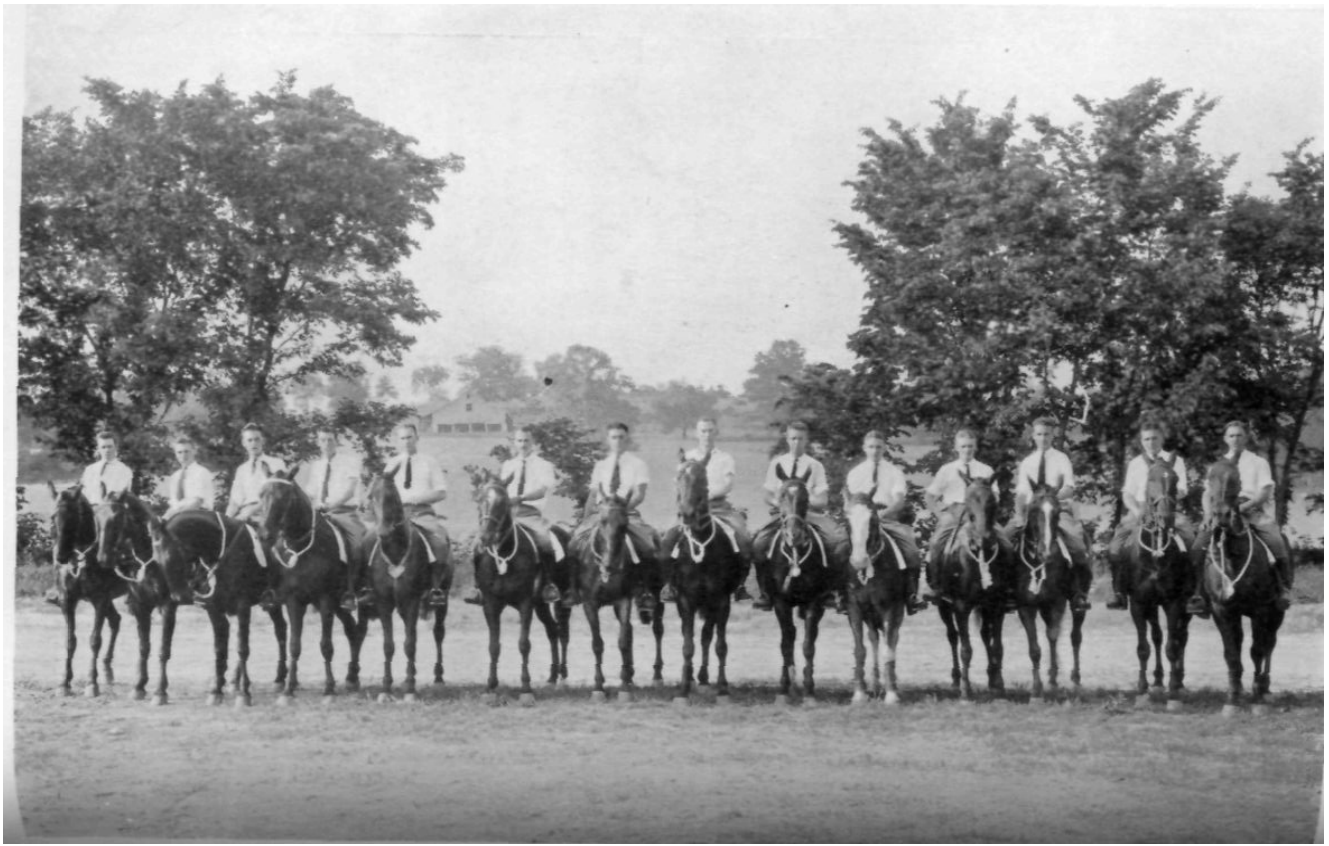
The instructor personnel are selected from the active army list from the grade of first lieutenant to colonel. On December 2, 1925, officers were detailed on this duty as follows:

| | |
|---|---|
| Colonels | 20 |
| Lieutenant-colonels | 47 |
| Majors | 241 |
| Captains | 682 |
| Lieutenants | 124 |
| Total | 1114 |

In addition, there are a large number of reserve officers employed directly by the various schools.

JUMPING IN PARIS, R.O.T.C. HORSE SHOW UNIVERSITY OF MISSOURI

POLO AT UNIVERSITY OF MISSOURI, FIELD ARTILLERY UNIT, R.O.T.C.



