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MAY-JUNE, 1939

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May-June, 1939

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Patron Saint of Artillery

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EDITORIAL

Blind Firing

OVER the past few years our consciousness has been thoroughly awakened to the import of "blind flying," but during the same period little or nothing has been said or done about "blind firing" in Field Artillery.

Parenthetically, it should be stated that the Field Artillery has no complaint whatsoever to make of the Air Corps. In every instance where the two arms have worked together, cooperation has been cordial, sincere, and conscientious. The only fly in the ointment is that we are getting nowhere; progress is not being made.

With suitable observation, the Field Artillery can obtain a certain effect, in so many minutes, with so many rounds, carried in so many trucks, requiring so much road space, and the labor of so many men.

Without observation, and by adopting expedients in diminishing order of their effectiveness, based on their availability, the same results can be obtained, if at all, only with greatly increased expenditures of time and ammunition.

Since the mission of the Field Artillery is to support the Infantry and the Cavalry by fire, artillerymen have long desired the liberty of placing their OP's either on the ground or in the air where they could most efficiently do that very thing. In the meantime they have trained and practiced sporadically with observers detailed through the courtesy of the Air Corps. It has not worked.

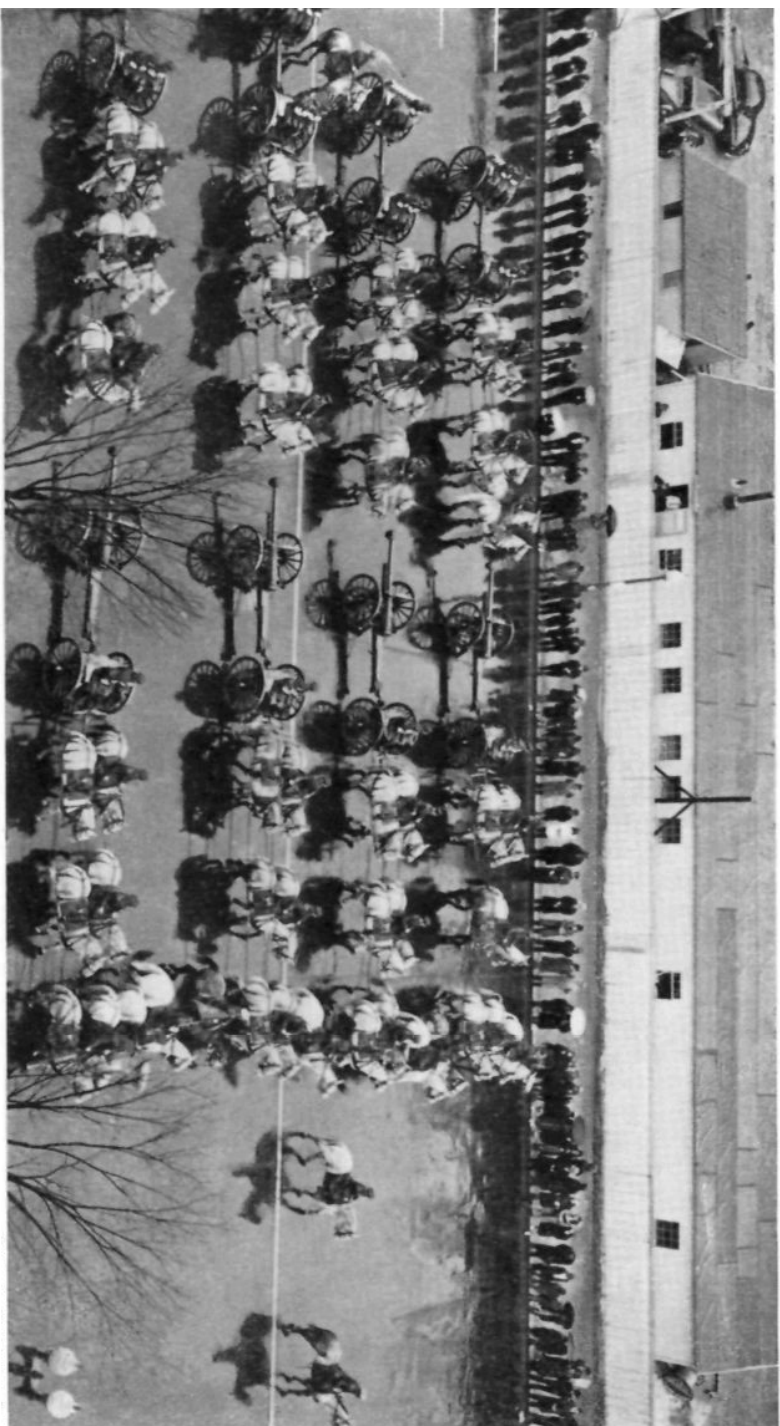
There are good reasons why it shouldn't work, and these reasons get better every day. Airmen have too much to do, too much to learn, do not live and work with the guns and the gunners, and do not stay long enough at the detail to learn the field artillery technique. They are constantly increasing the speed of their machines, and their principal mission demands that they do so. The field artilleryman, on the other hand, is not so concerned with traveling through the air as he is with coming as near as possible to a full halt while he observes the effect of his fire.

There is plenty of money and ingenuity being expended on fast planes. Who is interested in the slow ones?

It is doubtful if anyone but a trained field artilleryman can adjust fire which is not observable from the gun position. Granted that certain air-corps personnel deserve praise for a considerable degree of success in becoming technical field artilleryman in addition to their other duties, where are they now, and where will they be on M-day?

The trend in foreign armies is toward giving field artillery battalions their own air OP's in the form of small, inexpensive, slow-flying, and fool-proof airplanes. This matter is a field artillery problem, and the Field Artillery, with such help as the Air Corps may be able to give it, must solve the problem of "blind firing" itself.





BATTERY SIXTEENTH FIELD ARTILLERY (CAPTAIN ROBERT L. TAYLOR) ON PENNSYLVANIA AVENUE, WASHINGTON, D. C., ARMY DAY, APRIL 6, 1939.

Photo by Washington Star

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Flying Observation Posts for Artillery

(Digested from an article by Lt. Col. A. Verdurand in *Revue de l'Armée de l'Air* and in *Revue d'Artillerie*.)

BURIED in the avalanche of widely publicized demands and plans for more and more airplanes and antiaircraft protection for the United States, careful observers may have noted a statement by the Secretary of War to the effect that modernization of our field guns is also needed an indication that the War Department still believes artillery will be required in the event of war. However, unless the plans for the hundreds of millions to be spent on the Air Corps include a very definite earmarking of funds for artillery observation planes and a proper organization for their use by the artillery, the field guns might as well be left as they are. Blind artillery does not need any particular increase of range or flexibility in its weapons. All it requires is more and more ammunition to be plastered over the landscape in unobserved fire.

The artillery groped its way through the last war without adequate means of organization for observation from the air, and it is likely to do so again unless there is immediate insistence on remedying this grave deficiency during the present period of aviation development. The impetus must come from the artillery arm, for the air forces cannot be expected to give more than secondary thought to the question. Its importance, however, should be recognized and its solution demanded by the Army as a whole.

The experience of the past twenty years gives no cause for optimism in this regard. The artillery regulations of all nations emphasize the supreme importance of observed fire, but no nation has yet provided its artillery with eyes suited to the conditions of the modern battlefield. The accompanying digest is of an article on the subject by Lieutenant Colonel Verdurand, a French aviation reserve officer of extensive war experience, which was published in both the *Revue de l'Armée de l'Air* for October, 1938 and the *Revue d'Artillerie* for December. During the war the author, who is at present connected with the *Compagnie Air France*, served first in the artillery, then in turn as an air observer, pilot,

commander of an observation squadron, as staff officer at General Headquarters in connection with observation aviation, and as air officer of an army corps. He writes with authority and experience, and his article is worthy of careful study and reflection.

J. S. W.

Future military historians will certainly be astonished to find that, twenty years after the World War had ended, the field artilleries of the world were still groping blindly about without the aid of the flying observation posts demanded by General Estienne of the French Army prior to 1914. The fact that another arm of the service is universally entrusted with the task of furnishing air observation for artillery can only show that the majority of artillerymen everywhere have no conception of how the intensive use of air observation posts would influence artillery methods of employment and the effectiveness of fire.

Such a state of affairs could have had its origin only in the industrial idea of war which for too long a time has reduced the problem of victory to a matter of ammunition production. As soon as the tonnage of ammunition expenditure per kilometer of front becomes the governing idea, the problem of air observation becomes altogether secondary. It must be remembered, however, that stocks of ammunition and capacities of production are today far below what they were at the end of the war. Nor should it be forgotten that France's four long years of war, with their 1,500,000 dead, resulted mainly from the fact that

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all stocks of ammunition were expended in the first six weeks of combat—a prime reason for a more judicious employment of munitions in the event of another conflict. The artillery must be given a more effective method of disrupting the enemy's arrangements than the old one of blindly firing thousands of tons of projectiles in his general direction. The combination of rapid-fire guns possessing a large field of fire together with flying observation posts for each battalion will solve the problem. Moreover, it will restore to the artillery its former power of maneuver, lost through the necessity for accumulating immense quantities of guns and ammunition on narrow fronts.

If the artillery officers who transferred to aviation during the war had rejoined the artillery, undoubtedly the matter of air observation would have been settled long ago, for they would have emphasized the importance of the problem as well as the ease of its solution. Unfortunately, however, the arm has had to rely on the recommendations of the aviation alone. Naturally, the aviation has troubles of its own and cannot be expected to give more than very secondary consideration to artillery observation. The problem is not likely to be solved satisfactorily until the artillery itself is charged with its solution and given the necessary means of action. Only those who have the responsibility for delivering fire can judge truly the requirements for its air observation.

The pretension that all who use airplanes must be specialists in aviation has little basis in fact. Certainly, aerial combat is of such complexity that it must require the whole attention of a corps of specialists, but this is far from the case in the simple matter of providing an air observation post to look over the field of battle. There is no need of air specialists here. As soon as observation planes are chosen and adapted to their role by those

who use them, we will perceive the astonishing simplicity of a problem which has been uselessly complicated by mere doctrinal considerations.

Conditions of Air Observation

For artillery observation there are two different zones of observation within which the means to be applied are not the same. Experience shows that at altitudes of 600 to 1,200 meters it is possible to observe bursts of 75 and 105 at distances of four or five kilometers within the enemy lines, and those of 120 and 155 at seven or eight kilometers. Thus the near zone of artillery fire including ranges up to eight and ten kilometers can be observed without moving the plane within the enemy lines—a most important consideration, for several reasons.

The first reason is that airplanes cannot remain above the enemy lines at less than 3,000 meters altitude on the modern battlefield, on account of the numerous and powerful anti-aircraft machine guns which have been assigned to all ground troops for defense. On the other hand, these same guns provide protection for their own planes operating above them. In consequence, although observation planes are limited to their own lines, they are at the same time so protected by the ground troops that they need possess neither great speed nor armament for action against enemy aviation. In addition, the ability to land rapidly will give them additional security. These considerations are of the greatest importance, for without the necessity for high speeds, heavy armament, and high-ceiling operation, horsepower and weight may be reduced considerably, thus allowing the construction of a plane which can land or take off quickly in almost any small field. Consequently, ground units can always have their air observers in the vicinity of their

FLYING OBSERVATION POSTS FOR ARTILLERY

command posts. Moreover, since the observation post planes need not be costly to make or maintain, they may be allotted generously to division troops.

These conclusions may at first thought appear revolutionary, in view of the prevailing idea that only professional aviators can utilize airplanes. As regards this quaint conception, an idea of assigning automobiles only to professional automobilists would be just about as reasonable.

As a matter of fact, the handling of a modern slow-speed plane is no more difficult to learn than the handling of an automobile. Aerial navigation requires special training, but the flying observation post will be loaded on trucks for long displacements and will require no navigation expert on board.

With regard to cost, there are firms in the United States who will furnish a two-seat plane of 60 horsepower and include a course of instruction for about \$1,300.00. As to upkeep, any competent mechanic is qualified to do the job. Furthermore, with the introduction of wing slots and wheel brakes almost any pilot can land one of these small planes in a hundred-meter field. Even in 1916, it was possible to land an 80 horsepower Farman as a daily affair alongside the batteries on the slopes of Bourru Wood at Verdun.

The constant increase of speed and power demanded by aviators, in their natural obsession with aerial combat, led to the abandonment of a type of plane which was almost ideal for observation purposes. Undoubtedly, if these planes had been left with the artillery, they would have been perfected rather than eliminated.

Nature of Air Observation

The modern field of battle, viewed from above, appears at first as a desert studded with shell bursts. More attentive observation may reveal the flashes of enemy guns and their emplacements,

together with various elements of the enemy defensive works. In a general way, these things may be seen by almost anyone; but a correct interpretation of the hieroglyphics of the battlefield is an art in itself and far beyond the capacities of the ordinary superficial observer. The indications are so concealed and so fleeting that much training is required even to see them, and far more to grasp their meaning.

Method of Air Observation

The air observer for artillery should not be some fledgling aviator, but an officer of much experience. He must study all the tactical possibilities of the zone of action and be thoroughly conversant with the changing developments of combat therein. Evidently therefore, he must keep in close contact with his own command post between flights in order to study the information coming from the units with which he operates.

This conception of air observation requires an observer capable of analyzing the events which occur within his view, of estimating their influence on the operation, and of deducing rapidly the points at which fire must be applied to insure its success. The role can be filled properly only by the artillery battalion commander or an officer capable of replacing him. *For this reason, the flying observation post must be a part of each artillery battalion, always at hand for immediate use.*

Characteristics of Artillery Observation Planes

Close examination of the problem of providing many hundreds of small observation planes shows that they can be obtained at reasonable cost. Their characteristics are not particularly complex nor difficult of attainment.

In the first place, the air observer must be able to keep the whole of his

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sector under constant observation. He can not risk losing sight of any of the fleeting events that occur in his zone. The forward motors of the present planes conceal a large part of the field of view, forcing constant changes of course which are very fatiguing to the observer's vision. He should be placed as on a balcony at the extreme forward end of the fusilage, having before him a field of view of 200 to 240 deg, and only having to lean over to see directly below him.

For the same reasons, the plane must be slow. A maximum speed of 75 miles an hour to overcome exceptional winds is sufficient. Normally the plane will fly at speeds of not more than 35 to 45 miles an hour. With head winds, the speed with respect to the ground may be as low as 400 to 800 meters per minute, allowing constant observation for several minutes without need of maneuver.

Double control should be provided, for each of the observers will soon perceive the advantage of piloting the plane himself without having to signal to a pilot to make his demands known. In this fashion, flying soon becomes instinctive. Naturally, the plane must be light and easily maneuvered.

The characteristics described will enable the machine to be kept on the line battery-target without difficulty—a prime consideration for artillery observation, for the methods used must depend on sensing the proportion of shots over and short of the target rather than on an attempted evaluation of the deviation of individual rounds.

The Autogiro

The considerations outlined above have led to a demand by artillerymen for the autogiro as an observation plane. Unfortunately, this machine is not yet sufficiently developed, and experiment with it in its present stage is likely to retard rather than further the solution of the main problem. Although the autogiro

presents certain advantages of landing and take-off, and flying in place, it has manifest disadvantages for observation use. Its stability is uncertain, its landing is difficult on windy or gusty days, and its forward motor obscures observation. Pending further development of the autogiro, artillerymen should base their air observation on the use of the cheaper small low-powered planes which have already demonstrated their fitness for the purpose.

Motor Transport

The artillery observation plane must possess the further characteristic of being transportable by truck as part of the battalion combat train. All too often during the war, on account of bad weather, observation squadrons arrived on the field of action two or three days behind the other units of their division or corps. Too often, also, they arrived incomplete owing to accidents of landing on improvised fields. Transport by motor would avoid these risks and keep all personnel with the battalion during displacements.

Conclusions

To summarize, the characteristics for the flying observation post of artillery battalions are:

- Small size, of 70 to 100 horsepower.
- Observer in front, motor in rear.
- Maximum speed, 75 to 80 miles per hour.
- Minimum speed, 30 miles per hour.
- Take-off in less than 100 meters without wind.
- Landing in less than 50 meters without wind.
- Great maneuverability.
- Slotted wings.
- Double control, observers able to converse readily and easily.
- No armament.
- Wheel brakes.

FLYING OBSERVATION POSTS FOR ARTILLERY

Reservoir capacity for 4 hours flight at 55% of maximum power.

Short-range radio.

In quantity production, planes of this type should not cost more than a five-ton truck. At such a price, two could be allotted to each artillery battalion. The experience of the war shows that, with double control, artillery officers could soon pilot these planes without the need of flying instruction at special schools.

It is inconceivable that the artillery should be deprived much longer of the one means of assuring an effectiveness of its fire in keeping with the high costs of its material and munitions.

* * *

Colonel Verdurand does not discuss the second zone of artillery action, the zone of

distant interdiction and counterbattery. The planes for observation in this zone must be powerful, fast, and capable of self defense; in other words, planes such as those now being developed by the Air Corps for observation missions. The need for the slower, low-cost, lighter type at the exclusive disposal of close-support artillery will hardly be denied by anyone who studies the problem carefully. The autogiro may be the answer for close observation, but our own experiments with it to date lead to about the same conclusions as those reached by Colonel Verdurand.

The matter of prime importance to our artillery today is that steps be taken at this time to assure proper air observation at its immediate disposal for all its missions.

STAR SPANGLED BANNER WRITTEN BY AN ARTILLERYMAN

Francis Scott Key, writer of the National Anthem. The Star Spangled Banner, was a member of a volunteer artillery company at the time he composed it.

For this information we are indebted to the *Washington Post*, which has reprinted the words and music, and offers free copies for distribution to schools, clubs, lodges, and other societies. There is also given a very comprehensive account of the origin of the song and the circumstances surrounding its authorship, a century and a quarter ago next September 13th.

From this it appears that Key, a resident of Georgetown, lawyer, was also "a volunteer in Major Peter's Light Artillery," and the authority is the "Report on the Star Spangled Banner," which was submitted to Congress by Mr. Oscar George Sonneck, said to have made a most exhaustive research on the subject.

Now, who will enlighten us on Major Peter's Light Artillery, an organization deserving of some fame, if only because of the membership therein of so eminent and patriotic a citizen? Doubtless it is entitled to other honors, too.



Still maintaining their 100-percent membership standing in the Field Artillery Association are Virginia's 111th Field Artillery (third year) and Illinois' 124th Field Artillery (second year) . . . Battery E 123d FA (Illinois), makes front cover of April ILLINOIS GUARDSMAN with group picture, commemorating its fiftieth consecutive armory drill with 100-percent attendance.

The Autogiro — an Observation Post

BY CAPTAIN LOUIS B. ELY, FA

BIT by bit the picture comes into focus. The picture is not yet clearly-cut, but it is becoming clearer.

This picture which is coming into focus is that of the autogiro in the work of the field artillery. It has gradually become clearer over a period of years, by reason of tests at Sill, Bragg, Benning, and Riley. And now, from an unexpected source, comes another turn of the focusing screw, a turn which helps to clarify further a particular part of the picture. This part pertains to the use of the giro for conduct of fire.

Philadelphia's National Guard regiment of field artillery, the 108th, commanded by Colonel William A. March, borrowed a giro from the Kellett factory, took it to Indiantown Gap, and used it there for a very successful service practice. This, together with what is already known concerning the giro, gives us a pretty good idea of what it can do for us in conduct of fire. Apparently it will furnish us an excellent axial OP, giving good command of the terrain, for any location we decide upon for our gun position.

No startling discoveries were made as a result of the Pennsylvania firing. They merely confirmed what could be easily predicted as a reasonable expectation. This expectation took into account that if the giro is flown in such a way as to survive the enemy's action against it, it must be considerably back behind our lines, and kept generally at the lowest practicable altitudes. With these restrictions in view, it was believed that the giro, flying slowly back and forth behind our guns, would be an axial OP,

much higher and more conveniently placed than could usually be expected of a ground OP. Fire should be conducted with ease from the giro, if the observer had general training in field artillery gunnery. This proved to be the case.

When we first thought of using the giro, we discussed it with a number of officers of both the field artillery and the air corps. Generally speaking, their first reaction in the discussion was, "But it's very vulnerable." Among both branches were those who felt that this vulnerability made it highly problematical that the giro could be of use in actual battle.

We couldn't laugh that off, nor were we inclined to minimize it. We decided, instead, to examine vulnerability, primarily to see what could be done about pursuit aviation and antiaircraft fire. Because we conducted the shoot with this vulnerability in mind, this article will discuss briefly our ideas on the subject.

Pursuit aviation has increased its speed and armament to the point where it is a terrible weapon. Its speeds are approaching four hundred miles an hour, with diving speeds even higher. It is being armed with heavier, better guns, and more of them. Our craft is slow, and unarmed.

With these facts in view, suppose we keep these flying observation posts over our own territory, and as low as possible. Then we have a different picture. On the ground below, the artillery brigade has 212 automatic rifles. Infantry in reserve has 54 per battalion, in addition to numerous other small arms. The antiaircraft artillery may give additional

THE AUTOGIRO—AN OBSERVATION POST

reinforcement. These weapons on the ground are the protective armament of the autogiro. They can be readily increased by putting more automatic rifles into the hands of the field artillery. This mass of fire should be effective up to 1,500 feet. In the opinion of many able air corps officers, such a tremendous mass of fire power, held waiting to greet low-flying aircraft, will have such potentialities for destruction that aircraft so used will suffer prohibitive

a tremendous reenforcement to our ground observation; that they will greatly increase the effectiveness of field artillery fires. The enemy, feeling the effect of the increased efficiency of our artillery, will surely want to use strong pursuit aviation to check it. Hence, we must keep them low most of the time, or have no giros left. In particularly important sectors, of course, we may expect our own pursuit aviation to help defend the air above us,



BATTERIES ARRIVING, DETAILS LEAVING, AND OP READY TO OBSERVE

losses. The difficulty of replacement of combat aircraft is great. The relative ease of manufacture of these little giros, and the relative ease of training their pilots will make any extensive swapping of pursuit ships for giros unworthy of enemy consideration.

The giro should do most of its observing at a thousand feet or less, and seldom go above fifteen hundred. If these altitudes seem unnecessarily restricted, the later conclusions reached in this article will show why we keep the giros low. We expect to show that the giros are

and our own attack aviation to assault the enemy's pursuit airdromes. When strong assistance is available from these air force weapons, we should be able to observe with some degree of safety from higher altitudes.

A negative measure of the giro's defense against pursuit aviation is the difficulty of seeing it. Its fuselage is very small and its narrow rotor blades are in constant and rapid motion. As a further negative measure of protection, when the giro is seen, it can turn extremely shortly and dive very quickly.

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It can usually be warned from the ground, where the approach of pursuit is more easily detected. The pilot, having a fairly easy job, can be watching for such signals, as well as for the approach of pursuit. Even if the pursuit ship is unseen until a mile away, and the giro, at the moment, is up at 2,500 feet, it should usually escape. Diving at 150 miles per hour, at 45 degrees, it can get down to 1,500 feet before the pursuit, at 450 miles per hour, gets within 800 yards of it. The chances of a pursuit ship, at 450 miles per hour, hitting its tiny target at 800 yards are about nil. But, particularly on days when clouds are just right for concealed approach of pursuit, the giro had better stay down low as much as it possibly can.

How useful or useless the giro will be when flying in accordance with these restrictions we will examine later. Before doing so, we have to note another enemy weapon which is a serious threat to our giro, the defense against which will also involve some restrictions on where we can fly. We bear in mind that the enemy has antiaircraft weapons. He has at least the regular small-arms equipment for ground fighting and probably has caliber .50 antiaircraft machine guns. At least some of the time, perhaps much of the time, he has antiaircraft cannon with his front-line divisions.

In general, our defense against his small arms consists of keeping the giro two thousand yards or so away from the enemy front lines. Let us accept this further restriction, and deal with it in our next subject, that of conduct of fire from the giro under the admitted restrictions imposed by the enemy.

We now come to a consideration of the enemy's antiaircraft cannon. It may not always be present. He has vital lines of communication, factories, and airdromes to protect. Our air force is powerful and efficient, and gives

promise of increasing in its power and efficiency. So let us say that, in the less important sectors, at least, the enemy may not have antiaircraft cannon. Let us now discuss the effect on the giro when he does have such cannon near his front line.

These guns, of a caliber between 37-mm. and three-inch, inclusive, will likely have an effective slant range of 5,000 to 7,000 yards. According to our teachings, antiaircraft gun batteries are to be kept out of light artillery range, but there can be little doubt that, if we develop effective giro observation, the enemy will shove his farther forward. However, we should be able to count on their keeping at least 1,000 yards behind his front line. Even then, they will have to be well defiladed from field artillery OP's.

We may avoid these guns by keeping out of their range, holding our giro four thousand to six thousand yards from the hostile front lines. Even back here, the giro still can be very useful. By getting up to the limit of our protection from pursuit, or by going above it for short periods, we still have very effective observation on extensive areas behind his front lines. We may bring our giro farther forward, much of the time, by keeping it so low that enemy antiaircraft will be unable to fire on it. The giro can use altitudes which, for aircraft, seem very low, but may still be high compared to the kind of ground OP we often get in war.

But the giro is too valuable to use only in accordance with the will of the enemy. We should neutralize or destroy the enemy's forward antiaircraft batteries. And the ideal combination for neutralizing or destroying the enemy's antiaircraft batteries is that of the field artillery and the giro.

As soon as an enemy battery opens up on a giro in range, it dives into the

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battery's dead space. Then a second giro goes up, out of range. It is in communication with a field artillery battery laid on the general vicinity of the antiaircraft guns. The first giro now resumes its mission, flying a zigzag course and observing as best it can. The very high rate of fire of these guns makes them conspicuous. When the antiaircraft battery again opens fire, the second giro takes it under fire of our field artillery. "A battery seen is a battery lost." Once the antiaircraft battery is neutralized, it may be held under heavy fire while the giro observing it approaches close enough to destroy it. If the enemy's antiaircraft is particularly strong and efficient, it may be necessary to have more than one giro watching for it until this arm is well crippled.

Having reviewed the factors of enemy opposition which we had in mind when we planned our giro service practice, a brief account of that work will now be outlined.

The three senior field officers of the regiment had, at various times, mentioned that Mr. R. G. Kellett, an official of one of the giro factories, was a former member of the First Battalion. Finally, in May 1938. Captain Charles R. Gildart, the senior instructor of the regiment, went to see him. The result was the plan for borrowing the factory's giro for service practice.

In June we established telephone communication from the giro to the ground. The giro went up to 1,500 feet. Communication was excellent. Next we put a radio set into the ship, but failed to make it work. Then we devised a dropped message, an iron hinge fastened lightly to the leg. It makes a fair writing pad. A strip of cloth is fastened to it. The message written, the hinge is yanked off, and, at the proper place, thrown over the side of the ship. It worked well.

Lieutenant Harry S. Messee, who was to be an observer, and Captain Gildart and myself now had short flights. I had a

couple of hours' practice in flying the ship. My success as a flier may be measured by the pilot's principal remark. "You make me seasick."

On September 17th the Second Battalion, commanded by Major Joseph E. Shaw, went to Indiantown Gap. Heavy fog and rain prevented any experimentation. On September 24 the Third Battalion, commanded by Major James C. Rosborough, rolled to Indiantown. The giro left about the same time and landed four hours ahead. Its wings folded, it taxied over to our sleeping quarters.

The next morning, as the battalion left the park. Major Rosborough took off in the giro, reconnoitered the position area, and landed near the prospective firing position. His observers, moving forward rapidly by car, joined him. He quickly outlined the situation, including the location of an enemy antiaircraft battery of 37-mm. guns some 1,500 yards behind the Red front line, having a range of 5,000 yards. Further, the enemy pursuit was active, so the giro must stay below 1,500 feet except for short periods of time. He assigned missions to the observers for the support of an attack. Visibility was very satisfactory. (Later it decreased somewhat.) Each battery had its maintenance strength of two howitzers. Telephone communication was vetoed, there being too many trees in our vicinity to catch the wire and yank our giro down.

Major Rosborough assigned me the first target, an enemy CP in the vicinity of a stream junction. The giro OP took off. Meanwhile, the battalion had arrived and was preparing to fire. While we are waiting, let me introduce the principal figure of the activities, the pilot, Lieutenant John Miller, a flyer of the Marine Corps Reserve. Not only had I ceased making him seasick by now, but he had begun to become very

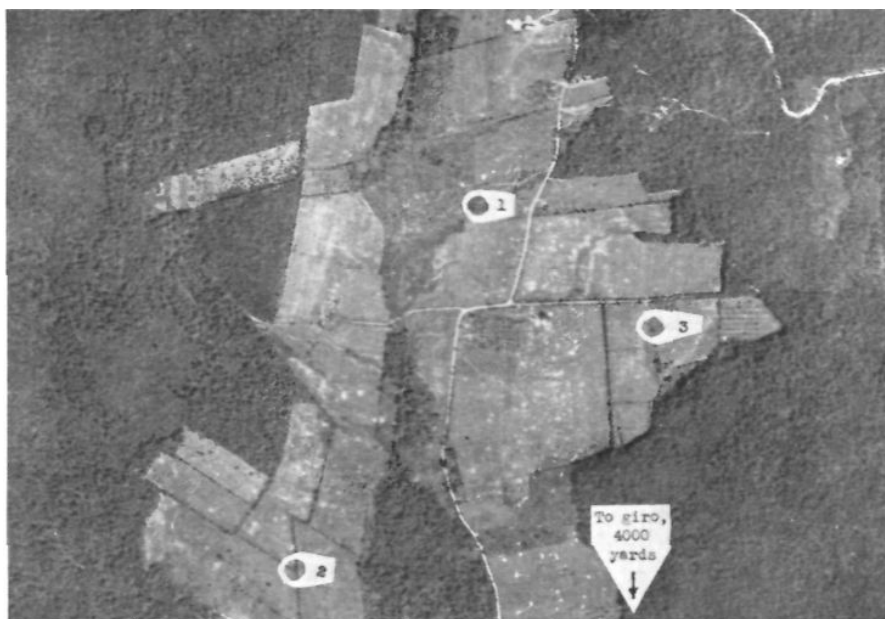
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enthusiastic over the whole affair. Seeing the column on the road, the guns in position, and the general interest taken by all, he entered heart and soul into the game.

