26TH YEAR OF PUBLICATION

THE FIELD ARTILLERY JOURNAL

NOVEMBER-DECEMBER, 1936

PUBLISHED BIMONTHLY BY
THE UNITED STATES FIELD ARTILLERY ASSOCIATION

November-December, 1936

CONTENTS

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VOL. XXVI No. 6

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Patron Saint of Artillery

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"The objects of the Association shall be the promotion of the efficiency of the Field Artillery by maintaining its best traditions; the publishing of a *Journal* for disseminating professional knowledge and furnishing information as to the field artillery's progress, development, and best use in campaign; to cultivate, with the other arms, a common understanding of the powers and limitations of each; to foster a feeling of interdependence among the different arms and of hearty cooperation by all; and to promote understanding between the regular and militia forces by a closer bond; all of which objects are worthy and contribute to the good of our country."

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★ To the Officers and Soldiers of the Field Artillery ★

This is an appropriate time, alike to remind you of more or less recent events affecting the welfare of the arm, for which we should be duly thankful, and to extend to you my best wishes for a Merry Christmas and a Happy and profitable New Year.

To the Congress, representing the people, and reflecting their grasp of the problem of adequate national defense, we are grateful for furnishing us with new tools—modern prime movers, high-speed traction, modernized armament, and improved communication equipment.

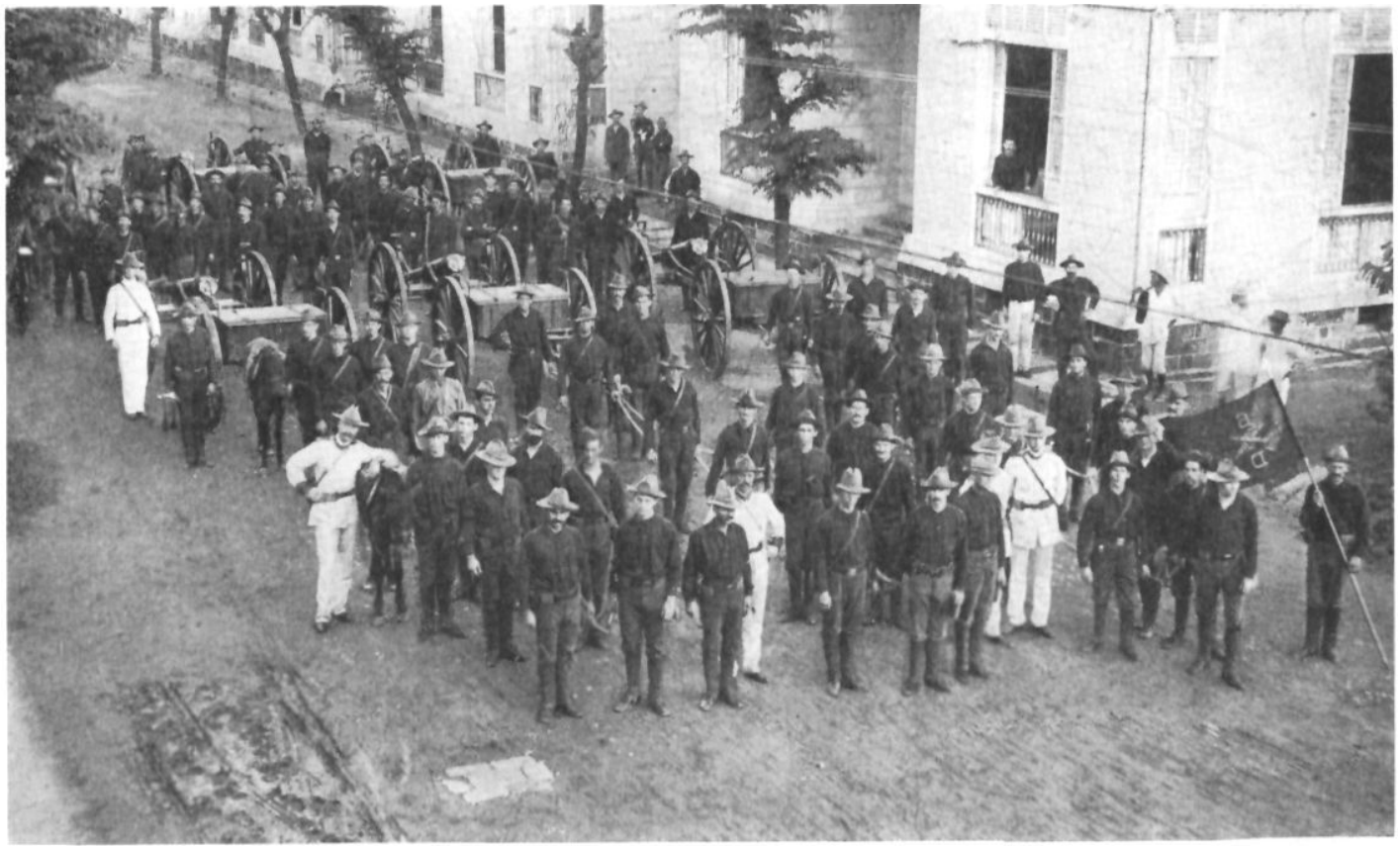
We join the rest of the Army in appreciating the benefits derived from appropriations for training in large-scale maneuvers, and we welcome into our ranks our quota of the Thomason Act appointees, whose presence will relieve, in part, our shortage of officers with troop units.

On the more personal side we feel the heightened morale resulting from the greatly improved housing situation, and from the increased promotion of both officers and enlisted men.

These grants are heartening, indeed, not alone because they increase our effectiveness greatly, but because they reflect the appreciation by a grateful people of the industry, ability, and loyalty of their soldiers.

We can go into the New Year primed and inspired to put forth our best efforts.

Upton Birnie, Jr.,
Major General, United States Army,
Chief of Field Artillery.



ONE WAY OR ANOTHER—"KEEP 'EM ROLLING." SEE PAGE 605

THE FIELD ARTILLERY JOURNAL

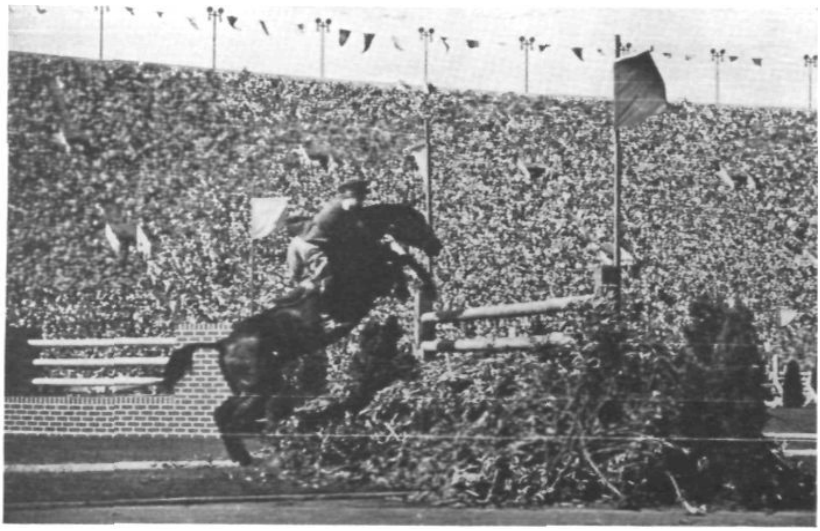
VOLUME XXVI NOVEMBER-DECEMBER, 1936 NUMBER 6

ONE-SECOND FLIGHTS

The Reactions of the Rider over the Jump

BY CAPT. I. L. KITTS, FA

(Member Army Riding Team, Tenth and Eleventh Olympiads)



EDITORIAL NOTE: *When the Army Olympic riders were training for the Tenth Olympiad at Los Angeles in 1932, Captain Kitts took motion pictures of his teammates with a 16-mm. camera. "When," he writes, "I examined the pictures frame-by-frame, I found something. The well-known photographer, Mr. Robert Farrier, of Mission Beach, California, enlarged them for me. I showed the pictures to members of the jumping team, and they agreed with me that what happens, and what we are likely to think happens, do not always coincide."*

The article was written three years ago. Captain Kitts refers to its argument as "the then new theory."

"WHAT a faulty position! The horse hasn't taken off yet, and the rider is standing straight-legged in his stirrups and is in *front* of the pommel. How unfortunate that the camera has recorded so disgraceful a position of an American Olympic rider."

I contend that the rider's position, with the exception of the

raised elbows (a minor fault) is excellent, and that his body is correctly poised for this particular phase of the jump.

The difference of opinion expressed above forms the basis of this discussion. I shall try to show that the generally accepted theory of what happens, or should happen, to the rider's body over the jump differs from the events themselves; and offers, with the aid of the motion-picture camera, a contrasting theory of what actually happens to the balanced rider in the brief second that is required for the horse to negotiate the obstacle.

The idea presented was developed after examining numerous pictures of the members of the Olympic squad in which it was discovered that each rider reacted similarly, and opposed to our former theory, and after many consultations with the riders themselves who are now generally in accord with this theory.

I shall limit this discussion to the performances of excellent riders astride experienced jumpers over formidable obstacles. I shall not discuss the merits of any particular jumping seat, position, or length of stirrup, but leave that exhaustive theme to those who are more qualified to expound it.

The motion-picture strips offered in collaboration were taken by the author just prior to the Tenth Olympiad (Los Angeles. 1932) and the subjects are the five riders* who competed for the United States in the Olympic jumping events. Note that the camera exposed 16 pictures each second—the time used in clearing the abstacle averaging *one and one sixteenth seconds*.

REACTIONS DEFINED

The term reaction will be used in this discussion in the same sense as that described by De Sevy on page 10 of his book, *Seat, Gaits, and Reactions,* which I quote as follows: "Equestrian language has sanctioned the custom of qualifying as *reactions* all the conditions of displacement of the rider.

"Conforming to this custom, we have distinguished, following the direction of these displacements, two types of 'reactions,' one

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*The five riders on the jumping team were: Lt. Col. (then Major) Harry D. Chamberlin, Cav.: Major (then Captain) William B. Bradford, Cav.; Captain E. Y. Argo, FA: and Capts. (then Lieuts.) John W. Wofford, and Earl F. Thomson, Cav.

The consecutive strip of pictures shows Captain Wofford; the animated series shows Captains Argo, Bradford, and Thomson; the strip taken of Lieutenant Colonel Chamberlin did not lend itself well to reproduction, and is regretfully omitted.

vertical, tending to drive the rider out of his saddle, the other *horizontal*, due to the variation of speed in the rhythm of the gaits; above all at the gallop.

"These names, however, lack exactitude.

"The *vertical displacement* of the rider has its origin in the *action* developed by his mount, an action in which he participates through *entrainement*. This movement of the rider could be attributed neither to the *mechanical reaction* of the horse on the ground, nor to that of the rider in his saddle.

"As to the *horizontal displacement*, its cause is the inertia of the rider during the variations of speed or of direction of his horse. It could then no longer be attributed to a 'reaction.'

"For the sake of clarity, however, we shall give the term 'reaction' the meaning that is generally attributed to it, accompanying it with the word 'mechanical' whenever we shall use it in its scientific sense.

"Nevertheless, let us note that the rider calls the shock that he feels in recovering his saddle the 'reaction.' The instant when his mind records this perception is always subsequent to the cause of the displacement. This distinction is not often made. It explains, in kind, the superiority of observation over sensation as a means of analysis."

FORMER THEORY

In order to discountenance the theory which previously we all have supported it is necessary to describe it.

We assumed, and taught in general, that the rider, sitting lightly in the saddle during the approach to the jump, was projected clear of the saddle at the thrust of the hind legs and maintained this position (which we are accustomed to seeing in pictures taken directly over the top of the obstacle) until the horse galloped away from the jump after landing.

The following excerpts from a pamphlet of instruction issued in the early 1930's corroborate this theory: "The rider approaches the jump seated. He has contact with the saddle along the full length of his thighs from knees to points of buttocks. His

weight, due to the forward inclination of body, is borne principally by the thighs, diminishing rearward until at the points of the buttocks it is practically nil. At the take-off his buttocks leave the saddle and move forward as a result of the thrust of the horse's hindquarters." In discussing the position clear of the saddle, "the rider is well out of the saddle and supporting practically all of his weight on his lower thighs, knees and stirrups. *This latter condition should exist after the take-off, throughout the jump, and until the horse has reestablished his normal gallop*." In discussing the position after landing: "For a few strides, the rider continues to support himself on lower thighs, knees and stirrups; then he relaxes the knees and settles GENTLY into the saddle."

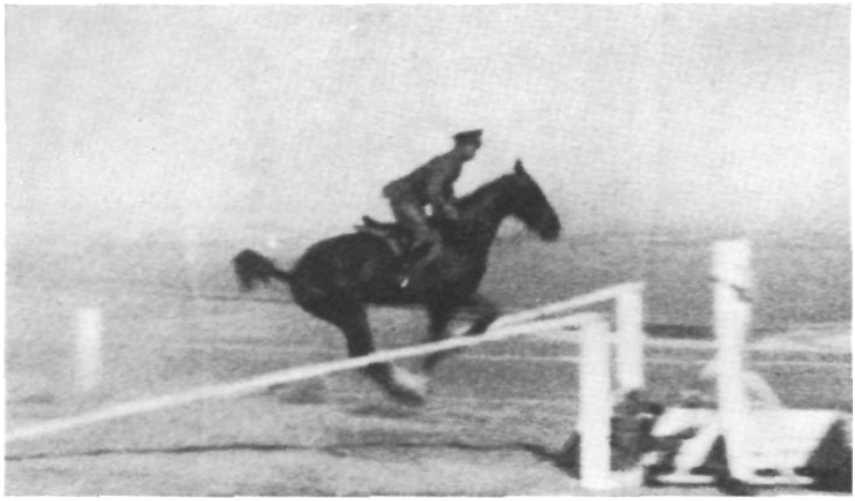
How did the foregoing theory come to be accepted? The sensations which were felt in jumping, and the study of single pictures taken over the top of the jump satisfactorily explain this impression.

Before the study of moving pictures of jumping horses, the rider depended upon still pictures to depict his jumping form. Most still pictures were taken at the top, or near the top, of the jump. He conceived then an image of good form over the jump from these pictures.

Experience demonstrated that on the approach to the jump the rider was seated lightly in the saddle and that, after landing beyond the jump, he was balanced clear of the saddle. At the instant of take-off he felt a distinct thrust.

Not being able to see what actually happened to the rider and his mount at each phase of the action, it was natural for him to assume, from what he could see and the sensations which he felt, that he approached the jump sitting lightly in the saddle, that he was projected clear of the saddle by this thrust he could feel (presumably of the hindquarters), and maintained the latter position until the horse galloped away after landing beyond the obstacle.

Sensations, however, are often deceptive, especially when occurring quickly and in rapid succession. Many horsemen, also, have an erroneous idea of their own actions and frequently contradict their theory by their practice. For example, the instructor may insist on a straight back when jumping and immediately exhibit



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a slumped loin in his own performance; or the polo player may claim that he makes all his strokes with a loose rein, when a hundred witnesses can testify that he often takes support on the mouth when making a difficult shot; or the school-rider may advocate the gallop depart with the inside leg dominant, and consistently use the opposite one unconsciously.

A cursory glance at the accompanying pictures of our five best jump riders shows that none of them, except when directly over the top of the jump, is approaching the position which, according to the above-mentioned theory, he should approximate.

The question then is: Are our five best jump riders riding incorrectly, or is our theory untenable?

I maintain that the riders are jumping correctly as I shall subsequently

endeavor to show, and that, therefore, the theory is inaccurate.

ACTIONS OF THE HORSE OVER THE JUMP

In order to comprehend clearly the reactions of the rider over the jump, we must briefly describe the manner in which the horse projects himself over the obstacle.

As the horse approaches the jump he begins to measure his take-off; he watches the obstacle, and regulates his stride with respect to his speed and the height of the jump.

At the place where he plans his take-off the head and neck are low and the angles of his forehand are closed (Fig. 1). By the quick opening of the angles of the forehand, combined with the projection of his head and neck, he places the mass of his forehand in the line of thrust (Figs. 2, 3, 4, and 5). Note that the forelegs leave the ground successively.

Coincident with the projection of the forehand begins the engagement of the hindquarters. Note that during the muscular effort of the forehand, the hindlegs are clear of the ground. The hindquarters are placed well under the mass, with the hocks extended, the hind feet taking their support at about the same place the fore feet were implanted. The forelegs usually leave the ground at approximately the same time the hindlegs engage, but may entirely clear the ground before the hindlegs come to rest, as may be seen in Figure

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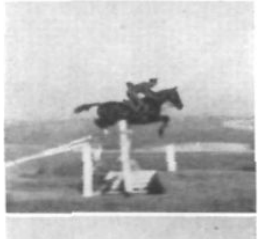

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4, and its enlargement, Figure 4*a*.

The hocks, which were extended on engagement, now flex during the forward movement of the entire mass, thus permitting the projection of the horse over the jump by their subsequent extension (Figs. 5, 6, and 7).

The flexed hocks now suddenly extend, and propel the horse over the obstacle (Figs. 6, 7, 8, and 9).

During his projection over the jump the horse uses several gestures of his head and neck to aid him in clearing the obstacle. For example, to clear the bar with his forehand, he gestures downward with his head and neck, and the mechanical reaction, being equal in intensity and opposite in direction to the direct action, causes the lightening of his forehand (Figs. 8, 9, 10, and 11); conversely, to clear the bar with his hindquarters he gestures upward with his head and neck, which causes the lightening of his hindquarters and hastens the engagement of his forehand (Figs. 13, 14, and 15).

As the horse reaches the ground beyond the jump he receives the mass of his weight initially on the forelegs, which take support successively. This shock is diminished by the progressive closing of the angles of the forehand, and by the gesture downward of his head and neck, which lightens the forehand and hastens the engagement of the hindquarters (Figs. 18, 19, 20, and 21).

Simultaneously with the engagement of the hindquarters, he reaches out with his forelegs and begins the gallop anew (Figs. 20 and 21).

The following is a brief summary of the foregoing:

The horse pushes from the ground with his forehand: the hindlegs, with the hocks extended, engage under the mass; the hocks flex; the hocks extend, projecting him over the jump; he gestures downward with the neck to lighten the forehand: he gestures upward with the neck to lighten the hindquarters; the forehand engages; the hindquarters engage, and the gallop is resumed.

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REACTIONS OF THE RIDER

Let us now consider what happens to the rider as his body responds to the various forces exerted by the horse in his effort over the jump. On the approach to the jump he is sitting lightly in the saddle; his legs are secure, but his upper body, although in balance, is comparatively unstable. The horse, moving at a certain rate of speed, suddenly slackens his forward movement, and the rider's body, owing to its inertia, is displaced forward; at the same time the horse springs from the ground with his forehand, which causes the rider's body to displace vertically, because of the direct action. The results of these two forces are affecting the rider progressively during the engagement of the hindquarters and the flexing of the hocks, and displace him far out in front in the position

shown above. (Note that the knee angle is opened almost to its full extent.)

The horse now projects himself over the obstacle by the sudden extension of his hocks, and the rider's body, because of

inertia, is displaced to the rear (Figs. 9, 10, 11, and 12). Near the top of the jump the rider's body has been displaced back to approximately over the saddle, and we see him in the position shown at bottom of preceding page, which is the one the still-camera usually depicts. This displacement to the rear progressively brings the rider's body back to the saddle, or very close to the saddle, in approximately the same position as that in which he approached the jump (Fig. 15).

The rider, now sitting lightly in the saddle, or very close to the saddle, follows the horse on his descent beyond the jump. Upon gaining contact with the ground the horse suddenly slackens the rate of speed at which he was traveling, by the engagement of his forehand, and the rider's body sinks deeply in the saddle for an instant (Figs. 18 and 19). At the same time the rider's bust is displaced forward, which permits him to maintain his balance at the resumption of the gallop (Figs. 19 and 20).

The rider now being seated deeply in the saddle, the horse releases his forehand to reach out in his next galloping stride, causing the rider's body to be displaced vertically clear of the saddle. This displacement is coincident with the forward displacement just mentioned above, and both correlative forces affect the rider's position at this phase of the action (Figs. 20 and 21). This is the position which the rider maintains for a few strides after landing.

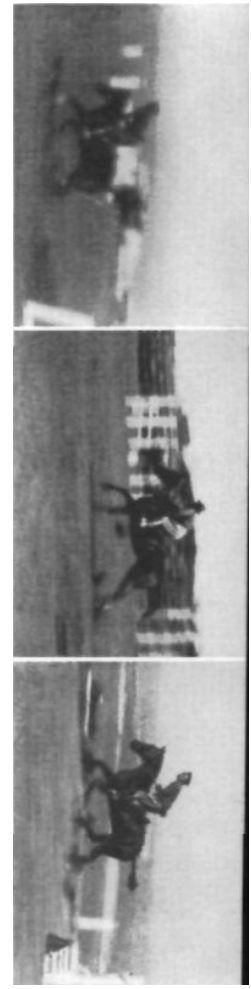
SUMMARY: The rider approaches the jump sitting lightly in the saddle; through inertia and the thrust of the *forehand* he is displaced forward and clear of the saddle; through the thrust of the *hindquarters* he is displaced to the rear; on contact with the ground he sinks deeply in the saddle, and is immediately projected clear of the saddle after contact.

CONCLUSION

The generally accepted theory of what happens to the rider's body over the jump appears inaccurate when studied with the exertions of the horse, and has been an effort on our part to explain what we have felt (or thought we have felt), the events themselves having occurred in so rapid a succession that they could not be observed in detail.

On the contrary, a study of the attached pictures indicates that each rider is reacting at each phase of the jump in a manner similar to that just described above. These reactions appear reasonable when compared with the forces expended by the horse in clearing the obstacle, and confirm Sevy's opinion of "the superiority of observation over sensation as a means of analysis."

Riders, from left to right, Thomson, Argo, Bradford.



Beginning on page 573, flip pages from rear to front to animate these pictures.