ADVANCED CLASS IN EQUITATION, R. O. T. C. UNIVERSITY OF MISSOURI. FIELD ARTILLERY UNIT HORSE SHOW PARTICIPANTS

The courses of training, schedules, etc., are decided upon by mutual arrangement between the War Department and the Department of Education. Two or three hours per week in the case of middle schools, and at least one and a half hours per week in the case of higher schools are devoted to training. Four to six days every year will be spent in field training.

Investigation having shown that a great mass of the young Japanese receive only elementary school education, it was then decided to extend military training to this class estimated to number one million five hundred thousand annually. While this class of training is to be entirely voluntary, whoever refuses to enroll does so at the risk of remaining in conscriptional training for the full specified term.

This training not-in-schools is to consist of eight hundred hours during a four-year period, as follows:

| | |
|---|---|
| Ethics and citizenship | 100 hours |
| Elementary education | 200 hours |
| Business training | 100 hours |
| Military drill | 400 hours |

The undertaking, being entirely national, will be placed under the direction of the local mayor or village chief. The schoolmasters, usually military reservists, will act as instructors. The War Department is responsible for the supply of arms and other necessary equipment as well as the inspection of the results attained. As can readily be seen, it is, in a way, an adaptation of many of the features of our Citizens' Military Training Camp system.

Perhaps the army alone realizes the full significance of the new system. Military training is extended to two million young men, the great majority of whom would not have received it otherwise, thus increasing to a marked degree the efficiency of the Japanese Army. The national physique will be greatly improved; the army and navy will regain its old place in the affections of the people; there will be a general get-together in national thought and ideas.

Undoubtedly the new system means a marked increase in Japan's military power accomplished at a minimum of expense either to the nation or to the individual.

**R.O.T.C. Horse Show at University of Missouri**

This year the Reserve Officers' Training Corps of the University of Missouri successfully revived the annual Horse Show given for years under the auspices of the College of Agriculture. This show had been temporarily abandoned under pressure of various conditions, not the least of which was the encroachment of motors on the domain of the horse, and the fact that the most available period for

holding the show is in the spring, when the horsemen of Missouri are usually out of the State, exhibiting at shows all over the country.

Prospects this year seemed favorable, so under the supervision of Captain Arthur R. Wilson, Field Artillery, the Tiger Battery, an association of the best riders in the Reserve Officers' Training Corps, undertook to carry through the show, and, fortunately, made an excellent start.

The show was held on the football field, with picket lines for the entries stretched on caissons just in rear of and below the main concrete bleachers. This made it possible for spectators to both watch the show on the field and at the same time watch the contestants preparing for approaching events. The latter seemed to interest them almost as much as the former as all students were required to condition their mounts and prepare them for the events, and there was consequently great activity and much interesting work going on along the picket-line.

Practically all events were so selected that the horses of the detachment and a few belonging to the officers made an excellent showing in them. In the five-gaited saddle-horse class there were a number of excellent horses entered by civilians.

The stage management and the judging made the show one of continuous action and interest. There was no delay between events and the judging was expert and admirable. The Judges were the well-known trainers and owners, Mr. John Hook, formerly trainer of saddle-stock for Mrs. Loula Long Combs and now trainer for the Carnation Milk Company stables, and Mr. George Lee, nationally known as an authority on Missouri saddle stock.

Most of the horses used in the events were, as previously mentioned, those in the detachment. These horses are averaging quite old now, but they came through in splendid fashion. The judges particularly remarked on the very small number of refusals at the jumps.

The amount of work done by the members of the Tiger Battery in organizing the show and by the contestants in preparing and entering was very heavy, but the fact that all say they enjoyed every minute of it is most encouraging.

**Section Competition, Panama Department**

The Panama Department Annual Section Competition was won on March 30th by the 4th Section, Battery A, 4th Field Artillery. During a ceremony by the 1st Battalion, 4th Field Artillery, at Fessenden Field, Fort Davis, May 13th, the Battalion Commander, Major J. M. Eager, brought forward the 4th Section commanded by Sergeant Dexter H. Minton from its place in line. The Department

Commander, after complimenting the section, presented to it the Department Commander's Trophy.

**The West Point Horse Show**

The West Point Horse Show was held June 7th and 8th in the Academy Riding Hall, many notables being in the audience. The Swedish Crown Prince and Crown Princess, who came for a review of the Cadets, stayed through several classes of the horse show, during which they were much impressed by the manœuvres of the Field Artillery. The mounted drill of the cadets was also a highly creditable performance as was the riding of all classes of military exhibitors.

