28TH YEAR OF PUBLICATION

THE FIELD ARTILLERY JOURNAL

JULY-AUGUST, 1938

A Story by

PETER B. KYNE

An Article by

FLETCHER PRATT

and

QUESTIONS } ON CONDUCT OF FIRE
ANSWERS }

PUBLISHED BIMONTHLY BY
THE UNITED STATES FIELD ARTILLERY ASSOCIATION

July-August, 1938

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AN INDEX?

This is the 147th number of *The Field Artillery Journal,* within whose pages, for more than twenty-seven years, can be traced the development of modern field artillery.

It has been suggested that there be prepared a complete, cross-indexed file of the matter contained, by subject, for those years—this for the benefit of those engaged in study and research, and for general reference.

The time and expense devoted to such a work can be justified only by the expression of considerable interest in the project.

The views of members, if transmitted to the Secretary, will be given careful consideration.

28TH YEAR OF PUBLICATION

VOL. 28 NO. 4

JULY-AUGUST, 1938

THE FIELD ARTILLERY JOURNAL

A PUBLICATION FOR THE FIELD ARTILLERY OF THE REGULAR ARMY, NATIONAL GUARD, AND ORGANIZED RESERVE

Patron Saint of Artillery

PUBLISHED BIMONTHLY FOR
THE UNITED STATES FIELD ARTILLERY ASSOCIATION

BY MONUMENTAL PRINTING COMPANY
32D STREET AND ELM AVENUE
BALTIMORE, MD.

Editorial Office, 1624 H Street, N. W., Washington, D. C.
Michael V. Gannon, Captain, Field Artillery, Editor

Entered as second-class matter August 20, 1929, at the post office at Baltimore, Md., under the Act of March 3, 1879

Published without expense to the government

The Field Artillery Journal pays for original articles accepted

THE U. S. FIELD ARTILLERY ASSOCIATION
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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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IN RECOIL

A 155-mm. Howitzer of the 80th Field Artillery, Fort Des Moines, Iowa. The air, rushing in to fill the vacuum caused by the blast, is rolling the blast-loosened dust toward the ascending column in front of the piece.

THE FIELD ARTILLERY JOURNAL

VOLUME 28 JULY-AUGUST, 1938 NUMBER 4

Short Order

BY
PETER B. KYNE

. . . "and blow at random into a cheap harmonica."

ANY ONE who has known active service as an enlisted man is bound to see considerable comedy and drama. There is always one buck in the outfit who is outstanding for his individuality. In a company of one hundred men or one thousand men he is as definitely silhouetted as a crow on a dead limb.

Early in my enlistment in Company L of the 14th Infantry I discovered a man whose personality was to challenge my interest and curiosity throughout my enlistment. His name, let us say, was Andy Bogue. He had sailed the dark blue and once he had been second mate on a whaler, but at the time of his enlistment he was a deckhand on a Sacramento river stern-wheel steamboat. He had been born and raised on the river and I think he had returned to it with something of the homing instinct of a lost dog. He was about five feet seven inches tall, with a deep, hairy, forty-eight inch chest, small spidery legs, long powerful arms that hung almost to his knees, a sullen, pugnacious eye, and a blue, prognathous jaw. He was not one to inspire confidence until he smiled, when a mysterious sort of good looks crept over his hard masculine mug. He did not smile very often.

I recall him as the first man I ever knew who just couldn't keep step. From a halt he always moved forward on the right foot and when a noncom's bitter tongue bade him change step he would change a step and a half. He was always bewildered, always caught offside on a whirling flank when the squad

executed a movement, and he hated himself for his inability to be rhythmic and suffered untold embarrassment. This made him irritable and ultrasensitive and inasmuch as he was not a very companionable man at his best, he had numerous arguments of a most acrimonious nature. Perhaps half a dozen of the lads quickly came to the conclusion that what Andy needed was a couple of good socks on the nose. So they socked him, but never succeeded in rocking him on his spidery legs. He would come in, leading with his right, and take a beating in order to get in one blow—and then it was all over. His preference was for rough-and-tumble, for which he had great natural ability, but in our outfit he discovered that sort of fighting was barred. Our first sergeant kept a set of four-ounce gloves and once the unprintable epithet had been passed, a challenge issued and a fight there was, with the first sergeant insisting on Marquis of Queensbury rules, or a profound apology.