COMMAND AND GENERAL STAFF SCHOOL QUARTERLY

Review of Military Literature

This valuable journal, published by the Command and General Staff School, Fort Leavenworth, Kansas, may be obtained from there at the subscription rate of one dollar a year. Its September number contained 207 pages, including a very complete reference list of foreign military journals, and a number of brief reviews. The contents of that number are listed below:

Essentials of Leadership
Field Service Regulations of the Future
The Russo-Polish War, 1919-1920, Part IV
Divergent Principles for Meeting Engagements Based on German and French Regulations
Maneuver and Fire Direction of the 75-mm. Battalion of Division Artillery
The Landing at Anzac
Employment of Motorized Machine Gun Battalions
Motorization in Different Armies
Tank Warfare
Naval Cooperation With the Army
Methods of Antitank Defense
Aviation and Infantry
Creation of Parachute Companies
River Defense
Antitank Defense
Employment of Antitank Weapons
Defense Against Armored Vehicles
Academic Notes
General Terrain Exercise No. 11
General Terrain Exercise No. 12

Convoys At The Crossroads

BY SERGEANT ROBERT E. DORSEY

Headquarters Battery, Sixth FA Brigade

EDITORIAL NOTE: *When Major W. C. Dunckel, FA, was made A.C.S., G-4, VI Corps, during the Second Army maneuvers in the Allegan, Michigan, area last summer, he had Captain W. F. Millice, FA, as Corps MTO, and Sergeant Robert Dorsey as Chief Transportation Clerk. Sergeant Dorsey's board, described herein, was the main factor in their control of a hundred motor convoys. Writes Major Dunckel, "Interferences and traffic jams were never encountered under this system, and truck trains arrived and departed with clear and open roads."*

THE mission which prompted the development of the convoy Control Board, used by the G-4 Section, was given me by Major Dunckel, G-4, prior to arrival in the maneuver area. This mission was to be able to ascertain where the head of each convoy as scheduled in Annex No. 1 to Administrative Order No. 1, VI Corps, would be at any given period, to provide for control when, because of delays or changes in schedules, an interference would be likely.

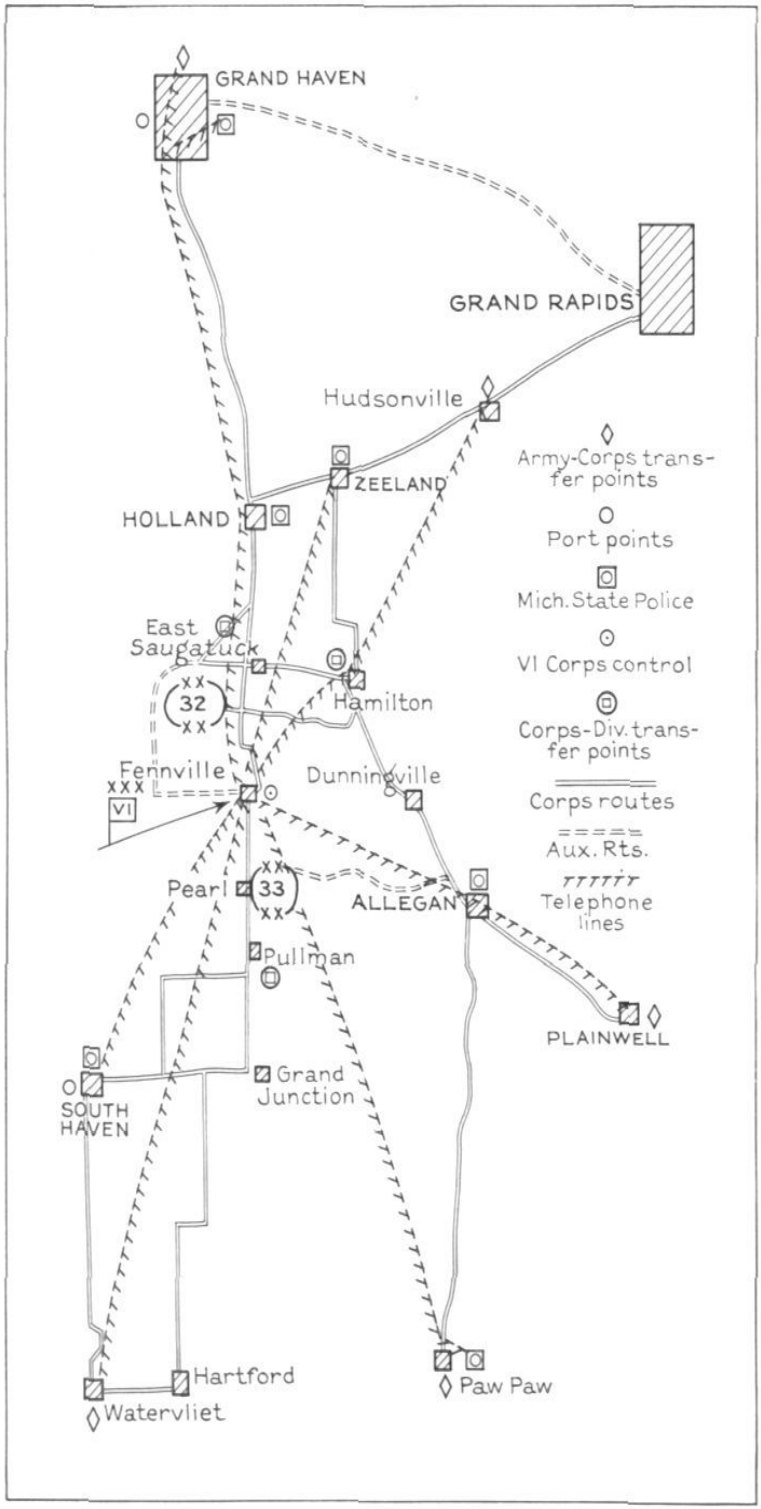
The directive, issued by this headquarters, prescribed that all convoys would travel at a speed of 25 miles per hour with an interval, between vehicles, of 40 yards. Schedules of movement from Army to Corps transfer points were provided by Army. Our schedules were shown in Annex No. 1 to Administrative Order No. 1, VI Corps, prescribing routes to be used and Corps-to-Division transfer points within the Corps Boundary.

Each convoy was therefore on a time-and-space control basis from the time it passed each transfer point, whether in or out.

Route assignments had been made and lettered, for quick reference. In addition to the normal routes in and out of the Area, all other automotive routes were also so designated.

Each convoy commander, either Corps or National Guard, received his route designation from this headquarters prior to departure. As his convoy reached Army-to-Corps transfer points and Corps-to-Division transfer points officer-control station personnel again designated his route if called upon to do so.

This country was strange to practically every convoy commander and, outside of knowing the eventual destination, the convoy



Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

was traveling in unknown country. There was no instance of a convoy losing the route assigned.

During the times that the Corps convoys were operating from the debarkation areas to concentration areas their paths were being crossed and recrossed continually by National Guard convoys, usually on narrow roads, where intersections were hidden by trees and undergrowth. There was no instance of an interference at this time or during the entire maneuver, although on 8-9 August there were times when clearances were as small as ten minutes at road intersections, and many serious conflicts were prevented.

The Control Board was set up at Fennville, Michigan, the VI Corps' initial Headquarters. This board was constructed and operated as follows:

A sketch was made on a scale of two inches to one mile of the entire VI Corps zone. On this board all roads to be used by motor convoys were shown. Upon these roads were also shown the army, corps, and division transfer points. In connection with the operation of this map, a smaller one showing all highways in the zone was used; so as to be able to make rapid computation of time and space factors where necessary to reroute or to hold a convoy in order to avoid conflict with another.

Red and green tabs were used to represent the National Guard and Corps convoys respectively, and on each tab was placed the serial number of the convoy it represented. A thumbtack was placed through one end of the tab for attaching to the map. The tack represented the head of the convoy, the tail being represented by the tab, whose length represented the "time length" of the convoy.

Telephone communication was established with all of the army transfer and port points. These transfer and port points were under the command of an officer with the necessary military police to carry out his orders and control traffic. At the port points the port officer was also in complete command of the debarking and entrucking of troops, this being necessary for their speedy departure. The Control Board personnel also had communication with the Michigan State Police at various points along the routes.

Transfer points and port officers were given orders to hold any

convoys reporting into their respective points if more than ten minutes late or early, and phone the Control Board for disposition. Also, they were instructed to keep a record of the time all convoys passed their points, to call in for disposition on a late or early convoy, to report the times of convoys that had passed their point, and report any convoys which had not arrived since last calling, thus eliminating the necessity of making a call to the control board on every convoy.

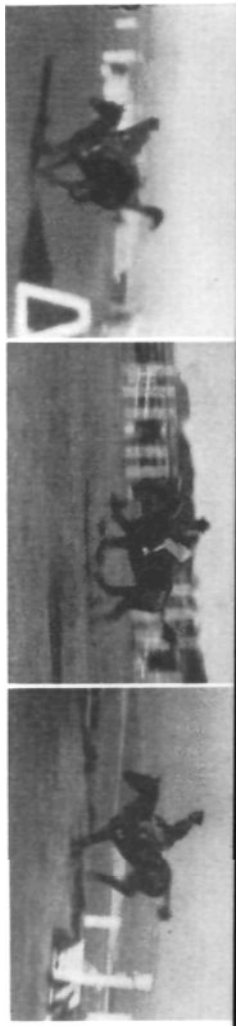
The dispatcher at the control board, by constant consultation of the schedule, would find the proper time for a convoy to enter the Corps Zone, and would then take the tab bearing the convoy's serial number and place it on the map at the location of entry. By knowing the speed the convoy was traveling in the VI Corps zone, the tab was moved on the map to show the location of the convoy, every 15 minutes. It was found by checking with the communication points, during the movement, that the tabs on the map were, at all times, within one mile of the actual convoy on the road!

It was necessary to reroute or to hold several convoys and this was able to be done with rapid dispatch by this system, without having any conflicts or confusion. It might be said that the varied number of problems that arose during this movement put the Control Board to an extreme test for efficiency.

The first debarking and entrucking of troops was scheduled on 8 August, in South Haven, at 4:30 AM. At 4:15 the dispatcher was notified by the port officer that the boat would be from one to two hours late. At first this presented no serious problem, as his convoy of one hundred sixty-three trucks was not scheduled for a return trip until afternoon and no convoys were scheduled to use the routes of this convoy until noon. The boat docked at South Haven an hour and fifteen minutes late: the troops were partially entrucked and the head of the convoy was moving out, when the dispatcher received a call from the Army transfer point officer at Watervliet that a convoy of eighty-two trucks was at his station six hours earlier than scheduled!

This convoy at Watervliet had previously been routed through South Haven, but to have sent it on through now would have

Riders, from left to right, Thomson, Argo, Bradford.



Beginning on page 573, flip pages from rear to front to animate these pictures.

resulted in serious interference because it would have conflicted with the larger convoy already moving through this town. The dispatcher immediately consulted his smaller map, picked out a new route, and then consulted his control board to determine whether the larger convoy would conflict in any way with the new routing of the Watervliet convoy. Finding that it would not, he issued orders to the Watervliet officer to release the ahead-of-schedule convoy at once, giving it its new route and ordering it to give right-of-way to any convoys it might meet. The time that elapsed while computing this new route and issuing the new orders took two minutes; the Watervliet convoy was held at the Army transfer point a total of eight minutes.

In another case a convoy commander called the control, that he had had to leave a truck sitting on the road because of the lack of necessary tools to repair it. The commander was unable to give the location of the truck, but he did know the time at which the truck had dropped out of the convoy. The dispatcher, with this information, was able to locate the approximate place where the truck would be located, and sent a mechanic there. The mechanic later reported he found the truck at the exact location given.

Another convoy was en route in the corps zone, when it came upon a bridge which the convoy commander considered unsafe for his heavily laden trucks, although it had been approved by the Army engineers. He instructed his trucks to turn back to the first town they came to. While his convoy was doing this he called the dispatcher, informing him of his difficulty. The dispatcher consulted his small map for the new route to be given and having decided upon this route, consulted the Control Board, called the commander, giving him a new routing, and immediately called the State Police at the closest point to the convoy asking protection for this convoy over the new route. This was granted, and the police were with the convoy ten minutes after it had again started. The dispatcher's next action was to ask the 33d Division, through whose area the convoy had to pass, to furnish right-of-way through that area. This convoy arrived at its destination five minutes late, taking into consideration the additional miles travelled through rerouting. Time for the dispatcher to

issue orders and reroute convoy was approximately three minutes; time for opening of roads and getting the necessary police protection, about fifteen minutes.

Several times, late incoming convoys were held at Army transfer points, or released immediately, with instructions as to the average speed they should maintain through the zone so as to prevent jamming at Corps-to-Division points. This was extremely important when outgoing convoys were at Division transfer points or leaving the concentration areas, for return trips. The dispatcher could readily have handled this intricate problem by a glance at his Control Board.

One convoy completely lost four trucks. Those were stopped at the Army transfer point at Grand Haven and the dispatcher was able to reroute these trucks and have them at their destination in time to join their convoy.

It would have been advisable to have had telephone communication with other points along all routes and at concentration areas. This communication would have made it possible for the dispatcher to have known when outgoing convoys left their point of origin. This was accomplished during this movement in a meager way by phoning the Divisions for this information.

If the Control Board system is properly operated it will show at all times the location of every convoy; providing, of course, that convoy commanders comply with the directions previously issued as to speed and interval.

A more extensive study of this system and more technical development of its communication control, should provide all future convoy movements with the accurate control of a railroad dispatch system.

FA ROTC at Texas A and M is looking for large wall charts, blueprints, schematic diagrams, and the like, of field artillery materiel. . . . 106th FA leads August standing of attendance in New York Guard. . . . And 2d Bn, 144th FA, of California, leads September standing in California. . . .

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

Over Hill, Over Dale, Over Airwave

BY CAPTAIN MICHAEL V. GANNON, *FA*

SAD news for certain radio sponsors is contained in the announcement that Colonel Edmund L. Gruber, Field Artillery, the author and composer of the Caisson Song, has secured a copyright of his air, and that henceforth it will not be available to the manufacturers who had paid its catchy rhythm the sincere flattery of adoption as theme songs for advertising their products.

These sponsors, of course, were well within their legal rights in the use of any song or air as long as it was not copyrighted. But, just as college men, were they to hear their alma mater, or fraternity hymn, sung to silly words, would feel uncomfortable (to say the least), so field artillerymen everywhere resented commercial use of the song. No one could copyright the air, thus to protect its use, but Colonel Gruber. He had taken no steps to do so, because, as he explains, "I wished to maintain my amateur standing." But the continued abuse of the song overcame this reluctance, and through the granting of the copyright the field artillery now is assured, it is hoped, the safeguarding of a well-loved portion of its tradition.

The feeling wagonsoldiers hold for this stirring song, whose "Keep 'Em Rolling!" is the artilleryman's "Let's Go!" had been voiced in complaint, both written and verbal, to the office of the Chief of Field Artillery, that the Caisson Song was the field artillery's, and why were others using it? But, while appreciation of the sentiment prompting these complaints was not wanting, it was felt that perhaps the feeling was restricted to so comparatively few individuals as not to warrant protest. It was the indignation of a young second lieutenant of Field Artillery Reserve, expressed in a letter to the Chief, that showed how strongly he was imbued with the spirit of an arm to whose traditions he had been so recently exposed. And showed, too, that not alone regulars, but their brothers in the other components, felt they were being deprived of something peculiarly their own.

It must have been, then, with a sense of pride in his officers and men that General Birnie wrote, under date of September 28,

1934, the following letter to each of the presidents of the two firms involved:

"My dear Sir:

"Some twenty-six years ago last March a group of field artillery officers on duty with the 5th U. S. Field Artillery at Camp Stotsenburg, P. I., conceived the idea of writing a regimental song to be used in celebrating the occasion when the 1st Battalion from the States came out to relieve the 2d Battalion in the Philippine Islands.

"Amongst these officers was a musical genius, Lieutenant E. L. Gruber, who, while at West Point, had composed most of the music used in the cadet dramatics of his day. Naturally, this group of young officers looked to Gruber to write something that could fittingly be used to mark this very auspicious occasion.

"Thus it was that Gruber, strumming a guitar, and the other officers, encouraging him with suggestions and with words for the song, wrote, while on service in the tropics, what is now known as 'The Field Artillery Song,' or 'The Caisson Song.' It was first sung by about 12 officers of the 5th Field Artillery at the Officers' Club, Camp Stotsenburg, P. I., on the occasion above indicated. It was a hit from that night on.

"Composed as a 5th Field Artillery song, its catchy, swinging air soon won its adoption in every field artillery regiment in the Army. When the World War came, it was quickly picked up by, and voiced the spirit of, the American Field Artillery and as such became a familiar and inspiring battle song and air, and came to be known and loved literally by millions of American officers and men.

"With such a background of its history, I believe you can well appreciate the emotional regard in which this song is held by the Field Artillery—not only Regular Army, but National Guard and Reserve as well, and by all veteran organizations of the country. This accounts for the many protests, vocal and written, which have been received by this office over the fact that your company, and one other, in your programs over the radio, are deeply offending the sensibilities of all who love the Field Artillery Song by the use to which it is thus being put.

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

"I am writing you therefore in behalf of the whole Field Artillery to express the sincere and earnest request that your company refrain, in the future, from the use which it is presently making of the music of this song.

"Trusting to your proper appreciation of my position in this matter, and with highest regard, I am,

"Very sincerely yours,
U. BIRNIE, JR.,
Major General, U. S. Army,
Chief of Field Artillery."

Dated October 2, 1934, one of the recipients of this letter wrote that his firm would write their advertising representatives with regard to the matter, and included the following statement:

"It is regrettable that you did not write to us earlier than this, because the '———————— Song' has become very popular, both the tune and the words, with radio listeners, and our program has become identified by it."

Nothing was heard from the advertising representatives.

The other firm replied:

"Dear General Birnie:

"Replying to yours of the 20th ult, would advise that the request made therein is so presented that we should like very much to comply with same. The situation, however, is one that makes it seem very sacrificial on our part to respect the wishes which you voice.

"For many years we have used the tune of 'The Field Artillery March' as the theme song for our sales organization, which has now extended pretty much the world around.

"For many years, each morning, in practically every city of this land, and in the important cities throughout the world where sales organizations are maintained, this theme song is sung for the opening of the sessions. It seemingly is as much a part of our organization now as is any other feature, and to give it up would surely mean a real sacrifice, and demand an explanation that might seem embarrassing.

"In the great battles that are being waged by sales organizations such as our own, to help sell the country back into the more normal and more prosperous conditions, it would seem that every contribution of every kind that can be made should be willingly offered, and if the tune of 'The Field Artillery March' can be used to help marshall sales organizations into an increased enthusiasm and activity, it seems a very worth-while use to make of it, and a contribution on the part of the War Department, such as should carry some appeal.

"Most sales organizations now use the song method for the development of real enthusiasm and spirit, and make adaptations of songs and tunes of every kind that may be used to advantage. I am sure, if you were to hear ———— organizations sing, you would appreciate the great good that is done in this way.

"Concerning the radio broadcasting, which, at the moment, we are doing, would advise that the greatest good we feel we get from same is the encouragement it offers ———— salesmen to continue and enlarge their efforts under the present and very trying sales conditions.

"No part of the program means as much to them as their own theme song, and which for so many years we have been so enthusiastically singing.

"Am in hopes that you can appreciate our position in this matter, and that under existing conditions you may see your way clear to remove from your own thinking the objections you have voiced in connection with our making use of this very inspiring tune, feeling that in so doing you are helping in the warfare that is now being so heroically waged by sales organizations such as our own, in the struggle to help improve the present economic situation.

"Respectfully," etc.

The War Department, of course, was not involved. The song was Colonel Gruber's production: it is, and will be, the common heritage of his fellow wagon-soldiers.

(It is said that the guitar mentioned in General Birnie's letter was that of the then Lieutenant William J. Bryden. When someone suggested that the Field Artillery Museum at Fort Sill be

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

the proper repository of an instrument with such historic association, it was recalled that it lies on the bottom ooze, somewhere in mid-Pacific, probably beyond the power of dredging operations to recover.)

When Sousa, the March King, incorporated the air into a series of patriotic marches during the war, he was under the impression, it is said, that it was a folk song, and had no idea it had been so recently composed. The many steps necessary to be taken to verify the authorship, and to secure the cooperation of Mr. Myer, the West Point organist, who had published an arrangement: of Lieutenant Philip Egner, who had included it in an army song book; and of the publishers of other scores, Mr. Carl Fischer, and the Shapiro company, now have been completed.

The Shapiro company has since published, with the Gruber copyright, a piano score for voice, and an orchestral arrangement in the modern manner; and a military-band score is in process of publication.

These are all "official" versions, which have Colonel Gruber's approval, incorporating the original words and harmonies, since somewhat distorted by time, and passage through many hands—and ears.

At any rate, radio listeners, *from now on*, when they hear the Field Artillery Song, may recall the picture presented to the composer when the lilting motif of his air was first inspired—morning dew on the hills and dales of the Pampanga Valley—the beckoning road—the good companion, boot-to-boot—a bugle call ahead; behind, the guidon whipping in the dust churned by the wheels of the rolling caissons.

The Nineteenth goes to the Campus

MR. TAXPAYER is getting a chance to see what he pays for when he maintains the field artillery. Its new trucks are bringing the arm before the people and inviting them to inspect it for quality. Prominent in the growing movement to combine training and instruction with this display is the First Battalion, Nineteenth Field Artillery (75-mm. guns, TD), Fort Benjamin Harrison, Indiana, whose commanding officer, Lieutenant Colonel Philip Hayes, FA, has sent his batteries to demonstrate before practically all field artillery ROTC units in the Fifth Corps Area within the past year.

Here the students are given demonstrations; the citizens are invited to make showdown inspections; to view the mess in action; to witness the care taken of the materiel and equipment; to watch soldiers at the stirring ceremonies of guard mount and Retreat, when nightly they show their devotion to the Color, and the national principles it represents.

The soldiers take pride in exhibiting their skill and attainments, and performance of the responsibility with which the citizens have charged them.

And the citizens respond to the opportunity thus offered them with feeling well manifested in the letters the unit has received.