As we flew back and forth behind the battery. I noted that my target was indistinct, being 5,000 yards away, and all trees in its vicinity having been cut down, so instinctively I took the ship higher, to about 2,200 feet. Now all was very clear. But while studying the target, I lost 1,200 feet. However, the target was still so distinct, after having viewed it from 2,200 feet, that I was surprised to note the low altitude when I saw the ground coming up. This was finding an unexpected usefulness of the giro, that of studying the terrain momentarily from the higher altitude, then comprehending this terrain well from the lower, safer altitude. About this time I noted that the pieces seemed to be pointed very nearly in the direction of the target.

Throughout the problem, I found it very easy to visualize the GT line fairly well.

Flying as slowly as I could make the machine go. I noted the panel "Battery is Ready," and rocked the ship, clumsily, to signal "Fire." I saw smoke from No. 1, and soon saw a very conspicuous burst in slightly defiladed terrain. Flying with my left hand. I wrote, "L 25. 360" on the iron hinge, increasing the range by 400 yards. Then the stick was yanked from my hand. I found that we were about to fly into Second Mountain. Miller flew the ship over the battery CP. we dropped the message, and again I flew the giro slowly back and forth behind the guns. By panel I now got. "Unsafe to Fire," and so dropped. "BR, 340," decreasing 200 yards. Soon we heard the battery fire, and noted its smoke. Watching closely. I saw two of the most beautiful bursts I have ever seen. Then Miller grabbed the ship again, as we were again about to run into the mountain.



THE TARGET AREA AND TARGETS

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We now had to land to discuss safety limits. Meanwhile, Messec did his firing. When Miller and I got back up in the giro, he did the flying. He managed so well that we seemed to be sitting still, about 1,000 feet above and behind the battery. Now that I was no longer trying to do two things at once, I found that I was in a very comfortable OP. The violent slipstream usual to an airplane was completely missing. The giro, when flying slowly, keeps its nose fairly well up, causing the passenger to feel that he is leaning back in an easy chair. The whole experience felt more like conducting fire from a super-excellent ground OP than from an airplane. Miller turned the giro so quickly in taking us back and forth that at no time did I lose sight of the target for more than about a second.

Having but three rounds left, I had given "Number 2. 1 round," before leaving the ground. When 360 burst, it was way over, the day having warmed considerably. Imitating Messec, I now resorted to voice communication, and got a short at 320, then an over at 340. The bursts were not as distinct now, due probably to changed light conditions.

Messec had had altogether only an hour or so in the air when he went up for his problem. However, after it was over he had fired a couple of "S's," and felt that, with this brief experience behind him, he could conduct giro fire with no difficulty. His account follows:

"My first target was in the vicinity of a well-defined terrain feature, with OT of

4,000. Although it was on a forward slope, it was invisible to any ground observation that could have been established by the battalion in a reasonable time. We flew back and forth behind the guns at about 400 feet. The gun-target line was fairly easy to keep visualized at all times during the firing. I heard the guns and saw their smoke. My first problem is set forth below. c equaled 10."

"On the conclusion of this problem, I called down 'Change target,' and gave data for the new target by dropped message. I had been firing Captain Haggerty's battery. I now fired Captain Gordon's. From now on I called the data down to the battery CP.

"My next target consisted of infantry mortars, firing from somewhere east of a high hill. I simulated noting their flashes in the vicinity of the edge of an orchard, on a rather steep reverse slope. I went up to about 1,900 feet for a brief study of the terrain, and did most of the observing at 1,500 to 1,600. The problem went about as the previous one except in a few unfortunate happenings. I put on a low-power glass that fastens to the head like spectacles. I lost a round because the burst was not in the field of view. I took off the glasses to be sure of not using any more of our scanty ammunition. I would have done better if I had tried to take less advantage of command of the terrain. These reasons, and dispersion, and error of initial data, caused me to use ten rounds."

<i>Command</i>	<i>Sensing</i>	<i>Remarks</i>
250	70 R ?	Haze in target area.
L 70, 250	5 R ?	Communication is by dropped message.
L 5, BR, 250	—	Brought in battery for better observation
	—	Obviously close.
270	+	This round in woods but easily sensed from giro.
	+	Dropped command for fire for effect.

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A ground observer, on a mountain behind the enemy lines, had located the bursts from the flank. His report showed that both Messec and I had under-estimated range errors to some extent.

Thus ended the first giro firing outside of the regular army, and possibly the first in our army conducted with meticulous respect for strong enemy opposition.

In December, wishing we could try firing with greater OT distances, we again adopted Miller into the 108th. The 103rd Observation Squadron staked us to winter flying clothes, and smoke bomb equipment. Three smoke puffs, simultaneously fired, seemed to make a burst smaller than a 155 burst. On December 8 we were ready, but the visibility on the ground seemed to be only about 2,000 yards. At Miller's suggestion we went up anyway. We observed at 1,500 feet, tried various OT distances, and found that at 7,000 yards the bursts and target were clear. We went up to 1,700, down to 1,200, and then down to 800 feet, finding observation to be best at 1,200. At this elevation there were no losts or doubtfuls. On landing, we still found visibility greatly restricted on the ground, so Gildart and I went to the roof of a 250-foot building not far away to get an accurate comparison of practicable OT distances in this particular kind of weather. At 2,500 yards we could see only rivers and very large buildings, Gildart's excellent eight-power glasses helping little.

As a result of our brief giro experiences, we feel that the giro is a comfortable, readily established, very mobile OP of adjustable height, from which observation of fire of 155's is practicable, from low altitudes, up to at least 7,000 yards. It is less affected by fog and smoke than is the ground OP. Artillerymen with little air experience can observe from it. The observer can readily

place the OP in the place he wants it for a particular target.

Before, during, and after our giro work we read whatever we could on the use of giros for the observation of fire, particularly the work done so far at Benning, Bragg, Sill, and Riley.

A Russian report, based on unknown caliber, gives 7,000 meters as the upper limit of observation of fire. None of the reports shows attempt to keep the giro at minimum altitude during observation. However, the reports we have examined, together with our own experience, and consultation with many officers, lead us to believe that we see somewhat the outlines of the picture of the giro's place in the conduct of field artillery fire. The best way to discuss this picture, probably, is to compare the giro with the means of observation with which we are already familiar: The balloon, the airplane, and the ground.

The balloon has few advantages over the giro. Perhaps more powerful glasses can be used, but the giro's ability to move farther forward than the balloon compensates in this matter. It is frequently said that the balloon has continuous observation. The giro, however, is so safe and easy to fly that the pilot, having little strain on him, can keep the ship up almost continuously. When he descends for gas, a relief giro can take over for this brief period. The wire communication from the balloon can be approximated from the giro, if we are willing to restrict its mobility. It can carry 6,000 feet of wire, and still have enough gas for more than one and a half hours' flying.

On the other hand, the balloon cannot go up and down easily for various targets as the giro can, nor can it, by moving easily, furnish axial observation to any but a few batteries. It has a top limit of about 4,500 feet with one person, where the giro can go higher if necessary and advisable. It must stay back

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behind our lines out of the enemy's light artillery range, where the giro will often be forward of this. It requires 157 members of its reenforced squadron to keep it in the air, while half this number could keep a small squadron of giros in the air. It is difficult to find personnel which is interested in balloons; many can be found who are interested in giros. The balloon is good for little else than observation; the giro has many other uses. The personnel of the balloon is seldom in close touch with any particular artillery battalion; the giro can readily be in close touch.

The final difference, and the most important, is the great vulnerability of the balloon. It is not only much easier to hit because it is so big and stationary, but it is easy to see from long distances. There are few who believe that the balloon will survive in coming warfare.

The next form of observation with which we are to compare the giro cannot be dismissed in so summary a manner. The airplane can survive enemy action, and we still need its help for observation of fire. Its primary advantage is that it can observe at any range that our weapons will reach. From the giro, observation can be conducted only part of the way up to our limit of range. Whether, for the 155's, it can be used only at seven thousand yards or at nine. I do not know. For 75's, six thousand must now be the top limit. Beyond that, airplanes must still be used. Moreover, when visibility is considerably limited due to smoke, mist or haze, the giro, while superior to the ground OP, will have to concede to the airplane even more of the terrain deep in enemy territory.

However, the advantages of the giro as an observation aircraft for the areas it can see give it predominant superiority, it seems to us.

The primary of these advantages, perhaps, lies in the greater teamwork

possible between the giro personnel and the artillery. The use of the giro brings the air-observation elements and the field artillery elements of the air-ground team immeasurably closer together.

In thinking of airplanes for conduct of fire, we are naturally prone to have in mind what we are accustomed to in service practice. Then the airplane and its personnel are usually located on a field not many miles removed from the gun positions. However, in war the fields from which airplanes for artillery observation operate are far behind the lines. The observer may come forward by car or motorcycle for conference, but to know well ahead of time with just which unit the observer is going to work will most likely be difficult. Then there is the travel over miles of road, possibly congested with traffic, perhaps at night without lights. It is much more likely that the plane will fly over our vicinity, report to brigade by radio, change frequencies, report to battalion, and then commence observation of fire.

The giro which is to observe for us, however, can bivouac with us, march with us, and operate from our position areas. In bivouac areas the rotor blades can be folded back and the giro parked with the guns or trucks. On the march it can fly above the column or ahead of the column, or march in the column. Flying, it can communicate by radio, dropped and pick up message, or occasional landing. It may go ahead to the position area, study the target area from the air, and be ready to conduct fire effectively as soon as the trails are dropped. In marching it can taxi, be towed, or ride on a light trailer. (It weighs less than 2,000 pounds.)

Within the position area, the giro will seldom have difficulty finding not only a landing field, but several alternate fields. Even a slow-flying airplane (if we had one), could not approach the

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THE GIRO LEADS THE COLUMN ON THE ROAD

giro in this respect. In flying into the area, either machine may be able to fly slowly and low to pick a field, but the airplane does so with so much difficulty that the pilot must concentrate on flying, rather than on examining the ground closely, whereas the present giro flies as easily at slow speeds as at fast speeds. Then, in landing, the giro can land practically without roll. (In the thirty or so landings I have witnessed, the average roll has been less than a foot.) The plane, which must have some roll, may nose over when the wheels sink in mud or strike hidden rocks or ditches.

The giro, then, works from the artillery position area during action. When not aloft for observation, it is hidden, with its wings folded. To avoid anti-aircraft, it may enter and leave the area by flying in defiladed valleys, for it is much safer flying close to the ground than is an airplane.

Part of the time the giro will land near the battalion CP, so that its personnel can quickly confer with the battalion commander, or his S-3, receive their instructions, and have everything made clear to them. Part of the time it lands

near the CP of the battery which is next to fire by air observation, thus bringing the observer - BC conference right to the BC, and at the best time to hold it. Then, in order to help mislead the enemy concerning the vicinities of our CP's, they land, part of the time, a mile or so away, and the personnel of the giro reports by motor transportation.

When not flying, the observer most likely will be at the battalion CP a great deal of the time. There, he can keep himself familiar with the situation, study the maps, charts, and photographs of the target area, all such work being done with an up-to-the-minute knowledge of the mission of the battalion. Probable or possible missions can be explained to him therefore, in few words, and he often can study well ahead of time the particular part of the target area in which he is to observe. For contact with the infantry the observer can dismount in the vicinity of the infantry regimental CP, or pick up a message. He can arrange for marking of the infantry front line.

For any particular mission, he surely will be able to take the air with an exact knowledge of what is wanted. He will

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even, in many cases, be able to note the direction in which the pieces are pointed as soon as he gets up, and quickly drop approximate corrections for any major errors of laying for direction. Marking of the infantry front line can be planned to be visible to a giro flying low behind our lines, and still be inconspicuous to the enemy. This arrangement will be less difficult than in working with an airplane. Conduct of fire of the larger calibers by photographing bursts will be facilitated by ready consultation between artilleryman and photographer.

The physical closeness of the giro personnel is bound to assist them to adopt that mental outlook necessary for the maximum cooperation, that degree of cooperation which may mean the difference between great effectiveness and only moderate effectiveness of our fire in those very extensive parts of the terrain invisible to ground OP's.

Again, in considering mental outlook and attitude, we may find ourselves misled by what we are accustomed to in time of peace. Air corps personnel working extensively with us is usually very cooperative in giving us good observation. This is most emphatically true in regard to the 103rd Observation Squadron. But the primary interest of the average air corps officer of the Regular Army, be it said to his credit, lies with the Air Force. The tremendous development and expansion of that arm are carrying with them serious problems of organization, supply, maintenance, training, and tactics, even problems of strategy. Can any large percentage of the Air Corps be expected to be much engrossed in the subject of artillery observation? And any flyer of airplanes must keep much of his mind and heart on flying in order to retain proficiency in that major attainment.

Such being the case, the air corps officer who comes among us must undergo a mental reorientation. He must

suddenly take a great interest in a one-inch-to-the-mile map, or a 1/20,000 photograph or firing chart. He must be willing to glue his attention, for long periods of time, on an area a few miles square, and to learn all he can about the tactics and technique of field artillery and its fires. Then he becomes part of us, becomes one of our two eyes, the other eye being our ground observation. Perhaps, if he works closely enough with us, he becomes our best eye.

Almost invariably, close association with another arm breeds friendship for its personnel, and ultimately identification of its aims with one's own. The giro permits the air people to be close among us, to eat, sleep, and live with us.

The advantages of the giro, over the airplane, include other matters besides closeness of teamwork. Protection by ground weapons is one of these. If the airplane dives to the vicinity of supposedly friendly weapons from its observing position over the enemy lines, it is likely to be shot down by our own troops by mistake.

Continuity of observation favors the giro. The airplanes cannot be expected to stay for long periods of time above the enemy territory. Not only does this subject them to serious losses, but also is a great strain on the personnel. Communication is better in two respects. The giro, from its position behind the guns, must make sensings akin to those used in ground observation. These, or commands, can often go direct to the executive, avoiding delay. The giro's alternate means of communication, voice, is impracticable from the airplane.

The final superiority of the giro over the airplane is that it can much more readily be manned by field artillery personnel. In war, the Air Force will need more officers than it now has. At least two crews per ship will be highly desirable. The Air Corps will likely be glad

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to avoid having its personnel drained away from the Air Force. Another advantage, of course, to our manning our own air service is that the work is then performed by personnel possessing field artillery training.

As a result of our comparison we may deduce that, by the attachment of a squadron of five or seven autogiros to each field artillery brigade, we may not only displace the balloon squadron but also decrease the number of airplanes in the observation airplane squadron. The author's own estimate is a decrease in the latter of about two airplanes.

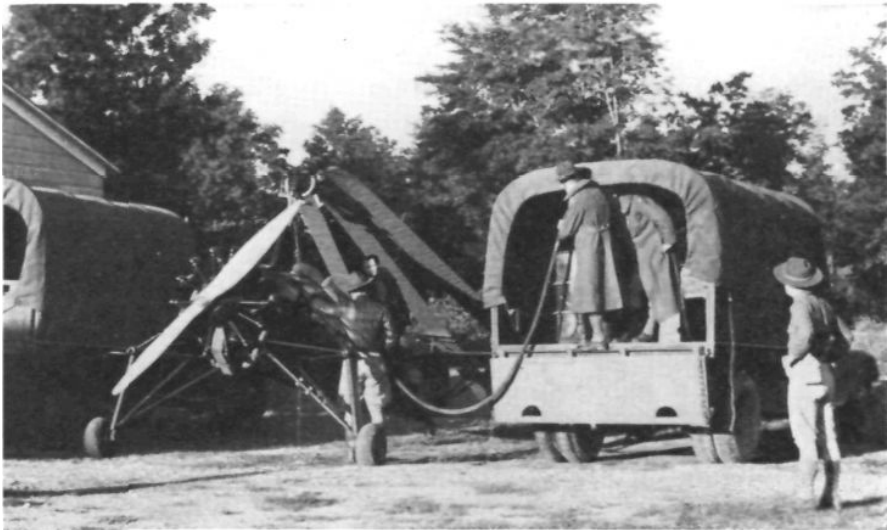
A comparison of giro observation with that of ground OP's shows that the two, used in conjunction, form a splendid team, providing far superior observation for us than when either is used alone.

The ground OP, with its powerful glasses, often sees farther than the giro, but the giro, by its elevation, sees much area made invisible to the ground OP on account of terrain features. By the use of instruments the giro cannot use, the ground OP can adjust at night, by high burst or

center-of-impact. The giro can adjust at times in daylight when the weather conditions limit the ground OP's visibility. Ground observation may be interrupted by neutralization by enemy small-arms, HE, or smoke; giro observation may be interrupted by having to refuel, by enemy pursuit or antiaircraft fire, or by mechanical breakdown.

The ground observer may watch very closely particular areas for enemy activity, or conduct precision adjustments on very small objects, while on the other hand the giro observer can observe a wide area, watching at least the entire battalion sector. By a minute study of the terrain with powerful glasses, the ground OP can learn much about the minute details of the parts of the terrain it can see, whereas the giro, by going up, can get an excellent idea of the relative location of objects of considerable size.

From the foregoing, it would seem that the giro is such a valuable supplement to the ground OP that it should be highly acceptable to us. There are, of



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course, certain points of inferiority, in that it cannot be as near the enemy front line as a ground OP; its observer cannot readily discuss the situation with the battalion commander while viewing the terrain, and receive fire-direction orders from him while doing so; nor can it, usually, maintain telephone communication. However, if it still seems acceptable, the next few paragraphs will show that it is far more than acceptable. The giro has an outstanding superiority over the finest of ground OP's—its mobility.

When fast-moving truck-drawn artillery starts for position, the giro OP can be occupied immediately, and then moved at 100 miles per hour, arriving before the batteries arrive. While the guns are catching up, the observer is studying the target area. While the BC's are clambering over rocks and climbing trees to get good ground OP's, the giro is conducting fire. The mobility of the giro OP simplifies greatly the conduct of fire. Axial observation is obtained by flying it behind whatever battery it is observing for. The high hill stands stubbornly in place; adjustments from it are all often by cumbersome lateral methods. By reason of the observer's mobility, liaison with the infantry is promoted. From this OP, to locate a certain part of the front line, or to establish other visual communication with the infantry, or to watch the progress of tanks, the observer can move the CP about and find the location from which he can see best. To pick up a message from an infantry regimental command post, this CP goes to that vicinity and picks it up. The fine, high hill stands stubborn, will neither move nor pick up messages. When deception is desired, the bulk of the giros may fly in the region where the deception is attempted, and be quickly removed therefrom when their presence is needed elsewhere.

Finally, the concentration of means at the decisive point, a primary requisite for victory, is facilitated immeasurably by the giro. This is not only because artillery can be sent to that point rapidly and open fire. By sending additional giros to observe for the artillery at that point, the fire power of this artillery is suddenly increased by reason of the additional number and efficiency of the observed fires delivered.

I hear no high hill volunteering to move about on the battlefield. They won't proceed at one hundred miles per hour to the vital point. They won't move at all.

This immobility of the ground observation often forces a commander into line of action he would not otherwise take. In the selection of a defensive position, he may sacrifice many valuable characteristics to secure good observation for his artillery. He may give up good fields of fire for his small arms, and serious obstacles to the enemy attack. When he attacks, the commander may envelop a flank which has open ground to cross in the face of machine guns, or which will give a less profitable victory in event of success, because he is able to seize good observation on that flank. In the World War, time and again, heavy losses were incurred for the capture of only moderately good ground observation. The giro, by lessening the importance of ground observation may contribute materially to the gaining of victory.

If the autogiro gives us a valuable means of observation, what does it cost? Purchased in quantity, these machines should cost \$16,000 apiece or less. The expensive feature about them is the rotor hub. When a hundred or so are made at a time, the parts for this assembly may be made by machinery. A squadron of five (one per regiment, two in brigade reserve), would, then, cost less than \$80,000.

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The optical instruments alone of the ground observation of a brigade cost \$74,000. To this must be added a share of the several hundred thousand dollars needed to buy such equipment as the trucks, reconnaissance cars, and wire which are issued to the eighteen battery details and the eleven headquarters batteries of the brigade. To maintain the suggested squadron in the field should not require eighty men. (A thirteen-ship airplane squadron needs 154). In contrast, ground observation is costly, in that a goodly number of hundreds of men must be maintained in the field for establishing and maintaining it and its communication.

But the giro does not need to be an additional cost over present means of air observation. Even a seven-giro squadron, by replacing two airplanes and the balloon squadron would cost less than what it replaces.

This article has concerned itself only with the use of the giro for conduct of fire. That there is much more to the giro-artillery picture is well known to all of us.

Furthermore the article has dealt only with what the present giro seems to be able to do for us. Future developments will likely increase its usefulness.

In common with all machines, its mechanical reliability will, of course, continue toward perfection. A new shape of rotor blade under construction is designed to make for smoother flying, permitting the use of more powerful glasses, longer ranges, and more precision adjustments. Ready for incorporation into new machines is the adjustable-pitch rotor blade, which is expected greatly to shorten the present very short take-off. Not far away is the jump-take-off, permitting the machine to

rise vertically for an initial fifteen to fifty feet. Ultimately, comes the helicopter.

Communication improvement may be expected. In immediate prospect is the mounting of a reel in the ship to enable it to carry wire aloft without so much danger. Perhaps more distant, the use of the telairophone, which magnifies the human voice, may be developed for communication in conduct of fire. Improved communication will make the giro approximate even more an excellent and highly mobile ground OP.

From a standpoint of the tactics and technique of our arm, however, it does not appear that the use of the future rotary-wing aircraft will be much different from that of today's giro. Concurrently with their improvement in design, therefore, we can get practice in their use. And the sooner we have them in considerable numbers, the sooner will the field artillery profit by the increased effectiveness they can give our fires.

The work of the 108th Field Artillery in supplementing that of the Regular Army was entirely voluntary. It received the support and assistance of many officers of the Regular Army and of the Guard, including that of the division commander, Major General E. C. Shannon, the military advisor of Pennsylvania. Colonel Ralph H. Leavitt, and Adjutant General F. B. Kerr. Members of the 103rd Observation Squadron gave valuable help. The work was well coordinated by the senior instructor of the regiment, Captain Charles R. Gildart. But it is primarily to Colonel William A. March and the many officers and men of his regiment that the Field Artillery owes thanks for assisting in the development of the autogiro as an observation post for the conduct of fire.

We Must See With Our Own Eyes

BY MAJOR H. W. BLAKELEY, FA

SHORTLY after the armistice, General Summerall, at that time Major General commanding the Fifth Corps, said, "All aerial observers must be composed of artillery personnel and must be absolutely under the control of the artillery. We shall never get successful results by the methods that have been pursued in this war."*

Let us consider what these methods had been. In the early days of the American Expeditionary Forces, field artillery officers had, theoretically, been detailed as air observers. Actually, they were in most cases field artillerymen in name only, who were trained by and lived with the air service. They rarely went back to the organization from which they came. The field artillery had little interest in them, individually, and the air service less than that. Furthermore, there was lack of uniformity not only in training, but in methods of assignment, promotion, etc., in France and in the United States. Finally, the general dissatisfaction of all concerned—field artillery commanders, air service commanders and the observers themselves—became so great that, after much correspondence between the General Staff of the A.E.F., the Chief of Air Service and others concerned, a new policy was published by GHQ on August 9, 1918, announcing "that the aerial observers be commissioned in the Air Service and that they be placed on a footing of absolute equality with the officers of that service as regards command, promotion and pay."

Some doubt may be felt whether these officers achieved, as a result of this order, the absolute equality, particularly in regard

to promotion, which was prescribed for them. The immediate command of Air Service units by officers who were not pilots was naturally not accepted with much enthusiasm by the Air Service.

Admittedly, this new policy had only a short test under war conditions, but the results from the Artillery viewpoint as summed up in the report of the Hero Board were as follows:

"The reports received from officers who have served at the front are unanimous that adjustment by aerial observation was unsatisfactory. Successful results were obtained only in a few isolated cases. There is only one officer who recommends that the observers remain a part of the Air Service. A majority of the officers recommend that aerial observers belong to the Artillery and that they be absolutely under the control of the Artillery.

"The aerial observers should be Artillerymen, should remain with their Artillery units, only leaving when they go on observation. This applies to both airplanes and balloons."

In one of the reports referred to by the Board, the late Major General H. G. Bishop, then Brigadier General commanding the 3d FA Brigade, 3d Division, said:

"The aerial observers should remain with their brigades, only leaving when they go on observation. This applies to both airplanes and balloons. When occasion for their use arises, they can be fully oriented and given definite instructions by the battery, battalion, or other group for which they are to work, proceed to the plane or balloon which has been assigned by the aerial unit and go aloft with a full understanding of what they are to do."

How, in war, can this be done and how, in peace, can we prepare to do it?

*Report of the Hero Board. Annex 8. Recommendations of Artillery Officers, American E.F.

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Let us take war conditions first. There should be, in my opinion, an additional officer on each field artillery battalion staff designated as "Air Observer." This position should be more nearly analogous to that of our present battalion liaison officer than to any other member of the staff. This air observer (remember we are speaking of war conditions) would have had the same training prior to receiving his commission—CMTC, ROTC, National Guard field artillery service, war training camps—as any other field artilleryman. After some duty with his arm he would be detailed for additional training as an air observer. This training would be under field artillerymen. On completing it, he would be returned to his organization with a rating as an air observer and, if a vacancy existed, be assigned to a battalion staff as air observer. He would, of course, work and live with his battalion and do routine staff duty with the other members of the staff. Probably, in time of war, he would not receive extra pay for flying. It will be difficult in the next war to justify more pay for a man in the air than for an infantryman in the combat zone.

It must be remembered that the point of view of the young men who will be our observers in the next war, even if it is next year, will be very different from that of our observers in 1917. In 1917, flying was unusual and dangerous. There were no parachutes except in balloons. Planes and engines were hardly beyond the experimental stage and were being turned out under pressure and with what materials were available. Now, a large percentage of our young men of the ROTC type have been in the air. It might be suggested that many junior officers in the next war will regard getting on a horse as more of an adventure than climbing into a plane. So it seems reasonable to conclude that the attitude of this staff officer will naturally be that he is a field artilleryman who gets into an airplane or balloon when the air is

the best place from which to see. The rest of the time he works along at his job of being an artilleryman, training himself to be a battery commander and later a battalion commander. He will not regard himself as an aviator who is being sidetracked into an observer's job or merely as an observer who can only achieve promotion and command by becoming a pilot.

Eventually, he will find himself going into action with his battalion. He will probably accompany his battalion commander during the latter's reconnaissance and selection of positions and be present when they are occupied. He will absorb without effort a great deal of knowledge which will be useful to him in the air. For example, he may know that Battery A has only three guns, that Battery B is the only battery that has any supercharge shell, that Battery C has many replacements and will probably not fire with normal accuracy. He will make, mounted or by motor, a reconnaissance to the rear to find out about Air Corps airdromes and advanced flying fields, unless he has already learned about these points on his way forward. When the need for air observation arises, he gets his mission, communication plan, and soon (by direct personal contact) goes to the nearest flying field, talks over the mission with his pilot, and takes off. (It is obviously easier for an artilleryman to get back to a flying field than for an Air Corps observer to go forward and find a battalion CP.) When he lands he reports back to his battalion commander and this is perhaps the vital point of the whole matter. If the "shoot" was a failure, he is faced by the "Why" of his commanding officer. If it was his fault, he must face the music. If the failure was due to misunderstandings of methods, communication, poor firing—any reason to which the personnel on the ground contributed—the observer is present among officers whom he knows,

WE MUST SEE WITH OUR OWN EYES

in an organization in which he probably has pride, and the errors can be thrashed out and prevented from happening again. Conditions may, of course, defer his return to his organization; additional missions may require him to get into the air almost at once, but eventually he has to face his commanding officer—the artilleryman who was responsible that his organization deliver certain fire, and also the artilleryman who will make out the observer's efficiency report.

It has often been said that one of the advantages of having artillerymen as observers is that the artilleryman is vitally interested and that the Air Corps officer, with the best intentions in the world, isn't. The artilleryman, too, has a better (and indispensable) knowledge of artillery methods; he knows his material, personnel and, under the system outlined above, knows exactly where his batteries, panel stations, and the like are located. It has never been suggested that the infantry do our forward observation for us, and it is equally illogical to expect another corps to do our air observation for us. (Incidentally, we didn't show much enthusiasm over the P.I.D. experiment in which the Signal Corps furnished our communication personnel.) The objection that the artilleryman is not "as much at home in the air" is becoming less true every day, even of the civilian personnel from which wartime officers are made. It doesn't take many hours in the air to make the average officer sufficiently at home to observe artillery fire and handle a radio set. If he is to be responsible for the operation of a machine gun in the air, he must, of course, have some additional training, but with the three-place observation plane, an Air Corps enlisted man will have this responsibility.