Andy was sporty and conformed to the rules, which was very hard on him because he had had so little gymnasium experience. Yet he won his fights and pretty soon he came to be regarded as a good man to leave alone, and so peace was his portion. He was the first man in our outfit to discover that you can't boil stew or rice on a brisk, uncontrolled open fire without burning it. Thus he brought himself to the company commander's attention, because we had no trained cooks and they were always burning the stew or the rice. So they made a cook of Andy, which was what they always did in those days with military misfits. And from that day forward we had pretty good grub which grew better as Andy gleaned more experience. He wasn't particularly desirous of being the company cook but it was better than continuous embarrassment at drill, with the concomitant distress of yearning to punch a sergeant or a corporal and not being able to yield to his desire. After he had made good as a cook he demanded to be made a corporal. He said he had no authority over the kitchen police as a mere cook, and he must have argued his case well, for the youthful company commander tacked the rags on him.

Promptly Andy issued challenges to numerous corporals, all of whom declined his courtesy, which left him quite low in spirits. While a meal was cooking and he had a little respite from his thankless task he would sit on a case of canned goods and blow at random into a cheap harmonica, as a baby would blow it. He had no bunkie and he was quite alone and fiercely resolved to die rather than admit it. When he had the supper dishes done he turned in; it just never occurred to anybody to ask Andy to walk out with him down to the Luneta to listen to the military bands playing and gaze upon the Spanish elite driving out in their victorias along the Malecon, taking the coolish evening air as it blew in from the China sea. When he drank a glass of beer at the regimental canteen he drank it alone. If he asked somebody to have one on him that someone would say: "Thanks, Bogue, but I'm having one with my pal here."

The first time I was assigned to kitchen police under Andy he glowered at me and said: "I suppose you're another one o' these Middle West bums." We had a majority of recruits from Utah, Ohio, and Wisconsin and anything west of the Sierra Nevada range was Middle West to Andy. I told him I was a Californian, and he pricked up his ears. Where was I from? I told him. He had been doggone near wrecked in the schooner So-and-So down my way. Down near Point Montara light, wasn't it? Had I ever been up on the Sacramento River? No? What a deprivation. It was so beautiful—particularly

in the early morning, with the sun coming up over miles of tules and the mist rising from the marshes and the wild ducks getting up off the river and scuttering ahead of the steamer, and the farmer's girls waving to a feller from the banks. Gosh, how he wisht he was back on that stinkin' ol' river instead o' down here in these damned hot lousy tropics with a lot of scrofulous natives running around with their shirt tails sticking out. Andy regarded outboard shirt tails as the ne plus ultra of something or other.

That day I plumbed Andy's secret sorrow. He was nostalgic for the river. His wild brave heart was aching for it—that and human companionship. Just before we served supper I invited him over to the canteen for a beer—and I made a ten strike. He bought right back and said: "Catch one o' these Middle West misers buyin' a feller a beer. Why, they're too cheap to give a feller a smile. Easy to see, Pete, that you're a Native Son."

I was so proud of having been the first to gain Andy's approval that I invited him to walk with me around the band stand on the Luneta that night, and he accepted eagerly. However, I was too young and unsophisticated for an ex-second mate on a whaler to pal around with and so I did not become Andy's bunkie. Nor did I wish to be. In fact I had one already and he disliked Andy and thought I should respect his prejudices.

Now, in those days of The Empire a steamer known as The Duke of Fife used to bring refrigerated beef and mutton up from Australia for the Philippine Expeditionary Force. She had proper refrigeration facilities and the meats were delivered in prime condition, but in quantity not sufficient to please a lusty soldiery. We seemed to get more than our share of chuck meat and our regimental commissary officer tried to be very fair in its distribution. Thus, if L Company drew prime beef today, then for the next four drawings they got something from between the horns or from the tail down.

This never flustered Andy Bogue and it never flustered us after we discovered Andy was equal to chuck meats. We had a puny little meat grinder such as a large family would use and how the kitchen police would have to work to chop up that chuck meat into little pieces and feed it through that meat grinder, to emerge as hamburger. Andy favored a heavy percentage of onion in his hamburger steak and his taste met with the approval of all except a handsome, college-bred lad named John Moore. John was the company clerk. He was a merry, bright-eyed, kindly soul whom everybody loved, but alas, he came from Ohio and that let him out with Andy. However, he had one virtue Andy greatly admired. He was one of those old-fashioned Spencerian penmen, who shaded heavily on the down strokes and made capital letters with lovely little pig-tails on them. Inasmuch as typewriters were unknown in the army of that day and the curse of excessive paper work had not yet descended upon the service, we had ample opportunity to admire John's marvelous chirography when announcements appeared on the company bulletin board. Andy used to shake his head in vast wonderment that any man should be so gifted.