For example, Battery A, Captain Frederick H. Black commanding, visited Eastern Kentucky State Teachers College September 24th. Its demonstration there evoked the following letter from the college president to the post commander:

EASTERN KENTUCKY STATE TEACHERS COLLEGE

Office of the President
Richmond, Ky.

September 30, 1936.

Brigadier-General William K. Naylor,
Commanding General, Ft. Harrison,
Indianapolis, Indiana.

MY DEAR GENERAL NAYLOR:

Battery A of the 19th Field Artillery, commanded by Captain Black, came to our college on September 24 and gave us one of the most remarkable demonstrations I have ever witnessed in

Riders, from left to right, Thomson, Argo, Bradford.

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connection with any army maneuver. An audience of over 2,000 witnessed the demonstration and were thrilled with the skill and ability of this organization. It was a genuine pleasure to have Captain Black come to our college and show the men in our new R.O.T.C. unit something of the work which they have before them.

I want to congratulate you upon this battery. I was greatly pleased with Captain Black and his men. This is an organization of which I am sure you are very proud. If all batteries of Field Artillery are as efficient as this one, we certainly have an army in which all citizens can take pride.

Let me thank you for permitting this battery to come to our college and give such a splendid demonstration before our new R.O.T.C. unit.

Cordially yours,
H. L. DONOVAN,
President.

And to this was added a letter to the corps-area commander by Major Charles W. Gallaher, FA, P.M.S. and T. at the college, who wrote, in part:

"The comments freely made among the large crowd of students, faculty members, and townspeople who witnessed this performance were not only favorable, but were highly enthusiastic. Faultless precision of movement, impressive speed in action, and a superior degree of quiet self-confidence were noted.

"Beyond this, the splendid appearance of the men, dignified and soldierly, was remarked on all sides. Dr. H. L. Donovan, President of the college, stated that in a recent tour of the capitals of Europe, he saw no body of troops composed of such a high type of men. It is felt that the prestige of the Regular Army in this vicinity has been tremendously enhanced by this visit."

This demonstration had consisted of:

1. Entry into action from column on the road.
2. Brief RSOP, consisting of:
   Wire, visual, and messenger communication.
   Service of the piece.
   Indirect and direct laying.
   Antiaircraft defense.
   Gas defense.

3. March order.
4. Bivouac with display of full field equipment.
5. Guard Mount.
6. Retreat formation.
7. Supper.

On September 16th, Battery B, Captain Robert C. Ross commanding, had visited Xavier University at Cincinnati, and given the following demonstration:

1. Parade around stadium.
2. RSOP.
3. Communication net.
4. Service of the piece.
5. Antiaircraft defense.
6. Gas defense.
7. March order.
8. Full field inspection.
9. Informal guard mount and posting of sentries.
10. Battery equipment displayed for inspection.

And the letters which follow illustrate the enthusiasm with which this demonstration was received:

XAVIER UNIVERSITY
Cincinnati, Ohio.

September 24, 1936.

General William E. Cole,
Headquarters, Fifth Corps Area,
Fort Hayes, Columbus, Ohio.

DEAR GENERAL COLE:

Ever since your very encouraging letter came to me I have been wanting to answer it; and I have been the more anxious to write you since the Opening Day ceremonies last week. I tried to tell Colonel Fuller how much I appreciated all you have done for us, and asked him to convey to you my deepest gratitude. The assistance we received was splendid.

With that guarantee it was no surprise that the ceremonies that evening came off perfectly. It is true that the rain put a damper on the large attendance we expected; but the four thousand or more who braved the elements were visibly delighted with the entire performance. I am hearing favorable echoes of it

Riders, from left to right, Thomson, Argo, Bradford.

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every day. No wonder; for the company of Infantry with their band from Fort Thomas were the last word in their drills, the battery from Fort Benjamin Harrison, Indiana, put on a real show, the officers in our sister university and the Reserve Officers of Hamilton County turned out in goodly numbers and even our own cadets, though less than a day old, were able to "right dress" and looked very attractive in their natty uniforms. Everyone was well pleased with the spectacle. I believe it helped a great deal to get our unit off to a good start. I realize its success was chiefly due to your kindly officers, and I am sure that St. Xavier, faculty and students, will do all in their power to live up to the high expectations you have of our unit as so graciously expressed by Colonel Fuller that evening.

With kindest regards and a heart full of gratitude, I am

Very gratefully yours,

DENNIS BURNS, S.J.,

President.

XAVIER UNIVERSITY

Cincinnati, Ohio.

Hinkle Hall September 24, 1936.

Captain R. C. Ross
19th Field Artillery
Fort Knox, Kentucky.

DEAR CAPTAIN ROSS:

Please do not interpret my tardiness in writing to you as a measure of my appreciation of the great favor you conferred upon last week. At the opening of the school year I am simply swamped with work; but I have been wanting to write to you every day.

You may tell your officers and men that the great show they put on for us is the talk of the town. When I go down town people comment on it. Every cadet in our unit wants to be like the men in your battery. And, of course, you know what I think of the Field Artillery in general and a certain battery in particular.

You will be pleased to hear that we took our first football game in easy stride, twenty to nothing. Tomorrow night will be a tougher order; for the University of Kentucky appears to have a powerful team this year. I wish yourself and Lieutenants Cato, Peters, Reid and Sheerin, in fact all of your men, could be with us for tomorrow's game.

With kindest personal regards to yourself and to them, I am

Gratefully yours,

DENNIS BURNS, S.J.,

President.

Then, on October 23 and 24, 1936. Headquarters Battery and Combat Train (Captain H. C. Fowler) of the battalion made a trip to Ohio State University at Columbus, accompanied by Battery B, and gave a demonstration similar to the others, but featuring the battalion communication and command set-up, and combined AA defense, in which blank ammunition was fired. This was followed by formation for inspection by the spectators.

Colonel G. L. Townsend. Infantry, P.M.S. and T. at Ohio State, wrote of "the soldierly bearing of the organizations," and of the "businesslike manner in which they staged the demonstration for the students."

Photo by Kirkpatrick, Indianapolis

BATTERY B. 1ST BATTALION, 19TH FIELD ARTILLERY—OUT CALLING

In the near future, Colonel Hayes plans to march the battalion to Purdue University. He believes that these visits not only afford the ROTC students instructional value of high order, but that they give his batteries training in march discipline, military bearing, neatness of appearance; indeed, all the attributes of proper soldiers and artillerymen.

Because of the comparative ease with which such demonstrations can be made by truck-drawn units, he commends them to the attention of other similarly equipped organizations.

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The Winds That Blow

BY COLONEL JOSEPH W. KELLER, *310th Field Artillery*

MANIFESTLY, knowledge of the weather is of incalculable value to all men and nations of all times, since it affects practically every activity of man. An unscientific wag has said that the ancestor of all cross-eyed men was a hairy ancient who, as he emerged from his cave, cast one eye at the heavens to observe the weather and one at the ground to detect enemies or locate food. At any event, this mythical fellow was aware of the paramount importance of the study of weather. Clay tablets dating back over 6,000 years record weather study; Aristotle wrote a whole treatise on it; but real scientific study dates from the invention of the thermometer and barometer in 1590 and 1643 respectively. Today governments cooperate on weather information to a degree that is rivaled only by postal work, and official and private expeditions, such as Admiral Byrd's, have actually traveled to the earth's poles mainly to study weather.

In military work, meteorological knowledge is of rapidly growing importance. To the field artilleryman, "who must know every other soldier's business and be able to do it better," an understanding of weather factors is more vital than to any other, with the possible exception of the chemical warfare and air services.

It is self-evident that space is not available here for even a skeletonized study of the six elements of weather—temperature, pressure, wind, humidity, clouds, and precipitation. But, it is the author's hope that the few following brief and simplified facts concerning just one familiar subject—the wind—may serve to stimulate a little further interest and study on the part of the reader.

Wind may be defined as air in motion near the earth's surface and nearly parallel to it. All other motions of masses of air are spoken of as air currents. Wind is measured as to velocity or pressure by instruments known as anemometers. Seamen quite frequently measure the wind's force by Beaufort's scale, wherein

0 equals a calm, and 12 a hurricane. The various classes, by this method, are calm, faint air, light air, light breeze, moderate breeze, fresh breeze, strong breeze, moderate gale, fresh gale, strong gale, whole gale, storm, and hurricane. For the soldier, it is well for him to know that both velocity and the direction of a wind may be affected by altitude, terrain, obstruction, and time of day. Velocities increase rapidly in the first few hundred feet upward from the earth's surface, as observing smoke or flying a kite will demonstrate. Near the surface, friction and obstructions cause eddies and intermingling of air masses. Buildings increase velocity near them and cause gusts, as shown by snow drifts about them in winter. Air also tends to flow along valleys. Owing to convection, the heaviest wind velocities usually occur during the day, particularly from noon to 4 PM, and are lowest in the night, with the least just before sunrise. That is why this period just before dawn is the favorite time for gas attacks, in which type of warfare wind is probably the most important of all meteorological considerations. Convection occurs through the air near the ground becoming heated from it, and as the warm air rises, the higher-velocity air of the upper atmosphere rushes in to take its place. With darkness and the lower temperatures of night, convection is, naturally, lessened.

As a practical military scale for judging wind velocities, the army commonly uses the following:

Miles per hour

0	No perceptible movement of anything.
0 to 4	Just moves leaves of a tree.
4 to 12	This moves the branches of a tree, and blows up dry leaves on the ground.
12 to 22	This sways the branches of trees and blows up dust.
22 to 32	This sways whole trees, blows twigs, and hinders walking somewhat.
32 to 72	This breaks small branches and hinders walking decidedly.
72 on	This brings about more or less complete destruction of everything in its path.

Winds of less than 4 miles an hour are likely to be uncertain

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and may change quickly. However, to a certain point increasing velocity usually indicates likely persistence of direction. The importance of this mite of knowledge in connection with the use of nonpersistent gas agents and smoke is self-apparent.

The direction of the wind is described in terms of that from which it comes. Thus, an "east wind" comes from the east and moves toward the west. In military work it is also a frequent practice to describe wind direction by imagining oneself standing in the center of a clock dial facing the target at 12 o'clock. The wind direction is then described in terms of the clock dial. Thus, a wind from the direct right would be designated as a "3 o'clock wind." Likewise, the magnetic azimuth of winds is sometimes used to designate their direction, and true north, as 6,400 mils, is the origin of measurement for the artillery metro message. The direction from which the wind comes is spoken of as "windward," the direction toward which it goes as "leeward." When a wind changes direction clockwise, it is said to "veer"; counterclockwise, to "back."

Winds of the earth are sometimes classified as constant, periodical, and variable. The best known "constant winds" are the so-called "trade winds." The equatorial zone, being most highly heated by the sun, causes the air to flow upward. This, in turn, causes the replacing surface winds to flow in from the higher latitudes on either side. Were the earth not turning, such winds would flow from the north toward the equator in the northern hemisphere and from the south in the southern hemisphere. However, as this planet rotates eastward with its heaviest surface velocity at the equator, the winds flowing toward the more rapidly traveling equatorial zone lag slightly. Thus, the trade winds in the northern hemisphere are northeast winds and in the southern hemisphere southeast. Because of their use to navigation, these winds are called "trade winds" and the calm belt at the equator is called the "doldrums." Because of the heat of the area, there are other tropical areas of calm (around a 30 degree latitude) frequently called "horse latitudes," since the becalmed sailing vessels frequently had to throw horses overboard in such regions in order to conserve water supplies. The ascending current from the

equator divides in the upper atmosphere and flows poleward. Trade winds cover about half of the earth's area and they often blow continuously for a week or more. Winds flowing poleward from the horse latitudes are called "prevailing westerlies." In the general use of gas during the late war and particularly on their initial gas attack, the Germans were often at a considerable disadvantage because Continental Europe lies in the prevailing westerly region where the winds were more apt to favor the Allies.

"Periodical winds" are well typified by daily land and sea breezes or mountain and valley breezes. Since land surface heats and cools more readily than water, the sun, heating the earth, causes air to rise rapidly during the day and the cooler air over the sea flows in to take its place. This causes the so-called "sea breezes" from the ocean. They usually extend only a few miles inland and start about the middle of the morning, increasing until 2 or 3 PM, roughly paralleling the intensity of the sun. At about sunset the sea breeze usually dies out and, as the land continues to cool, the operation is reversed, a light land breeze setting in during the night. Mountain and valley breezes occur because during the night, as the land cools, the air in contact with it cools, becomes denser, or heavier, and flows down into the valleys from a few hours after sunset. During the day, the heated air of the valleys flows up the hills, reversing the process. It is on a careful study of such convectional currents that the art of air gliding has become so highly developed. This knowledge of air currents of mountain regions also has many very practical military applications. For instance, in the selection of camp sites or the planning of the use of, or defense against gas.

"Variable winds" depend on local or temporary causes, such as vegetation, shape of terrain, vicinity of bodies of water, passage of storms and various other reasons. The *simoon, sirocco, solano, bora, gregale, puna, purga*, and *mistral* of foreign lands have their counterparts in the blizzards, hurricanes, tornadoes and other wind phenomena of our own land. The general circulation of the air is not a simple system of steady upper and lower winds, as it should be realized that the variable or local winds are always factors that must be considered.

Riders, from left to right, Thomson, Argo, Bradford.

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It will be noted with all the foregoing that two other meteorological elements—temperature and pressure—are inextricably associated with winds. If you will examine the weather map of the United States you will note areas marked "Low," bounded by closed lines called "isobars" which pass through points of equal barometric pressure. That they are roughly circular or oval in form would lead us to expect that the winds involved are cyclonic (circular) in arrangement, and this is the case. Lows are simply extratropical cyclones and may originate anywhere. In this country they usually move in a general eastward and slightly poleward course due to prevailing winds and at an average velocity of about 30 miles an hour. Lows move about twice as fast in winter as in summer. The action of the wind in connection with a low is usually typical and is important knowledge. Presuming we were in the line of the relative center of passage of a low, we would probably first note its approach when the barometer began to fall and a gentle east wind set in and began to veer to the southeast at an increasing velocity. As the pressure continued to drop the veering would increase, as would precipitation. We would then note that the veering of the wind continued and the velocity and precipitation slightly decreases as the wind reaches the south and southwest and the low passes. Then, as the barometer continued to rise, the veering would continue and the wind gradually increase velocity again as it veered from southwest to northwest. Were we off to one side of the center of the low, the sequence of the wind would, of course, be somewhat different. How often have we seen one of these commonly called "weather changes" without realizing just how the wind performed or how a knowledge of it might aid us in formulating military plans? The time of passage of the average low is usually from 2 to 4 days in winter and much faster in summer, but it, of course, may take a much longer period at any time.

Of course, between "lows" there are "highs," that is, areas with relatively high barometric pressures, generally characterized by outflowing, spiral, clockwise winds in our northern hemisphere and with their general characteristics the exact opposite of "lows." "Highs" are usually much larger areas than "lows," with clearer weather and winds of lower velocity.

And so, we might go on for a long time and in great detail illustrate the various practical military problems in which a better knowledge of the many basic principles thus outlined would aid tremendously in the planning or execution. But, whatever has been said in this brief and incompletely qualified way, the purpose has not been to educate, but, rather, to indicate that the wind, like other elements, is explainable, is governed by fixed and known principles, and that the officer making a more detailed study of meteorological matters is commendably adding to his professional knowledge and is infinitely better able to plan his tactics, protect his command, and defend his position, because to be "forewarned is forearmed."

Lubricant Classification at Schofield Barracks

From Daily Information Sheet, Schofield Barracks, T. H., October 5, 1936: "*Lubricating Oil, Motor Vehicles. a*. The following are the item and symbol numbers corresponding to the numbers used commercially for identifying lubrication engine and transmission oils for motor vehicles procured under the Navy Contract:

NAVY SYMBOLS AND S.A.E. NUMBERS

Navy Contract		Commercial Identification or S.A.E. Number	
Item No.	Symbol No.	For engine	For transmission
6	3050	20	
6	3050	20W	
7	3065	30	
11	1080	40	
12	1100	50	
13	1120	60	
14	1150	70	
7	3065		80
12	1100		90
14	1150		110
18	5190		160

To determine the proper S.A.E. number for the various makes of motor vehicles, the instructions contained in Manufacturers' Instruction Books should be taken as a guide."

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Special Notice

U. S. Field Artillery Association Prize Essay, 1937

AN annual prize of $300.00 is offered by the United States Field Artillery Association for the best essay submitted by any Field Artillery officer of the Regular Army, National Guard or Reserve Corps on any subject of current interest pertaining to the Field Artillery.

The following rules will govern this competition:

(1) The award of prize to be made by a committee of three members to be nominated by the President of the Field Artillery Association voting by ballot and without knowledge of the competitors or of each other's vote.

(2) Each competitor shall send his essay to the Secretary-Treasurer of the Association in a sealed envelope marked "Prize Essay Contest." The name of the writer shall not appear on the essay, but instead thereof a motto. Accompanying the essay a separate sealed envelope will be sent to the Secretary-Treasurer, with the motto on the outside and the writer's name and motto inside. This envelope will not be opened until after the decision of the Committee.

(3) Essays must be received on or before January 1, 1937. Announcement of award will be made as soon as practicable after that date.

(4) The essay awarded the "United States Field Artillery Association Prize" will be published in the FIELD ARTILLERY JOURNAL as soon as practicable. Essays not awarded the prize may be accepted for publication in the FIELD ARTILLERY JOURNAL at the discretion of the editor and the writers of such articles shall be compensated at the established rate for articles not submitted in competition.

(5) Essays should be limited to 8,000 words, but shorter articles will receive equal consideration.

(6) All essays must be typewritten, double spaced, and submitted in triplicate.

Dust for Simulated Bursts

By 1st SGT. JOHN C. HOOKER, *Hq. Btry., 1st Bn., 17th FA.*
(Photographs by Pvt. John U. Fisher)

EDITORIAL NOTE: *The July-August, 1936, number of the Coast Artillery Journal contained an article by Captain C. M. Conzelman, CAC, on the use of a "sand spotting" range for training observers. The application of a somewhat similar method to field artillery training would appear to have particular value where the terrain is available, but not the materiel. Visual communication—auto headlights, for example—might substitute for radio or wire. Liberties have been taken with the data in the type problem herewith, to the extent that they now accord with those in ST 101, "Abbreviated Firing Tables," which is in the hands of many extension-course students who may wish to avail themselves of this form of simulated fire.*

THIS method of producing simulated bursts is believed to be sufficiently valuable as a medium of instruction to warrant publication. Tests at Fort Bragg have resulted in this system being used extensively by the Seventeenth Field Artillery for the training of reserve officers and noncommissioned officers in all phases of observation of fire. The outstanding feature is the realism of the reproduced conditions: the cost is nothing.

The idea is this: An artificial burst is made, which the student views from an actual OP, and this burst is caused to move according to his commands sent to the battery (target detail) by telephone or radio. The making of the burst itself, and the mechanics of moving it, are. I believe, new to the field artillery, although the Coast Artillery has been using a somewhat similar method for some time. Attention is invited to the photographs accompanying this article, illustrative of the appearance of the bursts.

Heretofore, in smoke-puff practice and similar methods, the bursts were made by the explosion of black powder or flashlight powder, and it apparently hadn't occurred to anyone to use that commonest of all substances in the field—dust. Dust, when thrown into the air by hand or with a shovel, forms a cloud which is remarkably realistic: for percussion bursts it is thrown from the ground level with a scattering motion, while for air bursts it is thrown high, in a wad, and with practice the puff can be made to appear at any height up to ten yards. In wet weather, or when for any reason dust is not readily obtainable, ordinary lime may be used. Dust and lime are equally suitable; in one of the photographs lime was used, and in the others, dust.

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

The use of the dust burst for instruction in the field is its primary purpose and by far the most valuable application, though it has other uses. For instance, photographs of the burst may be used in the classroom to introduce the student to terrain sensings. It is believed that no system of practice, other than the firing of ammunition, comes anywhere near this method in teaching the student conduct of fire. All conditions encountered in the field are reproduced accurately and realistically. The training value extends to all members of the detail required to man the set-up, since each man performs the actual duties he would have in service practice.

For field practice with simulated bursts, a complete OP is organized, from which a good target area is visible, and in this area a prominent object is selected as the base point. The target detail proceeds at once to the base point and from there establishes communication with the OP, using either radio or telephone. When time does not permit the laying of a wire line for telephone, radio is quite satisfactory. An imaginary gun position is indicated to the student, this being located wherever desired—to the flank, to the rear, at the OP—at the will of the instructor. The target detail is given such information as to location of guns, OP, and (when used) aiming point, as will provide a clear picture of the set-up, which should be plotted. Assuming that compass is used to open fire on the base point, the Executive at the target determines the direction of the guns from the base point, by using back azimuth. When the rest of the data have been prepared they are sent to the target detail in the regular sequence of fire commands, just as sent down to a firing battery. All conversation between the OP and the target detail is limited to what would actually be said between the OP and the guns, and it is important that the target detail understand that it represents the firing battery.

The fire commands having been received by the target detail, the NCO in charge ("Executive") determines the direction of the gun position from the base point, identifies this direction on the ground, and uses it as a reference line for deflection shifts. When thought necessary, he may prepare a hasty chart showing the relative locations of OP, guns, and base point. From the range he

BATTERY ONE ROUND

computes the value of one deflection mil in paces, and from Column 5 of Firing Tables computes the value in paces of one elevation mil. The values of the range and deflection probable errors, and the time of flight, are also noted from the firing tables. He now is ready to fire the first shot, knowing that the base point is the first target, and a rough check is made to be sure that the data are approximately correct; correct or not, the shot is fired anyway, a record being made of erroneous data.

The burst representing the first shot is made in the general vicinity of the base point, with a generous error applied, which is arrived at by an estimate of weather and terrain conditions. When the report *On the Way* is sent to the OP, the entire target detail takes cover, and remains hidden until data for the next shot are received, the bursts being made from the prone or crouching position. Conversely, the student firing the problem is not permitted to observe the target through an instrument until he hears the report *On the Way*. As the problem proceeds, shifts and range changes are converted to paces to move the bursts according to the commands, and always with respect to the last shot fired, and its relationship to the assumed gun position. When the battery is brought in, salvos and volleys are fired in the prescribed manner, four burst-operators being used. The sheaf is realistically represented and manipulated, its mechanics being relatively simple, and all types of battery fire are easily reproduced.