How, in peace, should the field artillery prepare itself to furnish air observation in war? It may seem to be visionary to state as an objective that

every regular field artillery officer should have some air experience, yet we are already on the way to the attainment of such a condition. During the last ten years, over 90% of the officer students at the Field Artillery School volunteered for and were given some air experience. As far back as 1929-30, all but three out of a Battery Officer's Class (Regular Army) of over seventy, were given sufficient training so that they were enabled to attempt adjustments from the air, using two-way radio code. Some were not successful, of course, but on the other hand, four selected National Guard officers who had never been in the air before their arrival at Sill, fired satisfactory problems, using radio telephone, although they had had very little instruction. Incidentally, the objective at Sill is not to train air observers but to give artillerymen enough experience in the air to cooperate intelligently on the ground with observers in the air. However, each year there are officers in the Regular Class who could obviously, with very little additional training, give good accounts of themselves as air observers under any conditions. It is suggested that upon graduation each year, a few of these officers, perhaps only six or eight the first year, be retained at the school and given a two months' course in air observation. This course should include enough dual-control flying instruction to enable them to make a landing in an emergency if their pilot be incapacitated. It should include sufficient knowledge of the possibilities of air photography to enable them to act intelligently as liaison officers between the Air Corps and the Field Artillery when air photographs are needed.

It is believed that this course could be given at the Field Artillery School without any increase in instructors or school troops. This would be possible because of the fact that the demands of the Academic Division upon instructors and

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schools troops, including Air Corps troops, are at a minimum during the summer.

It is proposed that eventually each battalion of regular field artillery should have one officer on flying duty. In many cases, this officer would not be able to fly every month—pressure of other duties, lack of Air Corps troops at the station, and so on, would prevent, but his interest in air observation would be continuous and serve to keep training in air-ground methods alive in his battalion throughout the year. He should have flying pay, but since he need not fly as many hours in a month as a pilot, it might well be set at 25% of his base pay instead of the pilot's 50%. Normally, the securing of this additional pay might be an insurmountable obstacle, but a large Air Corps increase is under consideration and a shortage of pilots and observers is a possibility. Under these circumstances, the employment of field artillerymen as observers will help the situation and actually decrease the cost of the expansion.

It would take, of course, several years before each battalion could be supplied with a graduate of the proposed course, but in succeeding years, as the needs and methods were ironed out by experience, a large number of officers could be qualified in a shorter time. Eventually, instruction could probably be decentralized somewhat, possibly by giving a similar course in the Hawaiian Department, for

example, using graduates of the Sill course as instructors.

After a few years it would probably be desirable to limit the time that any field artilleryman could be on flying duty, to two years in every six, or some similar time, to develop more qualified instructors in time of war and to prevent officers from getting so "air minded" that they would forget that their main jobs as artillerymen are on the ground.

For the National Guard, a similar plan, modified to suit the conditions under which the Guard works, would seem to be as readily practicable as the present method of Air Corps observers.

For the Organized Reserve, the training in time of peace would necessarily be elementary and largely theoretical.

It should, perhaps, be mentioned that during the last few years the cooperation of the Air Corps with the Field Artillery has been generally satisfactory, but with increased demands on the Air Corps incident to expansion and to constant increase in technically complex equipment, the training burden is becoming greater and training of observers for artillery adjustments is likely to suffer.

The principle by which one arm is dependent on another for a vital part of its routine work—and in the next war air observation may often be *the* vital part of our procedure—is obviously poor organization. The time to change is *now*.

Lt. Col. R. H. Cushing, FA Res., of Hq Buffalo (N. Y.) Military District, 1st Mil. Area, reports the successful use of cellophane as overlay material. When used with "phano" glazing pencils—the marks of which are readily erased with art gum—the sharpness of the colored lines and the clearness with which the underlying map may be read are quite noticeable. Further, the marks do not wear off easily and overlays may be slipped under the cellophane cover of the map and read or traced with ease, cellulose tape being used, in place of thumbtacks, to hold the overlays in place. Thus there appear no marks on the original map, which may be used again and again. The material is commercially obtainable in 100-foot rolls of 20-inch width.

"Mecca"

BY LOIS R. DUNN

WHEN the muezzin calls, all good Mohammedans turn their faces toward Mecca, fall upon their knees, and pray.

When the time for a change of station draws near, all good Field Artillerymen, their wives, and their children turn their faces toward Washington, fall upon their knees, and pray to be sent back to Fort Sill. Note that I say "back," for it is only the repeaters who pray. Those of us who have never tasted the sands of the flying dust storms, nor felt the intense heat of a Fort Sill summer, can not yet realize the utter fascination for a post which boasts of such a variety of climate—nor can they appreciate what they forego, when their preference is service in California, or D.O.L. in New York City.

In 20 odd years of my husband's army career, we have spent nearly half of his service in Fort Sill. We have lived in every part of the post, including the old Post field, and in every type of house which exists there. One happy year was spent in the tenements of the old school. Another year, not at all objectionable, was spent in Lawton.

A newcomer who arrives in Sill during the summer may readily believe that his previous sins have swamped his career, and that he is being condemned to an advanced taste of the hereafter. The earth is dry and sunbaked, and not a blade of green grass can be seen for miles—unless the constant watering of one's lawn has become an out-of-door hobby. Great diligence applied to flower beds produces wonderful zinnias, but all of the lovely prairie flowers have become departed ghosts. The leaves on the trees are covered with dust, and the ever-present wind envelops one like the blast from an open furnace door.

Comes winter: The morning may begin in a rational winter way. A clear sunny cold day, and firing on Dodge hill does not seem too unpleasant. Toward noon, the sun quietly vanishes and the sky becomes gray, instead of blue. The whine of a forgotten wind cuts the stilled air, and you suddenly realize that the thermometer is dropping rapidly. You pull on your gloves and push up the collar of your coat. Your feet are freezing and your ears are tingling, but the firing must go on. Short-overcoat weather has quickly become long-overcoat weather. With a shriek and a howl, a wintry blizzard has descended upon Oklahoma, and on the way home the drivers can scarcely see the road because of the blowing snow. Like a woman's love, the weather in Fort Sill is a most unreliable thing, and shifts without reason from one extravagance to another.

The journeying of the Red river bottoms to the golf courses of Sill is old history. When we saw a dust storm approaching, we could tell by the color of the dust clouds from whence it was arriving. If red, then Texas dust was on a visit; if gray, Arizona was listless; and when a mottled tan appeared, we had to move over and give Kansas room. But we who lived there did not pay too much attention to the vagrancies of the disturbances. 'Tis true, that when we saw or smelled a dust storm en route, we closed the doors and locked the windows. I have even gone so far as to make a mash of old newspapers soaked in water, and applied said mash to the cracks under the doors and around the window sills—but in the main, bridge continued, Post Exchange gossip never faltered, and routine life went on.

Those who can not take the weather's playfulness are the one-year students.

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They even have the nerve to argue with the old-timers, saying that the dust storms are getting worse—that the summers are becoming hotter—that the winters are much colder than of yore. All of this is sheer nonsense. The present dust storms can not be dustier than they were during the depression days, and the winters can not be colder than they were during the famous 1917 and 1918 blizzards. As for the summers—they can never get any hotter than they always are, because if so, no one could stand them and live.

Newcomers from the west arrive and mourn. "I miss the mountains." We old-timers proudly take them by the hand, and point out the Wichitas. And it is some little while before we can convince these newcomers that the slight upward formation on the distant horizon is our proud mountain range. To us those hills are beautiful. Void of vegetation, filled with rocks and cacti, and alive with rattlesnakes, the Wichitas break the flat monotony of the landscape, and when the afternoon twilight comes on, there is no lovelier sight than the bluish-purple hills often wrapped in a soft pink haze.

The frequent droughts I will lightly mention, then skip. When we first arrived in 1917. Fort Sill had not had a sizable rain in two years. The creek bottoms were dry and cracked, and the country was brown and parched. We walked into our quarters, and turned on the water. A greenish slimy fluid trickled out, emitting an unspeakable odor. We let it run for an hour to clean out the pipes but it never improved. I drank coca-cola whenever I was thirsty, and strained my bath water. However, in the good year 1939, since the post is no longer dependent upon the reservoir for its water supply, droughts may come and go, and Sill can rise above the situation. I mention the past to show you what I lived through yet retained my happy memories in an untarnished manner.

And of course there is the occasional cyclone. Being in the cyclone country. Sill gets a nip now and then. It is to be expected.

With all of the foregoing truths as a preface to my tribute, let us find out why Fort Sill is the most desired of all Field Artillery posts.

Believe it or not, at certain times of the year Fort Sill is beautiful. It is a fact that a greater variety of wild flowers appears there in the spring than in any other part of the country. Springtime in Fort Sill makes you feel as your mother used to hope you would feel after a round of sulphur and molasses. The world is fresh and green, and the flowers carpet the low-lying hills and prairies. Birds by the thousands seek the trees and meadow grasses to nest. The climate is mild and balmy, and even with an occasional dust storm Fort Sill is delightful in the spring.

For those of you who like to hunt. I heartily recommend a tour of duty in Sill, just so that you can take advantage of the superior dove and duck hunting to be found there. What is a greater thrill than to be half asleep on a crispy fall night, and hear the honk-honk of the wild geese overhead? And there are sufficient reservoirs and lakes around Sill to attract the birds. A fall spent in Fort Sill can become a glorious memory.

Sill is a perfect riding country. Anyone with a drop of equine blood would respond to it, and after a season with the hunt he too becomes an ardent Sillian. Many who have never before known that they were born riders develop into the horsiest creatures in the army after a tour with the F.A.S. On the other hand, it was there that I learned that I did not want to learn to ride — and a horse taught me that pearl of wisdom.

Polo ranks in the top class as played in Sill. The entire garrison responds with fervor to the polo team, and the game on Sunday afternoon with tea afterwards

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in the small polo club is a high light of the week.

Our Field Artillery horseshow team is in constant practice there, and people come from all over the southwest to attend the horseshows. The one held in late spring is an outstanding Sill custom.

There are two golf courses, and while they may not be the best in the army, they present the most fun. There are regular tournaments, and the links are good enough to enjoy playing on.

The quarters for officers are excellent, and present a wide type of styles. The charming old stone houses from Indian days; the new post designed in stucco as a typical Mid-West style; the bungalow type; and finally the new quarters similar to all of the new sets being constructed today.

The men's barracks are new and up-to-date. Many of them are equipped with the cafeteria style dining room and with all of the new electric saving devices in the kitchen.

The Officers' Club is new and beautifully complete. The swimming pool is a constant joy, and the upstairs-ballroom arrangement creates a perfect lounge and reading room on the lower floor.

For those among you who are to become students. I must mention that the school has a fine plant, with modern class rooms, and fine facilities for study. The library in Sill is one of the best in the army.

The children, too, learn to love Sill. I have watched the most ardent games of bicycle polo played between the Old Post, New Post, and Academic area. Many a canoe has been raced up and down the creek behind the old post quarters. Tree houses tell a tale of happy childhood. An excellent grade school is maintained on the post, and the general atmosphere of the younger generation is one of pleased and healthy activity.

There is the true story of a retired general who was born in Virginia, grew up

in Virginia, and his people still lived there. But in the interim, he had got to know and to love Fort Sill. There is a hill there named for him. When his retirement came due, his family sat in Virginia waiting for him to come home, but the general was in Fort Sill scouring the surrounding country for a place to live. (I must be honest, and add that he did finally return to Virginia, but Oklahoma was his first choice.)

Recently, we took our small daughter, who was born in Sill and lived there for half of her life, to a seaside hotel. After luncheon, a little old lady called to her, "Come here, my dear, and tell me where you live."

Betty asked wonderingly, "Do you mean where do I live, or where is my home?"

The lady smiled, "Both."

Quickly Betty replied, "Well, I live in Fort Lewis, but Fort Sill is my home!"

Then, there was the return of our family to Sill from a vacation spent in the lovely cool Blue Ridge Mountains of North Carolina. As we neared Wichita Falls, our son sat forward in his seat, drank in a long hot dusty breath of air, and remarked fondly, "Now this is God's country!"

Like the itinerant preacher, I hope to have put my point over with the above stories. However, if there be non-Fort Sillians among you, who are chortling up their sleeves, and thinking that I have not, then to them I say: Outwardly, Fort Sill looks like a dozen other army posts, with perhaps the worst climate of any of them, but inside, she has something that no other army post possesses.

Hers is a spirit of the service; a dignity of age; with an outreaching feeling of fellowship, that no other Field Artillery post will ever achieve.

To you scorners I say, know your Fort Sill. When it is time for the call of the muezzin, turn your faces toward Washington, and fall upon your knees!

MAY

Arlington

By Fairfax Downey

Over the brown Potomac's tide,
Tree-framed on the Virginia side,
 Beckons the home of Robert E. Lee.
Its pillared portico, lofty, spacious,
Proffers still with a gesture gracious
 True Southern hospitality.
Welcomed now in the living's stead,
Lie the legions of soldier dead.

Here wide hoopskirts of the ladies
 swayed.
Yonder gaily the children played.
 Thence Lee gazed with shadowed
 eyes—
Gazed yet saw not in a coming dawn
The white stones dotting his own green
 lawn,
 Where ranked and marshaled an army
 lies—
The men he fought and the men he led,
Gallant legions of soldier dead.

Firm in the red Virginia loam,
Arlington stood, a peaceful home,
 Hard to leave on a fateful day.
Facing his future, forsaking his past,
Lee on Arlington looked his last,
 Met his destiny, went his way.
Back in his place with their ghostly
 tread
Marched the legions of soldier dead.

Open still stands the mansion's door,
Furnished much as it was of yore
 By Lee and Martha Washington's kin.
Sloping gently, the grassy hill
Also offers a welcome still.
 "Halt here, soldier. Rest herein."
Duty done and the last roll read,
Rest the legions of soldier dead.

..... **JUNE**

Molly Pitcher's Pitcher

(Mary Ludwig Hays McCauley, 1754-1832)

By Fairfax Downey

JUNE, 'Seventy-eight. A torrid day, A broiling day that parched.

Up through New Jersey in retreat, Sir Henry Clinton marched.

British and Hessians, grenadier, dragoon, and brazen gun:

Scarlet and gold, the column wound beneath that blazen sun.

Swing clear your drums from dripping sweat. Moisten dry lips for fife.

Now prime your powder pans afresh. Draw sabre, for your life!

For now you're nigh to Monmouth town. Halt, form your battle rank

And stand at bay, for Washington has fallen on your flank.

Cavalry charge and shock of foot and roaring cannonade.

Shattering round-shot, musket clubbed, and flashing, slashing blade.

Anthony Wayne—Mad Anthony—driving the redcoats back.

Till Charles Lee ordered a retreat, and lines of blue went slack.

Still they fought on through all that day, struck back, fell back and cursed,

Reeling beneath that blazing sun, half-dead from torturing thirst.

Filling her pitcher at a spring, back through the bullets' whine,

A gunner's wife brought water to the blue-clad battle line.

A sturdy lass, a buxom lass,

Good Pennsylvania Dutch.

On Molly Pitcher's ruddy face,

No trace of beauty's touch.

Yet none was willing on that day

For Venus fair to switch her,

Nor for rare nectar trade a draft

From Molly Pitcher's pitcher.

Stand! No retreat! George Washington on sullen Lee has frowned.

Halt, you American batteries! Unlimber. Fire a round.

Wounded, down Molly's husband drops. "Withdraw the gun!" they said.

But Molly grasps a rammer staff and serves the piece instead.

Forward, the blue! The scarlet ebbs. The stubborn foemen yield.

And Molly nurses wounded men, strewn upon Monmouth's field.

Attention, Sergeant Molly! Washington's at your side.

The words of praise the General speaks shall be your lifelong pride.

The State of Pennsylvania a yearly pension paid

In tribute to the valor of that field artillerymaid.

In after years when Molly watched parades upon the green.

"That's just a flea-bite," she would say, "to soldiering *I* have seen."

So Molly fought the war again for grandson on her knee,

Or startled friends partaking of a peaceful cup of tea.

"You girls should all have been with me, when Monmouth's fight was won."

They would have learned, she told them, how a woman mans a gun.

Our patron Barbara was a saint,

Our Molly but a lass.

Come, all you field artillerymen,

Lift high a brimming glass.

A toast to one, a toast to both,

Drunk in a beverage richer

And stronger than was poured that day

From Molly Pitcher's pitcher.

An American Attachment: Some Reflections

BY MAJOR A. G. LITTLE, R.A.

Editor's Note. Major Little, like Captain Pike, whose article. "A Short Visit to the American Artillery." appeared in the last number, spent several weeks with the Seventh Field Artillery (Lt. Col. R. W. Barker). Ft. Ethan Allen, last fall.

He saw service on widely separated fronts during the entire World War, and is at present on staff duty in the British War Office.

That Major Little should take time from his duties to prepare for the JOURNAL so thoughtful and informative an article will be appreciated as much by the readers, one is certain, as it is by the JOURNAL.

WHEN your editor paid me the great compliment of asking that I should write an article for THE FIELD ARTILLERY JOURNAL, he suggested that not only my impressions of a short attachment to the United States Army, but also some combat experiences might be of interest.

If the reader manages to get even as far as the middle of this effort, he will notice that neither of these has been attempted.

Personally I started the last war at a every tender age and without any of the background of regular peacetime soldiering behind me to show how extremely odd were some of the proceedings in the Kitchener New Armies, and more particularly so those of some of my senior officers. Even then I realized that elderly gentlemen who were not only ignorant of all methods of indirect fire, but were also extremely suspicious of them, were hardly suitable to command batteries. But it was only at a much later period that realization came of

the extent to which magnificent volunteer material was being spoiled.

Apart from certain moments of intense feeling overseas, there are only two impressions really which I retain of the last war. One has already been mentioned: The chaos which results from trying to form armies before the trained officers and material are ready for the men. In so far as that is concerned, I think that we had much in common in the way in which our respective nations raised our new formations in the last war, and it was of great interest to a British visitor to notice how you have made sure that you will not be caught in the same way again. Your Officers' Reserve is a source of envy to those of us who know of it, and one has only had to read the papers lately to see that you are taking all possible steps to provide the equipment.

The other impression was the futility of much of the work of what we used to call a Forward Observing Officer (but whatever his title he will still go on being required).

There were two main troubles. The first was the hopeless task of trying to keep a telephone line intact, and I am still not entirely convinced that wireless has solved that particular problem. The second was the great difficulty of picking out ones' own shells in the turmoil of a battle. Nobody ever seems to mention that, in these times, and perhaps none but the very inexperienced ever get caught in that way. Yet as only a small proportion of wartime officers in any army will have had much practice in observing fire, is there not perhaps some ground for thinking that the man

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up in front will generally be more of a reporter than an observer?

So much then for combat experiences and some entirely personal opinions arising out of them.

Now instead of setting down a series of impressions of the United States Field Artillery which would be unlikely to succeed in telling your readers anything much which they did not know already, the idea has occurred that it might be of more interest if I could tell them something of my own army, putting the emphasis on those points which an attachment in America made me think were least understood. I may of course be entirely wrong in that respect, because in six weeks it is not possible to gather much more than superficial impressions; and that is one of the reasons why I intend to stick to generalities.

The other reason is not quite so creditable. Having spent far more time in the last eight years in doing anything except soldier with my regiment. I am hardly in a position to express an opinion on any of the more technical aspects of any artillery question.

That can be safely left to Captain Pike who is now. I believe, one of your contributors, and who did a longer attachment, besides being present at firing practice, which was an opportunity I never had.

I think that I was as much struck as was he by the magnificent physique of your enlisted men and their educational standard. But I doubt if some of you appreciate how very fortunate you are in being able to devote all your time and energy to getting on with the job which really matters—the training of soldiers for war.

In England. State education, except for a small minority, ceases at the age of fifteen, and in some cases at fourteen, with the result that our recruits are a very long way from being able to start to master the intricacies of an artilleryman's job. They join at a depot instead of at regiments, and

there, in their three and a half month's elementary training, they nearly all do manage to get a third class certificate of education. But that is little more than a test of literacy, and after joining a unit, several hours have to be spent every week in working to get a second or higher class qualification.

The incentive to work is promotion which cannot be obtained without certificates, and so far as that goes the system is admirable. Yet can you wonder that an Englishman is envious when he finds that none of that is necessary in America? Your standard of feeding too must be the highest of any army in the world. Of that I am quite certain, for the recollection of some of the meals which I had from U. S. Army camp kitchens will remain with me permanently. Never in any British officers mess in the field have I eaten so well.

Perhaps these comments are nothing more than platitudes, but they are made because they illustrate the differences in our respective standards of living as regards the enlisted man. They strike a British officer at once and make him think. With an apparently healthier nation and certainly a more highly educated one, you are very favorably placed when it comes to military expansion, and can expect to achieve it with a rapidity which no other nation could equal.

It would probably be more logical at this point to turn from enlisted men and go on to officers, but I propose to do that towards the end of this article, and when doing so, to deal with the subject from only one particular aspect.

In the meantime I am going to take a chance on exposing my ignorance by making a few remarks on British artillery tactical doctrine, and what are imagined to be some of the points of difference from yours.

As many of your readers probably

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know, we have now adopted a system of artillery regimental organization almost exactly the same as your own. What you call the Battalion, we call the Battery, and what you call the Battery, we call the Troop, but otherwise units are similar. The difference in nomenclature is due to a thoroughly British reason, that of tradition. The word Battalion had never existed in the Royal Artillery, but was an infantry word, which could not therefore be annexed! However, Troops had had a long and illustrious record in the past and were reintroduced. One of the main reasons for the change was to produce a bigger fire unit as a first step in the centralization of artillery control, for the troop of four guns has no separate existence and is not meant to function independently. The theory is that there should be no need for it to do so as the infantry are now sufficiently armed to deal with local opposition by themselves.

The point I wish to make is that although we both have practically the same organization, we are using it in rather different ways. Your battery is capable of some degree of independent action and I think you still consider that the battery and the battalion may in certain circumstances make the essentials of a combat team. You can of course impose centralization by the use of your system of standard concentrations.

We, on the other hand, have abandoned the idea of any combat team of which the artillery element is smaller than one of your battalions and are going all out for centralized control.

It is believed that we shall soon have a mechanical calculator which will correct for displacement of troop positions and enable the twelve-gun battery to be shot by observed fire as one single unit.

Of course if there is time for survey, or large-scale maps are available, there is no need for this procedure, and your system

of standard concentrations is one which we might borrow with advantage. If the writer has your doctrine right, the difference therefore seems to amount to this:

That you decentralize to deal with the impromptu, whereas we are doing all we can to avoid having to do so.

Few of my other tactical impressions are worthy of inclusion in the pages of THE FIELD ARTILLERY JOURNAL.

Do you, I wonder, pay as much attention to antitank defence as we have been doing hitherto. We were always worrying as to whether we were "tank-proof" or had sufficient field of fire at the actual gun position. However, that particular trouble seems to be passing fairly rapidly with the development of special antitank units, and if the flood of literature on the subject is to be believed, the tank is hardly a menace any longer.

Am I correct in thinking that you do not consider that flying time of an observation aeroplane is usefully employed on artillery observation for anything except the heavier natures of gun, and that that is the reason for your having turned down the use of the horizontal clock code?

It is extremely simple and we find that both artillery and observers can learn to use it in a very short time, while it has the very great advantage that by bringing in a North point the observer does not need to know the position of the battery which he is shooting.

If only we could adopt the Mil system of measurement as easily as you could the clock code should you ever want to do so! After years of working in degrees and minutes. I had never before realized what unnecessary complications they introduced and how obsolete they were. But I am afraid that we shall never have Mils in England in my service lifetime.

This is hardly the time to introduce

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a change which would involve the rewriting of every text book and range table as well as altering every single sight and instrument. The only consolation is that most of us over here don't know what we are missing.

It may surprise some of your readers to hear that perhaps the majority of British Artillery officers should be ignorant of a system which is used not only in America, but all over Europe as well. Yet I am certain that such is the case, and although after my attachment it is realised that you know considerably more about us than we do about you, still feel that perhaps I can reciprocate and pay back some small part of the debt of knowledge which I piled up during my visit to America.

The subject which I wish to touch upon is one to which reference was made earlier in this article, and is that of the fundamental divergences in our respective systems of bringing up young officers which are not so widely appreciated as perhaps they should be.

It is thought that they are of some importance since they lead to a different method of approach to military problems which is most noticeable to a foreigner doing an attachment.

Now I know very well of course what the traditional British officer is supposed to be like. There are quite a number of people even in England who still expect him to wear a monocle, to have an elegant waist and to speak in a tone of voice.

One such specimen appeared not so long ago in one of your military journals which I read just before leaving for America. The thought of the impression which I might be expected to make was somewhat perturbing as it was quite obvious that I could not manage to pass myself off as the standard product.

Mine is the wrong sort of eye to hold a monocle in place, and I have had no noticeable waist line for more years than I care to remember. It is not meant to say

that such people don't exist. They do; but in steadily decreasing numbers, for the old days during which the British army officer was a member of a close select club and therefore very much of one particular type, are gone forever. We all have to work pretty hard these days and come from a much wider field.

I have gathered the impression that you deal with the problem of assimilating a large number of young men from all parts of a vast country and with very various home backgrounds behind them by putting them through four years of really severe discipline. I saw some "Plebes" before leaving America and it certainly did seem that the first year's sentence was a tough one. At the same time you do really teach them their profession; that is, as far as it can be done away from actual contact with troops.

We do nothing like that. Sandhurst and Woolwich (or Sandhurst alone as it now is) only provide short courses of eighteen months; they would seem incredibly free and easy to a West Pointer, and the military side of the education given does not aim at teaching anything more than the elements.

The natural deduction would be that such establishments must be quite useless, and perhaps under your conditions they would be. Yet in England they work tolerably well for a variety of reasons. For one thing the country is so small that there is not the variety of climate or economic conditions to produce any great differences of type.

But probably the greatest leveling factor hitherto has been the educational system under which our officers have been brought up. From the age of eight years old onwards, they have been at boarding schools and away from home influences for the greater part of the year. They start at private preparatory schools and go on to what we euphemistically call public schools. Which is just

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exactly what they are not, for they are about as private as they could possibly be. Whatever may be thought of the system, and it comes in for some heavy criticism nowadays, it has the effect of putting boys under a discipline from which there is no escape through their homes, with the inevitable result that they are turned out very much according to one particular pattern, and therefore easily absorbed into the military machine.

Whereas you start by moulding the raw material in the way you want it to go, we are apt to have it so much shaped already that freedom to acquire more individuality is the first essential.

It is thought that one effect of this set of conditions is that we carry encouragement of personality and independent thinking right on into our methods of dealing with tactical and military problems in general.

The more up to date the military center, the more the latitude which is allowed in producing the solution to any military question, and almost any answer will do which is arrived at by a logical chain of reasoning.

The result perhaps is a lack of sufficient respect for the tactical views of those above us, who may sometimes have much better brains as well as a wider experience.

That, however, is the price which has to be paid to correct the effects of early training. Whether this will remain so in the future still remains to be seen, for there can be little doubt that recent changes which have greatly widened the field from which officers will be drawn

must in time have a very great influence upon the methods of thought of the British Army.

I am somewhat nervous of this line of argument lest it should be thought that I am trying to draw comparisons and arrive at some sort of conclusion. That is the very last thing which I would attempt to do and anyway it is quite impossible.

Having enjoyed the very great privilege of being attached to the United States Army for some weeks. I want to try and share with my hosts some of the value which I got for myself. What I have attempted to do is to comment upon some of the most obviously apparent differences which strike the visitor, and to make some sort of effort to explain them from that point of view.

The friendly kindness and hospitality which I received everywhere I went, may be a national characteristic, although even if that is true it is a most delightful one: which can only be appreciated by those who have received it.

Yet I have one memory in my recollection which will outweigh even that. It was to hear an officer of the United States Field Artillery say that they all found it hard to remember that I was really a foreigner.

That remark, than which nothing could have been more gratifying, has made me seriously wonder whether anything which I have said in this article was really worth the saying.

If we seem so little different when we meet, can the points upon which I have commented be anything more than superficialities?

Officer of 16th FA, beginning lecture on artillery in Spanish Civil War at battalion conference: "Although the characters and places discussed in this paper are not fictitious, and do refer to actual persons and place names, the pronunciations thereof are entirely original."

A Method of Inspection of the Training of the Individuals of an Organization

BY COLONEL RICHARD C. BURLESON, FA

TRAINING holds an outstanding position of our attention and thought in the military scheme of our modern Army. The thoughts on training in the modern military planning most frequently are directed to the officer and his development. Beginning with the Military Academy, the ROTC units or CMTC and continuing into the Organized Reserve, the National Guard, and the Regular Army the officer's training is emphasized from extension courses and basic troop schools to the General and Special Service Schools. And quite properly so should this progressive development of our future officers of our armed forces continue against the day when this country must have to defend itself again from an armed aggressor. The well-balanced plan of training, however, does not neglect the training of the individual soldier and it is upon the shoulders of the regimental commander that falls the bulk of this phase of military preparedness.

The regimental commander's responsibility towards training is twofold. Certainly he must be a mold of officers, and using them properly he attains his second mission, which is the training of his enlisted personnel.