Among the three hundred horses exhibited were many civilian entries and a number of notable champions. Among the winners were the following:

Officers' chargers, Morgan, Captain C. H. Gerhardt, Cavalry; polo mounts or branded hacks, P. D. Q., Squadron A; open jumping, Sandy, M. J. Devaney; ladies' hunters, Hughes, Captain C. H. Gerhardt; lightweight polo mounts, Gold Rush, Captain C. H. Gerhardt; cadets' jumping, class 30, Fowler, Cadet Prudhomme, class 38, Robert Hall, Cadet Sims; heavy- and middleweight hunters, Irish Crystal, Squadron A; officers' heavyweight chargers, Irish Crystal, Squadron A; jumping open to all, Harold, Miss Muriel E. Bliss; local jumpers, Duke, Lieutenant W. Jervey, Cavalry; lightweight hunters, Messengers, Squadron A; polo mounts, Dazzle, Vesperland stable; officers' jumping. Tom Velie, Colonel Lewis B. Ballantyne; champion saddle horse, Just You, Chas. F. Hubbs; champion polo, Dazzle, Vesperland stable; champion hunter, Irish Crystal, Squadron A.

**Mechanical Time Fuse**

On page 201 of the March-April, 1926, JOURNAL reference is made to the Junghaus mechanical fuze. This was an error, the fuzes referred to being Tavannes fuzes which are to be procured from Switzerland.

**Training Regulations**

Information Bulletin No. 83 gave a complete list of Training and Technical Regulations published to May 1, 1926. It is intended to publish revised lists in the Bulletin at frequent intervals. Issues not having the complete list will indicate the pamphlets published subsequent to the last complete list shown in the Bulletin. Information Bulletin No. 84 will be published in September, the Bulletin not being published during the summer months.

The following Training Regulations of general application, not shown in Information Bulletin No. 83, were printed prior to June 25, 1926.

50–15—The Soldier. Instruction Dismounted Without Arms.
(Supercedes T. R. 50–15, April 14, 1923.)

162–5—Visual Signaling.

T. R. 430–30, Service of the Piece, 155-mm. Gun, Model 1918, after many revisions has been approved for publication. It is now in the hands of the printer and should be available in about six months.

**Volume I, Field Artillery Journal**

The Librarian, United States Military Academy, writes that their file of the FIELD ARTILLERY JOURNAL is complete except for Volume I, and requests assistance in making their set complete. Anyone having a copy of Volume I for disposal is requested to write to the Librarian, United States Military Academy, West Point, New York.

# THE FIELD ARTILLERY SONG

THE Field Artillery Song, or the Caisson Song as it is sometimes called, has become the most popular song of the Field Artillery and perhaps of the Army. Composed by Major Edmund L. Gruber as a regimental song for the Fifth Field Artillery, it has gradually been adopted by all Field Artillerymen and now belongs to the whole Field Artillery.

The JOURNAL is indebted to Major Gruber for the following history of the song:

"In April, 1908, the First Battalion, Fifth Field Artillery, came over to the Philippine Islands to relieve the Second Battalion. It was the first time that the regiment had been together since organization. All officers and men felt a great pride in the regiment and were anxious to see it get a good start. We thought the best booster for regimental morale would be a regimental song. By common consent I was told to write one.

"In searching for a good catchy title for the song, an incident which took place during a difficult march made by the Second Battalion in 1907 across the Zambales Mountains from Stotsenburg to Iba on the China Sea, recurred to me. On that march I was ahead with a detachment to select the route and make the necessary repairs to the numerous streams' crossings. We were well in advance of the battalion which during the afternoon was slowed down considerably by the difficulties encountered on the mountain road. Accompanied by the scout sergeant I proceeded to a high peak not far from the road in order to get a better view of the terrain which lay before us and, if possible, to see what progress the battalion in rear was making. From our observation post we could see the rolling country for miles. Here and there we caught glimpses of the mountain road, but not a sign of the battalion. Listening closely, we soon heard the distant rumble of the carriages which gradually increased and was punctuated at intervals by shouts and commands echoing up the valleys as the men urged their teams along. The sergeant turned to me and said: 'They'll be all right, Lieutenant, if they keep 'em rolling.'