The NCO in charge does not concern himself with dispersion except in one case, and that is when more than one shot is fired at the same elevation. This is because, in shot-to-shot firing, where but one shot is fired at a certain elevation, a sufficient variation creeps in, because of inequalities of terrain, and errors of personnel, to simulate the phenomena of dispersion. To preclude

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

successive shots at the same elevation appearing at the same spot, the following rule of thumb is used: In general, series of shots are varied, but within the limits of one probable error, a reasonable variation being applied. When fire for effect is begun, if the center of impact is more than one probable error away from the target, three shots are given in that sense; if less than one, but more than one-half probable error away, two shots in that sense, and one in the other; and if closer to the target than one-half probable error, then the three shots are fired as *over, short,* and *range correct,* with a slight deflection error. This way of applying dispersion errors, while of course not in true accord with the laws of probability, nevertheless does furnish a fair approximation of the variations to be expected, and can be applied comparatively easily. No target shots are given, unless "a very palpable hit" is obtained, and then only one of a group. This is based on the fact that in actual firing the percentage of direct hits is very small, and that for purposes of instruction a target shot has little value, if any. Except as noted above, the burst is in exact accordance with the commands received from the OP.

This method of making and controlling simulated bursts compares favorably with service firing. The bursts are slightly smaller than those from 75-mm. shrapnel projectiles, but distinctly larger and clearer than those from 37-mm. LE. There are, of

ON THE WAY

course, no duds. The response of the bursts to the commands is almost a perfect reproduction of service conditions, and "must be seen to be appreciated."

Practice is required before the target detail will function entirely properly, but this is mainly because of the lack of a proper understanding of the principles underlying conduct of fire. The NCO in charge of the target detail, in particular, needs a thorough knowledge of fire commands and their effects, together with a rough idea of dispersion and probability. By rotating senior NCO's in this duty, an important training aspect is covered; there is probably no other way in which the mechanics of fire can be taught as easily. In this matter of training, the dust-burst method offers possibilities which should not be overlooked, inasmuch as many varied duties are taught in a way that appeals to the men—learning by doing. Both the radio and wire details receive training, by making it habitual to fire using both means of communication; all personnel thus become accustomed to the use of both agencies for fire missions. The OP detail, since it must function as it would under service conditions, gets excellent training in the use of instruments and the preparation of firing data. In our own case, for example, by the intensive use of this system of simulated fire we have focused attention on the target, where it belongs, rather than on the OP, and stimulated a healthy interest in gunnery.

DESCRIPTION OF A LATERAL (LARGE T) PRECISION PROBLEM

(CONDUCTED AT FORT BRAGG)

OP at Capron Hill. Entire detail arrives at this point and the OP is organized, being manned by an instructor, four students, an instrument sergeant (acting), an instrument corporal (acting), an instrument operator, a telephone operator, a radio operator and his assistant, and a recorder. The instructor designates a tree on Coollyconch Mountain as the base point, and the NCO in charge of the target detail, a sergeant, identifies it and leaves at once with his detail, consisting of a corporal as recorder, a telephone operator, a radio operator and his assistant, and four burst operators. In addition, a wire truck leaves the OP at the same

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

time, laying a wire line to the base point as rapidly as possible; this truck is manned by a signal corporal (acting) and several linesmen.

The instructor informs all the personnel at the OP that the gun position is at Vaughn Hill (a lateral position at greater range) and assigns the problem to one of the students, with instructions to register on the base point. The student is given no assistance in the preparation of his data, even if these are seen to be entirely wrong. He thus gets the benefit of seeing what happens when mistakes are made. Should the data be seriously in error, the instructor should so advise the sergeant at the target in an unofficial message.

Data are found to be as follows: GT, 6000; OT, 3600; T, 500; pieces on left; COMPASS 5230; CHARGE 5; FUZE LONG; initial elevation, 332; site, 300; fork, 10; *c*, 8; *s*, 12;* and the factor *c/d*, .6.

By this time communication has been established with the base point (firing battery) though there is no telephone communication as yet. The data are sent down, by radio, as follows: NO. 1 ADJUST; COMPASS 5230; SHELL MARK I; CHARGE 5; FUZE LONG; NO. 1, ONE ROUND; QUADRANT, 332.

The sergeant at the base point, receiving these commands, makes the following computations: From elevation 332 in Zone 5 of Firing Tables, finds range to be 6000; change in range for one-mil change in elevation, 13 yards; time of flight, 20 seconds; and the probable errors in range and deflection to be 34 yards and 3 yards, respectively. He decides to use seven paces for one mil in deflection (6 × 34/30) and fifteen paces for one mil in elevation (13 × 34/30).

He fires the first shot short, and 20 or 30 yards downwind, 20 seconds after the report *On the Way* has been sent to the OP. He makes sure all members of the target detail are under cover before sending the report *On the Way*, and that they remain hidden until the next command is received. In certain cases, when the instructor desires to impress upon the student the manner

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*The tabular *s* is 9, but this is for 100 yards. The fork, 10, is for 4 probable errors, or 136 yards. The *s* for this fork, then, is 12. (Par. 275*e*, Field Artillery Book 161.)

LINE OVER

in which his commands move the burst (as in lateral fire) he may require him to observe the burst operator moving to his new position, thus materializing the shifts and changes on the ground.

Suppose the first shot sensed *20 Left*. To get on the line, the student will increase the range .6 × 20 or 12 mils, the command being *344*. The sergeant at the target lines himself in with the first shot and Vaughn Hill, and has the burst operator move 15 × 12, or 180 paces, away from Vaughn Hill, thus increasing the range.

Suppose the next shot sensed *Line Short*. The student decides to shift left 2*s,* and at the same time to go up in range two forks. The command is LEFT 24, 364. The sergeant at the target causes the burst operator to move to his left at right angles to the "line of fire" a distance of 24 × 7 or 168 paces, and then, lining-in again for range, to increase the range a distance of 20 × 15 or 300 paces, to the position of the next shot.

The problem continues in this way until the trial deflection is determined, the command 3 ROUNDS is received, and fire for effect begins. The range probable error, 34 yards, must be utilized. The sergeant locates the position of the first shot of the group as usual, and measures its distance from the target by stepping off the distance. Suppose this is found to be 30 yards, and is in the "over" sense. Following the rule, this calls for two overs and one short, since it is less than one probable error but more than one-half of one from the target. The deflection probable error is not considered in this case, since the problem is lateral; in axial fire, slight deflection variations would be applied to the successive shots in improvement fire, in addition to the range variations, both being applied according to rule.

The sergeant places one burst operator 30 yards from the target, over; another operator at, say, 15 yards, over and another

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

other at 5 yards short of the target. These men fire their bursts, at the sergeant's command, with 30 seconds interval (normal rate, 155-mm. Howitzer) the shots being reported to the OP in the customary manner, and with all target personnel under cover for all three shots. So on, to the end of the problem, when the base deflection is recorded.

Subsequent problems, being shifts from base deflection, are much easier for the sergeant at the target, as well as for the student.

●

New Chief Executive of Missouri will be Lloyd C. Stark, Naval Academy, '08, and World War major of field artillery. . . . Army and Navy Journal editorializes, Nov. 7, on field artillery modernization program, urging continuance.

●

Blue ribbon award of exhibit at international convention of Photographer's association, in Chicago, was made to Harold Hedger, senior instructor, AC Technical School, for snap of field piece in action at night, illumined by own flash. . . . Brigadier General Manus McCloskey, long at Fort Bragg, will relinquish command to Brig. Gen. T. E. Merrill, former commander of 5th FA there. . . . October number of *Recruiting News* carried picture and story of the Baker Brothers, Captains Herbert and Herschel. both FA, commissioned same day, wounded same day, awarded Purple Heart same day—(Note: Born same day).

●

Colonel William A. March, 108th FA, elected president of Pennsylvania National Guard Association. . . . Battling Townsend, referred to here last issue, arrives to join A of the 8th, Schofield, and Major H. H. F. Gossett, regimental athletic officer, writes it will be too bad for opposition boxers during December, January, February, March, and sometimes w and y. . . . Purdue ROTC pistol team, winner of Field Artillery championship, and 15 consecutive intercollegiate matches, pictured, with coach, Capt. William L. Kay, FA, on back cover of The American Rifleman, November.

Posts of Field Artillery Officers

(As of October 1, 1936)

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Colonel R. E. D. Hoyle
Colonel L. J. McNair
Lt. Col. T. J. J. Christian
Lt. Col. A. C. McBride
Lt. Col. Julian F. Barnes
Major L. E. Hibbs
Captain J. R. Sheetz
Captain M. V. Gannon

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Major L. J. Compton—with Ordnance, Aberdeen Proving Ground, Maryland.
Major H. A. Cooney—with Signal Corps—Fort Monmouth, N. J.
Captain T. North—with Engineer Board—Fort Belvoir, Va.

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1st Lt. F. W. Ellery
1st Lt. N. C. James
2d Lt. T. W. Carrithers
2d Lt. D. D. Breakefield

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Major D. L. Ruffner
Captain A. P. Barnes
Captain A. P. Moore
Captain R. L. Taylor
1st Lt. S. E. Otto
1st Lt. T. S. Pollock
1st Lt. H. C. Plapp
2d Lt. K. L. Davis
2d Lt. J. F. Surratt
2d Lt. E. J. Koehler
2d Lt. L. R. St. John
2d Lt. R. L. Martin
2d Lt. R. C. Bahr

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Major R. A. Gordan
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Captain R. B. Hart
Captain R. J. Sothern
Captain J. L. Langevin
Captain M. Faulhaber
1st Lt. M. C. Walter
2d Lt. W. S. Penn, Jr.
2d Lt. J. F. Smoller
2d Lt. D. G. McLennan
2d Lt. C. B. Elliott, Jr.

Riders, from left to right, Thomson, Argo, Bradford.

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Major L. W. Hasslock
Major W. B. Weston
Major G. G. Heiner
Captain R. Garey
Captain A. Bliss
Captain O. C. McIntyre
Captain E. O. Lee
1st Lt. F. C. Foster
2d Lt. W. M. Griffity
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Lt. Col. J. M. Swing
Lt. Col. J. M. McDowell
Lt. Col. N. N. Polk
Major C. D. Parmelee
Major F. D. Sharp
Major C. S. Ferrin
Major M. L. McCreary
Major H. C. Harri on, Jr.
Captain M. H. Doty
Captain W. C. Huggins
Captain H. D. Baker
Captain B. A. Tormey
Captain E. H. Lastayo
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Captain T. F. Hickey
Captain O. W. Martin
Captain H. E. Baker
Captain H. C. Brenizer
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Captain C. F. Burbach
1st Lt. W. C. Bullock
1st Lt. P. C. Wehle
1st Lt. W. E. Johns
1st Lt. B. A. Holtzworth
1st Lt. L. A. Vickrey
1st Lt. F. R. Redden
1st Lt. I. R. Schimmelpfennig
2d Lt. J. P. Craig
2d Lt. C. H. White, Jr.
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2d Lt. P. F. Oswald
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2d Lt. J. J. Duffy
2d Lt. E. G. Hahney
2d Lt. R. H. Safford

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Major W. H. McNaught
Major G. R. Rede
Major D. M. Hoagland
Captain A. E. King
Captain J. J. Binns
Captain L. J. Tacy
Captain J. C. Campbell
Captain W. L. Carr
Captain M. M. Pharr
Captain L. H. Caruthers
Captain J. M. Willems
Captain W. H. Kenneth
Captain L. V. Chaplin
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1st Lt. G. W. Gibbs
2d Lt. J. W. Keating
2d Lt. K. F. Bawalt
2d Lt. G. W. Hiester
2d Lt. E. Gray
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Captain E. H. Barr
Captain J. V. Collier
Captain W. N. White
Captain S. Edwards
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2d Lt. E. A. Grove
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Major L. M. Skerry
Captain F. H. Canlett
Captain S. A. Dickson
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1st Lt. R. W. Fletter
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2d Lt. J. L. Frink, Jr.
2d Lt. G. D. Ellerson
2d Lt. R. Van Roo

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1st Lt. J. Ganahl
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1st Lt. H. King
2d Lt. J. O. Seaman
2d Lt. C. Lynn, Jr.
2d Lt. T. B. Maury, III
2d Lt. R. E. Weber, Jr.

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Major L. McHale
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1st Lt. D. T. Workizer
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1st Lt. A. C. Goodwin, Jr.
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1st Lt. R. C. White
1st Lt. T. W. Dunn
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1st Lt. P. Clark, Jr.
2d Lt. R. R. Gnuschke
2d Lt. S. D. Smith, Jr.

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Lt. Col. E. R. Van Deusen
Major C. H. Tate
Major L. E. Savage
Major D. W. Craig
Major D. T. Boisseau
Major C. A. Beaucond
Captain A. P. Kitson
Captain O. L. McDaniel
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1st Lt. F. G. Stritzinger
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1st Lt. D. M. Perkins
1st Lt. H. S. Isaacson
1st Lt. H. W. Riley
1st Lt. D. C. McNair
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1st Lt. J. K. Wilson, Jr.
1st Lt. A. G. Stone
1st Lt. Robt. E. Chandler
1st Lt. C. A. Piddock
1st Lt. M. W. Brewster
1st Lt. D. C. Cubbison, Jr.
2d Lt. R. B. Partridge
2d Lt. C. D. Hartman, Jr.
2d Lt. W. C. Westmoreland

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Major L. F. Kosch
Captain E. T. Hayes
Captain H. C. Fowler
Captain R. C. Ross
Captain J. M. Lewis
Captain F. H. Black
1st Lt. F. A. Lightfoot
1st Lt. J. W. Ferris
1st Lt. M. D. Masters
1st Lt. P. R. Walters
2d Lt. R. L. Cato

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Lt. Col. F. K. Ross
Major S. White (23d FA)
Major J. E. Ray
Major T. E. Buechler
Major S. F. Reyes (PS)
Major J. R. Williams
Major W. A. Ray
Major A. F. Doran
Major H. P. Gantt
Major F. B. Segundo (PS)
Captain W. A. Metts, Jr.
Captain G. A. A. Jones
Captain B. M. Fitch
Captain J. R. Culleton
Captain W. D. McNair (23d FA)
Captain G. A. Grayeb
Captain P. L. Martin
Captain R. E. O'Connor
Captain M. C. Wilson
Captain W. A. Beiderlinden
Captain P. W. Brown
Captain J. H. Workman
Captain R. T. Finn
Captain M. S. Sulit (PS) (23d FA)
Captain J. Mesick
Captain A. Brill
Captain J. T. Loome
1st Lt. T. L. Sherburne
1st Lt. E. G. Shinkle
1st Lt. R. Hackett
1st Lt. J. B. Daly
1st Lt. Henry W. Herlong
1st Lt. G. E. Lynch
1st Lt. L. W. Cather
1st Lt. J. E. Theimer
1st Lt. S. Wood
1st Lt. G. B. Coverdale
2d Lt. R. C. McDonald, Jr.
2d Lt. D. H. Heyne
2d Lt. R. B. Firehock
2d Lt. J. A. Gloriod

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Lt. Col. E. Yeager
Major W. F. Kernan
Major J. A. Steere
Captain G. P. Harrison
Captain L. R. Wingfield
Captain H. G. Elliott
1st Lt. C. W. Raymond
1st Lt. N. M. Wallace
1st Lt. D. R. French
1st Lt. W. H. Richardson, Jr.
1st Lt. R. G. Speiser

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

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Captain D. B. Floyd
Captain W. B. Avera
Captain W. D. Webb, Jr.
1st Lt. J. D. F. Phillips
1st Lt. H. M. Peyton
2d Lt. O. N. Stokes
Major A. P. Rhett
Captain W. W. Scott
Captain L. O. Field
Captain T. E. de Shazo
1st Lt. A. R. Fitch
2d Lt. W. A. Davis

SIXTY-EIGHTH FIELD ARTILLERY, FORT KNOX, KY.

Lt. Col. A. C. Sandeford
Major H. J. Gaffey
Major B. H. Perry
Captain E. H. Metzger
Captain S. V. Krauthoff
Captain J. G. Howard
Captain J. P. Woodbridge
Captain N. W. Jones
Captain F. J. Hierholzer
Captain J. R. Lindsay, Jr.
Captain G. F. Wooley, Jr.
Captain J. O. Taylor
Captain M. P. Chadwick
1st Lt. R. B. Franklin
1st Lt. J. R. Pritchard
1st Lt. W. R. Calhoun
1st Lt. R. P. Thompson

SEVENTY-SIXTH FIELD ARTILLERY, FORT F. E. WARREN, WYO.

Major T. W. Wrenn
Major G. H. Duff
Major J. M. Jenkins
Major J. M. Reynolds
Captain B. M. James
Captain T. McGregor
Captain H. L. Love
Captain C. E. Margrave
Captain J. Y. LeGette
Captain H. L. Ingham
Captain J. H. Leusley
1st Lt. C. Wesner
1st Lt. G. L. Roberson
1st Lt. G. M. Cole
1st Lt. R. B. Hubard

SEVENTY-SIXTH FIELD ARTILLERY, PRESIDIO OF MONTEREY, CAL.

Lt. Col. H. D. Higley
Major J. M. Devine
Captain H. M. Schwarze
Captain H. J. John
Captain G. J. Reid
Captain H. M. Cole
Captain C. B. Leinbach
Captain C. A. Billingsley
1st Lt. J. F. Collins
1st Lt. R. W. Meals
1st Lt. R. Totten
1st Lt. J. P. Daley
1st Lt. M. Tague
2d Lt. M. V. Pothier
2d Lt. H. M. Batson, Jr.
2d Lt. T. L. Lipscomb

SEVENTY-SEVENTH FIELD ARTILLERY, FORT SILL, OKLA.

Lt. Col. J. J. Waterman
Major F. H. Hollingsworth
Major J. R. Young
Captain R. O. Montgomery
Captain J. F. Fiske
Captain C. P. Jones
Captain W. D. Williams
1st Lt. M. O. Perry
1st Lt. A. W. Blair
1st Lt. C. R. Hutchison
1st Lt. D. E. Jones
1st Lt. S. W. Horner, II

SEVENTY-SEVENTH FIELD ARTILLERY, FORT D. A. RUSSELL, TEX.

Colonel R. H. Lewis
Lt. Col. J. G. Burr
Major M. L. Craig
Captain R. H. Donaldson
Captain H. B. Enderton
Captain V. L. Knadler
Captain W. W. Dixon
1st Lt. P. A. Gavan
1st Lt. J. R. Brindley
1st Lt. J. L. Cowhey
1st Lt. L. A. Mason
1st Lt. J. B. Evans
1st Lt. S. F. Crawford
1st Lt. W. J. Daniel
1st Lt. W. V. Frentzell

EIGHTIETH FIELD ARTILLERY, FORT DES MOINES, IOWA

Lt. Col. J. H. Wallace
Major B. B. Lattimore
Captain C. G. Holmes
Captain K. W. Treacy
Captain C. W. Cowles
Captain F. H. Gaston
Captain O. R. Marriott
1st Lt. G. G. Garton
2d Lt. O. P. Robinson, Jr.
2d Lt. E. G. Hickman
2d Lt. J. E. Barlow

EIGHTY-SECOND FIELD ARTILLERY, FORT BLISS, TEX.

Colonel W. H. Dodds, Jr.
Colonel P. W. Booker
Major G. D. Wahl
Major J. G. Watkins
Major A. Smith
Major L. J. Whitlock
Major L. L. Boggs
Captain A. J. Hastings
Captain W. E. Watters
Captain C. H. Studebaker
Captain J. B. Clearwater
Captain F. B. Lyle
Captain W. P. Ennis, Jr.
Captain A. R. S. Barden
Captain D. Dunford
Captain R. D. Waring
Captain F. O. Wood
Captain W. A. D. Thomas
Captain A. R. Sewall
Captain R. K. McMaster
1st Lt. A. L. Cobb
1st Lt. W. P. Whelihan
1st Lt. W. O. Darby
2d Lt. R. H. Adams
2d Lt. G. Ruhlen
2d Lt. E. Kraus
2d Lt. H. J. Hubbard
2d Lt. K. A. Cunin
2d Lt. H. J. Critz
2d Lt. J. N. Wilson
2d Lt. H. B. Harden, Jr.

EIGHTY-THIRD FIELD ARTILLERY, FORT BENNING, GA.

Lt. Col. O. Ward
Major F. H. Timmerman
Major J. W. MacKelvie
Captain J. V. Carroll
Captain L. Mathewson
Captain L. S. Griffing
Captain H. W. Tarkington
Captain C. A. Pyle
Captain E. T. Williams
1st Lt. R. B. Neely
1st Lt. P. S. Thompson
2d Lt. P. T. Hennigar
2d Lt. C. D. W. Lang
2d Lt. C. R. Revie
2d Lt. B. K. Yarbrough, Jr.
2d Lt. W. P. Grieves
2d Lt. J. G. Brimmer

EIGHTY-THIRD FIELD ARTILLERY, FORT BRAGG, N. C.

Lt. Col. J. T. Kennedy
Major S. L. Bertschey
Major S. Knopf
Major P. Winlock
Major A. H. Lee
Captain H. L. Watts, Jr.
Captain T. F. Keefe
Captain B. L. Davis
Captain J. V. Phelps
Captain R. K. Quekemeyer
1st Lt. W. J. Thompson
1st Lt. H. G. Sparrow
2d Lt. H. M. Exton
2d Lt. G. Blackburne, Jr.
2d Lt. R. L. McKee

EIGHTY-FOURTH FIELD ARTILLERY, FORT RILEY, KANSAS

Major W. C. Green
Major M. E. Scott
Captain O. Ellis
Captain M. Pierson
Captain L. M. Hanna
Captain E. A. Elwood
Captain H. C. Dayton
Captain T. S. Gunby
1st Lt. R. I. Pride
1st Lt. J. F. Trent
1st Lt. J. K. Bryan
2d Lt. R. G. Baker
2d Lt. J. R. Winn
2d Lt. J. A. Costain
2d Lt. T. C. Foote
2d Lt. C. M. Peeke
2d Lt. C. A. Symroski

SECOND AMMUNITION TRAIN, FORT SILL, OKLA.