"Thorough training of the individual soldier is the basis of efficiency." This quotation is the first sentence of the famous paragraph 12 of the old 1916 Provisional Drill and Service Regulations for Field Artillery which was the field artilleryman's "bible" just prior to the World War and which continued to be the guide for him while training and participating in that war. The senior

officers of the branch are imbued with this training doctrine so briefly and concisely expressed. This valuable sentence from the old regulations is included verbatim in the present Field Artillery Field Manual in paragraph 5 of Volume I. However, old paragraph 12 did not cast aside the thought on the training of the individual in one sentence for further along in its contents on the subject of training is this statement: "... no amount of drill of a battery as a whole is likely to produce an efficient organization if its members are not thoroughly instructed as individuals." So when the regimental commander's plans for the training of his organization are being developed the contents of old paragraph 12 which were then printed in bold type cannot well be overlooked. The training of the individual soldier must be stressed. The field artillery battery is a group of specialists. In the majority of cases each individual of the battery must be trained to be a specialist in his own particular place in the team as a whole. Cannoneer Number Two of the gun crew must be the loading specialist for that crew. A quick perusal of a battery discloses individuals who are specialists in telephone operation, switchboard operation, motor maintenance, in laying a piece for direction and site, and so on. All are specialists who are in need of individual training for their own particular job before they can be formed into the team which constitutes the battery and the battalion and the regiment as a whole.

The regimental commander directs and supervises this training. Training

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Regulations 10-5 on the subject of Military Training cites in paragraph 22 that training supervision is a function of command and that one of the three recommended means of attaining this supervision is that of training inspections. Just what a training inspection should amount to and what it should consist of has been left to the ingenuity of the commander and to his conception of the problem.

A training inspection based upon the desirability of determining the state of training of the individual soldiers of the regiment was conceived by me while in command of the 13th Field Artillery, and the manner by which it was planned and carried out is described herein. It is known as "An Inspection of Individual Training."

An inspection of a regiment which would provide the commander a means of obtaining a real and positive index of the training efficiency of each individual soldier was the objective. Such an inspection should, in this case, be then a phase of "training supervision." It would be a "training inspection" carried into effect so thoroughly that every individual soldier would be tested. Then the efficiency of the command, based upon the individual training of each soldier of the command would be as closely ascertained as possible without an actual battle test. In this inspection recently completed it was gratifying to realize that an inspection so conceived was not only entirely practicable but that all the results which were expected of it were completely fulfilled or more so. Besides providing "training supervision" and giving the regimental commander a means of measuring the efficiency of his unit, other results were definitely apparent. It gave the battalion and battery commanders a tangible standard which the regimental commander had established for the training of the soldiers of his regiment. This tangible standard materialized itself in

a series of actual tests based upon the contents of War Department Training Regulations, War Department Field Manuals, War Department Technical Regulations, Department and Division Training Directives and, of course, the policies and instructions on training as indicated from time to time by the regimental commander to his regiment. The unit commanders actually saw their men tested and were thereby able to perceive by the concrete demonstration where there were weaknesses and where there was effectiveness in their training according to the regimental commander's standards. The results were electrifying. Battery and battalion commanders introduced constructive corrections even before the results of the inspection were published. Another result of the inspection was made manifest due to the completeness of the inspection. By inspecting every soldier in every battery the inspection disclosed whether every man in each battery was being given a definite job in the military organization and whether he was being given efficient military training for that job. Such a check tends to alleviate the inclination to consider the man who is detailed on special duty, on the ice delivery truck for example, as entirely out of the military organization and training, and to be completely satisfied if he fulfills his special duty job efficiently.

This inspection is not an easy one to accomplish. It requires infinitely more preparation and a display of military knowledge on the part of the officers concerned than does the usual Saturday morning inspection or the monthly full field equipment inspection. For this reason, perhaps, the proposed type of inspection will not instantly be popular, but results obtained from this inspection easily reward the time and effort and study that it requires. It is not an inspection that should take place

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more frequently than once a year unless the training accomplishments of the regiment are very low, and therefore need more frequent supervision.

The regimental commander's decision to hold the inspection and his description of what he desired in the inspection set his staff to work developing the idea into a plan of operation for the inspection. A week during which this inspection could be held was selected at about a month or six weeks thence. This interval between the decision to hold it and the inspection itself was necessary in this initial inspection for the purpose of giving careful and comprehensive study to so original a project; however, with the experience of a successful first trial any succeeding inspections of this type could be easily planned and prepared for two weeks in advance. Moreover, hasty preparation, especially upon the part of the officers detailed as assistant inspectors who are to make the individual inspections, should be seriously guarded against.

The plan called for a period of one week in which the mornings were devoted to this inspection. Actually, five days were required—from Monday to Friday inclusive—to accomplish the inspection of a ten-battery regiment of field artillery. Saturday of the week was held available for use of the inspectors in order to provide an extra day in case inclement weather or some other unforeseen condition should interfere with the progress of the inspection through the previously scheduled dates.

A schedule was prepared and published whereby the inspection of the individuals was carried out by daily increments. Each increment was composed of groups of soldiers whose primary military job required the same or similar training. This simplified the conduct of the inspection itself as well as it did the preparation on the part of the inspecting officers for each daily inspection. An example of the composition of these various increments is the one

scheduled for Monday, when all chiefs of gun sections, all gunner corporals, and all of the variously numbered cannoneers of the entire regiment were inspected. Thus, it was possible to give all individuals inspected the same examinations according to their class of training thereby placing the inspection throughout the entire regiment upon a uniform basis. Also, it was possible to test large groups of men all with the same test without the danger of having the nature of the tests become available to those who had yet to undergo it. Uniformity and fairness were made the guiding principles of the tests comprising this inspection. This schedule of daily increments had the additional advantage of providing an arrangement in which no conflict or hindrance occurred to the daily training program of all the other portions of the regiment and neither was the daily administration of the regiment in any way handicapped.

The following is a schedule of the daily increments of individual soldiers inspected. This schedule proved to be entirely satisfactory:

Monday

Chiefs of Section
Gunner Corporals
No. 1 Cannoneers
No. 2 Cannoneers
No. 3 Cannoneers
No. 4 Cannoneers
No. 5 Cannoneers

Tuesday

Operations platoons, communication platoons, and battery headquarters of the regimental and battalion headquarters batteries.

Wednesday

(1) The battery commander's details and the battery headquarters of gun batteries.

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(2) Battery headquarters of Service and all headquarters batteries.

These groups consisted of the following individuals:

- First Sergeants
- Instrument Sergeants
- Linemen
- Signal Sergeants
- Signal Corporals
- Switchboard Operators
- Telephone Operators
- Instrument Corporals
- Instrument Operators
- Battery Clerks
- Buglers

Thursday

(1) Maintenance sections (less motor sergeants and mechanics) of all batteries.

(2) S-1 Section of Regimental Headquarters Battery.

(3) S-4 Section of Service Battery.

These groups consisted of the following individuals.

- Personnel in the S-4 Section.
- Mess Sergeants.
- Cooks.
- Personnel in the S-1 Section.
- Battery Supply Sergeants.
- Battery agents with Service Battery.

Friday

(1) Motor personnel (less chauffeurs) of all batteries.

(2) Mechanics (other than motor) of all batteries.

These groups included the following individuals:

- Motor NCO's of Service Battery
- Battery Motor Sergeants
- Battery general mechanics
- Battery materiel mechanics
- Automobile mechanics

In addition to the individuals scheduled above, the chauffeurs were inspected upon an independent schedule due to the fact that

it was necessary to maintain the usual regimental and post administrative work wherein the regimental chauffeurs participated and also because in certain phases of the inspection of the foregoing individuals, chauffeurs were required to drive vehicles as a part of the inspection and further that it was considered that this inspection was an excellent opportunity for the regimental motor officer and his assistant to obtain a personal check upon the chauffeurs of the regiment. Therefore the inspection of chauffeurs was carried out coincidentally with the inspection of other individuals of the regiment, from Monday to Friday, inclusive, by the motor officer and his assistant.

In order to carry this inspection into execution the regimental commander detailed a number of officers to assist him. Those of the regimental staff, the battalion commanders, and their staff officers were named as assistant inspectors. In certain cases battery officers were also used as inspectors; however, of these latter the ones from gun batteries were used to inspect only the personnel of the headquarters batteries and vice versa. Every effort was made to obtain impartiality. The methods of utilizing the officers who were detailed as assistant inspectors was the means of shaping the character of the inspection. For each day's inspection one officer (and where need be, a group of officers) was delegated to inspect one of each of the increments of enlisted men whose training for their principal military job was the same. Where the increment was a large one, a group of two, three, or four officers was given the duty of inspecting the increment. In these instances each inspecting officer took a portion of the inspection. Uniformity was therefore obtained as a consequence of the arrangement of having all enlisted men subject to one sort of training test appearing before the same inspector for each phase of the test. Fairness was a natural by-product

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of this scheme. Impartiality of the tests was made possible by detailing officers on tests who were disinterested individuals as far as the batteries whose personnel was being tested was concerned. Thus the results of the inspection gave the regimental commander fair and impartial indication of the status of the efficiency of the individual training within his regiment upon a scale that was uniform throughout. It also enabled the battery and battalion commanders to gauge the training of their units with respect to the other units of the regiment by as uniform a comparison as it is humanly possible to provide.

Aside from disclosing that it is practicable to conduct efficiently an inspection of this type and the object for which it was conducted was realized to a high degree, it brought conclusively to the minds of all who were concerned with it that here was an inspection so thorough and so complete that there was not a single phase nor a single individual of the

regimental organization which did not come within its scope. Just as truly as this inspection disclosed many individuals whose training was entirely satisfactory, so did it uncover not a few individuals whose training could be vastly improved. Many of these observations are not easily manifest when inspecting a battery, battalion, or regiment as a team but they are emphatic impressions when individuals of a regiment are scrutinized through a means of such an inspection as this one. Thus a training inspection has been developed that is a means of training supervision which provides double action results. The regimental commander obtains a correct and complete picture of the status of the training of the individuals of his organization. The individuals, both officers and men, perceive actually and concretely the degree of proficiency and the quality of personal efficiency that the regimental commander expects their training to produce.

A RECORD TO SHOOT AT

BATTERY E, 3d Battalion, 123d Field Artillery, commanded by Captain Robert E. Salvage and with station at East St. Louis, Illinois, has had fifty-seven consecutive drills with 100% drill attendance. This drill-attendance record was started thirteen months ago on March 9, 1938, and no member of this unit has missed a drill since that date.

The 3d Battalion Headquarters Battery and Combat Train has had thirty-one consecutive drills with 100% drill attendance. This unit is also located at East St. Louis and is commanded by Captain Harry J. Schiermeyer. The 3d Battalion Headquarters Battery and Combat Train has had every member of the organization present for every drill since September 1, 1938.

Battery F, the other battery in the battalion, located at Alton, Illinois, and commanded by Captain Russell R. Lord, does not have quite such an impressive record of consecutive 100% drills, but does have an average drill attendance of 98.98% since April 1, 1938.

The average drill attendance for the entire 3d Battalion for the period from April 1, 1938, to May 1, 1939, is 99.48%. During the thirteen months' period referred to there have been only forty-six absentees throughout the battalion. The foregoing figures have been verified by Major Oscar N. Schjerven, Regular Army Instructor with the regiment.

The 3d Battalion 123d Field Artillery is commanded by Major George W. McClure, and the regiment is commanded by Colonel Dell B. Hardin.

The Military Organization of Yugoslavia

BY CAPTAIN GORDON GORDON-SMITH, ROYAL YUGOSLAV
ARMY

THE Kingdom of Yugoslavia occupies the leading strategic position in South-Eastern Europe. It is the bridgehead between the Occident and the Orient.

Up to the fourteenth century of the Christian era the Serbian race held the Key to the East, protecting the rest of Europe from invasion by the Turks and, until her defeat, on the battle-field of Kossova on June 28, 1389, by the army of the Sultan Amurath I. Serbia held the proud position of the "Guardian of the Gate."

The victory in the World War restored the Serbian race to its former position. As the result of the victory of the Allies in 1918, the Serbs of Serbia were joined by their brothers-in-race in Croatia, Slovenia, Dalmatia, Bosnia, Herzegovina, Macedonia, the Banat of Temesvar, and the Kingdom of Montenegro, to form, under the scepter of King Peter Karageorgevitch, the Kingdom of Jugoslavia. The little Kingdom of Serbia, with its 19,286 square miles of territory and its population of less than three million souls became the powerful Kingdom of Yugoslav with its 96,136 square miles of territory and its population of nearly fifteen million. The Serbian race was reunited and installed in its ancient historical position as Guardian of the Gate, holding the Key to the East and West.

Since the union of the Serbo-Croat race, it has justified the high hopes placed on it. Economically the country has progressed by leaps and bounds. Hundreds of miles of railways and thousands of miles of roads have been constructed. A merchant marine of over 300,000 tons has been created and ports

constructed and improved all along the Adriatic. The population of Belgrade, the capital, has gone from 80,000 in 1914 to over 300,000 in 1938.

In view of its important strategical position it was only natural that the Army should have kept pace with the other developments of the Kingdom.

There is in Europe no finer soldier than that of Yugoslavia. In the World War the exploits of the army of King Peter excited the admiration of the whole world. Twice in 1914 they hurled the Austrian army of invasion, under Field Marshal Potiorek, back across the Drina in hopeless rout.

It was only when, in 1915, the Austrians were reinforced by a German army, of 300,000 men, under Field Marshal von Mackensen and a Bulgarian army of 450,000 men, that the Serbian Army of less than 250,000 men was forced to retreat to the Albanian frontier.

Even then, when the ring of over half a million men began to form once more around all that was left of the Army of King Peter, at Prisrend, they kept their plighted word and refused to make a separate peace, preferring to retreat through the snow-clad mountains of Albania to the Adriatic to join hands once more with the Allies.

Guns, trucks and carts, everything on wheels, had to be destroyed before the army crossed the Albanian frontier, as there were no roads of any kind, nothing but sheep-tracks from village to village. All that it could transport in the way of provisions and fodder was what the men could carry on their backs and on the pack animals. It had to cross mountains, towering to the clouds, covered with snow and ice, a trackless waste, where food there was none and this in

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the depth of winter, with the thermometer well below zero.

From Albania the Army was transported to the Greek island of Corfu, where after being reequipped and reprovisioned, the reconstituted Serbian Army, 150,000 strong, all that was left of the manhood of the nation, landed at Salonica, with its morale still intact and fought its way back to Belgrade, the victorious army of the "Nation that can never die."

The modern Yugoslav Army is conscious of the great traditions handed down to it by the Army of King Peter and is organized on lines that will enable it to play a role worthy of its great predecessors.

The defensive forces of the country consist of the Army, the Navy, and the Air Force. By the Law of National Defence the King is the Commander-in-Chief of the armed forces of the Kingdom. In view of the youth of King Peter II, if the Army ever took the field he would have to appoint a general to take his place at the head of the Army of Operation.

The supreme organ of command and administration of the Army, Navy, and Air Force is the Ministry of War and Marine which are united in a single organization. Yugoslavia does not possess separate Ministries for the Navy and the Air Force.

The Ministry of War is organized into the following Departments:

- General Staff,
- Personnel,
- Supply,
- Artillery Technical Department.
- Engineer Technical Department.
- Military Justice,
- Medical Department.
- Veterinary Department.
- Control and Budgetary Department.

There are also special organizations subordinated to the Minister of War which

assist him in various ways. These are:

Army Council. This is an advisory organization on all important questions. It functions till the mobilization is ordered and only resumes its duties after the demobilization. The Council consists of three generals of army rank who are appointed by the King. The Minister of War presides over its meetings. With the permission of the Minister the Chief of the General Staff, the General-Inspectors, the Chief of the Corps of Engineers, and the Chief of the Cavalry can take part in these conferences and give their views on important questions.

General Staff. This is the organ of the Minister of War of which the mission is to prepare the armed forces and the country for the defence of the State. The Chief of the General Staff controls the whole work of that organization. He is responsible for the appointment of the officers under his command.

The General Staff consists of three Sections:

- I. Section of Operations and Intelligence.
- II. Section of Organization and Communications.
- III. Section of Training and Army History.

Inspections. All the chief arms have their inspectors. The Law of National Defence permits of the appointment of inspectors for other branches of the service but so far none of these have been created. The army inspectors are under the direct orders of the Minister of War but for the training and education of the troops they are subordinated to the Chief of the General Staff.

For questions of a technical nature there is a Technical Inspector, while the material preparation of the nation for war is under an Inspector of National Defence who cooperates with all the other Ministries of the Government.

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THE ARMY

The military organization of the Kingdom is divided into six Army Areas situated as follows:

- I Army Area..... Novy Sad.
- II Army Area..... Sarajevo.
- III Army Area..... Skoplie (Uskub).
- IV Army Area..... Zagreb.
- V Army Area..... Nish.
- VI Coast Army Area..... Mostar.

Each Area is under the command of an Army General (Général d'armée). The Army Area is the command organization for the troops in it and is a territorial one. The Cavalry, the Air Corps, and the Corps of Engineers are not subordinate to the Army Areas but are directly under their respective commanders.

The Yugoslav Army does not have Army Corps as individual formations. The next ranking formation is the Division Area. In peacetime there is a total of 16 Division Areas and in each of these there is a Division. In addition there are two cavalry divisions which do not have special territories.

A division has 3 to 4 infantry regiments, 2 artillery regiments and the necessary supply, medical and veterinary services and a Provost Marshal Section for dealing with military crimes and offenses.

The cavalry divisions have each two brigades (2 regiments each), one artillery group, one cycle battalion and other necessary sections.

In addition to these troop formations there are two fortresses, one on the Gulf of Cattaro and the other at Shibenik.

In all, there are 58 regiments of infantry (including one regiment of the Royal Guard and two of mountain troops). Each regiment consists of 2 to 4 battalions, of 2 to 5 companies each, with a company of machine guns. In addition every regiment has a company of accompanying light artillery, and mortars.

There are 10 cavalry regiments (including two of the Royal Guard). Every cavalry regiment has three rifle squadrons and one machine-gun squadron.

There are 32 regiments of artillery and independent artillery groups. Five Army Artillery regiments, one regiment of Motorized artillery, one artillery regiment of the Royal Guard, three groups of horse artillery, three groups of heavy artillery (motorized), three regiments of anti-aircraft artillery, two batteries of mountain artillery, two regiments of sappers, two regiments of pontoneers, one liaison regiment, one railway regiment and one battalion with carrier pigeons.

THE AIR FORCE

The command, administration, and technical service of the Air Force is headed by the commanding officer of that Arm. There is also an Inspector of the Force with duties and responsibilities similar to those of the inspectors of the other arms. In time of peace the Air Force is subordinated to the Minister of War, excepting in regard to training which is directly subordinated to the General Staff.

The Air Force has the following sections:

General Staff. Operations, training and personnel.

Technical. Technical material and administration.

Engineering. Buildings and other properties.

Air Raid Precautions.

Section for civil aviation.

The total Air Force consists of:

Six air regiments.

Two groups of special airplanes (6 squadrons).

Two groups of hydro-airplanes, and One balloon battalion (now in course of formation).

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There are four schools for pilots and other special schools. (Observation, aerial photography, meteorology, and so on.)

In all the services there are about 800 airplanes, including training planes.

SYSTEM OF RECRUITING OF THE ACTIVE ARMY

Service in the army is obligatory. Every citizen capable of bearing arms must serve his term in the Active Army. Those who are inapt for active service and those who have, for criminal acts lost their civil rights, are obliged to pay a special tax (*vojnica*). In time of war they are forced to service in the rear of the Army.

The obligatory service begins with the twentieth year of the recruit both for the Army and the Navy and the military obligation is in force till his fiftieth year. From their 20th to their 40th year each citizen is liable to serve in the Army of Operation and from their 40th to their 50th year in the Reserve Army. During mobilization and in war time the Minister of the Army and Marine, on a decision of the Council of Ministers, can call out young men of 18 to 20 years and old men of 50 to 55 years.

The soldiers of the Active Army serve either a full term of 18 months or a shortened term of 9 months. In the Navy and in the Air Force the full term is two years and the shortened term one year.

The recruits who are allowed to serve the shorter period of service are of two categories. The first consists of young men of good education, who have graduated from High School. Their superior education and intelligence naturally makes them learn their military duties more quickly than the recruit belonging to the peasant class. They also, on completing their military service furnish a high proportion of the Officers of Reserve.

The other category of short service recruits consists of young men who are the third of their family to serve in the Army. The two other members may be two older brothers, a brother and their father or, failing brothers, his father and an uncle, provided the latter is associated with the father in the working of the farm.

The military authorities also take steps to see that every soldier can read and write. In every regiment there is a school for the education of every recruit found illiterate. No man is allowed to leave the Army unable to read and write.

After the men of the active army have finished their term of service and have been passed into the reserve of the Army of Operations, they are called out, while they are in this category, for a period of training of four weeks. After they have reached forty years of age and have passed into the second Reserve they are called out for a training period of two weeks. The necessary officers are provided by those who qualify for commissions in the Reserve after they have completed their service in the Active Army.

RANKS IN THE ARMY

The rank of corporal can be obtained by the private soldier after six months of service, when the candidate passes an examination after a special course of instruction in the various regiments.

There are special schools for the other noncommissioned officers. In addition, any corporal who passes the necessary examination can attend the special schools for noncommissioned officers temporarily established for this in the various regiments.

Noncommissioned officers must sign an engagement for a minimum term of three years. This term can be renewed periodically.

There is a military academy for the training of lieutenants and a Superior

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School for the further training of officers. In addition officers who have graduated from foreign military academies, and who are citizens of Yugoslavia, may be appointed to commissions in the army or navy.

Noncommissioned officers, if they pass the necessary examination, may also rise to the rank of officers.

The promotion of officers up to the rank of colonel is by seniority, above that rank it is by selection.

The following terms of service are necessary for promotion in the infantry:

Sub-Lieutenant, four years till his promotion to First Lieutenant.

First Lieutenant, four years till his promotion as Captain of the Second Class.

Captain of the Second Class, three years till his promotion to Captain of the First Class.

Captain of the First Class, three years till his promotion as Major.

Major, four years till his promotion as Lieutenant-Colonel.

Lieutenant-Colonel, four years till his promotion as Colonel.

A colonel must serve four years before he can be promoted a General of Brigade. The latter must serve a similar period before he can be promoted General of Division. A General of Division must serve three years before he can become an Army General. (General d'Armée.)

Generals are only appointed Field Marshals (*Voivode*) in time of war and then only for special service and merit.

MILITARY SCHOOLS

In addition to the Schools for noncommissioned officers there are the following Schools:

For Officers.

The Military Academy.

The Academy for Commissioned Officers.

The Naval Academy.

The Schools for Reserve Officers.

Superior Military Schools.

The Superior Military School.

The Superior School for Commissioned Officers.

The School for Staff Officers.

Training Schools.

Training School for Infantry and Artillery Officers.

School of Equitation.

School for Engineer Officers.

Special School for the Training of Air Force Personnel.

DEFENSE EFFECTIVES FOR THE YEAR 1938-39

Field Marshal.....	1*
Army Generals.....	7
Generals of Division.....	43
Generals of Brigade and Vice Admirals.....	131
Colonels and Captain Commanders.....	364
Lieutenant-Colonels and Captains of Frigate.....	534
Majors and Captains of Corvette.....	479
Captains of the First Class and Lieutenant Commanders ...	1,988
Captains of the Second Class and Second Lieutenant Commanders.....	1,469
Lieutenants and Lieutenants of Frigate.....	2,999
Second Lieutenants and Second Lieutenants of Frigate.....	2,179
Noncommissioned officers	10,500
Corporals and privates.....	117,400

*Boyavitch, last surviving marshal of the World War.

THE MILITARY ORGANIZATION OF YUGOSLAVIA

Budget Expenditure for the year 1938-39, 2,967,325,629 Cinals (\$59,346,512), composed of:

Ordinary Expenditure

<i>Dinars</i>	
Army	1,542,101,000
Air Force	324,136,000
Civil Air Force.....	23,361,000
Navy.....	199,342,000
Frontier Guard.....	109,184,957
	2,198,124,957

Extraordinary Expenditure

Army	524,908,000
Air Force	23,110,000
Navy	26,123,000

OTHER ORGANIZATIONS OF A MILITARY TYPE

Gendarmerie.

It is only as regards discipline and organization that this force is subordinated to the Ministry of War. Otherwise it is subordinated to the Ministry of the Interior. Even though its organization is strictly military it is the executive organ for the enforcement of law and order in the State, and is supplementary to the civil police services. The gendarmes are armed with carbines, automatic pistols, and swords. The effective strength is 19,000 officers and men.

Frontier Guard.

In matters of discipline and organization this force is subordinated to the Ministry of War, but for the carrying out of its functions it is under the orders of the Ministry of the Interior, and to supplement the Service of the Customs, and suppress smuggling it is at the disposition of the Ministry of Finance. It is distributed in small sections along the frontier and, on account of this fact, it is not organized to take part in modern

military operations. It numbers about 5,000 officers and men.

The Yugoslav Army possesses an important arsenal at Kraguevatz, capable of constructing rifles and machine guns on a large scale and provide for the reparation of damage to materiel in time of war. This Arsenal was constructed before the World War by the famous French firm of Schneider-Creusot. During the German invasion of 1915 this was, of course, dismantled, but after the peace it was reconstructed on a much larger scale and is now an important adjunct of the national defence.

The Air Force also possesses manufactories for airplanes and motors and has well-equipped repair shops in the various airdromes.

The fact that Yugoslavia is largely an agricultural country, exporting annually thousands of tons of wheat and corn and vegetables of all kinds, as well as thousands of cattle and horses of excellent breeds, in time of peace assures it ample supplies for the Army in time of war.

The mineral wealth of Yugoslavia, especially in the so-called "strategic" minerals, is very great; in fact it is one of the richest countries in Europe, having coal, iron, copper, chrome, lead, zinc, bauxite, magnesite, and the like in enormous quantities. Formerly there were no smelting facilities, but this has been remedied in recent years and the number of furnaces is increasing month by month. The copper mines at Bor are the richest in Europe and further copper deposits are being developed. An English company is now developing the lead mines at Trepca, which are enormously rich. There is also silver in fairly considerable quantities and a number of gold mines, mostly alluvial, have been found worthy of exploitation. It is notorious that in ancient times the Romans drew large quantities of gold from what is now Yugoslavia.

From a social point of view the Army

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plays a great role in developing the national spirit. For hundreds of years Croatia, Slovenia, Dalmatia and the banat of Temesvar were under the yoke of Austria-Hungary, while Macedonia, Bosnia, and Herzegovina were formerly ruled by the Sultan of Turkey. When the union with the Kingdom of Serbia took place as the result of the victory of the Allies in the World War, it was only natural that the people, so long separated and brought up under three different regimes, should not at first see eye to eye on all questions and that a certain amount of give and take was necessary for the political development of the new State. One of the first errors was the name given to the new State, the "Kingdom of the Serbs, Croats and Slovenes." This suggested, to those unfamiliar with the conditions under which it was founded, that it was composed of three distinct peoples. There could be no greater error. Every subject of King Peter belongs to the same race, and reads, writes, and speaks the same language. The only difference is in the matter of religion, the Serbs belonging to the Greek Orthodox Church and the Croats and Slovenes to the Roman Catholic Church. There are also about a million Serbs of the Mohammedan faith in Bosnia and Herzegovina.

The military service does much to bring all the subjects of King Peter together. Serbian recruits do their service in Croatia and Slovenia and other former Austro-Hungarian provinces, while the young men from these centers do their service in Serbia and other provinces. This is an enormous force for the full development of the national spirit.

In the corps of officers the higher ranks are chiefly Serbian. This, of course, is inevitable as the officers, natives of the former Austrian provinces, entered the Army only after 1920 and have not yet had time to reach the higher ranks. But every officer goes through the same military school and follows the same career, with the same privileges and opportunities, so that the corps of officers is today completely homogeneous and animated by the same national spirit and *esprit de corps*.

The Serbo-Croat race has great military capacities. The commanders in the World War were *soldats d'élite*. Field Marshal Putnik, Chief of the General Staff, was a strategist and tactician of the first order. Field Marshal Stepa Stepanovitch, Field Marshal Misitch, Field Marshal Boyavitch (today the only survivor of the paladins of King Peter I). General Ghivko Pavlevitch, (Assistant Chief of Staff under Field Marshal Putnik), were all sons of peasants, tilling little farms of from 10 to 30 acres. And yet they were soldiers of "light and leading," whose handling of their troops excited the admiration of every foreign officer who came in contact with them.

The campaign of 1912-13 against Turkey first revealed the high qualities of the Serbian Army. The conduct of that war showed the military talents of the leaders and the fighting spirit of the rank and file.

There is little doubt that the Yugoslav Army of today is worthy of the great traditions of the Serbian race and that it can compare for efficiency and knowledge of the art of war with any army in the world today.

Coaching Pistol Teams

BY CAPTAIN IVAN D. YEATON, FA

Having once unexpectedly found myself the coach of a college pistol team, with no more knowledge of pistol shooting than has the average army officer, who shoots his expert score in qualification and lets it go at that, I resolved two things: First, that I would learn every trick in the trade, honest and otherwise; second, that I would at least be original, in that I would pass both kinds on to others, the first to use, the second to guard against.

To Colonel John K. Boles, FA, continued thanks for helpful suggestions that led me back on the right path whenever I strayed. To Colonel William D. Frazer, FA, thanks for a book that all pistol shooters should have in their library, and one which was a constant guide and reference to me: *American Pistol Shooting*.