One day he shyly went to John and asked him if he would write a letter for him to his girl back on the river, and John, who was a pretty hard-worked young man, made some gentle excuse to avoid the task. So thereafter Andy loathed him, as heartily as John loathed Andy's onion-ridden hamburger steak, for, as the medical profession now-a-days phrases it, John was allergic to onions. They repeated on him all day. The poor wretch would come to mess

with a swell appetite and the very first whiff of the fatal onions relegated him to goldfish when his soul craved meat.

We had hamburgers four or five times in succession (Andy would just as soon have made up a good solid stew, but his hamburger was more popular) and John had stood it as long as he could. I was in the kitchen doing a thirty-day penance when John said to Andy: "Andy, I hate hamburger with onions in it. They repeat on me. And canned salmon is undermining my reason. The next time we have hamburger would you set my ration aside before mixing in the onions and fry it for me separately in a skillet?"

Andy's hour had struck! He glared balefully at John and said in accents most insulting: "Say, you Ohio so and so, what the hell do you think this place is anyhow? A short - order house?"

Thus the ex-second mate to the gentleman.

"You low-bred, beetle-browed, no good this and that, will you kindly go into the latrine and cut your throat?"

Thus the gentleman to the ex-second mate.

They stared at each other like two game cocks—and then Andy remembered John was a corporal. So he could be challenged! He was of equal rank! How good God was to the afflicted!

"Will you fight?" Andy queried softly.

"With all the pleasure in life," came the prompt answer.

"Tonight, on the beach, after retreat. Tell the first sergeant. I'm too busy to discuss it now."

Our fights were pulled off with seconds, buckets, sponges, time-keeper and referee. So after retreat we all went down to see Andy Bogue murder John Moore. Alas, and alackaday! John walked around Andy as a cooper walks around a barrel and systematically and scientifically cut him to ribbons. Not one blow did Andy land. The first sergeant asked him repeatedly if he had had enough but death was preferable to Andy Bogue rather than such a base admission. Finally John measured him and after landing half a dozen terrible blows on that prognathous jaw he succeeded in knocking Andy out.

We carried him home and washed him off and the incident was ended. So we thought. But Andy was the odd number, the man you couldn't figure as you figured other men.

I felt so sorry for him the next day, as he sat on the case of canned goods and flock-shot the notes of his harmonica. His face was a terrible sight to behold, and he whipped us with his bitter tongue as we ground away turning out — **ANOTHER MESS OF HAMBURGER STEAK**. When we had it in the big pan and the onions all ground up to mix with it, Andy rose from his case of canned goods, took a huge double-handful and set it on a skillet, then ordered us to mix in the onions on the residue.

I knew then that I was about to witness the disclosure by Andy Bogue of that streak of magnificence which sometimes crops out in very evil men. I watched him carefully cook that huge patty of hamburger without onions—and when John Moore came by in the mess line and his nose went up in despair, I watched Andy reach back on the buzzy-cot for the skillet, slam its contents down in John's mess kit and say, in a surprisingly subdued voice, "There's your goddam hamburger steak without onions."

Two strong men stood face to face! John stared at Andy and Andy looked thoroughly uncomfortable. Then John turned loose his golden smile and all his charm was patent. He said: "Andy, you're a much finer man than I suspected and I wish I had taken time out

"DO YOU THINK THIS IS A SHORT-ORDER HOUSE?

to be your friend instead of your enemy. I'm sorry we fought. How about shaking hands, Andy, and forgetting it?"

Andy stuck out his great greasy paw. "Well, you're a hell of a sight better man than I suspected," he admitted comically, "but I ain't sorry we fought, because I found one man in this outfit to admire and it was worth a licking to know that."

When the supper was on and cooking John Moore came over to the kitchen and he and Andy went to the canteen and hoisted a few. And that night Andy got into a suit of whites (a million tailors couldn't have made that man look well-dressed, what with his parenthetical legs and rolling gait) and he and John Moore walked out to listen to the band play on the Luneta.