Major L. H. Frasier
Captain O. W. Van den Berg
Captain R. F. McEldowney

FIRST OBSERVATION BATTALION, FORT BRAGG, N. C.

Lt. Col. H. Parkhurst
Captain E. T. Owen
Captain P. A. Reichle
Captain A. F. Freund
1st Lt. F. H. Chaffee
1st Lt. D. N. Sundt
1st Lt. M. Moses

FIRST FIELD ARTILLERY BRIGADE, FORT HOYLE, MD.

Major L. J. Fortier
Major L. E. Reigner
Major J. H. Keatinge

FIELD ARTILLERY OF SECOND DIVISION, FORT SAM HOUSTON, TEX.
12th FA—15th FA—2d FA Brig.

Colonel F. W. Honeycutt (15)
Colonel J. E. Mort (15)
Colonel W. F. Jones (12)
Lt. Col. O. A. Dickinson (12)
Lt. Col. F. Heard (15)
Lt. Col. K. C. Greenwald (2FAB)
Lt. Col. I. Spalding (12)
Major S. G. Fairchild (12)
Major C. W. Mays (15)
Major L. A. Kurtz (15)
Major J. F. Roehm (15)
Major R. T. Heard (12)
Major R. C. Hunter (12)
Major J. W. Loef (15)
Major J. L. McIlhenny (12)
Captain W. A. Enos (15)
Captain M. M. Potter (12)
Captain E. S. Brewster, Jr. (12)
Captain B. L. Pearce (15)
Captain R. A. Carter (15)
Captain J. Gross (2 FAB)
Captain W. E. Waters (12)
Captain A. E. Smith (15)
Captain J. K. Gibson (2 FAB)
Captain J. E. Adkins, Jr. (15)
Captain J. C. Strickler (15)
Captain C. C. Knight (12)
Captain T. O. Foreman (12)
Captain R. L. Allen, Jr. (15)
Captain E. E. Elliott (15)
Captain M. P. Echols (12)
Captain J. R. Burrill (12)
Captain L. F. Young (15)
Captain J. F. Williams (15)
Captain W. L. Coughlin (12)
Captain J. A. Samouce (12)
Captain J. M. Works (15)
Captain G. E. Mitchell, Jr. (12)
1st Lt. B. Hamlett (15)
1st Lt. J. H. Rothschild (15)
1st Lt. F. Hill (15)
1st Lt. R. W. Goldsmith (12)
1st Lt. P. H. Pope (2d FAB)
1st Lt. J. H. Skinner (2d FAB)
1st Lt. H. S. Whiteley (2 FAB)
1st Lt. R. E. Hattan (12)
1st Lt. R. L. Brunzell (12)
1st Lt. G. A. Carver (12)
1st Lt. C. Longley, Jr. (12)
1st Lt. S. D. Armitage (15)
2d Lt. U. P. Williams (15)
2d Lt. S. W. Gooch (15)
2d Lt. H. J. Lemley, Jr. (15)
2d Lt. E. A. Clarke (15)
2d Lt. W. J. Bryde (15)
2d Lt. R. N. Tyson (12)
2d Lt. P. E. Johnson (12)
2d Lt. G. G. Warner (15)
2d Lt. D. Sinclair (15)
2d Lt. H. L. Sanders (12)
2d Lt. E. J. Gibson (15)
2d Lt. G. S. Eckhardt (15)
2d Lt. D. C. Wallace (12)

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on page 573, flip pages from rear to front to animate these pictures.

USMA 1936

2d Lt. R. M. Burnett
2d Lt. D. G. Grothaus
2d Lt. J. R. Neff
2d Lt. L. C. Shea
2d Lt. G. H. Duin
2d Lt. H. E. Mikkelsen
2d Lt. B. E. Powell

THIRD FIELD ARTILLERY BRIGADE, FORT LEWIS, WASHINGTON

Colonel W. H. Peek
Major L. A. Daugherty
Major G. R. Hayman
Major P. C. Boylan
Major S. F. Miller
Major M. V. Patton

FOURTH FIELD ARTILLERY BRIGADE, FORT SILL, OKLA.

Lt. Col. F. A. Prince
Major R. Campbell
Captain C. E. Berg
Captain N. F. Galbraith
1st Lt. P. H. Brown, Jr.

SIXTH FIELD ARTILLERY BRIGADE, CHICAGO, ILL.

Lt. Col. F. A. Doniat
Major P. G. Black
Major W. C. Dunckel
Major H. W. O. Kinnard

ELEVENTH FIELD ARTILLERY BRIGADE, SCHOFIELD BARRACKS, T. H.
8th FA—11th FA—13th FA

Colonel W. K. Moore (8)
Colonel R. M. Danford (13)
Colonel L. L. Lawson (11)
Colonel C. Parker
Lt. Col. R. S. Parrott
Lt. Col. J. A. Hoag
Lt. Col. J. E. Sloan
Major W. C. Lattimore (11)
Major G. E. Cook (13)
Major L. S. Partridge (11)
Major G. B. Rogers (13)
Major V. E. Prichard (11)
Major R. H. Crosby (8)
Major A. E. Billing (13)
Major J. J. Waters
Major H. D. Jay
Major J. H. Milam
Major C. W. Glover
Major R. C. Montgomery (8)
Major G. P. Winton (11)
Major H. H. F. Gossett (8)
Major J. A. Pickering (8)
Major W. J. Egan (11)
Major S. T. Wallis (11)
Major W. M. Tenney (8)
Major D. Hudnutt (8)
Major J. A. Stewart
Major M. A. Cowles
Captain T. E. Moore (8)
Captain J. M. Hamilton (8)
Captain J. F. Uncles
Captain S. L. Mains
Captain H. T. Molloy (13)
Captain H. F. Searight (11)
Captain H. J. Thornton (13)
Captain F. P. Porter (11)
Captain E. Herendeen (8)
Captain R. H. Knapp (8)
Captain H. L. Kersh (13)
Captain J. B. Murphy (8)
Captain S. F. Little (13)
Captain F. W. Farrell (13)
Captain D. J. Oyster (8)
Captain H. F. Handy (11)
Captain C. M. Thirkeld (11)
Captain C. D. Daniels (11)
Captain E. M. Taylor (11)
Captain R. B. Hood (8)
Captain E. C. Norman (13)
Captain J. B. Rasbach (8)
Captain G. B. McReynolds (13)
Captain J. J. Deery (13)
Captain K. N. Decker (8)
Captain F. A. Metcalf
Captain H. P. Adams (13)
Captain A. B. Hicklin (13)
Captain H. J. Harper (11)
Captain M. McClure (13)
Captain I. B. Warner (8)
Captain L. M. Rouch (8)
Captain J. P. Barney, Jr. (8)
Captain J. T. Dawson (8)
Captain R. L. Gervais (11)
Captain R. C. Hendley (11)
Captain R. T. Strode
Captain J. E. Perman (11)
Captain C. O. Wiselogel (8)
Captain R. S. McClenaghan (11)
Captain A. E. Fox
Captain R. M. Osborne
Captain W. A. Walker (13)
Captain R. W. Mayo
1st Lt. S. B. Bonner (8)
1st Lt. C. R. Murray
1st Lt. W. M. Tisdale (8)
1st Lt. J. C. McCawley (13)
1st Lt. D. A. Herman (8)
1st Lt. F. D. Atkinson (8)
1st Lt. J. W. Cave (11)
1st Lt. W. W. Dick, Jr. (11)
1st Lt. W. E. Grubbs (8)
1st Lt. R. A. Ports (13)
1st Lt. C. F. McNair (13)
1st Lt. W. W. Sisson (11)
1st Lt. C. W. Land (8)
1st Lt. G. Chapman (8)
1st Lt. W. F. Ryan (11)
1st Lt. W. R. Huber
1st Lt. C. R. McBride
1st Lt. C. G. Nelson
1st Lt. G. T. Powers III
1st Lt. E. J. Greco
1st Lt. E. B. Thayer
1st Lt. T. H. Slade (13)
1st Lt. D. E. Means (13)
1st Lt. D. L. Hine (13)
1st Lt. J. J. Davis (11)
1st Lt. E. S. Berry (11)
1st Lt. R. J. Crandall (8)
1st Lt. M. S. Davis (8)
1st Lt. T. I. Edgar (8)
1st Lt. J. J. MacFarland (11)
1st Lt. G. S. Speidel, Jr. (13)
1st Lt. A. N. Williams, Jr.
1st Lt. F. A. Granholm (13)
1st Lt. W. T. Kirn (13)
1st Lt. J. G. Shinkle (13)
1st Lt. F. G. Smith (8)
1st Lt. A. V. Dishman
1st Lt. F. P. Miller
1st Lt. J. P. Pearson, Jr.
1st Lt. R. C. Cooper
1st Lt. H. J. Versace
2d Lt. J. M. Worthington (8)
2d Lt. F. A. Osmanski (11)
2d Lt. S. W. Horstman (8)
2d Lt. L. K. Meade
2d Lt. B. E. Spivy, Jr.
2d Lt. P. J. Kopcsak
2d Lt. E. L. Barr (13)
2d Lt. C. W. Miller (11)
2d Lt. D. J. Murphy (13)
2d Lt. T. E. Wood
2d Lt. J. D. Torrey, Jr.
2d Lt. T. G. Bilbo, Jr.

THIRTEENTH FIELD ARTILLERY BRIGADE, FORT BRAGG, N. C.

Colonel R. C. Burleson
Lt. Col. J. A. Lester
Lt. Col. J. A. Rogers
Major R. W. Hocker
Major S. McGehee

THE FIELD ARTILLERY SCHOOL, STAFF AND FACULTY

Colonel A. McIntyre—Commandant.
Colonel C. S. Blakely—Assistant Commandant.

Lt. Col. R. W. Barker
Lt. Col. J. K. Boles
Lt. Col. J. C. Wyeth
Lt. Col. H. S. Clarkson
Lt. Col. L. E. Jones
Lt. Col. A. V. Arnold
Major H. W. Blakeley
Major L. H. Hanley
Major B. A. Day
Major A. A. White
Major G. D. Shea
Major A. C. Fitzhugh
Major R. P. Shugg
Captain M. B. Stokes
Captain C. B. Magruder
Captain P. P. Rodes
Captain H. M. Jones
Captain W. N. Gillmore
Captain R. M. Montague
Captain T. A. Roberts, Jr.
Captain F. A. Henning
Captain B. M. Bryan, Jr.
Captain C. P. Nicholas
Captain L. E. Heyduck
1st Lt. R. R. Mace

FIELD ARTILLERY INSTRUCTORS—OTHER SERVICE SCHOOLS

Lt. Col. E. J. Dawley—Infantry School.
Lt. Col. H. C. Vanderveer—Cavalry School.
Major H. H. Ristine—Air Corps Tactical School.

FIELD ARTILLERY SCHOOL DETACHMENT

Major C. A. White
Captain E. L. Andrews
Captain A. E. Kastner
Captain H. Cort
Captain W. S. Nye
1st Lt. J. C. Oakes

1936-1937 REGULAR COURSE—FIELD ARTILLERY SCHOOL

Captain A. D. Garcia (PS)
Captain J. D. Salmon
Captain H. W. Brimmer
1st Lt. D. E. Beach
1st Lt. J. R. Beishline
1st Lt. R. D. Black, Jr.
1st Lt. R. Q. Brown
1st Lt. R. S. Carter
1st Lt. G. E. Dietz
1st Lt. M. L. Fisher
1st Lt. F. S. Gardner
1st Lt. W. R. Goodrich
1st Lt. J. F. Greco
1st Lt. F. G. Hall
1st Lt. E. S. Hartshorn, Jr.
1st Lt. L. T. Heath
1st Lt. J. E. Beery
1st Lt. H. F. Bigelow
1st Lt. R. C. Bower
1st Lt. R. L. Carmichael, Jr.
1st Lt. G. V. Cusack
1st Lt. W. A. Downing, Jr.
1st Lt. W. F. Gallup
1st Lt. J. E. Godwin
1st Lt. W. P. Goodwin
1st Lt. J. Hagood, Jr.
1st Lt. W. A. Harris
1st Lt. A. M. Haynes
1st Lt. A. R. Hercz
1st Lt. R. A. Hewitt
1st Lt. A. H. Hogan
1st Lt. C. E. N. Howard, Jr.
1st Lt. I. W. Jackson
1st Lt. B. C. Patrick
1st Lt. H. C. Porter
1st Lt. J. W. M. Read
1st Lt. C. A. Schrader
1st Lt. C. C. Smith, Jr.
1st Lt. F. H. Tapping
1st Lt. W. R. Thomas
1st Lt. O. C. Troxel, Jr.
1st Lt. C. P. Westpheling
1st Lt. H. K. Whaling
1st Lt. C. K. McClelland, Jr.
1st Lt. L. V. Hightower
1st Lt. J. T. Honeycutt
1st Lt. W. H. Isbell, Jr.
1st Lt. M. M. Magee
1st Lt. N. E. Poinier
1st Lt. J. B. Rankin
1st Lt. S. Sawicki
1st Lt. A. W. Seaward
1st Lt. P. W. Steinbeck, Jr.
1st Lt. W. Taylor, Jr.
1st Lt. E. L. Thompson
1st Lt. E. A. Walker
1st Lt. P. R. Weyrauch
1st Lt. J. J. Winn
1st Lt. D. W. Traub

1936-1937 ADVANCED COURSE IN HORSEMANSHIP

1st Lt. V. B. Barnes
1st Lt. J. L. Beynon
1st Lt. C. W. McConnell

1936-1937 ADVANCED COURSE IN MOTORS

Captain V. H. Connor
1st Lt. E. H. Eddy
1st Lt. W. H. Hoover
1st Lt. R. W. Timothy
1st Lt. L. C. Davis
1st Lt. J. C. Hayden
1st Lt. R. S. Pratt, Jr.
1st Lt. D. F. Walker

SOUND-AND-FLASH COURSE—UNIVERSITY OF PENNSYLVANIA

1st Lt. J. G. Harding

AIR CORPS TACTICAL SCHOOL—1936-1937 COURSE

Major M. Ross

Riders, from left to right, Thomson, Argo, Bradford.

Beginning on this page, flip pages from rear to front to animate these pictures.

COMMAND AND GENERAL STAFF SCHOOL—STAFF AND FACULTY

Lt. Col. H. L. C. Jones
Lt. Col. S. D. Downs, Jr.
Lt. Col. J. B. Anderson
Lt. Col. W. E. Burr
Major H. L. McBride
Major A. F. Kibler
Major C. E. Hurdis
Major E. S. Ott
Major A. R. Wilson
Captain L. H. Slocum
Captain F. J. Tate

1936-1937 COURSE, COMMAND AND GENERAL STAFF SCHOOL

Major H. C. Bowman
Major W. H. Colbern
Major T. E. T. Haley
Major M. W. Pettigrew
Major J. F. Brittingham
Major S. F. Dunn
Major L. M. Haynes
Major R. deP. Terrell
Captain J. D. Balmer
Captain E. A. Bixby
Captain M. Buckley, Jr.
Captain G. R. Carpenter
Captain W. L. Kluss
Captain W. B. Leitch
Captain A. C. McAuliffe
Captain E. McGinley
Captain R. C. Partridge
Captain G. S. Smith
Captain C. J. Barrett, Jr.
Captain W. D. Brown
Captain S. E. Bullock
Captain M. W. Daniel
Captain L. B. Ely
Captain A. M. Gruenther
Captain J. H. Hinds
Captain Rex E. Chandler
Captain J. P. Eckert
Captain B. Evans
Captain W. H. Hill
Captain G. V. Keyser
Captain M. K. Kurtz
Captain T. E. Lewis
Captain S. Y. McGiffert
Captain W. B. Palmer
Captain E. S. Molitor
Captain LeR. J. Stewart
Captain R. M. Wicks

Philippine Scouts

Captain N. Catalan
Captain A. Martelino
Captain V. Z. Gomez

ARMY WAR COLLEGE, STAFF AND FACULTY AND HISTORICAL SECTION

Colonel N. B. Rehkopf (AWC)
Colonel G. W. DeArmond (Histrcl Sect)
Colonel H. W. Huntley (AWC)
Colonel O. L. Spaulding (Histrcl Sect)
Major J. P. Ratay (Berlin, Germany)
Major W. R. Woodward (Histrcl Sect)

1936-1937 COURSE—ARMY WAR COLLEGE

Lt. Col. G. H. Franke
Lt. Col. E. P. Parker, Jr.
Lt. Col. A. W. Waldron
Lt. Col. V. Meyer
Lt. Col. S. L. Irwin
Major R. W. Hasbrouck
Major W. H. Maris
Major E. H. Brooks
Major W. A. Campbell
Major E. C. Ewertt
Major W. H. Cureton
Major A. M. Gurney
Major P. V. Kane
Major B. M. Sawbridge

ARMY INDUSTRIAL COLLEGE, WASHINGTON, D. C.

Lt. Col. J. E. Lewis
Lt. Col. J. N. Hauser

NAVAL WAR COLLEGE, NEWPORT, R. I.

Lt. Col. E. P. King, Jr.

OXFORD UNIVERSITY, ENGLAND

2d Lt. W. M. Connor, Jr.

UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y.

Lt. Col. J. W. Anderson
Lt. Col. J. L. Devers
Major S. E. Reinhart
Captain J. W. Black
Captain T. Calhoun, Jr.
Captain R. H. Coombs
Captain G. D. Crosby
Captain F. M. Day
Captain R. G. Gard
Captain E. B. Gielsteen
Captain C. E. Hart
Captain W. R. Hensey, Jr.
Captain H. E. Kessinger
Captain A. T. Leonard
Captain E. J. McGaw
Captain W. T. O'Reilly
Captain G. D. Pence
Captain J. H. Sampson
Captain E. L. Sibert
Captain C. P. Summerall, Jr.
Captain W. M. Wright, Jr.
Captain G. H. McManus, Jr.
Captain E. Parmly, III
Captain H. M. Roper
Captain W. T. Sexton
Captain W. C. Stanton
Captain V. Van Wyk
Captain W. H. Bartlett
Captain J. J. Burns
Captain J. B. Conrad
Captain M. Craig
Captain C. L. Dasher
Captain G. DeGraaf
Captain E. C. Gillette
Captain J. L. Hardin
Captain S. V. Hasbrouck
Captain H. D. Kehm
Captain H. W. Kruger
Captain F. A. March, 3d
1st Lt. D. P. Armstrong
1st Lt. D. F. Brown
1st Lt. P. H. Draper, Jr.
1st Lt. E. G. Farrand
1st Lt. A. A. Greene
1st Lt. J. P. Hannigan
1st Lt. J. J. Heriot
1st Lt. W. E. Kraus

1st Lt. G. F. Lillard
1st Lt. G. C. Lothrop
1st Lt. E. H. McLemore
1st Lt. A. P. O'Meara
1st Lt. T. W. Parker
1st Lt. D. S. Somerville
1st Lt. J. F. Stroker
1st Lt. S. L. Morrow, Jr.
1st Lt. W. H. Allen, Jr.
1st Lt. J. A. Berry, Jr.
1st Lt. F. J. Brown
1st Lt. G. C. Duehring
1st Lt. A. Graham
1st Lt. H. J. Handy
1st Lt. C. L. Heitman
1st Lt. A. Hero, III
1st Lt. P. H. Lash, Jr.
1st Lt. D. C. Little
1st Lt. C. M. Matthews
1st Lt. J. S. Nesbitt
1st Lt. H. B. Packard
1st Lt. T. J. Sands
1st Lt. M. F. Stober
1st Lt. F. G. Terry
1st Lt. T. M. Watlington Jr.
1st Lt. R. D. Wentworth

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Major T. L. Futch
Major E. H. Almquist
Captain L. E. Jacoby
Captain W. J. Klepinger
Captain J. L. McKinnon
Captain K. L. Johnson
Captain G. R. Scithers

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Captain B. Campbell
Captain J. L. Lewis

Colorado State College of A & M Arts—Ft. Collins, Colo.

Lt. Col. N. P. Morrow
Major C. R. Lehner
Captain W. C. Stout
Captain B. P. Herrick
Captain J. P. Donnovin

Cornell University—Ithaca, N. Y.

Major C. E. Boyle
Captain J. L. Chamberlain, Jr.
Captain R. R. Raymond, Jr.
Captain G. M. Williamson
Captain L. B. Downing
Captain A. B. Devereaux
1st Lt. J. R. Pitman

Culver Military Academy—Culver, Ind.

Lt. Col. J. S. Wood
Captain W. J. Eyerly

Duquesne University—Pittsburgh, Pa.

Lt. Col. M. Proctor
Captain H. E. Sowell
Captain R. T. Tompkins

University of Florida—Gainesville, Fla.

Col. W. S. Browning
Major C. M. Lucas
Major C. A. Bennett
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Captain W. D. Paschall
Captain R. P. Huff
Captain I. L. Foster

Eastern Kentucky State Teachers College—Richmond, Ky.

Major C. W. Gallaher
Captain W. W. Ford
Captain E. M. Link

Harvard University—Cambridge, Mass.

Lt. Col. A. R. Harris
Captain C. D. Palmer
Captain L. B. Bixby
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University of Illinois—Champaign, Ill.

Major R. L. Burnell
Major C. B. Cole
Captain E. A. Routheau
Captain E. M. Quigley
Captain R. S. Marr
Captain W. F. Millice
Captain F. S. Kirkpatrick

Iowa State College of A & M Arts—Ames, Iowa

Lt. Col. H. R. Odell
Major J. B. Matlack
Captain P. A. Berkey
Captain J. H. Lewis
Captain H. P. Storke
Captain T. C. Wood, Jr.

Louisiana State University—Baton Rouge, La.

Major C. Pickett
Captain R. C. Conder
Captain R. H. Bacon

Michigan State College—East Lansing, Mich.