This is the third and last of a series of articles written on pistol shooting. The first article, called "Pistol Training at the University of Oklahoma," was published in the January-February issue of the 1931 FIELD ARTILLERY JOURNAL. The second was first published in the August, 1933, issue of the University of Oklahoma Bulletin and later republished in the May-June issue of the 1934 FIELD ARTILLERY JOURNAL. I. D. YEATON.

PISTOL shooting may be classed as to Slow-, Time- and Rapid-fire; or as to large and small-bore shooting. The slow-fire, or deliberate shooters, using a small-caliber, long-barreled, single-shot pistol, form an exclusive clique in the pistol family. This hobby or sport closely resembles and is patterned after the free pistol shooting of Europe. It is to this type that I would direct all who hope to perfect themselves in this or the rifle shooting game.

EDITOR'S NOTE.—Captain Yeaton coached the University of Oklahoma Pistol Team during the five years they were the National ROTC champions.

Any person starting out in this most exacting sport or who has already started and gone wrong would be wise to attempt to perfect himself first in the slow-fire, small-caliber field, after which he can branch out into the faster types of fire, large calibers or trick shooting without retarding his progress. It is my contention that the slow-fire expert is the most dangerous of all competitors, and for years, working on that theory. I have trained my teams to the point where I believed them incorruptibly confirmed in the ancient art of *holding* and *squeezing* before allowing them either to decrease the time of squeeze or shoot a larger caliber.

In order to determine whether a candidate should be a right- or left-handed shot, the fact that he is naturally right- or left-handed is disregarded. In examining a man for a pistol team. I first determine by optical test which eye is the stronger. The man is then trained to fire with the hand on the same side of the body as the stronger, or Master Eye. Some resistance to this is met with at first, because the individual concerned feels that the stronger arm can shoot the best. This, however, soon disappears, when by a little experimenting, the man finds out that he can not shoot properly with either hand and that neither arm is trained for the use to which he is about to put it. He is then easily convinced that it is just as easy to train one arm as it is the other.

On the other hand, which eye is used to aline the sights is most important. In shooting any hand gun, BOTH eyes must be kept open at all times. Vision will be better, the target clearer, and eyestrain reduced to a minimum. In order to shoot with both eyes open, it is necessary to learn to let the master eye aline the sights and disregard the objects seen by the other eye. For example, a man

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with a stronger right eye, if he focuses his eyes on the target and then raises a gun or his finger into the line of sighting, will see two guns or fingers. The gun on the left of the two will be the one to aim at the target and the one on the right disregarded. If the shooter is stronger in the left eye, of course the opposite is true. Make the above test and then close the eye that is thought to be the weaker. If the gun is still pointed at the target, the guess was right. In case the shooter sees only one gun, his eyes must be focused on or near the gun, and he therefore should see two targets. This is wrong and should be corrected at once. The use of both eyes is a trick easily learned and all shooting should be held up until such time as it is mastered. Care must be taken not to practice on some object too close to the eyes, certainly no closer than the target range.

On the subject of position, the Regulations are still tops. Face the target, turn away 45 degrees, feet parallel and about 15 inches apart, knees straight without stiffness, hips level, back straight without stiffness, shoulders *level* and relaxed. Turn the head and look squarely at the target without stiffening the neck muscles. Raise the shooting arm without raising the shoulder, and let the free arm hang relaxed at the side. This position must be straight (Fig. 1), in perfect balance, free from strain, relaxed, free from all pull of clothing and above all, *not one unnecessary muscle brought into play*. At the very first feeling of tenseness, strain, discomfort or distraction of attention, the gun should be put on *safe* and the arm lowered to the side or returned to *Raise Pistol*. Under no circumstances should a shot ever be fired in desperation, just to get rid of it.

Breathing during the time of aiming should be normal and regular up to that moment when the squeeze is started. At this point a normal breath is taken in and

held. To take in more air than usual is bad, to take in less than usual is worse. The stopping of the breath must be done with the throat and not the diaphragm. Simply take in a normal breath, close the throat and hold the breath without strain.

The stocks of a pistol or revolver are another thing to which the uncoached amateur pays little or no attention. Experts, on the other hand, have been experimenting with them for years. The perfect stocks, in my opinion are those which will allow the following: The thumb to be placed on the gun at least as high as the trigger finger and preferably higher, and to provide some support for the thumb in this position; the trigger



FIGURE 1
The author

COACHING PISTOL TEAMS



FIGURE 2

finger to rest comfortably on the trigger, with the trigger touching the finger halfway between the tip of the finger and the first joint, that is, just opposite the base of the nail; the weight of the gun to balance and rest on the middle finger, halfway between the first and second joint, and this same middle finger to be below the trigger finger in a normal, comfortable position; the ring and little fingers to be in the same relative position as the middle finger and directly below it (Fig. 2), and to be used only to steady the gun in the hand when necessary.

Each part of the hand has its own individual task to perform, and like people, if each performs its own task well, it will not have time to help the other parts of the hand and thereby get them all into trouble. Any tendency to squeeze the stocks with all fingers while the trigger is being squeezed must be overcome at once by making the shooter fire without the use of those fingers (Fig. 3). Most people would improve their 45 cal. slow-fire scores if they would use only the thumb and trigger finger and let the pistol rest on the almost straight middle, ring, and little fingers (Fig. 3). The thumb and trigger fingers are concerned primarily with counteracting each other's side pressure and with developing a perfect squeeze, straight to the rear, the middle finger with the support of the gun only and the ring and little fingers with keeping the gun straight in the hand, and this principally during rapid-fire. The more open the hand and the more relaxed the muscles of the hand and forearm, the more nearly perfect the squeeze.

Most guns are issued or sold with good all-around, serviceable stocks, but no stocks in the world could fit all sizes and shapes of hands or would be right for all types of shooting. The advice of a coach or stock expert will usually help the score. The 45 cal. automatic stocks are, in my opinion, the best general-purpose stocks issued or sold. Of course, following this line of thought, I believe that all automatic stocks are better than revolver stocks, as issued.

On all automatics, the thumb should be placed as high on the wooden stock as the safety will allow, taking care not to place the thumb against the slide. On the revolver, the thumb may be placed on the frame, as close as possible to the hammer without interfering with its downward motion. On the revolver, the stocks can be greatly improved by enlarging the butt and filling in the space in rear of the trigger guard (Fig. 2).

The most important consideration for any ambitious coach or shooter is what goes on in the mind of the shooter while he is squeezing the trigger. Failure to safeguard this one little detail has lost more matches than any other single item. As in all things, practice the thing expected in a match. I have seen many a coach protect his shooters all year and then put them on the spot the day they shoot their biggest match. The result is obvious and the coach can blame no one but himself.

There are, of course, so many bad



FIGURE 3

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things that a shooter could think of that I will attempt only to name a few here, and to assure myself that he does not think of these bad things, I give him something to think about that will increase the score and not decrease it. Note the bad things in order of their importance: *Scores*, past scores, present scores, future scores, friendly scores or enemy scores; prizes, past, present and future; the value of any shot fired or to be fired; clothes or equipment; noises or conversations within hearing; moving things within vision. To insure against the above, the following should be memorized and repeated over and over while squeezing the trigger: "I am going to keep both eyes wide open until the noise of the shot causes them to blink involuntarily, I am going to align my sights on the target and slowly squeeze the trigger as long as they are on the target. In case of doubt or distraction I will stop and start all over again and, above all things, *I must not know when the gun goes off.*" Some time during this mental recitation the gun will go off and if he has been doing what he says he has, the shot will be good.

The one danger of this type of schooling is the development of what is known as "freezing." where the individual, through caution, becomes unable to exert enough pressure on the trigger to fire the shot. This can be overcome by locking the piece and exerting all possible pressure on the trigger; then release the safety and the shot can be fired.

Now to take up a few generalities that may help increase team or individual scores. Spotting scopes should never be permitted on a pistol team. Every shot should be fired with all possible care and, having been fired, forgotten. Spotting scopes produce only eye-strain, nervous strain, and lower scores.

Sights should be changed only after 50 or more carefully fired rounds, on at least

5 different targets. If these shot groups show definitely that the center of impact is not in the center of the target, and that in each case it is in the same direction from the center of the target, then and only then should they be moved. It is well to keep in mind that even the slightest change of grip or the position of the hand on the stock will change the position of the shot group. Therefore, during any experimental or training stage it is best to let the sights alone, provided of course that they are not too far off, and shoot for a group and not for a score. As a coach, I never allow a member of the team to touch his own sights; the team is taught to shoot and take pride in the smallest possible group and it is my responsibility that the group is centered when the time comes.

The effect of wind and light is not so important to the pistol shooter as it is to the rifle shooter, but does play some small part. A little experimenting during the practice season will result in enough experience safely to handle the matches. Shading the sights will often handle most light conditions. I use an open-front sight guard. The position of the body, given above, is the best general position to meet all possible wind directions, not forgetting that, in pistol shooting, it is the shooter that is affected more than the bullet.

Stage one, or the slow-fire stage, consists for the most part in dry shooting and holding the arm out. Two weeks of this is not too long before the first shot is fired. It also discourages some of the boys who are only mildly interested, and the sooner that happens, the better for all concerned. When firing is started, one or a very few shots per day are sufficient. Let the results of those few shots determine the number to be fired the next day. Every round fired at this stage of the game should be made a *big event*; turn the heat on now, keep it on, and the day of the Big Match will be

COACHING PISTOL TEAMS

just another day. All matches accepted during this stage must conform to *your* method of training. A match calling for rapid-fire now may do irreparable damage.

On holding the arm out, not much can be said, but much had better be done. This, I consider the second most important item, but of course either, without the other, would result in no team. Three minutes per day, in perfect shooting position, with a gun in the hand, is as good a place to start as any. If you desire this work done at home where no pistols are available, a book of the same weight, held like a pistol, will do the trick. The time must be taken with a watch and it will go easier on the individual if he does it seven days a week. Every week the time must be increased thirty seconds; when the team gets up to twenty minutes per day you can expect some real slow-fire scores. Publish the daily standing of the team but *not the scores*. If a man shoots a score that would break the world's record, tear it up, throw it away, do not tell a soul, and as for the man that shot it, tell him to be a little more careful next time.

When the team has perfected the meticulous, slow-fire type of shooting then and only then are they ready to pass to the second or rapid-fire stage. It is my very carefully studied opinion that, either to shoot time-fire, or to train for it, is worse than a waste of time. Teach a man to shoot slow- and then rapid-fire properly, let him shoot his time-fire scores in rapid-fire timing and his total score will be higher. Again and again let me repeat: **TO PASS TO RAPID-FIRE TOO SOON IS TO LOSE ALL THAT YOU HAVE WORKED FOR.**

The severity of training in the second stage, will be, of course, in direct proportion to the desire of the team to win. To the really serious team that is 100% behind its coach, the following is

recommended: Rigid training diet, abstinence from smoking or drinking; and a daily course of exercises designed to do the following four things: Perfect the balance; increase the lung capacity and prolong the time an individual may hold his breath; increase the mobility of the spine and joints; and last, to strengthen the muscles used in shooting.

The principle of training, that is, the principle involved in actual firing, must also now change. In slow-fire it was: **NEVER SQUEEZE THE TRIGGER UNLESS THE SIGHTS ARE ALINED ON THE TARGET AND NEVER KNOW WHEN THE GUN IS GOING OFF.** In this, the second or rapid-fire stage, it changes to: **PERFECT A CAREFULLY TIMED RHYTHM OF SQUEEZE AND ATTEMPT TO KEEP THE SIGHTS ALINED WHILE DOING SO.**

The real danger now is that the shooter will stop squeezing and start jerking the trigger. At the first sign of this he should be sent back to slow-fire until the fault is corrected. To pass directly from slow-fire to one shot every 2½ seconds is extremely dangerous, so the transition should be made gradually and systematically. Start with one shot every 10 seconds. The coach or some person must beat out a smooth rhythm, one tap every 10 seconds, and **ALL HAMMERS MUST FALL ON THE BEAT**, regardless of where the sights are. Revolver shooters must, of course, learn to cock the hammer by a smooth circular motion of the thumb, while the pistol shooter may tie a string to the hammer or slide of his pistol, and by an upthrust of the shooting hand, not only cock the piece but imitate the motion of recoil. All movements except the actual squeeze must be practiced until they are the perfection of economy of movement and speed. This allows the maximum time for the squeeze. During the early part of this stage all actual firing should

continue to be *slow-fire*, in order to offset the tendency to jerk.

When the rhythm has reached the stage of one shot every 4 seconds (time-fire), firing may be started. When the "possibles" begin to show up, then slowly and systematically cut the rhythm to one shot every 2½ seconds and again when the "possibles" begin to show up the team or individual is ready for the third stage of his training.

The third stage should start about 30 days before the big match. This stage consists of the same rigid training plus the shooting of the entire course through at least once daily. Every little detail of the daily shooting must now resemble the conditions of the meet. Every day is Big Match day, from now on. The more nearly perfect those conditions are simulated, the less chance there is for the score to drop off in the match. The coach who shoots, or whose team shoots, championship scores one day and drops 20 points the next day, because it's a match, can look to himself for the answer. A well-coached team will hold its average or even shoot a little better in a match.

The time spent on each stage or in training can not be laid down here, as it depends upon too many things. The amount of ammunition available, the seriousness of intent and the rigidity of training are all things that may influence the time it takes to turn out a team. With my college teams, the first stage lasted the whole first semester, the second stage about 30 days and the third stage about 30 days. A yearly break in training is, of course, advisable and a fresh start each year, following the exact same course as prescribed above, is recommended, no matter how old in experience the team or individual in it. The long period between the Big Match and the start of training for the following year can be very profitably spent in shooting slow-fire matches for marbles, chalk, or pleasure. In



THUMBS DOWN ON THE THUMB-DOWN GRIP

case of clubs that shoot the year round for pleasure. I recommend that only slow-fire matches be accepted during the off season.

On the subject of triggers I have little to say, except that I never cut a trigger below the legal limit, and if my opponents have it is all right with me. The legal limit is the safe limit and it is also as low as one can go and still be sure that the piece will not go off when you take hold of the trigger. Many good scores have been fired by "hair-triggers," but I have also seen many matches lost by the one that slipped.

Lately the pistol world has been engaged in a friendly dispute over the use of the double action in rapid-fire revolver shooting. After investigating this new activity, I am forced to join the old-fashioned boys for the following reasons: I find it impossible to fire a good score without doing two things — make certain changes on the revolver and taking a new grip that is in direct violation of all my principles of grip and squeeze (Fig. 1). In view of this, I refuse to commit a fault in holding, to counteract a fault in manufacture. If enough people want to use the double-action feature of the revolver to shoot rapid-fire, the manufacturers will issue a revolver *designed* for rapid fire. If I desired more speed, I would use a pistol—that is what it was designed for. To me, the pleasure in revolver shooting lies in its perfection of trigger release for slow-fire, single-action work. I find more pleasure in hitting a beer can once at 100 yards than hitting it 5 times in 5 seconds at 15 yards.

COACHING PISTOL TEAMS

In coaching on any range, indoor or out, I find the following set-up very helpful: First, a special shooting table is constructed, containing a rack for pistols and revolvers plus ammunition blocks. About 3 yards behind this table another is placed, at which I sit. During the months of practice I sit at this table observing and talking to the shooters, until I know all their tricks and habits, until I can call their scores almost before they fire the first shot and until they become used to me sitting there and helping them. Slow-fire is fired without the use of a clip, so the usual procedure is for the shooter to come out of the practice, or dry-shooting pit, when called, walk up to the shooting table, count out 10 rounds and either put them in the block or load a clip. During a match, it is this operation that tells me whether to let the man shoot then or later. The slightest tremor in the hands will show up. In shoulder-to-shoulder matches this has to be handled in a different way but it's just as easy.

Now, you ask, how can you make a man relax at a given time. That is also easy. If you desire to do it mechanically, an osteopath will either show you how or come and do it for you. If you belong to the other school, your medico will prescribe something between aspirin and sodium amatol. But this, you say, is like doping a horse, and not fair. Maybe so—pistol rules don't say anything about it, and it is possible that you have already been beaten by a team that did. Last, but not least, while we are on the subject of dope, don't forget to give every man on the team a laxative before any important match; to be taken at bed time and followed the next two or three days by mineral oil. If the matches are outdoors and last for several days, keep the oil up until the matches are over. Never shoot on a full stomach.

A coach has many problems and to do the job right, he must give up the idea of

being a shooting member of the team and he should be present at all practices. That, of course, takes a lot of time and is not always possible. Carelessness is apt to develop in unsupervised practice and should be penalized at once and severely. I use the method of cutting the ammunition down and have reduced men to one round per day for a week. The hardest difficulty to correct is of course jerking or flinching. If all else fails, change the grip and the stocks so completely that the position of every finger, muscle, and tendon in the hand is changed. In other words, break up the old combination that may have started on a cap pistol and fool the nerves that have been doing the dirt. On the other hand, the trouble may be in the mind. Some shooters get scorecrazy and the only cure for that is not to let the man see his scores from one month's end to the next. In fact, I am not quite sure but that it's not a good policy to keep all practice scores from the team all the time. I have given away many a match to keep my team from finding out how good they really were. To be a good coach, it is not necessary to be able to hit the ground with your hat. Tell your team how to shoot; don't try to show them.

For the service and for peace officers I also recommend this type of training. One well-placed shot will always beat 10 jerked, and saves wear and tear on the innocent bystander. The good old days, when gunmen took pride in keeping their guns in the holster as long as possible, made a different type of game than the one played today. Nowadays a peace officer has to deal with rats and to walk into a situation today without your gun in your hand is just poor judgment. The slow-fire expert will squeeze fast enough when the time comes and will be a much safer bet not to jerk in a crisis.

The present system of pistol firing in

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the service, I still believe to be out of date and badly in need of revision. To me it is the one field in the shooting game where we have let our civilian brothers get way ahead of us. It has been argued that the pistol is not of sufficient importance to put any more time or money on it. My contention is that the game does not need any more time or money spent on it, just a little more understanding and official cognizance from above.

Why not two pistol courses:—A. and B? Course A to be a little harder than the present one, such as the Standard American, or the present one with a longer slow-fire range, such as 35 or 50 yards. Course B to be 15, 25 and 35 yards and all slow-fire. This course "B" to be the required course for recruits, and no man allowed to shoot the "A" course until he

had fired several high scores on the "B" course.

I further recommend the encouragement of indoor ranges by allowing officers and men to qualify officially on the indoor Standard American 50 foot target using any .22 cal. This qualification, I believe, should be held under strict supervision, but in case a man fails to qualify, he should be allowed to try it again the next month and not have to wait another year. Many men would gladly buy their own 22's and their own ammunition under such circumstances and I am sure the "Bolo" group in every battery, company and troop could be washed out by the commander concerned. Teach a man to fire a pistol slow-fire and watch his rifle scores jump up, also his self-confidence when he gets in a tight place and is armed.



THE GRIP FOR DIFFERING TYPES OF STOCKS

SOLDIER'S MEDAL TO ARTILLERYMAN

"WAYNE S. SLADE, private. Headquarters and Headquarters Battery, 15th Field Artillery, United States Army. For heroism displayed in rescuing an enlisted man from drowning at Fort Sam Houston, Texas, on September 13, 1938. When an enlisted man, with whom he was swimming under water along the bottom of a swimming pool at a depth of about 8 feet, was suddenly caught and held at the bottom of the pool by suction from a drainage pipe. Private Slade immediately went to his assistance. Although having been under water for a considerable time and despite the danger of being caught in the suction. Private Slade, with great difficulty, by pulling and rolling the almost unconscious soldier, finally released him from the drainage pipe and assisted him to the surface, thereby saving his life. The heroism and presence of mind displayed by Private Slade on this occasion reflect great credit upon himself and the military service. Residence at enlistment: Sumrall, Miss."

Aiming Point to the Rear

BY FELIX SEMPER

WHEN, in 1938, the FIELD ARTILLERY JOURNAL appeared in red covers, the editor called attention to what he had decided was a new dress. The statement sounded peculiar, but I was not able to decide until long after just what was the matter with it. I have finally come to the conclusion that the red covers are just another one of the JOURNAL'S many necessary repetitions.

They do not represent any innovation; the original FIELD ARTILLERY JOURNAL had red covers (or at least red margins).* The JOURNAL is a history of the field artillery, and like all history, it must repeat itself, and it does so with unflinching regularity. These repetitions, as well as other features, deserve recognition.

Maybe this is itself a reminiscence, like "Twenty Years With THE JOURNAL" and "Them Were The Days" (I believe that Them *Was* the Days would have been more correct), both in November-December, 1937.

I have often wondered how many present readers of the JOURNAL enjoy reading its back numbers, and spurred on by a recent remark by the Forward Observer, January-February, 1937, and presuming that there are some who would appreciate a backward glance, I will point out the way for what I think will be a pleasant and profitable journey.

Regularly there has appeared one who by now should be known officially as the "Poet Artillaureate," none other than Fairfax Downey. His late version of the Field Artillery Song (September-October, 1936) set forth his spiritual age, not

increased by even a year since he wrote "A Battery Seen is a Battery Lost" way back there sometime and reprinted in March-April, 1923.

He seems to have opened the way for a lot of discussion, for in the same issue. Lieutenant Colonel Aymer Embury II presents "Concealment of Artillery Positions" in which he admits that he does not believe a great deal of camouflage material is needed except bare chicken wire as a frame for branches and straw (sounds familiar). Then too he stresses the importance of concealment of means of access to the position. Quoting for Colonel Embury "I remember asking a French officer how he kept down signs of circulation "By posting a sentry?" and he said "Well, some people like sentry, me, I put up a little barb wire." Full of gaul those Frenchmen are, don't you think? Lieutenant Colonel Embury continues his discussion in July-August, 1923. I almost forgot "Burlap and Fishnet," July-August, 1936.

Then very carefully proceed backward to January-March, 1916 (taking full advantage of all natural cover), and you will find that Major McNair has some very pertinent remarks on the subject, particularly about straight lines attracting attention, and gives as an example four gun sections exactly aligned, marking on the ground a straight line from sixty to one hundred feet long, which attracts attention on ordinary terrain, where natural straight lines are wanting.

The illustrations in Colonel Lanza's article on "Counterbattery in the AEF," September-October, 1936, should be studied in connection with the subject, and compared with the photographs

*The parenthetical qualification is a compromise resulting from a bitter engagement, at extreme range, with the editor.

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given in the May-June, 1923, article "Firing From Photographs" (Lieutenant Colonel D. F. Craig).

Reading Captain Nicholas on "The Circular Shift," September - October, 1936, arouses my suspicions that he is in league with Major Clark, who proposed in September-October, 1921, "A Solution to the Three Point Problem." At least the diagrams are very similar and the text possibly in the same language (Greek). However, when the former was written, little was known of *phi* and *omega*; in the time of the latter they had already been discarded. But Captain Nicholas descended pleasantly to the vernacular in his "An Adventure in Gunnery" (March-April, 1937), an inoculation with Probabilities so painless it is a pleasure to forgive him.

Motors have always been of vital interest to the JOURNAL, reflecting that of the field artillery itself. The JOURNAL devotes a lot of space to motors; they appeared early, and they have remained. I notice that in the January-March, 1916, issue, Major Moody makes a report on "Motor Transport for the Field Artillery." Here will be found a description and some photographs of a combined Battery and Store Wagon (motor-driven), model of 1903, the Granddaddy of them all, six tons, and capable of a speed of ten miles per hour—probably. The design as seen from the photo indicates that the title is exactly correct, a motorized wagon. Included in the report are some very interesting descriptions of tests, with photographic records, all showing failures. Little success is indicated but that was due to the fact that all of the tests were pushed to the point of failure to obtain the ultimate useful limit of the machine under test. There is an eye-arresting portrait of a gun being carried on a light truck, the first picturization I know of Portee Artillery. The photograph is captioned "Antiaircraft

gun on field carriage being transported by truck." As the gun is quite obviously not an antiaircraft gun, it is possible that this is the initial use of camouflage. Some of the recommendations made as a result of the tests on both motors and tractors are interesting; kerosene for lighting as storage batteries may fail, tubular radiators instead of the cellular type, chamois-lined funnels for straining gasoline, and a speedometer is suggested for working map. All sounds both familiar and queer.

Also in January-March, 1916, there is a report on a tractor test at Fort Sill, the tractor being a 45-horsepower caterpillar, and it was very successful, failing only under the most trying conditions. Nothing seems to have been done about it at the time, and we have since gone through tractors, to trucks, and are again nibbling at tractors in a half-track sort of way, viz. March-April, 1938, "Mechanized Field Artillery," and at the bottom of page 108, there is a halftone illustration of a half-track truck, being towed half-heartedly half-way across a creek, and which illustration is very similar to Fig. 4, in the 1916 article, but in the earlier photograph the tractor and its tow is emerging triumphantly from Cache Creek. No additional tow rope is visible, not even a prolonge.

Lieutenant Greco's prize essay on "Maps and Map Makers," March-April, 1938, demonstrates the advances made in that field, when compared to a map of Fort Sill made by Sergeant L. U. Kass in 1890, which map is given in May-June, 1923. I notice with some misgivings that two recent successive prizes were given for essays on maps, and if this trend continues, I may be tempted to win one myself with an essay entitled, "The Field Artilleryman's Map and Who Wiped the Smile Offen It?" Particular attention should be paid to the illustrations accompanying Lieutenant Greco's

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article, and for sheer force of character, his strong-arm squad dragging out the orienting line is unsurpassable. It is probable that Sergeant Kass was forced to do his mapping without such modern impedimenta (the Greeks* have a word for everything), so do the French (Captain Vanture, July-August, 1938).

While Colonel Lanza's article in July-August, 1937. "Bridgeheads of the Marne," treats of the engagement with an army as a whole, "The Drama of the Marne." March-April, 1921, is the individual experience of a member of the XXIII German Corps. The moral of his story seems to be that although training in his Corps must have been of the highest type, and although they had plenty of experience, the AEF accomplished more by main force and awkwardness. This account shows what meager knowledge an individual may be able to obtain of a general engagement. The German officer knows little more of his battle than the narrator of the "Battle of Dittinger" in July-August, 1924.

But more of Colonel Lanza: Some Forward Observations in November-December, 1938, gave the opportunity for expression of preferences in articles in the JOURNAL. Out of 350 there were 181 who declared for Colonel Lanza. While recently Colonel Lanza has had much to do with the success of the JOURNAL. I wonder how many have read his letter to the Editor in March-April, 1921? In this early contribution his subject was transportation and is in the usual smooth, unhurried, positive style that has since become so much a part of the JOURNAL itself.

There is no dearth of personal experiences. For instance, Lieutenant Colonel Seeger (translated by Colonel Oliver L. Spaulding), "Operations of the Horse Battalion 15 (German) Field Artillery," an account of the unpleasanties

between October 2 and 20th, 1914, during the race to the sea in the March-April, 1921, and January-February, 1922, issues. Then there is "On the Polish-Bolshevik Front in 1919 and 1920," by Major Michael J. Fibich, July-August and September-October, 1923, also "With the Tenth Field Artillery at the Second Battle of the Marne," Major J. W. Anderson, and "Battery B of the Twelfth Field Artillery. During the Late War," by Captain George D. Wahl, FA, in January-February, 1924, and probably "The Scapegoat of the Battle of the Marne, 1914" (Brigadier General J. E. Edmunds) may be included in that category.

Going back to motors and their progeny, the self-propelled mount makes its bow in July-August, 1921, and strenuous tests are scheduled to prove that its weight of 13,000 pounds is excessive, but the so-called self-propelled mount seems to have been unable to propel itself to the proving ground, although further tests are promised. In November-December, 1923, "Horses, Tractors and Self-propelled Mounts" puts forth some very forceful statements, and the self-propelled mount, or unarmoured immobile tank is put away very carefully in lavender and old lace, from which I sincerely hope it will not be withdrawn.

In January-February, 1922, there is presented to an expectant world of artillerymen. "New Four Point Seven Guns," a reprint from *Army Ordnance*, January-February, 1922, and they are something or other indeed, probably the other. March-April of the same year contains further information about it, and a new 155-mm. howitzer, both using the same mount. The 4.7 gun, model of 1920, needs an extra wagon, while the model of 1921 E is self-contained, but, unfortunately, weighs 10,600 pounds. The mount designed to be suitable for both 4.7 gun and 155-mm. howitzer leaves the impression that, while it is expected

*EDITOR'S NOTE.—We have you there. Mr. Semper—*Latin*.

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to function fairly well for either, it will be satisfactory for neither. The 4.7 gun has the marvelously mystifying extreme range of 20,500 yards, and the 155-mm. howitzer looks like an elongated GPF. The extreme-range bogey has always been a nightmare to some gun designers. The Germans recently unveiled a 25-mile cannon capable of very high mobility. Just what the cannon can be doing 25 miles from the battlefield is not stated, and the inbred mobility seems to be a good idea, as the amount of close support it may be expected to provide the infantry can be so little that high mobility will be needed to keep it from falling into the impious hands of the enemy. I distinctly remember a long-range experience a young officer had with his father, an old black-powder artilleryman, on his return from the war. On being shown a map, on which were marked the enemy front line, and the gun positions of the youngster's battalion, he very deliberately measured the distance and found it to be some 7000 yards. After some minutes of silent consideration he said with gentle grimness. "Well, at least you did get into the same county as the War."