"After a hard march the battalion finally crossed the divide and made for camp on the other side. We rejoined the column as it was approaching camp. In passing the leading sections we again heard one of the chiefs of section call out to his drivers: 'Come on, keep 'em rolling.' That expression, which was frequently used by officers and men of the battalion, made quite an impression on me and seemed to characterize the spirit and determination of the battalion to push on in spite of obstacles.

"At a despedida given at Stotsenburg to our battalion just before it sailed for the United States, we sang the Field Artillery song for the first time.

"Since the original song had never been published by me, it was played and sung by ear. As a result, it has passed through some variations both in words and music, losing some of its nicer harmonic changes. I am sending you the original version of the song. As it stands, the title and music are mine. Several officers then serving in the Fifth Field Artillery assisted me in writing the first verse. The other verses I have added from time to time.

"The song was written for the purpose of creating a regimental spirit. I had no idea that it would become popular and that later Sousa would paraphrase it in his 'Artillery March.' The song established itself through its lively melody and its catchy phrase 'keep 'em rolling.' These appealed to all Field Artillerymen who made the song what it is."

Other Field Artillery songs which, with music, have been published in the JOURNAL, are as follows:

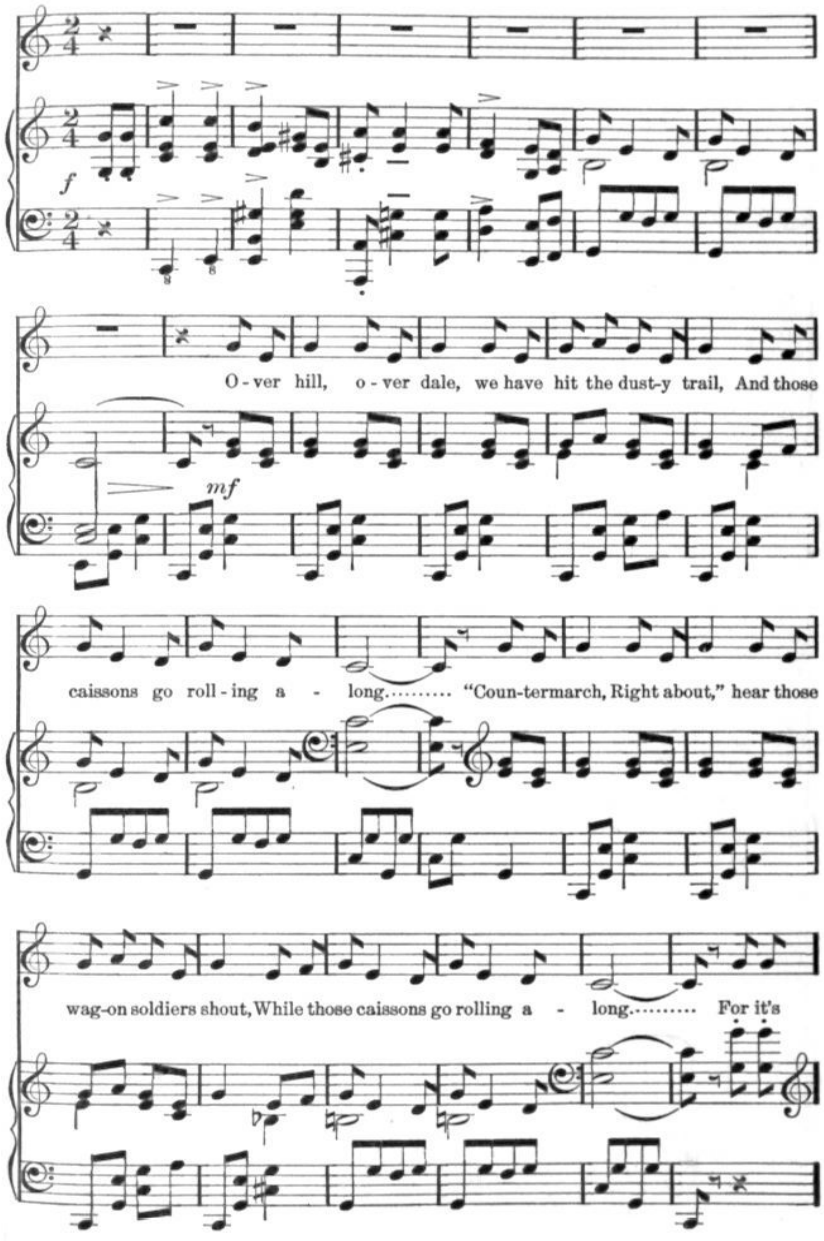
"The Red Guidon": July-August, 1923; pages 271 and 366.