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Captain D. S. Babcock
Captain O. M. Barton

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	Captain C. S. Whitmore	

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Ohio State—Columbus, Ohio

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Captain G. D. Adamson	Captain E. V. Williams	Captain H. K. Palmer, Jr.

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Major D. F. Jones	Captain G. P. Privett	

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	Captain J. A. Cella	

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Major Z. E. Lawhon	Major J. T. B. Bissell	Captain C. G. Blakeney
	Captain E. B. Ely	

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Major R. B. Warren	Captain J. L. Graves	Captain S. A. Beckley
Captain W. L. Kay, Jr.	Captain A. S. Miller	Captain P. W. Thompson
Captain R. C. Singer	Captain C. M. Hallam	

University of Santa Clara—Santa Clara, Cal.

Major E. T. Barco	Captain H. E. Sanderson	Captain R. G. Duff

Stanford University—Leland Stanford, Cal.

Lt. Col. B. R. Peyton	Major H. B. Allen	Captain J. F. Bird
	Captain H. Y. Grubbs	

St. Bonaventure—Allegany, N. Y.

Major D. S. Trenholm	Captain T. B. Whitted, Jr.	Captain C. F. Murray

Texas A & M College—College Station, Texas

Major O. E. Beezley	Captain P. H. Enslow	Captain L. R. Garrison
	Captain B. P. Heiser	

University of Utah—Salt Lake City, Utah

Lt. Col. C. C. Bank	Captain P. Sather	Captain R. M. Cannon
Captain K. W. Hisgen	Captain C. H. Swartz	Captain F. W. Lee

Virginia Military Institute—Lexington, Va.

Major J. M. Fray	Captain J. B. Horton	1st Lt. H. J. Coyle

Yale University—New Haven, Conn.

Lt. Col. F. T. Armstrong	Captain E. L. Strohbehn	Captain C. P. Townsley
	Captain T. B. Hedekin	

Xavier University—Cincinnatti, Ohio

Major A. M. Harper	Captain G. E. Wrockloff	Captain F. Camm

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Beloit H. S., Beloit, Wisc.—Major C. Bassich
Bendictine School, Savannah, Ga.—Captain S. S. Koszewski
Chicago H. S., Chicago, Ill.—Colonel W. F. Morrison—Lt. Col. J. D. von Holtzendorff
Chattanooga H. S., Chattanooga, Tenn.—Colonel B. Lyerly
Davenport H. S., Davenport, Iowa—Captain K. S. Sweany
Detroit H. S., Detroit, Mich.—Captain R. S. Slider
Elizabeth H. S., Elizabeth, Tenn.—Captain C. G. Follansbee
Fishburne Military Academy, Waynesboro, Va.—Captain E. V. Kerr
Florida Military Academy, St. Petersburg. Fla.—Captain L. C. Friedersdorff
Gary H. S., Gary, Ind.—Captain D. Q. Harris
Guthrie, H. S., Guthrie, Okla.—Major J. W. Russey
Jackson H. S., Jackson, Miss.—Captain D. F. Healy, Jr.
Joplin H. S., Joplin, Mo.—Major E. R. Block
Long Beach H. S., Long Beach, Cal.—Major J. C. Hughes
Los Angeles H. S., Los Angeles, Cal.—Lt. Col. G. W. Sliney
Marion Institute, Marion, Ala.—Captain W. W. Murphey
Marmion Prep. School, Aurora, Ill.—Major A. M. Goldman
Memphis H. S., Memphis, Tenn.—Major G. H. Cushing, Jr.
New Bedford H. S., New Bedford, Conn.—Captain L. L. Lesser
New York Military Academy—Cornwall, N. Y.—Captain E. L. Johnson
Oakland H. S., Oakland, Cal.—Captain W. J. Epes
Porter Military Academy, Charleston, S. C.—Major A. B. Wade
R. E. Lee Institute, Thomaston, Ga.—Captain T. E. Binford
Roger H. S., Newport, R. I.—Major R. L. Greene
Santa Barbara H. S., Santa Barbara, Cal.—Captain F. F. Carpenter
Savannah H. S., Savannah, Ga.—Major H. R. Hanson
St. Joseph College and M. A., Hays, Kansas—Major J. G. Cook
St. Joseph H. S., St. Joseph, Kansas—Captain F. R. Brisack
St. Norbert College, West De Pere, Wisc.—Captain D. V. Johnson
Tampa H. S., Tampa, Fla.—Captain W. H. DeLange
The Sewanee M. A., Sewanee, Tenn.—Major J. F. Hepner
Walla Walla H. S., Walla Walla, Wash.—Captain P. W. Allison
Winder H. S., Winder, Ga.—Captain B. Furuholmen

OFFICERS ON DUTY WITH THE ORGANIZED RESERVES

1st Corps Area

Lt. Col. B. Frankenberger
Lt. Col. S. L. Kiser
Major T. F. Kerschner
Major J. D. Matthews
Major M. A. Dawson
Major L. H. Bixby
Major D. J. Sabini
Major H. Harding

2d Corps Area

Colonel C. H. Lanza
Colonel W. S. Sturgill
Colonel F. E. Hopkins
Colonel A. J. Greer
Colonel J. W. Downer
Lt. Col. J. M. Eager
Lt. Col. C. M. Tuteur
Lt. Col. A. J. Betcher
Major T. Kennedy
Major E. A. Henn
Major R. B. Willis
Major W. J. Jones
Major P. C. Fleming

3d Corps Area

Colonel J. R. Starkey
Major F. M. Crist
Major P. C. Vance
Major R. C. Mallonee
Major D. A. Connor
Major W. D. Mangan
Captain J. A. Jennings

4th Corps Area

Colonel J. F. Barnes
Colonel W. D. Smith
Lt. Col. T. G. Gottschalk
Lt. Col. F. H. Gallup
Major F. Royse
Major J. M. Garrett
Major J. A. Sheridan
Major J. H. Fye
Major G. R. Middleton
Captain E. A. Niblack
Captain H. J. Crigger
Captain G. P. Vanture

5th Corps Area

Major A. J. Zerbee
Major G. S. Beurket
Major R. G. Mangum
Major P. G. Tenney
Major J. M. Sanderson
Major R. V. Maraist
Major F. H. Boucher
Major E. D. Ferguson
Major D. C. Schmahl
Major H. N. Lockwood
Major S. McLeod
Major S. M. Smith
Major E. A. Hyde
Captain C. H. Brammell

6th Corps Area

Lt. Col. J. Andrews
Lt. Col. C. H. Hayes
Major R. V. K. Harris
Major J. C. Patterson
Major R. T. Guthrie
Major T. C. McCormick
Major J. C. Butner
Major M. C. Heyser
Captain F. W. Crary

7th Corps Area

Colonel G. M. Peek
Lt. Col. R. F. Hyatt
Lt. Col. M. H. Taulbee
Lt. Col. C. B. King
Major M. A. S. Ming
Major C. W. Bonham
Major J. C. Adams
Major Y. D. Vesely
Captain C. H. Day
Captain V. R. Smith
Captain C. B. McConnell

8th Corps Area

Major T. R. Miller
Major H. W. Turner
Major V. R. Woodruff
Major S. C. Hilton
Major G. A. Pollin
Major A. L. Campbell
Major R. C. Rutherford
Major M. C. Shea
Captain W. S. Bryant
Captain W. B. Walters
Captain W. R. Schaefer

9th Corps Area

Colonel A. Boone
Lt. Col. H. Templeton
Lt. Col. L. R. Dougherty
Lt. Col. W. F. Maher
Major G. L. Danforth
Major R. W. Yates
Major S. Bacon
Major M. R. Cox
Major P. E. Shea
Major H. T. Brotherton
Major W. P. Bledsoe

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National Guard Bureau

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Lt. Col. E. A. Zundell
Major A. W. Shutter

1st Corps Area

Colonel P. V. Kieffer
Major W. C. Goessling
Major W. C. Brigham
Major N. E. McCluer
Major J. Keliher
Major W. E. Jenkins
Major A. C. Searle
Major W. W. Belcher
Major W. Michener
Major R. A. Knight
Captain W. P. Blair

2d Corps Area

Lt. Col. E. C. Hanford
Lt. Col. R. Hospital
Lt. Col. C. B. McCormick
Major J. L. Gammell
Major W. R. Frost
Major J. S. Tate
Major S. G. Brady
Major M. L. Young
Major W. G. Dockum
Captain J. B. Barth

3d Corps Area

Lt. Col. W. F. Winton
Major W. W. Hess
Major N. C. Manley
Major A. M. Sheets
Major J. J. B. Williams
Major W. L. Bevans
Major C. C. Brown
Captain C. L. Booth
Captain C. R. Gildart
Captain L. T. McMahon

4th Corps Area

Colonel A. L. P. Sands
Lt. Col. G. H. McCoy
Major S. D. Bedinger
Major B. Moore
Major B. C. Anderson
Major C. R. Doran
Major W. H. Quarterman
Major A. S. Quintard
Major A. R. Reeves
Major S. F. Clark
Major L. E. Babcock
Major O. M. Marshburn
Major T. C. Harry

5th Corps Area

Major O. I. Gates
Major A. R. Ives
Major G. H. Stuts
Major W. S. Evans
Major R. B. McBride
Major J. R. Bibb
Captain H. C. Raymond

6th Corps Area

Lt. Col. G. E. Arneman
Lt. Col. C. K. Rhinehart
Major O. N. Schjerven
Major W. H. E. Holmes
Major E. R. Roberts
Captain H. Crawford
Captain F. E. Kauffman
Captain J. E. Bush
Captain E. Y. Argo

7th Corps Area

Major E. B. Edwards
Major F. B. Inglis
Major J. H. Carriker
Major R. H. Dixon
Major J. G. White
Captain A. C. Donovan
Captain J. A. Sullivan
Captain J. J. France
Captain R. O. Smith

8th Corps Area

Major H. B. Parker
Major R. M. Bathurst
Major D. L. Crane
Major H. C. Jones
Major J. J. Atkinson
Major A. Brumage
Major M. C. Walton
Captain M. B. Barragan
Captain H. J. Guernsey

9th Corps Area

Colonel W. C. Potter
Lt. Col. P. L. Thurber
Major J. O. Hoskins
Major H. A. Schwarz
Major J. M. DeWeese
Major J. J. McCollister
Major J. B. Hunt
Major G. J. Downing

OFFICE, ASSISTANT SECRETARY OF WAR

Lt. Col. J. E. McMahon

WAR DEPARTMENT GENERAL STAFF

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Colonel E. L. Gruber
Colonel J. N. Greely
Colonel S. Miles
Colonel W. Bryden
Lt. Col. C. G. Helmick
Lt. Col. C. M. Busbee
Lt. Col. L. C. Sparks
Lt. Col. C. Andrus
Lt. Col. J. B. Wogan
Major F. B. Prickett
Major L. B. Hershey
Major T. T. Handy

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Colonel F. W. Clark, Ft. Lewis
Col. J. P. Marlev, Panama
Col. L. P. Collins, 1st C. A. Hq.
Col. R. W. Briggs, Philippines
Col. R. S. Pratt, 9th C. A. Hq.
Col. J. L. Collins, 2d C. A. Hq.
Col. T. D. Osborne, Hawaii
Col. O. L. Brunzell, 1st C. A. Hq.
Col. E. W. Wildrick, 3d C. A. Hq.
Col. E. R. W. McCabe, 6th C. A. Hq.
Col. F. T. Cruse, Panama
Lt. Col. I. T. Wyche, 4th C. A. Hq.
Lt. Col. K. P. Lord, 1st Div Hq.
Lt. Col. T. G. M. Oliphant, Ft. Lewis
Lt. Col. M. Magruder, Hawaii
Lt. Col. C. L. Clark, 3d C. A. Hq.
Major G. P. Hays, Chicago, Ill.
Major H. E. Maguire, Chicago, Ill.
Major M. M. Montgomery, Columbus, Ohio
Major D. S. Rumbough Philippines

DUTY WITH GENERAL STAFF WITH TROOPS

Captain C. A. Horne, Philippines
Captain J. S. Winn, Jr., Chicago, Ill.

ARMY STAFF

Col. J. H. Bryson, Hq. Third Army
Col. F. A. Ruggles, Hq. Third Army
Col. J. A. Moss, Hq. Second Army

CORPS AREA STAFF

Col. R. H. McMaster, 7th C. A. Hq.
Col. E. Swift, Jr., 6th C. A. Hq.
Col. R. Talbot, 9th C. A. Hq.
Col. J. P. Barney, 3d C. A. Hq.
Col. B. M. Bailey, 4th C. A. Hq.
Lt. Col. L. R. Cole, 3d C. A. Hq.
Lt. Col. C. A. Selleck, 1st C. A. Hq.
Major R. E. Dupuy, 2d C. A. Hq.
Major C. I. McClure, 7th C. A. Hq.

MILITARY ATTACHE

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Lt. Col. R. E. Lee, England
Lt. Col. W. C. Crane, Japan
Lt. Col. J. Magruder, Switzerland
Lt. Col. H. H. Fuller, Belgium
Major J. S. Winslow, Poland
Major L. M. Riley, France, Asst, Military Attache

DETAILED WITH OTHER ARMS AND SERVICES

Adjutant General's Department

Major L. V. Warner
Captain S. M. Bevans

Air Corps

2d Lt. J. V. G. Wilson
2d Lt. D. G. Presnell
2d Lt. A. A. Fickel
2d Lt. J. H. Walsh
2d Lt. G. H. Austin
2d Lt. C. K. Bowen, Jr.
2d Lt. R. D. Gapen
2d Lt. S. W. Hulse, Jr.
2d Lt. J. D. Ruthledge, Jr.
2d Lt. F. R. Terrell
2d Lt. C. D. Vincent
2d Lt. R. W. Sumi
2d Lt. K. P. Bergquist
2d Lt. D. E. Ingram
2d Lt. J. K. Brown, Jr.
2d Lt. K. C. Bothwell, Jr.
2d Lt. R. H. Carmichael
2d Lt. J. E. Goodwin
2d Lt. C. M. McCorkle
2d Lt. N. C. Spencer, Jr.
2d Lt. C. B. Tyler, Jr.

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Brig. Gen, C. F. Cox (Col, FA)
Colonel D. C. McDonald
Lt. Col. H. Eager

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Captain L. M. Johnson
Captain G. J. Deuterman
Captain L. J. Greeley
Captain T. A. Doxey
1st Lt. R. L. Cardell

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Captain L. R. Wood
Captain T. M. Tiernan

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Colonel W. S. Wood
Colonel C. P. George
Lt. Col. L. J. Ahern
Lt. Col. F. B. Jordan
Lt. Col. K. S. Perkins
Lt. Col. L. A. Craig
Major C. C. Park
Major E. C. Williams

Judge Advocate General's Department

Captain A. R. Ginsburgh
Captain A. R. Taylor
Captain L. W. Bassett
Captain A. Svihra
1st Lt. W. P. Connally, Jr.

Ordnance Department

1st Lt. J. S. Walker
1st Lt. J. H. Weber
1st Lt. J. A. Meeks
1st Lt. F. A. Hansen
1st Lt. J. W. Hansbrough
1st Lt. J. A. Barclay, Jr.
1st Lt. S. Smellow
2d Lt. M. B. Chatfield

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Lt. Col. G. S. Gay
Lt. Col. J. A. Gillespie
Major H. B. Hester
Major H. B. Dawson
Major H. Kernan
Major H. E. Tisdale
Major C. R. Hall
Captain D. S. McConnaughy
Captain C. S. Berrien
Captain A. N. Stubblebine
Captain G. W. Vaughn
Captain A. Bratton
Captain E. A. Banning
Captain C. Cavelli, Jr.
Captain L. E. Snell
Captain N. C. Cureton
Captain L. Vocke
Captain H. L. Berry
Captain J. J. Turner
Captain E. F. Kollmer
Captain M. C. Calhoun
Captain P. R. M. Miller
Captain R. T. Bennison
Captain W. E. Shallene
Captain R. P. Hollis
Captain J. Massaro
Capt. P. H. Ringsdorf
Captain C. E. Sargent
Captain C. E. Pease
1st Lt. F. M. Steadman
1st Lt. C. I. Hutton

Signal Corps

Captain S. P. Collins
1st Lt. W. J. Given, Jr.
2d Lt. J. H. Squier

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Captain H. J. Conrey
Captain J. F. Sturman
Captain F. C. Holbrook
Captain J. M. Callicutt
1st Lt. R. H. Harrison
1st Lt. D. Parker, Jr.

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Captain M. D. Taylor, Japan
Captain S. H. Fisher, China

RECRUITING

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Colonel W. Webb
Colonel W. H. Sharp
Colonel L. S. Ryan
Colonel H. L. Landers
Lt. Col. A. C. Sullivan
Major S. J. Cutler
Major J. D. Key
Major F. G. Chaddock
Major E. S. Van Benschoten
Captain N. H. Smith
Captain J. B. Kraft
Captain A. Vepsala
Captain T. R. Willson
Captain G. E. Burritt
Captain J. P. Crehan
1st Lt. F. H. Sinclair

UNITED STATES ARMY TRANSPORT

Colonel C. R. Norton

STUDENT, COLUMBIA UNIVERSITY (RUSSIAN)

Captain I. D. Yeaton

HOME AWAITING RETIREMENT

Captain C. J. Kanaga

LIAISON OFFICER WITH THE GOVERNOR GENERAL, PHILIPPINES

Major J. McDowell

SECOND LIEUTENANTS, ORC, ON ACTIVE DUTY UNDER THOMASON ACT

First Field Artillery, Fort Sill, Okla.

Wirt W. Holsinger
John W. Miller
Robt. M. Webber
Leo Burdzous
Donald E. Glassco
James L. Goodnow
Edward McMaken
Raymond K. Hirsh
Paul J. Bidle
Martin Rudich
Robt. J. Sweitzer

Third Field Artillery, Ft. Sheridan, Ill.

Harold A. Brader
Albert A. Albrecht
Robt. C. Adair
John C. Brogan
John L. Brown
Wm. E. Brubaker

Fourth Field Artillery, Ft. Bragg, N. C.

Richard D. Holder
Linden Chase
John R. Canavan
Charles C. Adams
David W. Newell, Jr.

Fifth Field Artillery, Madison Barracks, N. Y.

Robt. W. Van de Velde
Bernard P. Scully
Oscar M. Doorflinger
Paul G. Krotts

Sixth Field Artillery, Ft. Hoyle, Md.

C. F. Huckestein
S. B. Rotharmel
N. C. Epperly
W. G. Wells
Joseph E. Stopp
Elmer B. Kennedy
Roy S. Duhart
Jack H. James
James T. Avery, Jr.
Francis McC. Clark
Andrew G. Corski

Seventh Field Artillery, Ft. Ethan Allen, Vt.

Otto W. Chadbourne
Richard H. Eanes, Jr.
Reginald M. Cram
Gilman W. Haven
Michael F. Moffitt
Robt. C. Williams
Herbert P. Orland
Wilson C. McNamara
Robt. E. Thurston
Silas C. Carpenter

Ninth Field Artillery, Fort Lewis, Wash.

Wm. A. Enemark
Wm. J. Fluke
Charles E. Welsh

Tenth Field Artillery, Fort Lewis, Wash.

James D. Doulon	Bertram I. Nash	Lynn H. Stockman
Dee J. Valentine	Stanley C. Andersen	Wm. H. Woodford
Raymond Welch	John T. Lorenz	Robt. J. Tripp
	Richard T. Benson	

Twelfth Field Artillery, Ft. Sam Houston, Texas

Leo Cohen	Richard F. Askew	Charles W. Hines
Osborne B. Jones	Edgar E. Bartlett	Leonard C. B. Jenks
Charles G. Cassell	Stuart F. Brady	Wm. L. Waldrop
Ben E. Allen	Glenn A. Foster	Frank G. Ratcliff

Fifteenth Field Artillery, Ft. Sam Houston, Texas

Bertel O. Sandberg	John E. Wurst	Robert A. Tullis
Julius B. Heines	Franklin E. Schroeck	Jack A. Walker
Gus H. Froebel	Thomas Fulbright	John F. Hunt, Jr.
Clarence W. Hahn	John M. Newton	Robt. L. Roper

Sixteenth Field Artillery, Ft. Myer, Va.

John F. Ott	Bernard F. Bruns	Temple S. Ryland
John G. Simpson	Richard C. Hoffman	Wm. B. Wingfield, Jr.
Erwin H. Shupp	Gilbert M. Payne	Herbert W. Peters

Seventeenth Field Artillery, Ft. Bragg, N. C.

Arthur M. Baker, Jr.	Philip A. Fogle	Conrad P. Irwin, Jr.
Richard G. Banks	Frank T. Gayer	Edwin B. Joseph
Walter E. Barker	George Gulian	Forbes R. McCreary, Jr.
John M. Fitzgerald	Donald W. Hindes	John L. Ruby

Eighteenth Field Artillery, Ft. Sill, Okla.

James Z. Nicholls	Lyle J. Robertson	Ralph A. Ruud
Elton E. Hill	Russell E. Jones	Steven F. Steib
Walter E. Tardy	Noel McK. Weaver	Charles R. Butler
Willis B. Lynch	Wm. S. George	James L. Lain

Nineteenth Field Artillery, Ft. Benjamin Harrison, Ind.

Ross G. Crump	Woodrow W. Lee	Farmon W. Reed
Gerahon Kerstein	Howard Peters	Robt. E. Stearon

Twenty-fifth Field Artillery, Madison Barracks, N. Y.

Howard L. Snyder	Leroy J. Wolf	Marcus A. Mullen

Thirty-sixth Field Artillery, Ft. Bragg, N. C.

Frank H. Ellis	Paul S. Hicks	Max T. Roadruck
Jerome M. Smith	Edward G. Smith	

Seventy-sixth Field Artillery, Ft. F. E. Warren, Wyo.

Donald N. Etchison	Thomas E. Noble	Wallace A. Rogers
Stuart J. Sietsma	Lloyd P. Van Court	Floyd W. Whitford

Seventy-sixth Field Artillery, Presidio of Monterey, Calif.