Those interested in the design of cannon will find more than passing interest in articles like "The Evolution of Field Artillery Construction." Joseph Mills Hanson, September-October, 1923. He goes back to the earliest mention of artillery and traces its development from that time to the end of the World War. He presents in bold detail the influence that tactical employment has had on the natural structural changes in material; recent developments (like the 75-mm. howitzer) provide the hope that the period of oppression is closed, when only extreme range was considered at the expense of mobility, concealment and simplicity (and appropriations) like the aforementioned 4.7 and 155-mm. models. However, in March-April, 1922, there is

described and illustrated "The 155-mm. gun, 8-inch Howitzer, Motor Carriage, Model 1921." This is a caterpillar mount, not self-propelled, and seems a move in the right direction.

And finally in March-April, 1923. "Thoughts on Artillery Tactics of Future Wars." Colonel Baron Von Weisershausen (translated by Colonel Oliver L. Spaulding), casually propounded a mighty doctrine when he boldly stated "I can well imagine that in future the artillery will be armed with small and medium calibers only, and will be concerned solely with the infantry combat"—"two new weapons . . . will influence the artillery tactics of the future; those are bombardment squadrons (planes) and the tanks. The bombing squadrons may very well take the place of heavy artillery, etc." Just what you were thinking of saying. Also refer to the other articles mentioned previously about artillery with extremely extreme ranges. The author evidently intends to convey the impression that he believes that the sole mission of the artillery is support of infantry, which doctrine is found in TEFA, Chapter I, Paragraph I, page I.

But in connection with guns of great destructive force, and not merely extremely great range, there is the discussion of "The 42CM Mortar. Fact and Fancy." May-June, 1922. That this cannon was actually "Big Bertha." there is no doubt, in spite of legend which has grown up afterward in favor of the cannon which bombarded Paris. I think that the Germans should be given credit for knowing which one they wanted to call by that name and this article seems to favor the mortar discussed in it. This was indeed a cannon of great caliber—17 inches. There were two models, one capable of rail transport only, the other moderately mobile, split up into separate leads for transportation by motor, the heaviest load 18 tons, capable of 7 kilometers

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per hour. The ranges were certainly modest, 14 and 9 kilometers respectively, but their accuracy and destructive power were certainly respectable.

Pack artillery comes into position often, but outstanding is March-April, 1921, with Major G. R. Allin. Then for diversity there are "From the Atlantic to the Pacific with a Battery of Pack Artillery," Lieutenant Colonel Clarence Deems, Jr., November-December, 1923, and a little more of the same for a change in "From Sea to Mountain." Lieutenant Colonel G. H. Franke, May-June, 1938. Scene and dramatis personae are the same. Problems and illustration of either may cover the other.

Accompanying Guns and Batteries come in for their share of criticism. In July-August, 1921, Colonel Deems made a few remarks. And in November-December, 1921, Major Richard C. Burleson fires a volley and concludes that, to be successful, they must be mobile, "and the officer responsible for their control must have knowledge of Field Artillery Firing, Liaison and above all must possess Initiative." Just an allaround field artillery officer. "Artillery Operations. First Army. AEF." Part VI. page 205, May-June, 1922, concludes that it is almost impossible to expect anything from an accompanying gun.

Love interest? Well, I leave it to you. but romance is there in plenty. In fact, the artillerist is an incurable romanticist. Look at Frontispieces. November-December, 1921 (O.P.). May-June, 1922 (Soixantequinze). March-April, 1922 (G.P.F.), and March-April, 1923 (Mud, Rain and 75), May-June and July-August, 1923 (First Shot), and (Standards), January-February and March-April, 1924 (Escutcheon and Horses). Then January-February, September-October and November-December, 1938 (Symphony, Point to Point, and The Caissons).

Do you like poetry and song? I repeat, try Fairfax Downey. "A Battery Seen is a Battery Lost." March-April, 1923. "The Birth of The Cigarette." January-February, 1924, and his "Field Artillery Song. 1936 Revision." September-October, 1936. "The Sixth Field Artillery Song." Major McMahon, May-June, 1923. "The Red Guidon," Colonel Gerald E. Griffin. July-August, 1923, and again Colonel Griffin. "The Mountain Battery Song." November-December, 1923, and in the same issue. "One Round Hogan." J. E. Brownlow; "Symphony." Captain C. R. Gildart. Januarv-February, 1938, and "Ballade" (J.N.G.), January-February, 1939. This latter will tug at the heartstrings of every true artilleryman.

"Cushing's Command." and the accompanying picture are not to be denied, and still further there have been "Pack Saddle Weddings" and "Lines of Communications."

Santa Barbara was presented in the frontispiece in November-December, 1920, and again on page 176. May-June, 1937. Accounts accompany both illustrations, and Colonel Lanza (again) in the same number as the latter, has effectively used some of the very stirring verses of the "Ballad of St. Barbara" as chapter heads in his "Bridgeheads of the Marne."

Then in November-December, 1923. Lieutenant Colonel Jennings C. Wise offers an essay on "The Artillery Mechanics at Gettysburg," which is a masterly discussion of the importance of artillery tactics. In May-June and July-August, 1923, in his "Boy Gunners of Lee," in heroic prose, he lays before us the panorama of the Battles of the Civil War. We are drawn across the wheat field with Pickett's charging line and feel ourselves with Alexander's batteries galloping into the Peach Orchard; without conscious effort the scene changes to the crater at Petersburg. Marys Hill, the

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Bloody Lane — we hear the cannon's roar, see the billowing clouds and smell the pungent black-powder smoke, and as suddenly bring ourselves back to consciousness of the present—and J. E. K. and lateral conduct.

Although there seems no reason to let's get on to shrapnel and have it over with. Major Yeager reported on experimental fire of shrapnel at Fort Benning, by photograph, in July-August, 1922, and the illustrations are perfect, as are the bursts. However, Lieutenant General Rohne (again Colonel Spaulding is the translator) allows the "Shrapnel Question" to rear its ugly head again in the same issue, and in making a case for shrapnel, quotes a detractor—"shrapnel may be effective against thick skirmish lines in the open, if the battery commander is skillful, observation good, the fuzes burning well, and the guns new." He does not name this keen observer, but goes on to establish the merits of shrapnel, which of course it undoubtedly has, and concludes that the discussion need not degenerate into a quarrel. Then Colonel Baron Von Weitershausen (previously mentioned) in May-June, 1923, under "Artillery Fire With and Without Observation" (Colonel Spaulding again translates), admits, "even in peace, it has been my observation that many battery commanders cannot handle this adjustment." But then this is nothing new to you and me: we both have known for a long time that only we two were able to handle shrapnel properly. And sometimes I wonder about you.

Of course in line with conclusion of the Colonel Baron and General Rohne's anonymous heckler I believe that there is no more perfect artillery projectile than shrapnel, provided that it can be fired during daylight hours, under ideal weather conditions, by a well-trained battery using calibrated guns, controlled by a skillful artillerist having axial observation, against

untrained enemy troops in close order in the open, at ranges not to exceed 4000 yards. Well, perhaps not. but still, there is a doubt and "When in Doubt. Say Doubtful" (January-February, 1924).

Major Edmund L. Gruber (July-August, 1921), gives "The Principles of Bilateral Observation." with formulae and figures. Although this is a splendid treatise on the subject. I still like his lyric handling of the Rolling Caisson ever so much better.

Did you read "Trucking and How." and "Mountain to Mahomet" (and you had better) in September-October, 1936? You may have suspected that the ground work for the march of 709 miles in three days was laid many years before. That was a fine march, but what of Captain Rav L. Burnell, January-February, 1924, "Marches of Battery C. 76th F.A.," 500 miles, horse-drawn? If you liked "Mountain to Mahomet," then you should read "Over Signal Mountain with a Motor Battery of Field Artillery." May-June, 1922, and if you are still skeptical about the march of 709 miles in three days, you will be surprised to find many things of interest in "A Tractor March of the 1st Battalion, 83 F.A.," (623 miles in 25 days), different from "Trucking and How" and *how!* But Major Rumbough reports, academically, during his 25 days—broken bridges, twenty-five percent grades, treacherous sand, and roads — imaginary lines — a foot deep in mud; Corbin to Jellico (Scylla to Charybdis). He makes little mention of drivers asphyxiated, and no mention at all of blistered hands, bruised shins, smarting eyes, backaches, and heartaches; misfortune dogged them at every turn, but they made it. 45,000 gallons of gasoline, 2,700 gallons of engine oil. 1300 (1364¼ to be exact) gallons of transmission oil. 4,200 pounds of cup grease. The amount of intestinal fortitude necessary was not reported. The supply no doubt was ample. Not

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giants, just plain, ordinary, everyday wagon-soldiers, 1920 model.

I have never been much interested in the war issues, never having had them, nor do I recall seeing any of them. At the peril of dating myself. I have to admit that it was a case of shadow and substance. Many will remember Alphonse—"When you go to ze wah, you scrow away see bouk"—I just did not get the book at all. Of course you remember Alphonse de Valdahon? An entire number of the JOURNAL should be dedicated to him.

What about the red covers? I have a copy of a red-covered JOURNAL, and it seems to be an outstanding issue. January-March, 1914. It features "The Superiority of the French Field Gun (Model 1898, 75-mm.) over that of the United States." Lieutenant Robert M. Danford, 5th Field Artillery, offers "The Psychology of the Battlefield," and then he reappears in March-April, 1938, as the Chief of Field Artillery. A long stride, but not unexpected.

There was war in the Balkans, as usual,

some Tactical Studies, and some notes on training at Tobyhanna, Pa., by Major Charles P. Summerall, 3d Field Artillery. Pictures of high-explosive shrapnel and observation ladders are present, and Major Allison Owen gives the "Record of an Old Artillery Organization" (The Washington Artillery of New Orleans) and has some very forceful paragraphs on Marys Hill and other incidents of the Civil War, already referred to.

The present JOURNAL is just as instructive and interesting as any back number, and just because I have spent some time with back numbers I do not bemoan the loss of the "Good Old Days"; in fact, I doubt if there were any good old days. Today is my day. It may not be a long one, but it's mine. However, backward through each issue of the JOURNAL can be traced the history of the field artillery; the story of its problems and victories; the report of its improvements and replacements, both material and personal; a brilliant record of its development.



—Inter Continent Press Photo

FRENCH MANHANDLING A 75-MM. GUN WITH SPECIAL LIMBER

Adventures in Subcaliber

PART 1—THE DESIGN OF THE GUN

BY MAJOR EDWARD P. HAMILTON, FA-RES.

IN 1926 the late Colonel "Dan" Craig encouraged the author to build a smoke-puff terrain board, which was taken to Ft. Devens that summer and found to be of great help in the initial training of post-war artillery reserve officers. This board was used by the 389th Field Artillery for several years and was then discarded, but it served as an introduction that led to these subcaliber adventures.

During a visit to England in 1927 the author served a very pleasant if short tour of duty with the 2d Field Brigade, Royal Artillery, and had an opportunity to examine their large permanent terrain board and discuss its use. At that time the smoke-puff terrain board seemed the best solution. Cotton-batting puff boards, while interesting, are not really much different from blackboard firing. Smoke-bomb, limited to comparatively few special ranges, is always sure to put the great majority of the class to sleep, at least mentally. These methods and various others all have one basic fault. They attempt to simulate curved fire, not to create it. True dispersion cannot be had. It must be introduced arbitrarily or by some mechanical means. In the days shortly after the war a device which would train in simple axial fire was all that was really necessary, but as the quality of the reserve improved through the addition of trained ROTC graduates more refined methods became necessary.

At Ethan Allen in 1932 Francis T. Colby, late Major, Field Artillery, now Colonel, Field Artillery Reserve, turned the author's thoughts in the direction of

true subcaliber with a miniature gun. Townsend Heard, Lt. Colonel, Field Artillery, was most enthusiastic over the idea, and was of great assistance throughout the entire development period through his constructive criticism and suggestions. Colonel Colby had used the old Winchester "Spot Light" cartridges against a painted steel target, as well as caliber .30 guard cartridges in 155 howitzer subcaliber tubes against a terrain target. Neither of these, however, gave the essential of field artillery, curved fire. Without this, which for short-range work meant very low velocity, no miniature gun could have the characteristics and performance of real artillery.

What was wanted seemed to be a gun and a small explosive projectile which would give, over a range of not more than some 200 yards, a curved trajectory with an initial elevation of at least 60-70 mils and a corresponding angle of fall. The burst should be visible at 200 yards. Both gun and shell should be safe, and the ammunition should be cheap. A bore of over half an inch seemed undesirable, and the automatic pistol cartridge offered interesting possibilities.

The first model was made of an auto pistol slide and barrel on an elevating mount which in turn traversed on a sub-base. A special hammer and sear was arranged to fire the cartridge, and the gun was controlled by a panoramic sight and gunner's quadrant. Standard 200 grain all-lead bullets were drilled from the front end, and a caliber .22 long-rifle case blank, with the rim still unformed,

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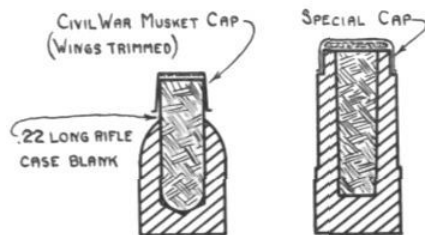


FIGURE 1

was forced base down into this hole. This bullet was seated in a .45 pistol case loaded with a light charge of powder. Just prior to firing, the inserted tube was filled with black powder and covered with a Civil War musket-cap, such as was used on the smoke-bomb range. The cap fitted partly on and so snugly that the impact of discharge did not set it off. Impact with any reasonably firm terrain caused a burst. The author prepared and fired a great many of these shells (Fig. 1A), and every time he put on a cap he had expectation of trouble. Fortunately it never occurred. Many kinds of powder were tried in various quantities. It is very difficult to burn a light load of powder cleanly at low pressures in a short barrel. A light charge of "Bullseye" was found to be the best, but it was not too satisfactory and the velocity was too high, giving a flatter trajectory than was desired.

The next best line of approach was along the line of the present Bishop gun. A $\frac{5}{8}$ " bore brass tube some 10 inches long was fitted immediately in front of the chamber of a .22 rifle action. A mold was made which cast a cylindrical slug with a vaned tail, much like a miniature airplane bomb. This had a recess on the head to which a paper explosive component much like a Fourth of July torpedo was clipped. When propelled by .22 blank cartridges this projectile gave a low velocity and curved fire but it was erratic and fouled badly from the black powder. Theoretically black powder should give

the most uniform results at low pressures but it did not work at all satisfactorily in any of the models.

The next step was back to the first gun which was tried with a longer barrel, hoping to get better combustion, but without results. The only other remaining variable was the projectile. A heavier bullet would give higher pressures and cleaner burning, and still allow the velocity to be low. It was feared that a larger caliber would be necessary on account of the probable tumbling of a longer bullet. The .45 caliber seemed worth trying, however, and a three-piece mold was made, casting a long hollow-point bullet of materially greater weight. It was recessed at the front to take a special copper cap of almost bore diameter (Fig. 1B). A pleasant surprise was had when no tendency to tumbling developed, the powder burned cleanly, giving a velocity of around 400 feet a second, and the bullet burst on almost any terrain even at very flat angles of fall. Some trouble was had from muzzle bursts, due probably to the caps being of too light gage material, but otherwise all the essentials of subcaliber explosive shell were realized. One bit of spice was introduced at this stage. The home-made breech mechanism to which the caliber .45 pistol barrel was attached in the third gun (Fig. 2), a more finished modification of the first, was entirely satisfactory for the original lighter-weight bullets. When the heavy bullet was introduced the pressure was built up enough to open the breech and eject the case automatically in quite a delightful if slightly risky manner. These last tests were made in the spring of 1937, and it was felt that the device had progressed as far as was possible with one-man development. By this time the Bishop gun was in general use and the final solution seemed to be a barrel and breech

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mechanism for this shell which could be clamped to the Bishop mount. At the conclusion of five years of intermittent experiment with these little cannon the author was pleasantly surprised to find that he still had ten fingers and two eyes.

The 389th Field Artillery went to camp at Fort Ethan Allen early in the summer of 1937 so that the Fourth of July came in the tour of duty. Whatever may have been the post rules regarding pyrotechnics, there was quite a bit of celebration, particularly in the National Guard regiment adjoining. The author was not entirely guiltless, and suddenly a new idea popped up, that of a small spring catapult flipping toy torpedoes at a range of 10 to 20 yards. The regular army instructors had this latest brainstorm and its variations unburdened on them to such an extent that the author became a good deal of a pariah. In fact, his own regiment's jovial instructor refused to sit next to him at the regimental dinner unless he promised to say nothing whatsoever about subcaliber.

The idea of a spring-operated gun had been in abeyance because all thought had been in the direction of an outdoor gun which could be used on any reasonable rifle range. Yet the major opportunity for

the use of any such device occurs among the civilian components indoors during the winter season. The outdoor gun seemed developed to a practical form and thought was now directed to an indoor device of more general application than the Bishop gun. What about a gun that could be taken into any classroom and fired safely and quietly at ranges of 30-50 feet? The only disadvantage of such short range was the lateral displacement of some of the observers, and the other advantages seemed great.

Experiment showed that any pellet of reasonable weight would give a visible impact on any dry and dusty surface, so the torpedo idea was dropped. What was needed for this classroom device seemed to be a spring gun of small size and light weight discharging a projectile sufficiently large and heavy to give an observable impact and yet light enough that it would not be dangerous. A lead bullet was desirable because it was of greater density, cheaper, and dark enough in color so as not to be visible either in flight or after. The first projector was made of heavy wall 5/16 inch bore brass tubing and used a commercial buckshot which fitted quite

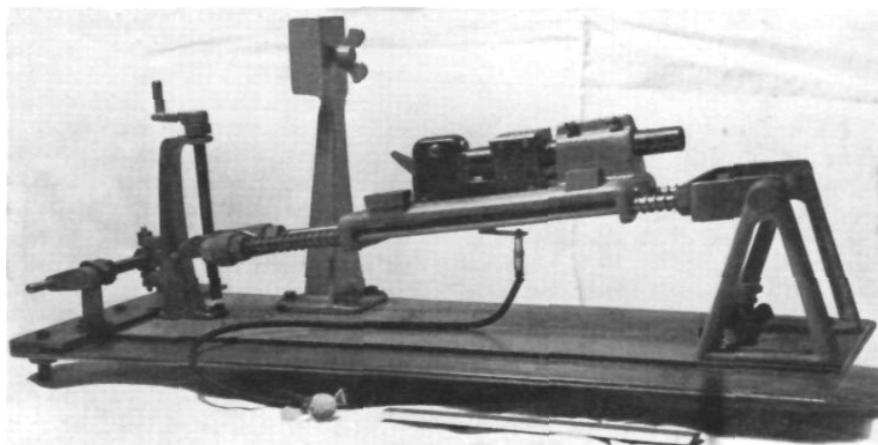


FIGURE 2

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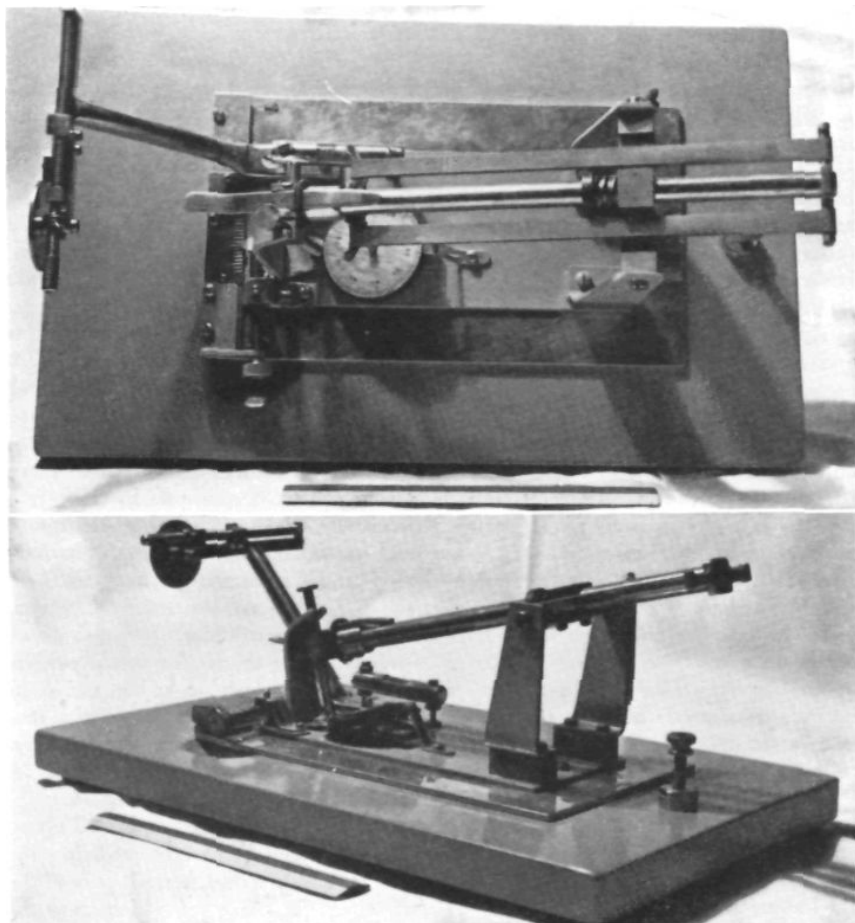


FIGURE 3
Two views of the present Hamilton gun

loosely in the tube. A spiral spring drove a plunger up the barrel. This device did not give sufficient velocity, and stiffening the spring sufficiently would have materially increased the weight and strength of the projector. The next attempt used rubber bands, which due to their high ratio of elasticity to weight gave very satisfactory results. The velocity could be controlled by the strength of the bands and ran between 40 to 60 feet a second. At this velocity the

pellets are entirely safe (unless one should happen to strike an eyeball) for use anywhere and the lightest form of backstop is sufficient.

While the lead buckshot seemed most desirable in every way, it was felt that steel ball-bearing balls should nevertheless be tried. They were found to be materially less accurate than the commercial buckshot, although the latter varied somewhat in weight and were not uniformly round. As a final experiment

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a compressed-air gun projector was built, but it was found to give worse results than the rubber type.

The final model (Fig. 3) consists of a 5/16 inch bore brass tube some 10 inches long, the rear portion slit on two opposite sides. A light steel rod sliding inside the tube has a cross bar at the rear, the two wings of which extend through the slits in the tube wall. At its front end a steel cup with a conical cavity fits snugly in the bore of the tube.

The buckshot, smaller than the bore and slightly irregular, are centered in the cup by inertia at discharge and are shot along the tube in a straight line, rather than rolled and rattled along by an ordinary plunger. Two stout rubber bands extend from the plunger wings to a crossbar at the muzzle, and a sear at the rear end controls the plunger. The complete tube is mounted on trunnions and elevated by a screw moving a mil scale. The upper portion of the mount moves on a sub-base for deflection. In the first model a wind-gage sight marked in mils was used, but a very simple panoramic sight based on the old French collimator was later substituted.

Considerable difficulty was at first found from the plunger rod breaking under impact at its forward limit of motion. After experimenting with an air buffer, which incidentally made as much noise as a .22 rifle, a spiral spring buffer was developed. This completed the mechanical development of the projector.

During the very hot August of 1937 the author's cellar was turned into a combination proving ground and Turkish bath, and many rounds were fired and dispersion groups obtained at ranges from 20 to 50 feet. The results of these tests were incorporated into a tentative range table, which with the gun and ammunition was turned over early in September, 1937, to Dominic Sabini, Major, Field Artillery, the senior artillery officer at 94th

Division, with the request that he put it to work and find all the flaws in it he could. Subsequently a heavier model was made fitted with a bracket for the standard panoramic sight. Before closing and letting Major Sabini give his experiences with the gun in actual training, the following notes as to its use originally made by the author might be of interest.

"This device is primarily intended for indoor use in the class room at ranges from 30 to 50 feet. A horizontal target terrain of sand, sawdust, or some such material is used, the impact of the bullet throwing up a puff of the material and showing the location of the hit.

"This device does not simulate curved artillery fire; it produces it. The projectiles behave exactly as they do in normal guns, the same laws of probability hold, and the resulting dispersion is exactly like that of full-sized guns, but greatly reduced in size.

"The device is safe for use anywhere, makes no appreciable noise, and costs nothing to operate except occasional new rubber bands and replacement of a certain amount of buckshot which may not be recovered and used over again.

"I have designed a simple and cheap form of panoramic sight, utilizing the old collimator sight tube unit only of the wartime 75, many of which must be available. This allows the gun itself to be used as an aiming circle.

"As I visualize it, this device is not only for the basic training in axial and lateral adjustments, but it opens tremendous possibilities of training in all phases of gunnery. Construct a large semipermanent sand table terrain, say ten by twenty feet, make a map of it, and the whole field of rapid and deliberate preparation of fire is opened up, as well as transfers of fire, concentrations and other prepared fires. One gun may be used as an aiming circle, and reciprocal laying carried out. A compass

ADVENTURES IN SUBCALIBER

could be attached to the panoramic sight for laying by Y-North, but in many cases local magnetic fields would probably make this impractical, and orienting lines would be established by other means. Such a set-up, at almost no cost, would allow gunnery in all its phases to be utilized throughout the year. It also opens up a possibility available in no other way. A prepared or adjusted fire for interdiction or destruction may be carried out and then the actual results examined on the terrain, and the center of impact's relation to the target observed. A simple clockwork windlass would pull a model tank across the terrain at a correct relative speed, giving practice on moving targets. Stand on a chair near the target and adjust airplane fires.

"These possibilities are fascinating to the artilleryman in the opportunities they give for varied training. The basic value, of course, is the opportunity of limitless volume of fire resulting from the almost negligible cost of operation, and the availability of a range anywhere. We all

know that few, if any, artillery officers get sufficient volume of fire so that rules of fire are applied instinctively. A device such as this makes this volume available. Divide up a class into groups of three, one firing, one operating the gun, and a third conducting. Give each group a gun and let them rotate, the instructor moving around and keeping a check on all groups. In this way, the adverse psychology of the firing point is done away with, mistakes are learned by firing the problem out, and confidence and instinct are developed."

Note—Since writing the above the author has learned of and examined an elastic band projecting device used by the Chemical Warfare group at Massachusetts Institute of Technology. This also consists of a tube and elastic-band gun which is clamped to the bore of a 4" mortar for high angle fire on a sand table at ranges of 15 to 30 feet. While excellent for CWS training, it appears to lack the accuracy necessary for field artillery work. The author feels it only fair to acknowledge that this device anticipated some parts of his own.

PART 2—THE TEST AND USE OF THE GUN

BY MAJOR DOMINIC SABINI, FA

REGULAR Army officers detailed to duty with civilian components are confronted with the problem of teaching gunnery in all its phases. Hardly any unit or group of artillerymen I have come in contact with during nine years of association has not some sort of contrivance which attempts to simulate cannon fire. Some of these devices indicate time, study, and expense have been devoted to the subject and point to the need of something practical for the instruction in the conduct of fire of a battery and the operation of a battalion firing center. It is true that much can be accomplished with simple blackboard firing up to a certain point but what is

desirable is a device which requires computation of all elements of firing data and correct observation of results produced by such data to bring fire on a target. Again, the blackboard requires the instructor's imagination as to dispersion in the final bracket. In the case of lateral problems this dispersion is important. Facilities for the use of the Field Artillery Trainer exist in very few localities, especially where indoor instruction must be provided.

Major E. P. Hamilton, FA-Res., had devoted much time over a period of years developing several types of miniature guns. We had discussed the subject many times and finally he produced

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the device which is described in the foregoing article. He turned the gun over to me for constructive criticism and for practical test of its instructional value. Several refinements were suggested and applied. Firing tests produced surprising results as to accuracy, the probable error in dispersion being practically that of the 155-mm. howitzer. A sand table with about four inches of ordinary flour for covering was used for the test. Every conceivable type of fire, except time fire, was experimented with and results were most satisfactory. The gun has been used by National Guard Reserve, and ROTC units and so much enthusiasm was aroused that several

models along the same lines have been developed and are being used. Some have been adapted to the Field Artillery Trainer. Several groups have borrowed the gun for use in private homes where a sheet with flour sprinkled over it was used for the target area. Missings, or false brackets, especially in lateral firing, are immediately detected by an examination of the area around the target.

The gun was not developed with any view of financial gain, hence the description is fully given to the Field Artillery as a contribution, hoping that the problems of gunnery instructors might be simplified.



—Inter-Continent Press Photo

BRITISH STAFF COLLEGE STUDENTS EXAMINE NEW 3.7 HOWITZER

INDOOR ADAPTER FOR FA TRAINER, M-2

BY LIEUTENANT COLONEL JOHN A. HOAG, FA

THE following is a description of an adaptation of the F. A. M-2 Trainer for indoor instruction as a variation from terrain board firing.

During the summer of 1938 the writer used a battery of FA M-2 trainers at Fort Ethan Allen, Vt., in connection with active duty training of the ORC. Looking forward to a winter of indoor training, with a terrain board that was unsatisfactory, the thought occurred that the FA M-2 trainer with its solid base and all the motions of a field piece might be used or adapted for use as a means of indoor instruction.