"The Mountain Battery Song": November-December, 1923; pages 471 and 561.

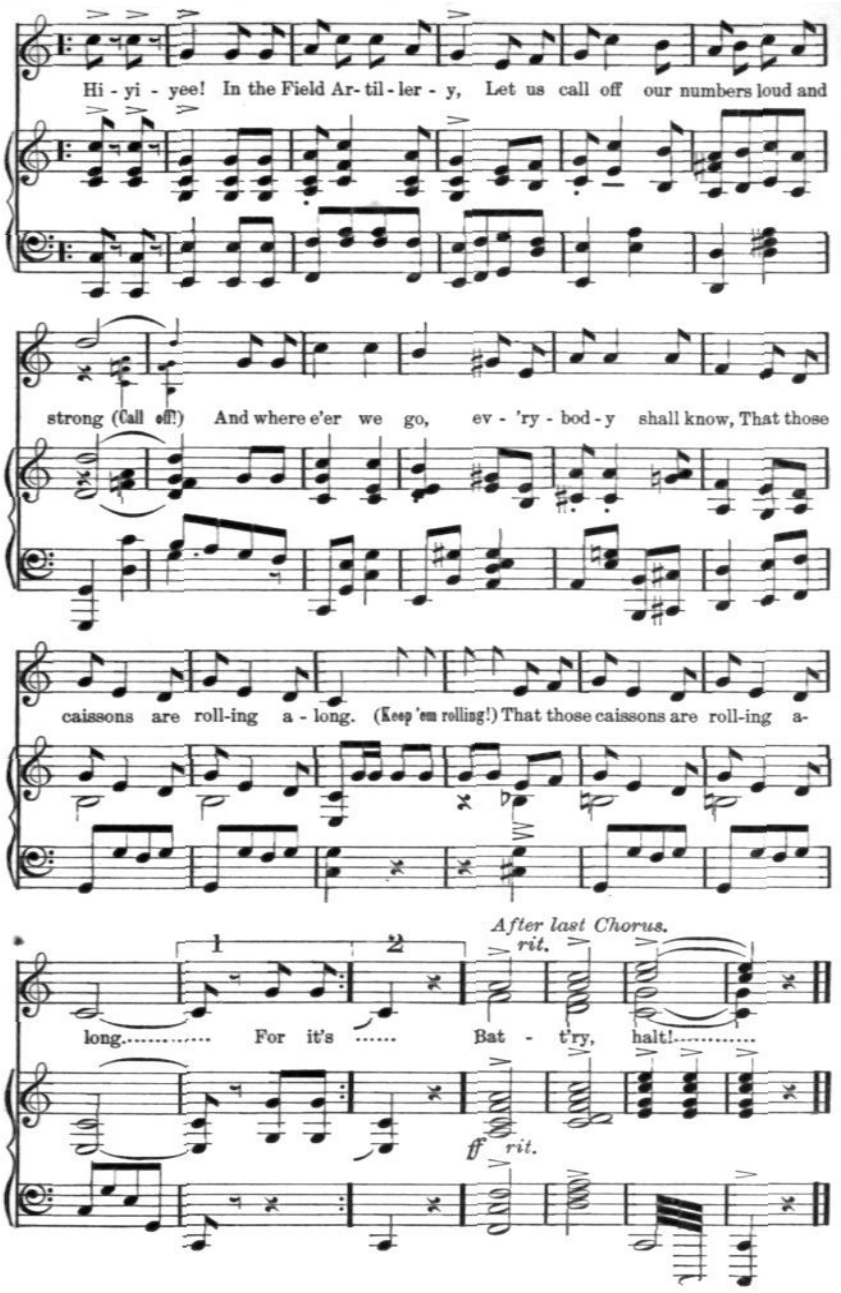
# The Field Artillery Song

"The Caissons" E. L. GRUBER

*March time*



**CHORUS**


Hi - yi - yee! In the Field Ar- til - ler - y, Let us call off our numbers loud and
strong (Call off!) And where e'er we go, ev - 'ry - bod - y shall know, That those
caissons are roll-ing a - long. (Keep 'em rolling!) That those caissons are roll-ing a-
1
2
After last Chorus.
rit.
long.
For it's
Bat - t'ry, halt!
ff
rit.