Wm. S. Alldredge	Edward J. McKeon	Byron D. Magee

Seventy-seventh Field Artillery, Fort D. A. Russell, Marfa, Texas

Raymond W. Hanna	Thomas St. John Arnold

Seventy-seventh Field Artillery, Fort Sill, Oklahoma

Walter L. Beadle	Don W. Dixon	Bill J. Tutin
Harold M. Simon	William Law	Warren F. Welch

Eightieth Field Artillery, Ft. Des Moines, Iowa

Harold W. Gramness	Dwight S. Hull	Dale E. Skyllingstad
George J. Helms	Clifford H. Schlesselman	Robert E. Treneman

Eighty-second Field Artillery, Ft. Bliss, Texas

Alfred B. Banks	Wm. W. Engels	James H. Marsteller
Martin P. Cornelius, Jr.	Paul T. Marion	Ralph L. Norling
John F. Duncan	Carl J. Martin	George W. Aux

Eighty-third Field Artillery, Ft. Benning, Ga.

Robt. J. Friedman	Richard C. Welty	Eugene M. Lee
Elwood T. Rouse	Henry L. Hill	Edwin B. Warren
Julian A. Greer	Payton E. Schepps	

Eighty-third Field Artillery, Ft. Bragg, N. C.

Sam W. Westbrook	Philip G. Hughes	Augustus P. Vitali
Tony J. Raibl	Albert J. Noylan	

Eighty-fourth Field Artillery, Ft. Riley, Kansas

George P. Apland	Claude Headen, Jr.	Robt. J. Taylor
Evans H. Burnite	Allen S. Kilborn	Cleve Turner
James B. Clift	Francis X. Olney	Ernest H. Schaper

STANDARD REFERENCE CALENDAR

A 32-page booklet is published by the Standard Calendar Association, Washington, D. C., which contains 14 "finding tables" for all dates from September 3-14, 1752, to 2100 A.D. With the aid of these tables may be found the day of the week of any date within the inclusive years. The tables are in regular calendar form, and are never out of date. Table VI, for instance, is the 1937 Calendar. The booklet includes, also, important church festivals, anniversaries, and holidays, listing the states and territories where they are observed: it gives a short history of the calendar and its reform, and a very complete description of the 13-month calendar, whose adoption it urges. It may be purchased from the copyright holder, Mr. Newton J. Darden, 922 Grant Place, N. W., Washington, for fifty cents, postpaid.

In Memoriam

The Field Artillery Association announces, with deep regret, the death of Colonel Alden Farley Brewster, Field Artillery, at Fort Francis E. Warren, Wyoming, September 17, 1936.

At the time of his passing he was Commanding Officer of the Seventy-Sixth Field Artillery. Three times had he commanded the regiment at Fort Warren, and six times had he been stationed at that post. It was fitting that his last resting place should be chosen there.

Colonel Brewster was born in Illinois, July 30, 1877. He was a graduate of St. John's Military Academy, Delafield, Wisconsin, in 1896, and of the United States Military Academy in 1901. On February 18 of the latter year he was appointed a second lieutenant of the artillery corps, and served with that arm until the time of his passing, save for a year in the Adjutant General's Department, and for two years in the General Staff Corps.

He had been commended for distinguished service in the field in Jolo. P. I., in 1905, and the late General Hugh L. Scott, under whom he had served in the Sulu Archipelago, wrote, while Superintendent of the Military Academy, of his "gallant conduct under fire," his "skilful serving of the guns," and his "faithful performance of every duty." He had been a captain in the Fourth Artillery at Vera Cruz, Mexico, in 1914, and went to France in 1917 with the 12th Field Artillery, with which he served in the Toulon Sector in March and April, 1918. Following his promotion to Colonel of Field Artillery, National Army, he was assigned as Liaison Officer of the Chief of Artillery, AEF, with the Services of Supply. His work in hastening the appearance of artillery brigades at the front by his energetic supervision of their supply of equipment won for him the award of the Purple Heart. The French recognized his attainments by making him an Officer of the Legion of Honor.

Colonel Brewster was a graduate of the School of the Line, 1922, and of the War College, 1929. He was on the General Staff Corps Eligible List. From April 12 to August 16, 1928, he was Executive Officer for the Chief of Field Artillery. He was widely known as a horseman, and his commands, since the war, were repeatedly commended for their proficiency in this respect.

He is survived by his widow, Mrs. Florence Willits Brewster, and two sons, Willits Alden Brewster and John Potts Brewster. To these the Field Artillery Association extends its condolences and its sorrow at the passing of a distinguished officer whose loss to the Field Artillery and to the Army will be felt deeply.

Gunnery

IN THE publication of Field Artillery Book 161, "Gunnery," the Field Artillery School has crystallized those modifications and simplifications of technical procedure which were foreshadowed in the 1935 *Digest of Field Artillery Developments*.

The principal changes from the practices formerly prescribed in TR 430-85 apply chiefly to preparation of fire.

The terms "Rapid Preparation" and "Deliberate Preparation" have been succeeded by the more descriptive terms, "Preparation of Fire With Instruments," and "Preparation of Fire from Firing Charts," respectively.

The necessity of manipulating the sheaf from staggered positions has led to the adoption, as standard, of a method of converging the sheaf at the target and then opening it to the desired width. The executive is charged with the duty of computing and applying the deflection differences resulting from the BC's command: "CONVERGE AT (So many yards)."

The elimination of deflection "safety factors" (lateral margins of assurance) for unobserved concentrations, results from the adoption of a means of checking the map-shift direction from a high burst fired at the executive's command.

The complexities of computing a separate concentration for each piece (which was part of the former method) have been done away with by no longer requiring deflection, site, and elevation changes for each piece (because of irregularities in terrain, or perimeter of the target), and by a method of "standard areas," which prescribes circles of 100-, 200-, or 300-yard diameter to represent targets, for which the assigned rounds sweeping are, respectively: None, Two, and Three. For each of these areas, standard allotments of ammunition for neutralization are prescribed, so that not only conduct of fire, but fire direction, has been considerably relieved of last-minute computations.

In addition, the preparation of deflection shifts for a number of concentrations has been simplified by a slightly different method of establishment on the base line. Formerly, whether the transfer were by *K* or *VE* method, the adjusted deflection was "stripped" of all deflection effects, so that base deflection theoretically

bore-sighted the base piece on the base point. It then became necessary to apply drift and weather effects separately to each target.

The current method records base deflection for *K*-transfers as that direction which moves the bore *right* of the adjusted deflection to the base point by the amount of drift at base-point range. "This allows the correction for drift for any subsequent target to be applied directly and in full, and obviates the necessity for a comparison each time with the drift for the base point."

For *VE*-transfers, of course, it still is necessary to remove all known effects from the base deflection, but a weather-correction chart, which may be made up in advance, considerably simplifies this procedure.

Much simpler methods of high-burst and center-of-impact adjustments also have been adopted, and the chapter on lateral conduct of fire, it is thought, will resolve a good many doubts by those who have struggled with the subject.

Only the practical features of probability and dispersion have been retained. Where necessary for the students to grasp certain phases of the problem, experience tables have been substituted for the former requirement of computation. Twelve pages, liberally illustrated, contain all the instruction assigned to this feature.

Methods of rapid convergence of the fire of several batteries on a single target are described in a section on battalion observed-fire charts.

The simultaneous revision of firing-battery practice, made necessary by certain of these changes, appears in Field Artillery Book 162, "The Firing Battery."

For extension-course instruction there has been prepared Special Text 101, "Abbreviated Firing Tables for 75-mm. Gun and 155-mm. Howitzer." These tables are the result of long study and development by the Department of Gunnery at the Field Artillery School. They are of entirely new form, reduce interpolations to the minimum, and contain nearly all effects on one page. The complete data for HE Shell, Mark I, Normal Charge, Fuze Long, for example, which required some 23 pages in the official tables, have but five in this. It is true these pages are larger, as they were not designed for field use, but the type is larger and

more easily read. Position-correction tables have been dropped in favor of the more accurate complementary-angle-of-site tables. In the 155-mm. section, data for fuze long and fuze short have been combined for all functions save elevation. The book contains but 67 pages, including very detailed description of use, a type problem, a blank data-correction sheet and a duplicate filled in with the entries for the type problem, and miscellaneous tables, including those for *s* and *d,* conversion tables, natural functions in mils, ammunition tables, rates of fire, data to cover standard areas, and the executive's convergence table.

The 75-mm. section *omits* data for Mark II and Mark IV shell, and reduced charge for Mark I. The 155-mm. section *omits* data for shrapnel, *omits* Charges I, II, and VII, and *contains* Charge III complete, Charge IV for ranges 3,000-7,000; Charge V for ranges 5,000-9,000; and Charge VI for ranges 7,000-11,000. It will be noted that the data included for selection are those appropriate for perhaps 95 percent of all service practice.

Enrollment of ROTC at University of Illinois shows increase of 512 over previous year, and of 1,522 over 1933-34, with FA increase of 491 over October, 1933. . . . 135th FA, Ohio NG, was Honor Unit in attendance record for 12th and 13th consecutive times in June and July. Its 155-mm. sister regiment, the 136th, was organized June 25—went to camp in September—led in attendance both August and September. . . . Maj. G. S. Beurket, FA, speaker at annual dinner, Indiana Chapter, Reserve Officers Association (Indianapolis, Dec. 5), of which Col. C. C. Bassett, FA-Res., is president. . . . Hart Moore, 38 years away from service in Btry A, 2d Artillery, won't let anyone else carry National Colors in Uniontown, Pa., parades. . . . The three Puckett brothers, Wagoner, Okla., join Btry A, 77th FA, at Sill. (Probably heard 77th was mopping up in football.) . . . 2d FA (Ft. Clayton, C. Z.) five take Corozal into camp, 42-31.

TALKING SHOP

Over in this corner is the huddle where the conversation is climaxed with, "Why don't you write that up for *The Journal?"* Contributions should be brief. Those received will be acknowledged, and printed when space permits.

Perps

The new Field Artillery Book 161, "Gunnery," gives us, as the official doctrine, a simple method of computing offsets without use of obliquity factors; but the rather mouth-filling phrases: "The perpendicular distance (estimated), G to OT line," and "The perpendicular distance (estimated), G to O—BP line," bother some officers. In giving instruction they find the necessary repetition of these tongue-twisters causes confusion in speech, thought, and action. It is suggested that for the first phrase they substitute "T-perp" (written T ⊥), and for the second. "P-perp" (written P ⊥). These contractions are rather descriptive of the ideas they represent. (No copyright has been applied therefor.)

—MAJOR J. O. HOSKINS, *FA.,*
Instructor, California National Guard.

Designation Plates for Trucks

The marking of designation plates for vehicles in truck-drawn units, always a problem where adequate paint-shop facilities do not exist, was performed in one ROTC unit with the aid of the State Motor Vehicle Commissioner, who supplied them at fifty cents a pair. Personal interview was necessary to insure obtaining the particular type desired. Neatly stamped and painted plates were secured, which conformed to accepted field artillery practice, and, as closely as possible, to AR 850-5. (The latter, however, has not been revised since issuance of late-type vehicles, for some of which its provisions cannot be applied exactly.)

—CAPTAIN DAVID S. BABCOCK, *FA.*

Has the Army Too Much Radio?*

BY MAJOR GENERAL J. B. ALLISON, *Chief Signal Officer*

I AM frequently asked the question, "Has the Army too much radio?" This question comes up in one form or another almost every day: "Should our laboratories undertake to develop a new radio set for a certain purpose?"; "Should a proposed basis of issue of radio equipment be approved?" "Can personnel be spared to operate a certain station?" Sometimes the proper answer to such questions is "Yes" and sometimes "No." Each case is a special one and must be decided on its own merits, usually only after very careful study of cost of equipment, frequencies required, demands for personnel, and the actual need for the additional communications requested.

In some quarters the growth of our radio organization is viewed with apprehension. It is true that the number of different types of sets, the total number of sets, and the number of men assigned to operate them have all continued to increase. Since 1903, when the first Army radio stations began handling regular business across Norton Sound, radio has "sold" itself as the answer to more and more Army needs. It is natural that this persistent augmentation of our radio set-up, with its consequent demands for more men and money, should occasion concern, especially so among those who have not been in close touch with radio development and among those who visualize the communication needs of the 1936 Army through the veil of their memories of operations in the AEF.

It is a truism to say that we are living in a marvelous age. It is trite to mention that radio has had an amazing evolution from the crude, heavy, power-consuming sets of a former period, to the finished, light, efficient equipment which we have today. The Army has also greatly changed during this period. It has become more and more complex with each passing year and its means of transport has continued to speed up. At the cost of becoming

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*The view expressed and the conclusions drawn in this article are those of the author and not of the War Department.

tiresome. I must mention these things because they account for the constant expansion of our radio set-up.

Our changing Army is constantly finding new needs for radio; and radio itself is ever improving its ability to serve these new needs while serving the old needs better than before. Because of these things, our radio organization which filled the bill in 1916 was ancient history in 1926, and in turn our 1926 set-up would look like the horse-and-buggy days now. We just cannot imagine the GHQ Air Force, the Mechanized Brigade, or the 1st Cavalry Division without modern radio. Nor could the commanders of these organizations hope to coordinate the action of their commands without it. To the offhand peruser of the radio charts of these organizations, they may seem extravagant of personnel and equipment. But to the commander, faced with the actual problem of control, they represent the minimum essentials.

By virtue of Army Regulations I am the advisor of the War Department on radio matters. In that capacity I am frequently forced to apply the brakes when people ask for more radio. But I do so only after careful study and then I see that the matter is followed up to make sure the decision be the correct one. I have little fear that radio will be unduly expanded; there are too many hard-headed commanders, staff officers, inspectors, and other higher-ups who look at radio with a cold and fishy eye. Whatever place radio has in the Army, it has earned, and whenever it lies down on the job, you may be sure it will be promptly kicked out.

When I am asked the question, "Has the Army too much radio?" I know the questioner believes the proper answer to be "yes" and I assume he has some definite phase of the problem in his mind. A simple "no" will not satisfy his doubt. It is necessary to learn just what is back of his question. Effort may then be concentrated upon answering along that line of thought. The questioner usually has in mind one or more of five different phases of the problem. I shall set them down in turn in the form of questions, each followed by my answer to that phase of the subject:

Question 1: Radio is slow, unreliable, subject to enemy jamming, intercept and goniometric location. It does not compare in

reliability or usefulness with the wire telephone or telegraph. Why not therefore soft-pedal the former and concentrate on the latter?

Answer: The premise is correct and well recognized. Units which can hope in active operations to keep up wire communications, plan to do so. With them, radio is merely a contingent or auxiliary means to be resorted to when their respective wire systems have failed or before they are put in. The main effort of the communication troops of such units is naturally toward the upkeep of their wire systems. On the other hand, air-air and air-ground communications and those within mechanized and horse cavalry must obviously depend upon radio for long distance and immediate action communications. With them, radio has priority. They recognize its disadvantages but they realize it is radio or nothing. I am happy to say that radio is giving them satisfactory service. That they will have much more serious difficulty with radio when in contact with the enemy than in peacetime maneuvers, no one doubts. The effectiveness of radio for the next war, like that of air operations, can obviously never be proven until the opposing forces are in contact. Meanwhile, against such a test, we are striving to put into the field the best equipment in the world and a radio organization capable of handling it effectively.

Question 2: The War Department Radio Net is handling a large volume of traffic and is handling it well, but at a number of small posts there are radio stations which do only a handful of business. The pay of the operators sometimes exceeds the charges which would be billed against the Government were the entire traffic of the station turned over to commercial companies. Since such stations are not economically justified, why not close them and assign the operators to other duties?

Answer: It is a fact that the radio stations at two of the smaller posts are definitely not justified economically, and it is probable that several other stations would be similarly classified if all items of cost were charged against them, but this is a question which has been asked officially and has been answered with finality. In 1931 the Chief Signal Officer appointed a board of officers to study this matter and as a result of the board's report, recommended the closing of 30 of the smaller stations. There followed

protests from corps-area commanders, and only nine were actually closed. Then came urgent requests for reopening, and seven of the nine were recommissioned. Thus, of the 30 stations recommended for closing, only two have remained closed and of these one was located at a post which has since been abandoned. The net result of all this bother is thus approximately zero. In many respects corps-area commanders differ from one another, but they have this in common: Each is quite insistent that communications with all the fighting troops of his area be safe from interruption in case of national emergency or domestic disturbance. Even though the commercial companies may have a number of alternate routings from corps-area headquarters to a distant small post, the all-Army direct radio channel gets the call. The experience cited seems to have definitely settled the question. Forts Brady and Wayne have their stations and. economically justified or no, I believe they are going to keep them.

Question 3: Each radio set which is authorized requires at least two and usually three operators. We have difficulty in training our relatively small peace-strength personnel even though we have all year to do so. How can we hope to train the large numbers of operators required for the war-time Army when we shall have only a few weeks available for their instruction?

Answer: This is a serious problem and one which is receiving earnest attention in my office. We expect to select for training as radio operators only the most promising and mentally alert of our Signal Corps recruits or draftees. Assuming ideal conditions, we hope to be able to turn these men out effective field radio operators at the end of 16 weeks. The problem of the reserve divisions, therefore, seems capable of satisfactory solution. But for the inactive units scheduled to arrive in the theater of operations as part of the covering force, the radio operator problem will be more difficult. However, there are something like 48,000 amateur radio operators in the United States, varying in ability from almost complete ineffectiveness to a state of excellence approaching commercial or War Department net standards. These latter and the considerable field of commercial and ex-Army operators will be our main reliance for the early units. We have contact with about 1,200 excellent amateur operators in our Army Amateur

Radio System. These men, working entirely on their own time, learn Army procedure, and handle Red Cross and other emergency traffic in accordance with Army methods. As far as the Signal Corps is concerned we can and will find a solution. This problem is also equally as serious, perhaps even more so, for the Infantry, Cavalry, Field Artillery, Air Corps, Coast Artillery, and corps-area commanders. It is presumed that each has worked out his plans.

Question 4: Because of its complexity of equipment, because of its lack of secrecy, and because of its wide frequency channel, should not radiotelephony be curbed and should not Army field radio sets be built for radiotelegraph operation only?

Discussion: During the last five years the Army has exhibited a marked tendency to abandon the radio key in favor of the microphone. This tendency is viewed with alarm by many students of the subject, who point out that when a radiotelegraph set is replaced by one using voice modulation, three important disadvantages attend the change:

(1) The new set is more complicated, expensive, and difficult to maintain: in addition it is heavier and requires more power for its operation.

(2) Speech is less secret than dot-dash signals and less adaptable to the use of code and

(3) A voice-modulated signal cannot be tuned as sharply as can an unmodulated radiotelegraph transmission. In alloting circuits, therefore, telephone nets require about 2½ times the frequency separation as do nets which use unmodulated telegraph only. Owing to the inadequacy of the usable spectrum for Army requirements, this appears an extravagance difficult to justify.

In discussing these points in sequence, the situation may be analyzed thus:

(1) It is true that radiotelephone equipment is more intricate, requires more skill for its maintenance, and costs more than corresponding radiotelegraph equipment. Voice sets are also slightly heavier. In addition, they require a larger power input for the same distance range than do radiotelegraph sets. These increases in weight and power input might well be of decisive importance for some possible special use, but when the set is to be transported

by a motor vehicle or airplane, and operated from its source of power or from a separate gas engine, these factors assume minor importance.

(2) An organized radio intelligence service will employ expert operators for its intercept activities. Such a service may be expected to have little difficulty in making reliable transcript of key traffic or of voice transmissions. In this respect, therefore, the telephone is not at a disadvantage. However, when radio traffic is by voice in the language of the enemy, we may be sure his front-line troops will also listen in, and that such an expanded radio intelligence service would almost inevitably learn at least the general intentions of the voice-using unit. The adaptability of voice transmission to code has not been fully investigated by our Army, nor are results available of any tests which may have been held elsewhere. Lacking such information, material has been prepared to test the use of code with voice transmission. Reports of recent maneuvers indicate that an enemy would be likely to gain much information from our radio transmissions owing to carelessness or ignorance in cryptographing, and to unnecessary informal communications between operators, whether by key or voice. By the use of radio monitoring stations at future maneuvers, it is hoped to correct our deficiencies, determine the weaknesses of our methods, and learn the relative merits of radio telegraphy and telephony in respect to secrecy.

(3) The dispersion of small Army forces at widely separated posts generally permits each such unit to utilize for its training the entire frequency band of each of its types of sets. These units are thus able to be most liberal with themselves in the matter of frequency channel separation for the various local nets. Warning of scarcity in case of a large concentration disturbs them only slightly, as of some far-remote possibility which may never occur. Such being the case, it is difficult to make them see the famine of frequency channels which will exist when a field army is concentrated in a theater of operations. However, in spite of the nonconcurrence of the using arms, the extravagant demand of the telephone channel for width of frequency band is a vital concern to us all.

This analysis seriously indicts the radio telephone. The only

friends it has are the people who use it; they swear by it. They point out that for rapid operations, coded telegraph messages are entirely too slow for the need, whereas a few words by voice are sufficient to coordinate instantly the movements of a large force. They mention the fact that three or four highly trained radio mechanics can keep many sets in operating condition, whereas the numerous operators, since they need not be fast key men, can give much of their training time to other specialties required by their units. Radiotelephone enthusiasts also attempt to show that, for the more frequently used messages, a simple prearranged code, supplemented by a specially prepared map, will secure the necessary secrecy, it being their estimate that before an enemy could solve such messages and act on the information they contain, the situation would have so changed meanwhile as to render the information of no value.

Answer: After considering all sides of the radiotelephone problem, I continue to view its use with distrust because of its lack of secrecy and its wide frequency channel. Pending results of tests of radio secrecy and collection of further information on use of frequency channels, I believe it wise for the using arms to fully investigate the tactical possibilities of voice transmission. But they must be prepared to use the telephone with the serious restrictions which will have to be imposed.