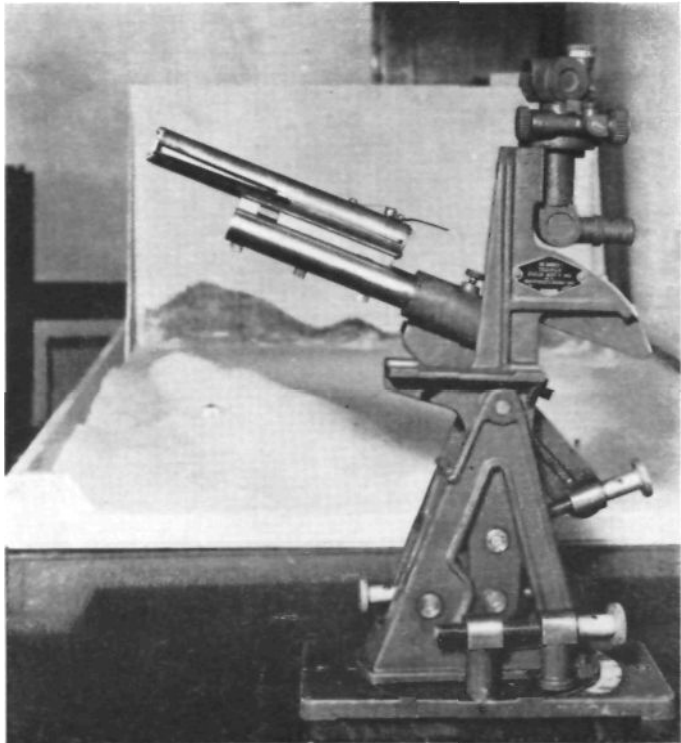
With this in view a trainer was brought to Pittsfield. Ranges of 8-12 yards were obtained by increasing the length of the powder expansion

chamber but the large ball, noise and large range dispersion did not lend itself to work with a sand table. It was thought that better results might be obtained by using cal. 22 short cartridges in which a light wad would replace the bullet but the difficulty of preparing such ammunition caused its abandonment.

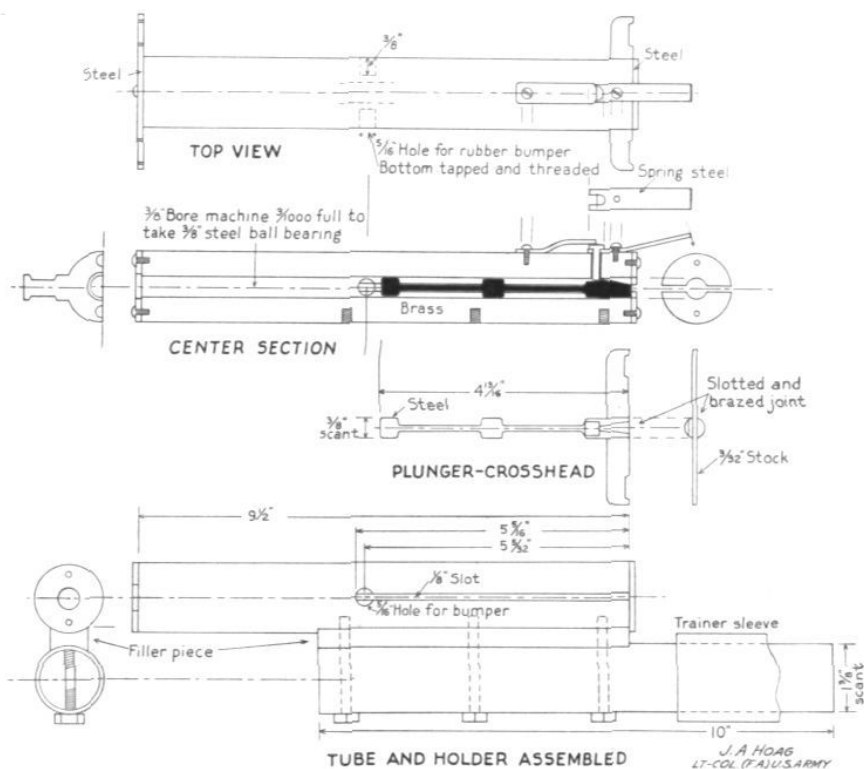
About a year ago Maj. D. J. Sabini, F.A., in collaboration with Maj. E. P. Hamilton, FA-

Res., developed an elastic-actuated gun or trainer. It fired a lead buckshot with considerable accuracy and was equipped with horizontal and vertical motion, as well as with standard for the gun sight. This trainer was used on a rainy afternoon with one of the reserve groups, firing onto a table covered with a thin coating of flour. The results were surprisingly good.

The thought then occurred that the principle of the elastic-actuated gun could be applied to the solid base of the FA M-2 Trainer for indoor use. Without the knowledge of the small dispersion developed by the Hamilton-Sabini gun it is doubted if consideration would have been given to any form of elastic



INDOOR ADAPTER FOR TRAINER F.A.M 2



as a propellant. Before starting the pilot model the collaborators of the weapon were contacted, and very kindly stated that they were only too glad to have the idea of the elastic gun carried to the FA M-2 Trainer.

The gun as developed (shown in photograph and diagram) consists of $1 3/8"$ brass bar $9 1/2"$ long bored throughout its length to take a $3/8"$ steel ball bearing with a tolerance of not more than $3/1000"$. The bore is polished to reduce friction. The bored bar is slotted $1/8"$ wide to within $4 1/4"$ of the muzzle. The cross-head brazed at right angles to the plunger and carrying the rear end of the elastic bands travels in this

slot. The forward motion of the cross-head is arrested by $5/16"$ round by $3/8"$ long plugs of live rubber set into $5/16"$ threaded holes drilled into the tube at the forward end of the slot. It will be noticed that the plug holes are drilled only $3/8"$ deep, leaving a shoulder as a stop for the rubber plug. A firing mechanism engages in a notch on the top of the plunger just in front of the cross-head to hold the retracted bands until the firing lever is depressed. A plate with horizontal arms holding forward ends of elastics and with a $1/2"$ hole in the center is fastened on the muzzle by two screws. A plate is also fastened on the rear of the bar to prevent drawing plunger out of

INDOOR ADAPTER FOR FA TRAINER, M-2

the bore. The bar or gun tube is mounted on a $1\frac{3}{8}$ " steel tube with spacer between and held in place by three bolts. The steel tube fits snugly in the Trainer sleeve and is held in place by the tightening screw. It will be noted that the length of the plunger is such that there is no unaccelerated travel in the bore by the steel ball bearing. Sketches show the details of the above description. It is not considered necessary that all dimensions be adhered to. Only those considered essential are shown on working drawing. In the design of this adapter or gun, low construction cost and simplicity have been kept constantly in mind. While the outside may be crude in construction it must be borne in mind that all moving contact surfaces must be polished and made as frictionless as possible.

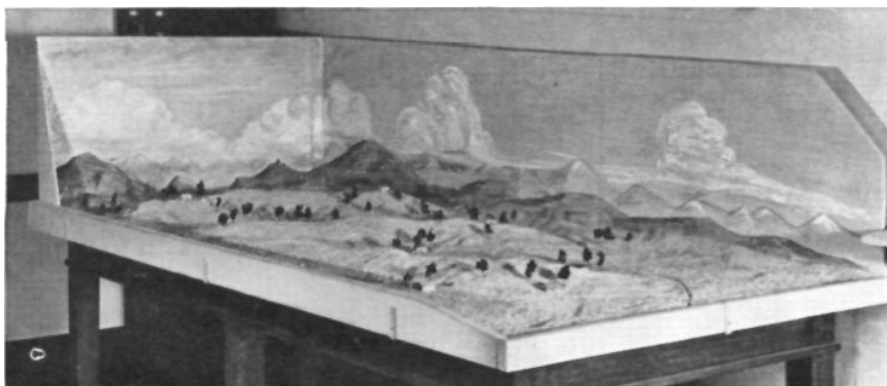
With the gun as shown standard grey rubber bands $2\frac{1}{4}$ " by $\frac{3}{4}$ " have been found to be most satisfactory, and can be obtained at any stationers. To secure uniformity of operation, the gun should be fired immediately after the bands have been retracted to firing position, as elastic fatigue sets in quickly. There will be small daily variations in functioning of the elastic due to room temperature which can either be taken up as an arbitrary site adjustment

or considered as variations of the day and corrected by registration fire. The rubber plugs cushioning the forward motion of the plunger are cut from live rubber with a standard No. 10 ($\frac{5}{16}$ ") belt punch tapered and sharpened to reduce distortion of the rubber. These plugs of course require periodic replacement.

Dispersion groups (average group of 20 shown) have been made at a range of 35 feet by means of carbon paper and a board. An average of 200 rounds fired in groups of 20 gave a maximum $5\frac{1}{2}$ " and a minimum 4" range group with a lateral width of $\frac{1}{3}$ those figures. The average P.E. from 200 rounds is .07 ft. at a range of 35 ft. This compares favorably with the dispersion of a 75-mm. field piece at the adopted scale and gives sufficient accuracy for all purposes. Firing at 35 ft. the maximum ordinate is 4.3' with an approximate angle of fall of 500 mils.

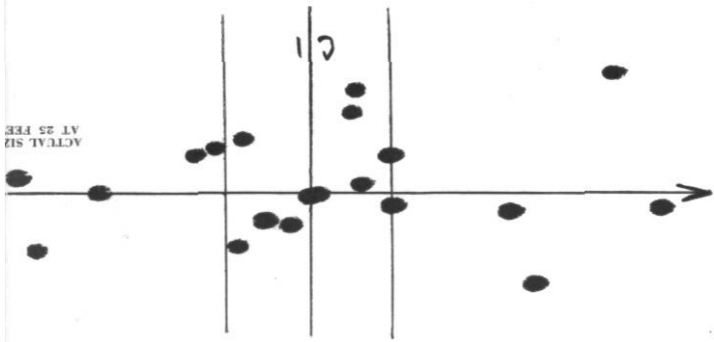
The gun can be fired with the gunner's quadrant from a computed range table or using a yardage range scale. For speed in firing it has been found more convenient to replace the scale now on the trainer with a paper range scale developed from firings from 200 to 4500 yds. (20' to 45').

The scale used is one foot to one hundred yards and the terrain features on

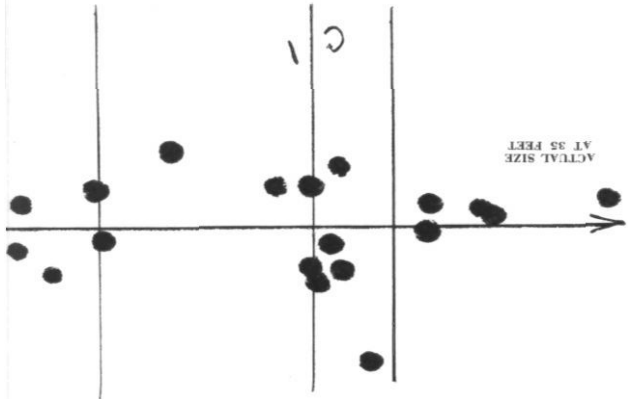


TERRAIN BOARD SET UP IN OFFICE

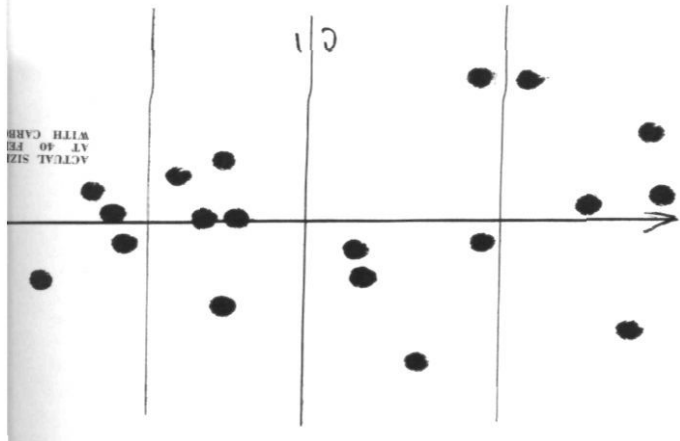
ACTUAL SIZE
AT 25 FEET



ACTUAL SIZE
AT 35 FEET



ACTUAL SIZE
AT 40 FEET
WITH CARE



INDOOR ADAPTER FOR FA TRAINER, M-2

sand table are built as they would appear to an observer at 3500 yds. actual. The office, 14' by 49', is considered as a firing range 1400 by 4900 yards. The floor is gridded in 1000-yard squares, two intersections being marked.

The sand table, 4' by 8', has back boards on one end and one side and is fixed in place. It is marked at 100-yd. intervals on side and end for easy reading of target coordinates. The trainer, on small solid table, the same height as sand table, is shifted to any desired point in the room. The site correction is introduced by varying elevation of targets on the sand table. The parallel sheaf of a battery is represented, using the single gun, by appropriate deflection shifts.

Observation is from 30-45 feet, usually with field glasses, the spray of sand giving a fair representation of a shell burst. The observer is required to remain seated, which fixes him with regard to angle T and prevents a bird's-eye view of the target.

Firing data are computed from aiming-circle readings and distances obtained to nearest 100 yd. by steel tape, representing a range finder, or by estimation. The plotting board and firing chart are also used. Card markers in various parts of the room represent aiming points and a screen in front of the gun is used for a mask. By the use of plumb bob attached to aiming circle and a light tripod with plumb bob, complete battery and battalion surveys are run to scale in the office as a means of orienting the gun, so that determination of data and firing the problem are complete.

So much for the description of the gun and method of operation. Ten years of continuous staff duty has afforded me little time to keep up in technical gunnery but the development and use of this "pop gun" has been a splendid refresher course for an older officer. It is seldom that on the range we have been able to go out and see where our rounds actually fell. That short, which

we accepted, and later found the C.I. to be over, can be seen in the sand pits, and dispersion and probability is on the sand table before us. We can show a concentration fired on uncorrected map data, then an adjustment on a base point and the pits in the sand from corrected fire by a K -transfer, a thing we can seldom see on the target range. We can carry through a map RSOP and then deliver the fire on the table where the map terrain has been duplicated in the sand. Probably the most interesting problem tried so far is in cooperation with the infantry instructor who carries on an attack problem on the sand table and calls on the artillery for actual supporting fires. The preparation and early fires are carried on from artillery OP's, then when the attack has been passed beyond the first range of hills and is out of sight of the OP. the direction passes to an artillery liaison officer seated close to the table with the infantry officers.

So far nothing has been said of the effect of this type of training on the Reserve officer. In Pittsfield the results have been excellent. Attendance has stepped up and an enthusiasm has developed which can readily be appreciated by any officer who has ever had an OR detail. Reserve officers now drop in to fire an occasional problem and a volunteer group comes in on Saturday morning. Competition is developing and as every problem fired is conducted exactly as on the range they are receiving instruction as well as being entertained.

As entertainment is included with instruction, without detriment to the latter, and seems to produce results, I see no objection to it.

The above description is written only with the idea that some other officer facing apathy on the part of his charges may find the same measure of satisfaction that I have found in the use of this training method.

The Field Artillery Horse Show Team in Mexico City

BY MAJOR NORMAN J. McMAHON, FA

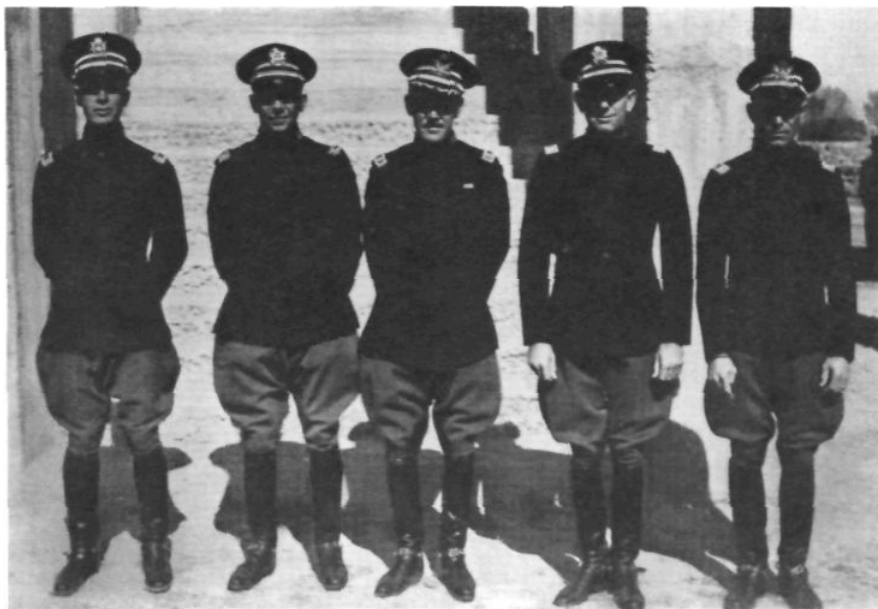
DURING the month of December, 1938, the Field Artillery Horse Show Team composed of five officers—Major N. J. McMahon, Captains E. L. Andrews, L. S. Griffing, H. S. Isaacson, and Lieutenant W. A. Harris was sent to represent the United States in the first International Horse Show of the City of Mexico. The horses that accompanied the team were: "Virginia Navarre," "Billy the Kid," "Silent Sam," "Judge," "Honolulu Tomboy," "Drummer Boy," "Stoneverne" and "Orito": only eight horses being authorized by the Mexican government.

Upon arrival in Mexico City on the

evening of November 30th we were accorded a most friendly welcome by officials of the governments of the United States and Mexico and by members of the other participating teams.

The cordiality and warmth which characterized our reception remained a constant quality in all of our relations with our hosts during our visit. Innumerable hospitable attentions and courtesies were extended to us by individuals and by officials of military units and departments of government.

Though this show was the equal in most respects of international competitions conducted in the United States and



LEFT TO RIGHT LT. W. A. HARRIS, CAPT. E. L. ANDREWS, MAJ. N. J. McMAHON, CAPT. L. S. GRIFFING, CAPT. H. S. ISAACSON.

THE FIELD ARTILLERY HORSE SHOW TEAM IN MEXICO CITY

deserving of high praise, scant publicity was given it in our newspapers. The newspapers of Mexico supported it in a superlative manner, publishing each day complete results of the competitions and expansive descriptions of related activities.

The prizes awarded were quite unusual. They were, for all classes, equestrian bronzes of heroes of the Mexican Revolution and of figures representative of mounted sports, all the work of an eminent Mexican artist and cast in the foundries of the government munitions factories.

We entered Mexico via Laredo, Texas, at which place our horse car was attached to the morning passenger train. The trip was rapid and completed in two and one-half days but, the greater part of it being through mountainous country, was somewhat rough, and several of our horses suffered serious injury which for a time threatened our chances for a successful showing. The journey also involved a change in altitude from 1300 feet at Fort Sill to 7500 feet on the plateau of Mexico City. The change in atmospheric pressure had a very noticeable effect on all of us and is a factor that must be given serious



CAPTAIN ISAACSON ON "VIRGINIA NAVARRE"

The capture of all of these splendid trophies but two which were awarded for high individual scores naturally gives us deep satisfaction, but we had fortunate moments and prefer to feel that our most valuable prize is the friendship of many amiable and generous Mexican sportsmen.

consideration in the conditioning of horses and riders for competition. Ten days were allowed for this acclimatization; the horses adjusted more readily than the riders and by December 15 all seemed to be quite fit, but at that time only one day of competition remained.

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The show, conducted under the leadership of Brigadier General Avila Camacho, Secretary of National Defense, and under the immediate direction of Brigadier General Juan E. Azcarate, formerly military attache to the Mexican Embassy in the United States, was unqualifiedly successful. It was held in the city in a recently constructed stadium of a capacity of 75,000. During the show attendance was estimated to be from 15,000 to 35,000.

Conditions affecting the competition were not entirely satisfactory. The surface of the stadium arena was hard and it became necessary to cover the surface with finely crushed rock; this made a satisfactory footing but being loose resulted in several falls on sharp turns. In general, F.E.I. rules governed the competitions but several local regulations introduced riding

conditions that at first consideration appeared to be difficulties; these factors placed a premium on ease of handling and control of the horse and in the end proved to favor us.

The show was held during the week of December 11-18 and except for the opening ceremonies and presentations it comprised military jumping competitions only. Four teams were in competition, two from Mexico, their international team recently returned from New York, and one from the "Escuela Militar de Aplicacion," the Cuban team, and our own. The Chilean team was expected but was unable to attend.

The courses were well arranged and composed of large well-constructed obstacles, some quite unusual in type and which varied in height from 1.30 meters (4' 3") to 1.60 meters (5' 3").

FIRST DAY. CLASS I—Prize "City of Mexico" (Individual)

On the first day, Sunday the 11th, two classes were held. First, the individual class composed of 12 obstacles, varying in height from 1.30 meters to 1.50 meters

(4' 3" - 5' 0"), length about 700 meters. In this class there were 29 entries. The places awarded were as follows:

<i>Horse</i>	<i>Rider</i>	<i>Score</i>
1st—"Virginia Navarre"	Capt. Isaacson, U. S.	12 faults
2d—"Rayo"	Lt. Inchaustegui, Mexico	16 faults
3d—"Resorte"	Lt. Inchaustegui, Mexico	16¼ faults
4th—"Diablo"	Lt. Cortes, Mexico	21 faults
5th—"Malacara"	Lt. Villalobos, Mexico	33 faults

Cuban horses were unplaced. Other Field Artillery horses entered were "Orito," ridden by Captain Andrews, and "Silent

Sam," ridden by Captain Griffing. Both of these horses were eliminated because of stepping out of bounds.

CLASS II—"Caballeria Mexicana" (Team)

The second class was for teams of four officers. The course was comprised of 12 obstacles, three of which were multiple jumps. This course was about

800 meters in length and the obstacles varied in height from 1.30 meters to 1.50 meters (4' 3" - 5' 0"). The teams were required to jump the course twice, the

THE FIELD ARTILLERY HORSE SHOW TEAM IN MEXICO CITY

second round with three horses. The Field Artillery horses entered were: "Virginia Navarre," Captain Isaacson; "Billy the Kid," Captain Andrews; "Silent Sam," Captain Griffing; "Judge," Lieutenant Harris. In the first round "Silent Sam" was eliminated by stepping out of bounds. Scores were as follows:

FIRST ROUND

<i>Horse</i>	<i>Rider</i>	<i>Score</i>
"Virginia Navarre"	Capt. Isaacson	12 faults
"Billy the Kid"	Capt. Andrews	12 faults
"Judge"	Lt. Harris	34 faults
"Silent Sam"	Capt. Griffing	Eliminated

SECOND ROUND

"Virginia Navarre"	Capt. Isaacson	8 faults
"Billy the Kid"	Capt. Andrews	20 faults
"Judge"	Lt. Harris	19½ faults

The places were awarded as follows:

1st	United States	105½ faults
2d	Mexico	139 faults
	Cuba	Eliminated in first round.

An individual trophy was awarded in this class to the low-score horse, which was won by "Virginia Navarre" with 8 faults and time 2 minutes and 4 seconds. The lowest score horse of the Mexican team was "Donaji," ridden by Lieutenant

Palofox, whose score was 16 faults and time 2 minutes and 18 seconds. The second best performance was that of "Billy the Kid," who had 12 faults and time of 2 minutes and 2 seconds.

SECOND DAY. CLASS I—"Camara Nacional de Hoteles de la Republica" (Individual)

On the second day there was held a very interesting individual class comprised of 10 obstacles, 8 of which were placed on the center line of the arena. After jumping each of these obstacles a reverse turn around a limiting flag was required in order to reach the next obstacle. Two parallel chalk lines limited the turn around the flag; stepping over the chalk line entailed a 3-point penalty. The obstacles varied in height from 1.30 meters to 1.40 meters (4' 3" - 4' 8") and in width to 3.50 meters (11'

6"). In this class 26 horses were entered. Our entries were "Virginia Navarre." Captain Isaacson: "Stoneverne," Lt. Harris; "Honolulu Tomboy," Captain Isaacson; "Orito," Captain Andrews; "Silent Sam," Captain Griffing; "Billy the Kid," Captain Andrews, Precision in riding and control of the horse were the essential factors of a good performance on this course. In general the performances were very good throughout, there being but six horses eliminated. Places were awarded as follows:

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<i>Horse</i>	<i>Rider</i>	<i>Score</i>
1st—"Virginia Navarre"	Capt. Isaacson, U. S.	6 faults
2d—"Gato"	Lt. Vilchis, Mexico	6¾ faults
3d—"Tolteco"	Lt. Chagoya, Mexico	12¼ faults
4th—"Rayo"	Lt. Inchaustegui, Mexico	14¼ faults
5th—"Silent Sam"	Capt. Griffing	15 faults

First and fifth places went to Field Artillery horses; second, third, and fourth to Mexico; Cuba was unplaced. In this class the individual trophy for low-score horse was again awarded to

"Virginia Navarre," whose score was 6 faults. These faults were 3 for stepping out of bounds and 3 for overtime. This performance was the only clean one over obstacles in this class.

CLASS II—"Secretario de la Defensa Nacional" (Team)

The team class of this day was started at 3:00 P.M. Many interruptions occurred and darkness falling very rapidly made it necessary to postpone the event until the following Saturday. The course comprised 16 obstacles, one of which was a multiple jump and one that had to be taken twice, in opposite directions, making a total of 19 obstacles; these varied in height from 1.30

meters to 1.50 meters (4' 3"—5' 0") and in width to 3.50 meters (11' 6"). Four teams were entered in this class, two Mexican teams, one their International Team, the other from the cavalry "School of Application," the Cuban team, and ours. The course was ridden one time and placement made on the total score of four horses. The awards were as follows:

1st—United States	105 faults
2d—Mexico (School of Application)	118½ faults
3d—Mexico (International)	131¼ faults

The Cuban team was eliminated, three horses failing to finish the course.

Individual faults for the Field Artillery team were:

"Virginia Navarre"	Capt. Isaacson	8 faults
"Billy the Kid"	Capt. Andrews	16 faults
"Silent Sam"	Capt. Griffing	40 faults
"Judge"	Lt. Harris	41 faults

THIRD DAY. CLASS I—"Asociacion de Banqueros" (Individual)

On the third day, Sunday the 18th of December, the teams were presented as on the first day and the closing ceremonies

followed the team competition. As on previous days, there was held an individual and a team class. The individual

THE FIELD ARTILLERY HORSE SHOW TEAM IN MEXICO CITY

class on this day was quite different from the preceding individual classes. It was composed of 8 obstacles, each a single rail 4'-6" in height and spaced at 23 feet, which made of the course a multiple in-

and-out. A total of 22 horses were entered in this class, 4 were Field Artillery horses, 4 Cuban horses, and the remainder Mexican horses. The places were awarded as follows:

<i>Horse</i>	<i>Rider</i>	<i>Score</i>
1st—"Diablo"	Lt. Cortes, Mexico	4 faults
2d—"Tarasco"	Lt. Ponce, Mexico	4¼ faults
3d—"Jarocho"	Lt. Chagoya, Mexico	8 faults
4th—"Virginia Navarre"	Capt. Isaacson, U. S.	12 faults
5th—"Tolteca" (5th on time)	Lt. Chagoya, Mexico	12 faults

The other Field Artillery horses entered were: "Billy the Kid," Captain Andrews, 20 faults; "Drummer Boy," Captain

Griffing, 32 faults; "Stoneverne," ridden by Lieutenant Harris, was eliminated because of three refusals.

CLASS II—"Presidente de la Republica" (Team)

In the team class of this, the last day, four teams were entered; two Mexican teams, the Cuban team, and ours. Before the beginning of the class, the Cuban team scratched. The course for this event comprised 12 obstacles, three of which were multiple jumps, making a total of 15 obstacles that varied in height from

1.30 meters to 1.60 meters (4'-3"—5'-3") and in width to 3.60 meters (11'-10"). This class was for teams of four horses and was required to be ridden twice, three horses on the second round. It was an excellent competition and the best team event of the show. Scores were as follows:

FIRST ROUND			
<i>Horse</i>	<i>Rider</i>	<i>Score</i>	<i>Time</i>
"Virginia Navarre"	Capt. Isaacson	4 faults	1'-32"
"Billy the Kid"	Capt. Andrews	4 faults	1'-34"
"Silent Sam"	Capt. Griffing	20 faults	1'-47"
"Judge"	Lt. Harris	24 faults	1'-37"
Second ROUND			
"Virginia Navarre"	Capt. Isaacson	8 faults	1'-30"
"Billy the Kid"	Capt. Andrews	12 faults	1'-30"
"Silent Sam"	Capt. Griffing	16 faults	1'-42"
		Total 64 faults	

The places were awarded as follows:

1st—United States	64 faults
2d—Mexico ("School of Application")	108 faults
3d—Mexico (International Team)	120 faults

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Our trip to Mexico was successful beyond our expectations. With one exception the Mexican horses that had shown in New York with notable success were present; though they performed in most instances exceedingly well, they doubtless would have been in better form had it not been for their long sojourn in the United States. Among the many other Mexican horses that participated a considerable number showed great promise—and we may expect to meet a strong contender in the Mexican team at our 1939 shows. The Cuban team had a difficult time mainly because their horses

were young and insufficiently prepared for competition of the kind encountered. They were hard riders and good sportsmen and in a year or two several of their horses may give an excellent account of themselves in international shows.

A very interesting program of official activities and social festivities had been arranged and was thoroughly enjoyed and appreciated by all of us. To Ambassador and Mrs. Josephus Daniels and to our military and naval attaches, Lieut. Col. W. F. Freehoff and Commander W. M. Dillon, we owe much for a most enjoyable and memorable visit to Mexico.