Question 5: A war-strength field army under present allowances will have about 2,000 radio sets in more than 327 separate nets. So many nets cannot operate on the available frequencies without mutual interference. This being so, why not take much of this equipment away from the troops now burdened with it and leave only those sets which can all operate at the same time? This would avoid some of the confusion we now experience in radio operation and would save men for the firing line. Moreover, the money which is now spent on this surplus radio equipment could be utilized for other things which we sorely need.

Answer: (1) Before answering this question we shall ask and answer a question of our own, "Who are the troops presumed to be burdened with radio equipment which they cannot use?" Obviously not the Air Corps, Cavalry or mechanized troops. There are left then, the Infantry, Field Artillery, Anti-aircraft Artillery,

and Signal Corps. These troops are apparently assumed to be so burdened. But are they in fact? It is true that the former, more speedy group will require the lion's share of the limited frequencies and that there may be too few channels left over to permit all nets of the latter group to operate simultaneously. However, before we make this a positive statement and say there definitely will be too-few channels, we must know the character of operations in which we shall be engaged. If these operations will be similar to those on the Western Front in 1918 then there is no question about it: there will be too few channels to go around, and some modification will have to be made in the normal organization of our radio nets.

(2) In such a case, it will be the duty of the Army Signal Officer to find a solution and to devise a special radio organization to fit the situation from day to day. The indicated solution is liberality to units in the main effort and to those anticipating special need, but restraint to those in less-vital operations. The Army Signal Officer will remember that radio is only an auxiliary or contingent means for these troops, and he will know how to apportion the available frequencies so they will do the most good. For example: Our charts usually show all 12 infantry battalions, 4 regiments, and 2 brigades of a division on the front line, grouped into six tactical nets, and thus requiring six different frequencies. This chart is purely schematic and we never expect to see such a formation in action. Three regiments with six or seven battalions of the line would be a more likely attack formation. Three frequencies, instead of six, would serve excellently the infantry needs of such a formation; even a single frequency, would serve for emergencies and might save a situation otherwise lost. During the bombardment of the 3d Division by the Germans on 14 and 15 July, 1918, at the Marne, every line of the 4th Infantry was severed. Eight pairs of linemen went out in an endeavor to repair the breaks but every man was either killed or wounded. Radio was then resorted to and operated successfully.

(3) But many strategists find it difficult to visualize operations on the North American Continent similar to the trench-warfare stalemate of the Western Front. They picture swift-moving thrusts by forces operating with strategic coordination but with

considerable tactical independence and with wide intervals between adjacent forces. The main ideas are strategic speed, surprise, and fast-moving drives against vital points. If the operation of a force is blocked it will not necessarily dig in and organize for a head-on attack against a prepared position. Rather will it seek to withdraw and to move with speed to strike a telling blow elsewhere. It will abandon its strategic mobility only as a last resort. If this be the likely character of our future operations, we shall need all our radio nets and shall be able to operate them simultaneously. Incidentally, it would be quite impracticable to maintain wire communications for operations of this character.

Such are the questions. It is well that they are asked. It indicates that thought and study are being given to our radio set-up. And discussion of such matters is valuable. I live with this problem and I naturally feel a certain familiarity with it. But I almost never leave a new discussion of it without a feeling that I have touched a new point of view; that I am thereby one step nearer the correct solution. That solution, with all its related appendices and corollaries, is perhaps the biggest problem of the Chief Signal Officer.

THE UNITED STATES FIELD ARTILLERY ASSOCIATION

In compliance with Article VII. Section I, of the Constitution, notice is hereby given that the Executive Council has fixed 4:45 PM, Friday, December 11th, 1936, as the time of the annual meeting of the Association, to be held at the Army and Navy Club, Washington, D. C.

The business to be disposed of will be the election of a Vice-President, three members of the Executive Council (of these, two are to be elected from the Regular Army, and one from the Field Artillery Section of the Officers' Reserve Corps) and the transaction of such other business as may properly come before the meeting.

In view of the fact that the Constitution requires fifty percent of the members in the United States to be present in person or represented by written proxies to constitute a quorum, it is urgently requested that the return postcards which have been mailed to the members of the Association be filled out and returned to the Secretary.

Field Artillery Family Party

DEAR EDITOR:

Your correspondent wishes to explain that the illustration above, drawn by Lieutenant Colonel S. LeRoy Irwin, FA, was the design of the place card at the Annual Field Artillery Dinner at the Army and Navy Country Club, Washington, D. C., October 23rd, 1936, which he attended, pursuant to your assignment. An attempt to initiate a contest to suggest the most fitting remark which the near horse is making to the off horse was frustrated by a little group of willful men who announced that not only would there be no contest but that there would be no remarks. This left the diners speechless.

The ballroom, where Major General and Mrs. Upton Birnie, Jr., and Colonel and Mrs. Oliver L. Spaulding, FA, received the guests, was a blaze of colors and scarlet guidons. Some of the latter were borrowed from the Smithsonian Institute by Captain Harry C. Larter, Jr., The Great Borrower, who would, and could, borrow the crown jewels to set off an artillery occasion. Among them were several of great historic interest, notably an early Revolutionary guidon of gray, and one which, believe it or not, had "Navy" on it. (Those who wish more information about the guidons need only give their address to Captain Larter, who will write them not to exceed 10,000 words on the subject.)

Your correspondent had a vague impression that this dinner

was an annual affair where a dozen or so inhabitants of the Munitions Building got together for an evening of shop. On the contrary, it was, as someone remarked, comparable only to the lobby of the Astor Hotel on the eve of an Army-Navy game for encountering friends one had not seen in a half-dozen tours. Colonel Allen J. Greer, FA, who came from New York for the occasion, held the distance record, but he was closely pressed by several other contestants.

Colonel Spaulding was chairman of the arrangements committee. His middle man was Colonel R. E. DeR. Hoyle, FA, who supervised the activities of the junior member, Lieut. J. O. Seaman. 16th FA. Now that the chain of command has been explained, let it be said that Major John Nash, punchmaster general, adhered to his usual custom of requiring that the lemons and oranges be squeezed by hand.

During dinner, Captain Mark H. Doty, adjutant of the 6th FA. Fort Hoyle, Md., who appeared to act as intermediary between the orchestra and the diners, arose, and announced, gravely, that so many volunteers had offered to sing solos that it had been thought best to combine their efforts. The immortal words of Colonel E. L. Gruber's Field Artillery Song then burst forth. This number went to the last verse, and the Mountain Battery Song to the third, but during the rendition of "When Irish Eyes Are Smiling," there was a good deal of humming, indicating a state of faulty memory which your correspondent believes should be corrected. "The Long, Long Trail" was not sung. This precedent was commented upon favorably.

A peek at the place cards:

Major General and Mrs. U. Birnie, Jr.: Lt. Col. and Mrs. C. Andrus: Lt. J. T. Avery, Jr.; Lt. Col. and Mrs. J. F. Barnes; Major and Mrs. E. H. Brooks; Lt. B. F. Bruns and Miss Finch; Col, and Mrs. W. Bryden; Capt. and Mrs. C. F. Burbach; Major and Mrs. W. A. Campbell; Lt. Col. and Mrs. T. J. J. Christian; Lt. Col. and Mrs. C. L. Clark; Capt. and Mrs. S. P. Collins; Major and Mrs. L. J. Compton; Lt. and Mrs. R. Condon; Lt. Col. and Mrs. J. A. Crane; Lt. T. L. Crystal, Jr., and Miss Marion Bryden; Major and Mrs. W. H. Cureton.

Col. and Mrs. J. R. Davis, Miss Baum: Col. and Mrs. G. W.

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BOOK REVIEW

AMERICANS ALL, *The Rainbow at War*. Official History of the 42d Rainbow Division in the World War. By Henry J. Reilly, Brigadier General, ORC. Published by the F. J. Heer Printing Company, Columbus, Ohio. $3.00.

General Reilly (of "Reilly's Bucks") has taken battle apart and put it together again in this monumental work of 888 pages.

It is safe to assume that when, as official historian of the 42d (Rainbow) Division, he embarked upon what was clearly a labor of love, he could not have foreseen the compass of his work. Again and again, he begins with a national policy, describes the orders of the high command that aimed at execution of the policy, traces the actions of armies, corps, divisions, and brigades right down to Number One in the front rank, and there suffers the latter's hunger, thirst, and pain, or chuckles with him over the never-absent humorous incident. Then he tells Number Two's story, and Three's, and works back up again, illustrating the more important actions with the most easily read maps this reviewer has seen.

General Reilly has a nose for news. He should have. He was a war correspondent until our entry into the war; then, West Point and ten years of regular service behind him, he took, first, a regiment of field artillery, then a brigade of infantry, into action. It was hot action, and everywhere that Reilly went his bucks were sure to go. Perhaps they did not know until considerably later that their leader, famed as one of the strictest disciplinarians in the division, had not missed one of their tricks, from the bold venture to the good story—even if the latter was on him.

With good stories this book abounds. They are not all humorous stories. Some of them seem so now, but how tragic then must have been the plight of the machine-gun driver who, reporting over a field phone that he was short a horse, was interrupted by his major (who cut in with a hand set on any wire he saw, just out of curiosity) and was directed to *get* a horse, and get that gun up with the advance, where it was vitally needed. The tale of the securing of that horse will be a classic wherever soldiers gather.

Every famous name in the AEF appears, somewhere or other, in this book, whose cover alone, engraved with the Rainbow insignia and with that of every unit in the division, is worth the sale price.

General Reilly is an artilleryman and the son of an artilleryman, the Captain Henry J. Reilly, of "Reilly's Battery," who fell before the gates of Peking.

A SENATOR AWARDS SPURS

BY CAPTAIN HOMER A. DYE, FA-RES.

YEAR after year, the selected soldiers of the small-arms go to Camp Perry and vie, one with the other, in marksmanship. And after their elaborate courses in vying, which emphasize the slow squeeze and the held breath, prizes are passed around.

Leaders in field artillery thought have considered the possibility of promoting similar encouragement for the artillery aspirant who does his shooting by proxy from an observation post—who figures his preparation of fire, gives his commands, gets his bracket, and goes into fire for effect. If the instructor lets him.

An old regimental custom was continued at Fort Riley last summer when the officers of the 379th Field Artillery reported for fifteen-day training. The regimental commander, Colonel (and United States Senator from Missouri) Harry S. Truman, prescribed a program of skull practice prior to service practice, and announced that he would award a pair of spurs to the officer firing the best problem in the regiment, and a pair of gold bars to the second lieutenant firing the best problem.

"And maybe," he commented, "a second lieutenant will get both." He was close. First Lieutenant Dwight C. Johnson took the spurs; Second Lieutenant Joseph E. Martin, the gold bars.

Those of us who had our introduction to conduct of fire back in the days of the ninety-day training camps, and who have seen these youngsters of the post-war generation step up for their awards, can offer but one alibi: Increased facilities and advantages for artillery instruction received by present-day cadets.

Both winners were ROTC graduates from the University of Missouri. Johnson was from the 1931 class, and Martin from the class of 1934. Each had taken his fundamental instruction in field artillery in calm, normal, leisurely fashion, just as any other classroom instruction had been received. Each, when it came his turn to step up to the BC scope, to measure the angle

from base deflection, did so as if he knew what the instrument were for, and just how he was going to use it.

Back in the days when I first studied artillery, the first thing that was impressed on me was that the scope was worth several thousand dollars, F.O.B. wartime, and that candidate officers, expendable, were assayed at $33 a month (two for sixty). The Principle of Economy of Force (TR 10-5), which obtained at that time, was that a candidate learned to operate the instrument by reading about it in the red-back FADR, and that the instrument's time should not be wasted by handling the gadgets on it until arrival at the front.

As a result a BC scope is something sacred to me, and even now it is hard for me to bring myself to paw over it, without a trace of bashfulness.

But these kids, who are graduates of a school that has the instrument as readily available as an atlas, are so little in awe of it that they actually use it. They have learned their artillery in easy stages over a four-year period. They aren't fussed at the firing point. It's old stuff to them.

Yet new angles are kept before them, too. The regiment, has, in its Kansas City armory, terrain boards, miniature ranges, and other devices which are much in evidence at weekly meetings. Instructors from the Command and General Staff School visit these meetings during the course of winter assemblies, to deliver lectures to the reserve and national guard officers of all arms and services.

Colonel George M. Peek, FA, unit instructor of the Western Missouri Artillery Group, explained the details of the competitive firing for Colonel Truman's prizes:

"Each officer fired three problems, with 37-mm shell. There was no percentage in grading. It was an easy matter to pick out the better problems, and from these the winners were selected. Naturally, all points were taken into consideration—accuracy of initial data, time to get an adjustment, manner and sequence of commands, and mistakes of any kind that were made.

"Time, of course, counted. The man who fired a perfect problem in the minimum time naturally would be considered best. The man who fired an imperfect problem in a shorter time than he who fired a perfect one would not be adjudged winner, provided

the time for the perfect problem were not excessive."

Preparation of fire entered into the various problems given the thirty-five contestants, although it was not made so vital a part of the time element. Each was given his problem while the three or four who preceded him were conducting theirs.

Tactical situations were assumed in all cases. In some cases minimum-range lines were laid down. There was no shrapnel firing. We old-timers felt, of course, that had there been shrapnel—Ah, then the outcome of the contest would have been different. Our hearers were unsympathetic.

After all, several years ago, when the officers of the regiment were shooting on the Fort Riley range for the silver cup offered by the late Brigadier General Karl D. Klem, it was Second Lieutenant Frank Baker who aimed where he was looking, and took the award. And the following year it was the then Lieutenant Cornelius Vanderbilt Cannon who carried it off. Of course, the next time it was won by Captain Marvin Hummel, but second lieutenants have had more than their share of it. Of course, there are more second lieutenants.

Colonel Truman has reared a lot of them. He did a hitch at the School of Fire as observer during all the time the 35th Division trained there. He went to France in March. 1918, and took in the Second Corps Field Artillery School and the one at Coetquidan.

He hasn't explained how the youngsters could take that award away from me and the other old-timers.

I wonder if buck ague at the firing point had anything to do with it? After all, they knew their instrument, and I was trying to remember my finger calibrations.

—Drawn by Homer A. Dye

"Three mils, and uh—let me see—a hangnail left of the base point."

THANKS TO THESE—

The frontispiece, which shows Battery D, Sixth Artillery (Dyer's Battery), and its six 3.2 guns, on the Calle Lazenida, Manila, P. I., in the summer of '98, was secured through the courtesy of Mr. Alfred A. Hoffman, Cherrydale, Va., who was then a section chief in the outfit. Sergeant Hoffman (formerly of Capron's Battery) stands at the head of his section, abreast of the guidon, and on the latter's right. The officers, in white, are, from right to left: Lieut. E. D. Scott (recently retired as Brigadier General); Lieut. Adrian S. Fleming (Hoffman's brigadier in France, and now Brigadier General, retired); Lieut. Harry Leroy Hawthorne (Colonel, retired, and Medal of Honor man from Battle of Wounded Knee); the battery commander. Captain Alexander B. Dyer (deceased); and Lieut. Conrad S. Babcock (now Colonel). Months later, the battery received mules for transport. In the meantime, they kept 'em rolling—by hand.

Major General JAMES B. ALLISON, the Chief Signal Officer, who asks, "HAS THE ARMY TOO MUCH RADIO?" entered the service during the Spanish-American War, after graduating from the South Carolina Military Academy. His first service was with infantry, but between original commission and joining the signallers in 1917, he graduated from the Army Signal School in 1908.

Sergeant ROBERT E. DORSEY, Hq Btry 6th FA Brig, Ft. Sheridan, Ill., who wrote CONVOYS AT THE CROSSROADS, did so by order. Major W. C. Dunckel, his chief, was so impressed by the Dorsey Board, "invented, personally operated, and controlled with astonishingly accurate results by Sgt. Dorsey." that a mimeograph was prepared to describe the system for the benefit of others. The author, now in his first enlistment, is a former Purdue University student, and had four years' experience as a mechanical and construction engineer prior to Off-again. On-again, Gone-Again, Allegan.

Colonel JOSEPH W. KELLER, commanding officer of the 310th FA, Philadelphia, felt challenged by Mark Twain's remark that everybody talks about the weather, but nobody does anything about it. He has probably felt this way ever since, as a member of the instruction staff at the School of Fire, Fort Sill, he stood at one of those windswept OP's. Hence, THE WINDS THAT BLOW.

Captain HOMER A. DYE, FA-Res, who wrote A SENATOR AWARDS SPURS, has not attended drills in the Kansas City Armory of his 379th FA recently. He has been busy trying to convert an infantryman. Captain Charles Edmondson,

Inf-Res, who, when the daily affairs of Veteran Company 3774 CCC, at Mt. Vernon, Mo., have been attended to, goes into conference with him over these matters. Captain Dye can certainly think up pieces to put in the papers, and has covered the midwestern military journalistic field like a fresh fall of snow.

When Captain ISAAC L. KITTS, FA, who wrote ONE-SECOND FLIGHTS, wasn't dressaging, in 1932, he took pictures of his Olympic teammates on the jumping team. Following the recent Games in Berlin, he toured England; took a two-week dressage course at the German Cavalry School, Hanover; meanwhile settling his family at 8 Park Road, Radlett, Herts, England, where, he writes, his boys, far from acquiring British accents, disturbed the master no end by teaching their schoolfellows Yankee-isms. He debarks at New York December 16th.

JOHN C. HOOKER, author of DUST FOR SIMULATED BURSTS, is First Sergeant of Hq Btry 1st Bn 17th FA, Ft. Bragg, N. C. Son of the late Colonel R. S. Hooker, USMC, who commanded the Fourth Marines in Shanghai in 1932, Sgt. Hooker spent two years at the USMA in the Class of 1923, but resigned, to marry. Before he started top-kicking he was a drill instructor in the Marines; and a battery commander in the 258th FA (NYNG). He has completed the 30-series in the extension courses; is the inventor of a new neon aiming-stake light; makes the study of gunnery his hobby—and probably is a great trial to Mrs. Hooker when she wants something done around the house.

A friend is under the impression that the closer to the front cover the article appears, the more official sanction attaches thereto. If that were correct, then these Observations are in the right place. But it isn't. "Authors alone are responsible for statements contained in their articles;" as we regularly print at the bottom of the front inside cover. Articles are inserted in the arrangement at makeup time just according to our personal whim. We could adduce good reasons for these whims—but who cares?

●

Well, now, Fairfax Downey never claimed that his "Field Artillery Song—1936 Revision." which appeared in our last number, was the first motorized version. There had been others, of course, but this one was the first ever illustrated by Colonel Irwin. So that's that. Mr. Downey is reminded by a Yale classmate (and 20-year member of our Association), Mr. Morris Hadley, that when the latter was a member of the then recently motorized 302d FA, at Camp Devens in 1918, "certain scoundrels in the 301st" taunted them with a song, the refrain of which was, "Crank the Ford, climb aboard, trust to luck and pray the Lord, that the flivvers keep chugging along."

And ended with, "N-o-o m-o-r-e g-a-s," sung with a "mournful, dying fall."

The air, not the singers.

In the hurry and scurry of going to press with the last issue (It is hoped no city editor, with three daily editions to get out, reads this), we failed to give public thanks to Lieutenant Colonel William P. Wattles, Sig-Res., Editor of *The Reserve Officer*, for permission to use Captain Walter J. Gardner's "Trucking — And How," on which he had prior rights. To Colonel Wattles and his fellow national officers of the Reserve Officers Association, who have been most helpful to us, a deep bow.

●

And to Captain Gardner, who returned the check we sent him, asking us to pay up his membership years in advance therewith, a salaam.

●

Brigadier General Henry J. Reilly, ORC, whose book is reviewed in this issue, was in the office the other day, and occasion was made to ask him for suggestions. In the course of the conversation, it appeared that General Reilly leans toward those writers who, like Leavenworth grads and gentlemen of the press, emphasize Who, When, Where, What, and Why. These, he says, can go straight to the objective without bombing out all the traverses, peeking behind all the trees, and mopping up all the corners.

●

Suggestions were asked for. Some

were received. Criticism also was requisitioned, and is being doled out only in driblets. Among the suggestions: Procure some prints of Santa Barbara, for the convenience of members who wished them. What do you think? Another was that this department inform the field what goes on in Washington. We know very little about Washington, outside the deep rut worn between the Munitions Building and this handsome edifice. We know military visitors are visibly shaken at the state of police in this office, but newspapermen find it so homelike they sit down and go to sleep; that the various army departments, far from being the coldly impersonal affairs you may have imagined them, will go to bat for you any time, without taking a called third strike; that one commentator wrote the city was a place where everyone had two cars and drove both at the same time. This was an exaggeration.

It's difficult enough to drive one car here at the same time.

●

A battery commander whose Association membership was in arrears, paid up in full and accompanied his check with three subscriptions—from his lieutenants. There's self-imposed penance for you.

●

We were quartered in an old stone house to which a measure of tradition and a reenforced brigade of roaches were attached.

And a fellow came around and offered to control these insects for two dollars a month. Regularly, for what seemed like years, we paid the comptroller, and just as regularly he appeared and performed his contract, appreciably reducing the increase of our little feathered friends; but, as we began to notice, not doing much about those in foal.

When the Medical Department at this post offered to send a squad around to "destroy" roaches, we snapped them up, realizing belatedly what a flexible language is English.

Came the day when the destroyers arrived, and the dust of carnage arose from our backyard, where the patriarch of the herd lay gasping his last and cowkicking with all six legs at his attackers. On the fringe of the crowd we saw the comptroller, sadly shaking his head and fingering, over and over, a thin sheaf of two-dollar bills.

We were sorry for him, for he had lived up to his promise, maintaining for us a herd of roaches appropriate to our grade and station, of show conformation, proud carriage, and glossy coat. And it *was* a little stupid of us to imagine he would control himself out of a job.

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On a number of the proxy cards returned, friendly and encouraging messages had been penned. Gentlemen, thank you. Next year the printed form will contain, "Having a fine time. Wish you were here."

●

MERRY CHRISTMAS.

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NUMBERS 1, 2, 3, AND 4 EDITED BY

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THE UNITED STATES FIELD ARTILLERY ASSOCIATION
WASHINGTON, D. C.

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MILITARY BOOKS

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

	Price (Domestic postage included)
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