THE TROPHIES WON BY THE FIELD ARTILLERY TEAM

Short Cuts for High Burst or Center of Impact Adjustments

BY 1ST LIEUTENANT CLYDE R. McBRIDE, FA

IN order materially to reduce the time necessary to prepare for and obtain corrections from high-burst or center-of-impact adjustments, the following two methods are presented. The first method eliminates the most time-consuming feature of these adjustments—the locations of a suitable flank OP and the establishment of communication. The second method does not reduce the time of preparation of fire, but it eliminates the necessity of plotting the observers' sensings.

The first method is based on the determination of the map range by computation, using the flash of the burst and the corrected velocity of sound.

The method is briefly as follows:

Preparation of Fire:

The axial instrument is laid on the check point by a deflection and a site. The guns are laid independently, preferably by base angle. Determine, from Table of Corrections, the temperature correction for the velocity of sound and the correction in yards for the wind component in the direction of fire. (Note: If a metro message is not available, a thermometer will give the temperature.

The direction and velocity of the wind may be estimated by watching the smoke from a cigarette.)

Conduct of Fire:

Stand at the battery position. Start a time-interval recorder when you see the flash of the burst. Stop it when you hear the burst. Take the mean time of six observations; add 1/10 second to mean time for your reaction. Multiply the time by the corrected velocity of sound and add algebraically the correction in yards for the wind component. You now have the map range—guns to center of impact. The deflection correction and the adjusted range are determined in the usual manner from the observation of the axial observer.

The record of the problem was as follows: The weather data was obtained from a metro message.

Chart direction of wind	4500
Range wind component	+ .29
Velocity of wind	9 MPH
Velocity of Range Wind	2.61 MPH
Temperature	69° F.
Velocity corr. for Temp.	385 yds/sec.
Corr. for wind component	+15 yds.
Corr. for location of observer	+ 5 yds.

No. 1, 1 round, 175.

AXIAL OBSERVER			LATERAL OBSERVER		
<i>Round</i>	<i>Deviation</i>	<i>Site</i>	<i>Deviation</i>	<i>Time</i>	<i>Rounds</i>
1	Lost	Lost	Lost	None	Disregard
2	R-1	340	R-140	11.2	
3	Lost	Lost	Lost	11.7	Disregard
4	R-1	337	R-120	11.3	
5	L-1	338	R-124	11.3	
6	0	338	R-126	11.3	
7	0	337	R-115	11.4	
Mean	0	338	R-125	11.3	

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11.3 + .1 (reaction time) equals 11.4

385 × 11.4 + 20 yards (wind component) equals 4400 Map Range.

Adjusted Range equals 175 — 1.8 (for British Gun 1917) — 38 (site) equals
4100 adj. Range.

The corrections obtained by method one were, Deflection 0; *K* of —65 yds/thous.

Table of Corrections:

- a. Sound travels 383.45 yds/sec at 59° F.
- b. The velocity of sound increases .364 yds/sec for each increase of 1° F. It decreases the same amount for each decrease of 1° F.
- c. Effect in yards of range for each 1 MPH of range wind. The correction is added for a wind blowing towards the observer; subtracted when the wind blows from the observer.

3000	3.85	3800	4.85	4600	5.85
3100	3.95	3900	5.00	4700	6.00
3200	4.10	4000	5.10	4800	6.10
3300	4.20	4100	5.20	4900	6.25
3400	4.35	4200	5.35	5000	6.40
3500	4.50	4300	5.50	5100	6.50
3600	4.60	4400	5.60	5200	6.65
3700	4.70	4500	5.75	5300	6.75

Example:

A high-burst adjustment and transfer was fired the night of March 30, 1939, by Battery F, 13th FA. The writer conducted fire from the battery position. A lateral observer was used to check. He did not report his sensings until the next day.

The corrections obtained by plotting the next day were: Deflection 0; *K* of—83 yds/thous.

The center elevation of a prepared concentration was fired, with these results: A mixed short, deflection correct. Time—7 minutes 28 seconds from the first round of the adjustment, until battery was firing for effect.

Limitations:

While this method has given satisfactory results at service practice at the Presidio of Monterey and Schofield Barracks, it has a serious limitation. That is, the difficulty of determining which burst you are hearing if more than one gun is firing. However, it is a possible means of obtaining corrections at night when flank observation is not possible.

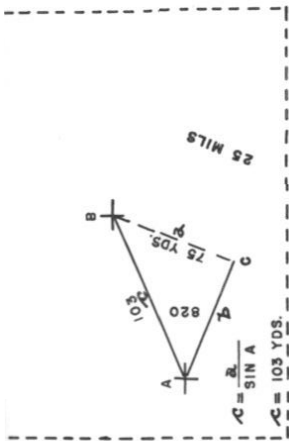
The second method is based on the determination of the distance Center of Impact—Check Point, by computation using the observations of a lateral observer.

Preparation of Fire:

The preparation of fire is the same as described in paragraphs 293 to 295 inclusive, Field Artillery Book 161. The axial instrument is laid on the check point by a deflection and a site. The guns are laid independently, preferably by base angle. The setup is plotted on a fire chart. The distances OL to Ch. Pt., G to Ch. Pt. and the angle *T* are measured. (See diagram.)

Conduct of Fire:

If the center of impact is within ½ s for deflection as observed by the axial observer, then all rounds left of the Ch. Pt. as observed by the lateral observer are over; all right are short. (See diagram.) The distance Ch. Pt. to OL, times *d*, divided by sine of angle *T*, equals distance CI to Ch. Pt. The algebraic sum of CI to Ch. Pt. and Ch. Pt.



GUN POSITION
2-113

3500

2900

FLANK O.P.



REFERENCE POINT

96

MAP RANGE GUNS TO CH. PT.—3500
 COMPUTED RANGE GUNS TO C.I.—103
 MAP RANGE GUNS TO C.I.—3603

SCALE 1/20000

88

88

96

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to G equals map range. This operation can be made on a slide rule in twenty seconds. The adjusted range and deflection corrections are determined in the usual manner from the observations of the axial observer.

Example:

A high-burst adjustment and transfer was fired the night of March 30, 1939, by Battery E, 13th FA. Staff Sergeant Paul G. Keating, sergeant major of the Second Battalion Thirteenth Field Artillery, conducted fire from the battalion CP.

Using a slide rule with the determined factors set up. Sergeant Keating determined his K and deflection correction thirty-five seconds after the last observation was reported. The K was obviously in error. A check with both observers revealed that the observers were reporting deviations from the reference point instead of the check point. The axial observer was reading site in respect to his laying instead from the horizontal. It took five minutes to check and discover the errors of the observers. A

new K was hurriedly computed and applied to a prepared concentration. The following results were obtained: A mixed short, deflection correct. Time—12 minutes and 10 seconds from the first round of the adjustment until the battery was firing for effect.

The K determined by computation was—56 yds/thousand, with a deflection correction of right 2.

The K determined by plotting was—54 yds/thousand, with a deflection correction of right 2.

General Conclusions:

The first method affords a means of rapidly obtaining corrections at night when no flank observation is available. It has a serious limitation: The difficulty of distinguishing the sound of a burst. The second method gives a means of rapidly obtaining corrections without plotting the observers sensings. As this second method has no serious limitation, and requires less time than the standard method, I believe it of value.

EDITOR'S NOTE—An officer well-informed on gunnery points out: As a basis for determining a K and a direction which may be used for transfers in the target area, best results are obtained when the instruments of both observers are first laid, *without error*, on a reference point in the area. (It is obviously desirable that this terrain point be as close as possible to the check point.) These considerations increase in applicability as assurance in the accuracy of survey relations—position area to target area—is decreased. Where no fire-control map is available, they are of first importance.

Brush Lifting at Benning

BY 1ST LIEUTENANT J. D. WILMETH, INFANTRY

FORT BENNING, the Army's large military reservation in western Georgia, is the home of the Infantry School Hunt, organized in 1923. The reservation's one hundred thousand acres, constantly patrolled by range-guards, has long been a sanctuary of the horseman's game—fox, bobcat, and wild pig.

With such a vast area, and with a well-planned conservation program, game is never exhausted. It has more than doubled during the past two years.

As fox and bobcat inhabit no particular portion of the reservation, hunts are often conducted over stretches distant from the stables. The horses are brought to the area by the stable personnel, while the hunter motors out in his car. The hounds arrive in a specially improvised truck. Coffee and doughnuts are served at 5:45, the field mounts promptly at 6:00, and the Huntsman leads out to the chase. Sometimes a brush is lifted within the hour, but at others an eager pack will run sweet until well into the afternoon, and then be foxed. Reynard is nobody's fool.

Red fox gives the hardest chase. Small, sly, and cunning, these rascals tax the hounds' endurance and the Huntsman's skill. Normally they dwell on the crests and love the broad open spaces, but when pursued they break for the swamps and the tall uncut. Often, to lose their scent when it is rich in the nostrils of the lead hounds, they will bound from a thicket and run through the entire Field to the accompaniment of whinnying horses and hallooing hunters. Or when pressed close in to the Post they take to the paved roads of the residence sections, or bound across the golf courses, seeming to know that the

General has forbidden horses on the fairways. And many a hunter will tell of having seen a red fox climb a tree (while many another will scoff).

The gray fox is heavier and has greater endurance, but lacks the cunning of his red brethren. Nonetheless, he will lead hounds and Field a merry round before his brush is lifted. Swimming streams, backtracking, and cutting circuitous routes through planted fields, he is no pick-up, but if the hunters have the dogged determination of the hounds, they usually fetch in a kill—after a five- or six-hour run.

Bobcats are treacherous. They seem to realize that tree climbing means their doom, and they never resort to this false expedient when pushed by the pack. Like the red fox, they turn to the swamps and the hard going. Cornered time after time, a cat will claw his way through the pack and make an escape, only to be tracked down to a new rendezvous. Often they prove the stronger, wearing down the hounds through both the vicissitudes of the chase and the frequent combats. A twenty-five pound bob always takes his toll in hound flesh whether caught or lost. Their claws are razor-edged scimitars ready to tear a gaping hole in any hide that ventures within stroke. The hounds have only the dint of numbers in their favor.

Wild-pig hunts are usually held in the afternoons. Several low areas on the reservation abound in this game, and the hunt seldom returns empty-handed, though the Field always gets a good workout. Most of the pigs are small, fat, black-and-white little devils completely at the mercy of the hounds once they are discovered. The Huntsman stays close to his pack to effect a rescue before a pig

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falls a casualty to sharp canine teeth. But occasionally a large tusker is routed, and the decks are cleared. If a hapless hound is a little too slow the boar's tusks rip him from bark to back. If crowded, sometimes a tusker will charge the Field, cutting horses from under their frightened riders. One of the doughtiest "hounds" in the pack is a pit bull dog.

Years ago when the Hunt was first organized the care of a few scraggly mutts was entrusted to Sergeant Thomas Tweed, who had a time in those early days to keep the foxes from eating the hounds. Today Sergeant Tweed still is Huntsman, but he has a fine blooded pack of sixty noses. Over this period of years hounds from all parts of the country have been tried. Purchases were made in Virginia, Ohio, Kentucky, and California, and out of the many breeds that have hunted in the pack from year to year Sergeant Tweed chose four as being particularly adapted to the country and the game. Trigg, July, Black-and-tan, and Walker have proved themselves on

the chase and in the kennels. These four strains are now bred at the School, but experimentation still continues by annual outside purchases.

Available for hunting are one hundred and seventy mounts at the Infantry School Stables. Many of the horses are Thoroughbreds and winners of distinction in the horse shows and hunter trials held annually at Benning.

On alternate Sundays drag hunts are held with a special pack of fleet-footed hounds leading a fast pace over the vagaries of a specially prepared six-mile course of rolling terrain, steep grades, ditches, and other obstacles that give the high-schooler a brisk workout. Spills are frequent but rarely serious, save that a policing and a runaway means the rider returns home on foot.

The drag hunt is divided into three echelons—those who follow the Master at a brisk, cross-country gait, taking the course as they find it; those who follow at a canter but do not choose to negotiate the jumps; and those who, at a slow



PART OF THE FIELD AND THE "MIXED-BAG" PACK. FORDING A STREAM

BRUSH LIFTING AT BENNING

trot, take an inner course, stopping at vantage points along the way to watch the thrilling rides of the first echelon. Oftimes a motorcade of nonriders parallels the course by automobile and joins the hunters for breakfast when the chase is completed. At the end of the course the hounds are rewarded with a litter of spare ribs for their oft-repeated pursuit of the

aniseed-scented drag.

Annually, a few weeks prior to the opening hunt in October, the new Master of Fox Hounds is announced together with his coterie of Whips. Proud beat the hearts of those selected few, the envy of all hunters, whose skill in the saddle has won them the distinction of appearing in "pink."

Centennial of Ohio's 135th Field Artillery

THE year 1939 marks the 100th Anniversary of the 135th Field Artillery, National Guard of the United States. Various events are taking place to commemorate it. The Association of The Cleveland Light Artillery already having held its primary Centennial luncheon on February 25th at the Army & Navy Club in Cleveland. This was attended by approximately 100 artillerymen of Cleveland, and arrangements are being made by the association for further commemoration of the event.

The entire regiment will visit Cleveland June 10-11, at which time a night military parade will take place, the escort consisting of all of the other National Guard units of Cleveland and surrounding territory. The regiment will conduct a church parade and church service on Sunday, June 11th at Trinity Cathedral in Cleveland.

Invitations to other military organizations are to be issued by the regiment, as it is felt that there may be many who will desire to assist the 135th Field Artillery in perpetuating traditions of the service.

A history of the regiment was compiled and edited by Capt. Richard L. McNelly, a member of the Regimental Headquarters, and published in 1936. From this historical

account is learned an account of the origin and development of the Regiment. Its history has been made official by an indorsement dated May 22, 1933 to a War Department Order, said indorsement emanating from the Historical Section of the Army War College.

The 135th Field Artillery Regiment had its birth in what was known as the Cleveland Light Artillery. In 1839 a gun squad was formed within the Cleveland Grays, a military company of the early days. This was the beginning of what is now the full regiment, and the date to which the 135th FA traces its inception.

In 1845 the gun squad seceded from the Grays, forming a separate organization known as the Cleveland Light Artillery.

During the period 1845 to 1860, the original battery in Cleveland had been the guiding spirit for an organization which was to gain the proportions of a regiment and to be known as "1st Regiment, Ohio Light Artillery."

Companies A, B, D, and E, all from Cleveland, Company C from Brooklyn, which was then a separate city, and Company F of Geneva, Ohio, had been organized into a regiment and as of August 1st, 1860, designated as "1st Regiment of Light Artillery of Ohio Volunteer Militia." Later these units were redesignated "The 1st Regiment of

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Ohio Light Artillery, 3rd Brigade, 4th Division, Ohio Militia."

Upon its entrance into the Civil War, the regiment had its baptism of fire at Phillippi, West Virginia, on June 3, 1861. Following the first 90 days' service the regiment was reorganized on August 8, 1861, and twelve batteries were formed in rapid succession throughout the state, in addition to those already comprising the Cleveland Light Artillery.

The Ohio Artillery had now become a state-wide organization, and was completely reconstituted as the "First Regiment, Light Artillery, Ohio Volunteers" on February 3, 1862. A list of the principal engagements follows:

Shiloh	Gettysburg
Manassas	Chickamauga
Fredericksburg	Chattanooga
Murfreesborough	Nashville
Chancellorsville	Atlanta

as well as operations in Kentucky, Tennessee, Georgia, Mississippi and Virginia.

By 1872, the reorganized Cleveland Light Artillery was a part of the Ohio Independent Militia, and officially accepted by the State of Ohio under the Ohio Independent Militia law in May, 1873. Special Order No. 7 dated May 6, 1886, formed the First Regiment, Light Artillery, Ohio National Guard.

In 1898 certain units of the regiment were transferred to the Infantry and Cavalry. The remainder, designated "First Battalion OVLA," was called into Federal Service on May 11, 1898 and mobilized for war.

It had no foreign service during that war, getting no farther than Camp Bushnell, and in October was mustered out of Federal Service.

The battalion was called into the Federal Service June 19, 1916. Mobilized at Camp Willis, Ohio, July 5, 1916, the battalion was mustered into Federal Service on July 11, 1916 and after a brief training period left for Mexican Border duty on Labor Day, 1916.

Arriving on September 7th, the battalion



"CLEVELAND LIGHT ARTILLERY BATTERY 1857"

This picture taken near the old Eric Street Cemetery in Cleveland on what is now East 9th Street in the center of the city.

CENTENNIAL OF OHIO'S 135TH FIELD ARTILLERY

served on the Mexican Border in the vicinity of Fort Bliss, Texas, until March 12, 1917. Later, at Fort Harrison, the battalion with added units was on May 4, 1917, designated the First Field Artillery, Ohio National Guard. On September 15, 1917, the First Field Artillery was redesignated the 134th Field Artillery, and assigned to the 62nd FA Brigade, 37th Division. The regiment found itself on October 10th, 1918, occupying a portion of the Marbache sector in the Lorraine district.

While there, the regiment served as assigned artillery in support of the 92d Division, in lieu of divisional artillery. The command post was located during this time at St. Genevieve. Considerable action was seen during this period and the regiment having suffered rather heavy casualties in men and animals during a continuous ten-day period, was withdrawn to a rest area. After seven days of recuperation during which time replacements were obtained the front was again its destination, this time to the vicinity of Vigneuilles, Pannes sector, in support of the 28th Division, where the regiment reenforced the artillery brigade of

Brig. Gen. Donnelly. The signing of the Armistice on November 11, 1918 found the regiment still in support of the 28th Division.

In August, 1919, directly following the return from France, the First Field Artillery, Ohio National Guard, was reorganized as a full regiment. In 1920 the regiment was again redesignated the 134th Field Artillery and Batteries "E" and "F" and Service Battery, 134th FA were on July 1, 1921 designated as the 135th Field Artillery, to which further units were to be added to constitute the regiment. On February 1, 1922, regimental organization was completed.

The regiment has indeed done its full share in upholding the real purpose of the civil constabulary of America by giving useful service both in peace and war, and demonstrating by act and deed the meaning of its motto, which appears on its regimental crest. *Omnia Possibilia—"All Things Possible."*

The 135th FA and its sister regiment, the 134th FA, constitute the oldest National Guard Regiments outside of the original thirteen states.



One former editor of THE FIELD ARTILLERY JOURNAL. Colonel O. L. Spaulding, retires at the end of June as a Brigadier General; another, Colonel John N. Greely, goes to Spain as Military Attache . . . Master Sergeant H. W. Roberson, 12th FA, holder of the Croix de Guerre, is awarded the Silver Star at Fort Sam Houston regimental review.

Reviews

American Armies and Battlefields in Europe. Prepared by the American Battle Monuments Commission, General John J. Pershing, Chairman, Supt. of Documents, Govt. Printing Office, \$2.75.

No review could do justice to so superb a work as this. None will be attempted. Instead, a panoramic sketch:

547 pages, 561 official photographs from American, German, and Allied sources (including that thriller on page 20, direct hit on a tank), 120 small maps and sketches, 27 sketch maps in color, 9 colored insert maps and charts, and 3 large-scale maps covering the operations of American divisions which participated in the Aisne-Marne, St. Mihiel, and Meuse-Argonne offensives.

American operations and units on every front of the war, even the Italian and Archangel sectors, are covered, and perhaps no more accurate, painstaking, and elaborate instructions have ever been issued than the accompanying guidebook data for leading the visitor to the scenes described. Anyone who served abroad will find, in the photos, the maps, and the many panoramic sketches of horizons now historic, something to touch his interest and his recollection. Military students will find it an indispensable compendium of tactical information, and anyone will be impressed by the statistical data on American participation with which the book closes. This is unquestionably THE book on that participation.

The Genesis of the American First Army. Prepared by the Historical Section, Army War College, Govt. Printing Office, 50 cents.

This would have been at once the most important and the best-written work that has appeared on the JOURNAL desk

in some time—had it not been for American Armies and Battlefields in Europe, reviewed above, with which it competes for attention just now.

But let not the more elaborate work detract from the significance of this one. The history of our military effort in the World War is here summarized from the semidiplomatic angle. Commanders of large units have more than strategy, tactics, technique, administration, and supply with which to deal. They must be prepared, as this 82-page work shows, to devote considerable time to matters supposedly outside their province.

The formation of the American First Army was not a mere matter of orders, staff work, and transportation requests. Its constitution was faced with many obstacles. The history of the fruition of the desires of the American people is compressed in this little volume into a story told simply, accurately, and with great power. One could wish more histories were written as well.

Infantry in Battle. Published by *The Infantry Journal*. Second edition. \$3.00.

"In five hours the regimental commander had learned nothing of the situation. The American artillery kept pressing him for targets, but he could designate none. . ." From page 23 of this revision of a book initiated by Colonel (now Brigadier General and shortly to become General and Chief of Staff) George C. Marshall.

Our readers have known of this book, and many have read the first edition. This one has been extensively revised. The quotation cited, from a chapter called *Obscurity*, refers to the German attack on the Third Division at the Marne.

REVIEWS

There is this book, and there is Cavalry Combat. Some of our readers have inquired, "When, and by whom, will be written a book. Artillery in Battle?" We don't know when, and we don't know by whom. It is a good guess that Artillery in Battle is comprised within the covers of these two volumes, and it is thought that no artilleryman should be without either of them. The JOURNAL has published two articles, which, with them, should give every artilleryman sufficient pause to keep him busy for a while. These articles were by Colonel Conrad H. Lanza, FA, the first, "Counterbattery in the AEF," (September-October, 1936), and the second, "Bridgeheads of the Marne" (May-June, 1937). There have been many others, of course, of great value, but those referred to above focus attention on what might be called the great breakdown of theory—you can't hit 'em if you don't know where they are.

Science and Mechanization in Land Warfare. By Donald Portway. W. Heffer and Sons, Cambridge, England, Six shillings.

The author is Lecturer in Engineering at Cambridge University, and Bvt. Lt. Col. in their O.T.C. From the preface, we learn that Cambridge supplies over half the number of Regular commissions which come from the universities, and this book is a text used in the 45 lectures on military science which accompany their instruction. It is stated frankly, that the book will, it is hoped, stimulate private study for more complete details.

Beginning with some "Fundamental Scientific Principles," the book holds the interest with some discussion of the use of photo cells and television. Between there and some interesting material on meteorology, survey, and sound-ranging, there is a good deal on railways, which, with the exception of a description of their

use in the American War Between the States, appears a bit dull.

In fact, interspersed with valuable instruction in matter common to all armies, there is so much applicable only to the British, in terms and organization, that the attention wanders.

Yet the thoughts and conclusions, by no means dogmatic, of such a one as the author are worthy of note. Few on our side of the Atlantic have been at the same time so versatile and so inquiring. For several years he was on the staff of the Royal Naval College. For over thirty years, mostly as a Territorial, he has kept in touch with the profession of arms. He commanded a regular cable section. Royal Engineers, in 1914, and for two years subsequent, a division signal company. His book, for our purposes, is valuable without being vital.

Memoirs of the Confederate War for Independence. By Heros Von Borcke. Peter Smith. N. Y. (Two Volumes.) \$7.50.

This is a republication of the noted work, out of print for many years, during which copies sold for from \$35 to \$50. The author was that Prussian Brandenburger, who, by his own account, spoke "execrable English," yet found himself, shortly after his arrival in America and tender of his sword to the South, an aide—later chief of staff—to the gallant Stuart.

Many writers have made us familiar with the legendary trio, Jeb Stuart of the golden sash. Von Borcke, and Sweeney with his banjo—"If you want to have a good time, jine the Cavalry."

What impresses this reviewer most is a quotation on page 71 of the first volume, "For the first time at Malvern Hill, in the progress of the American war, was it satisfactorily shown how important in a battle is the concentration of a large number of pieces of artillery upon

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one point; and the army of General M'Clellan was only saved from utter destruction by sixty guns, which, being very favourably posted in his centre, poured dismay and death into our attacking columns. The effect was more disastrous than had been before produced by artillery. In this battle our losses were very heavy, and I may say that the victory was ours only from the ignorance of our position on the part of the enemy, who retreated exactly at the moment when he had gained the most important success."

The two volumes contain 641 pages and a fold-out map.

Secret and Urgent. The Story of Codes and Ciphers. By Fletcher Pratt. Bobbs-Merrill. \$3.75.

Not to rouse a long-dormant theme—but this is certainly one of those books not to be without on the fabulous desert island. Long after the possibilities of solitaire and even that billionth move in chess have been exhausted, this book will enable one to plan fresh and engrossing labors for the morrow.

A set of Shakespeare, while not indispensable, would come in handy, too, for the variations of the Baconian theory are here treated in Fletcher Pratt's best style, which is one that readers of this JOURNAL have had cause to appreciate. Those who are acquainted with this style know Mr. Pratt could make the Theory of Least Squares entertaining. That he should combine with it a prodigious capacity for research is unfair. Mr. Pratt

should be picketed, and this reviewer will be glad to carry a placard. (This reads like it had been written before by someone else. Apologies, then.)

Codes and ciphers are very old, and often were employed by people who did not know they were using them, Caesar, for instance, in his Commentaries, and Xenophon, in his Anabasis. That is a personal theory of the reviewer's, which, once out of the way, will get us back to Mr. Pratt's absorbing story of the decipherment of the ancient Persian inscriptions. Those who have read "Pasteur," and delighted in the logical, step-by-step deductions of the great master, noting, with him, the results of the day's work, and planning with him the choice of experiments to be determined next, will find fresh food for this taste in Mr. Pratt's summary.

It appears very unlikely, moreover, in the light of these revelations, whether any great historical change did not depend upon garbled encipherment, or the too-ready breaking of a code or cipher, from the cause of Mary. Queen of Scots, to Russian radio early in the World War, or the Battle of Jutland. The matter seems portentous.

On page 249—where Mr. Pratt begins 32 pages of notes and index, including that master asset of the cryptanalyst, frequency tables—he writes, "The story of ciphers and codes since the World War is still locked in the secret records of the world's Black Chambers." Up to and including that war, his volume certainly did a comprehensive job.



Recruiting News reports that the soccer team of Btry E 7th FA, winners of the Ft. Ethan Allen championship, added to their honors by twice defeating the Canadian Army team from St. Jean's Barracks . . . the same live-wire magazine tells of the Twelfth Field 1st Bn basketballers going through the season and final tournament undefeated.

Some Forward Observations



THAT NATIONALLY KNOWN newspaper commentator, former Brigadier General Hugh S. Johnson, wrote in his column not long ago that more people should read the Infantry, Cavalry, and Artillery journals. Thank you, General. Your profession requires that you do much reading. In addition to many books, perhaps you examine dozens of exchanges daily. That you find the service trade mags and house journals not only interesting to yourself, but worthy of examination by others should speak well for their content to those for whom this content is of first importance.



A DIFFERENCE OF OPINION makes a horse race. In this issue of the JOURNAL are several different opinions regarding air observation. In former issues, readers may have noted contrasting or divergent approaches to the same aims, and in consecutive articles, at that. When these are assembled, the JOURNAL opinion is that the subject is a good one to discuss. It must be, or so many contributors wouldn't be interested enough to write on it.



BY THE TIME an additional statement of account has been sent to a member in arrears of dues, the postage and overhead have eaten up his proportionate share of that small margin of increase which it is hoped can be devoted to improving the JOURNAL (in more illustrations, more

content, or higher remuneration to contributors).

How much is that margin? Well, examine the last annual statement (Jan-Feb. 1939, number), and note that total expenditures were \$10,299.73. This included \$1,161.58 spent for books and magazines. They were paid for by members, and are not chargeable to the JOURNAL. Almost everything else in the expenditures column is. The balance is \$9,138.15. Divide this by the 18,700 copies printed last year, and you find that to put that copy of the JOURNAL in your hands cost \$.488. You paid 50 cents for it. The margin was \$.012, or less than half of just the postage required to mail an additional statement.

This is not an exact cost-accounting breakdown, but it's close. A few other approximate figures: To print and mail that copy, \$.183; its share of clerical salary, \$.107; the pay of authors, engravers and photographers whose work appears therein, \$.10. The other \$.098 cents went for various administrative expense.

Some more figures: More than 23,000 copies will come off the press this year. We can't tell what is to be in half of them until it is seen how arrears of dues are coming in. The margin is too narrow. Postage alone, for initial statements on January expirations, was \$33.06. For the second notice, it was \$16.41. Third notices now are being assembled. It is hoped that fourth notices will cost nothing.

MILITARY BOOKS

Following is a list of books on military subjects which are recommended for their professional value as well as interesting content:

	<i>Price</i>
	<i>(Domestic postage included)</i>
THE UNITED STATES ARMY IN WAR AND PEACE— <i>Col. O. L. Spaulding</i>	\$6.00
WARFARE— <i>Spaulding, Nickerson and Wright</i>	3.00
PEN AND SWORD IN GREECE AND ROME— <i>Col. O. L. Spaulding</i>	2.00
INFANTRY IN BATTLE (2d edition).....	3.00
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The Command and General Staff School "Quarterly," in its March number, features a very able summary and evaluation of all the conflicting reports from the scene of the Spanish Civil War. Sixteen pages, with maps, and an impressive bibliography, make up this article. The material, entitled, "The Employment of Supporting Arms in the Spanish Civil War," was prepared by Captain Wendell G. Johnson, Infantry, who concludes with: "That [the Spanish] war has been successfully waged throughout by an army which has not always had superiority in materiel, has usually been inferior in numbers, but has from the very beginning had capable officers to plan, direct, coordinate and control the employment of its various elements. We have seen this army consistently winning and the one without such officers consistently losing. Think that over."



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