Well, John never had to complain of onions in his hamburger thereafter and Andy took a delight in cooking him little specialties. He saved a big crate that otherwise would have gone for firewood and a small box for a seat and John ate his meals from a table, as a white man should. And Andy was never lonely any more—until we had the big fight at Zapote river and a brass-coated 45-70 Remington slug took John between the eyes and set him down in Valhalla.

Now, of course, frequently a man will never know who has been killed until long after the action is over. We had sixty-five prisoners to take back to Las Pinas and stable them in the church there, and Andy and I accompanied the prisoners. After we got rid of them we were dismissed from formation and told to make our way back to the river as best we could, for it was raining, with thunder and lightning.

Now, we had a sergeant killed close to John and I had dragged both bodies together and covered them with my shelter-half. (Of course I never used the shelter-half again and I'll be shot if, when I was discharged, they didn't deduct $2.08 from my finals to cover the cost of it and no depreciation figured for a year of wear and tear. Why do men fight for their country, anyhow?) As I walked across the field I saw, in a flare of sheet lightning, another sodden figure headed in the same direction.

I knew the sergeant had two potatoes in his haversack and it was in my mind to take them, since the loss would entail no deprivation to him. And I thought: "I wonder who that fellow is? And can he be bound down river to Sergeant Lawes's body to frisk it for those spuds?"

I lurched up alongside him and yelled: "Hello, who is it?" and back came a muffled, husky answer, "Andy Bogue. That you, Pete?"

"Yes."

"I hear John's been killed. I—I'm—looking for him, kid. I—want—to—say—goodbye—to—my bunkie."

I told him I'd lead him to the body and I did. I grasped the edge of the shelter-half and when the lightning flared I drew it back and emptied the water that had accumulated in the folds of it and Andy gazed down into the face of his dead bunkie—John with his nice blue eyes wide open, as if in wonder. And the rain had washed his face before I covered it.

The lightning hung for about three seconds, then the darkness shut down and above the tumult of the storm I could hear Andy gasping and choking back his grief. But he mastered it. He was the type. Presently he came close to me and delivered his eulogy.

"Pete," he choked, "I used to cook that boy's hamburger steak without onions. You—remember—onions—repeated on him. Lemme see him again, Pete . . . . Oh, be good to him, God, be good to him. He was — one — of the finest."

I was one of Andy's pallbearers about three years ago and as they lowered him into his grave in the Presidio National Cemetery I thought of that scene in the long ago and his touching panegyric to John Moore. And I thought, too, "Kind begets kind and birds of a feather will flock together. And may God be good to you, too, Andy Bogue, because you also were one of the finest!"

●

The Commanding General, Ninth Corps Area, is supervising the collection of historical material on Army activities in San Francisco Bay Area. This information will be used in the preparation of a brief history of the Army in that vicinity, beginning with the Spanish Era, and for inclusion in guide books and historical markers for tourists. Those persons having pertinent literature, maps and photographs, or having knowledge of the location of historical marks in the vicinity of San Francisco, are requested to communicate with the Commanding General, Ninth Corps Area, Presidio of San Francisco. Copies of original material are especially desired. If originals are loaned they will be returned immediately after having been copied.

Awards of Field Artillery Medal

The Field Artillery Association Medal, to be awarded to one member, in each institution, of the First Year Advanced Course in Senior ROTC units of the Field Artillery, has been won, in 1938, by cadets outstanding, not only "in soldierly characteristics," under the terms of the award, but in every field of university activity, academic, cultural, and athletic. A few of the winners so far reported are listed here. It is hoped that the remainder can be included in a following number.

This year and next, these young men will be eligible for commissions in the Field Artillery Reserve. They, and other graduates, a few years hence, will be commanding batteries and battalions in the National Guard and the Organized Reserve. Some will be in the Regular Army. All, it is safe to predict, will be leaders in their professions and communities, having proved their industry, ability, and quality. *The Field Artillery Journal* takes pleasure in presenting this group of young American citizens.

UNIV. OKLAHOMA

THOMAS JOHN SHARPE

5008 Tracy Street, Kansas City, Mo. Member Varsity and FA Pistol Teams. School of Petroleum Engineering.

UNIV. SANTA CLARA

JEROME E. KELLEHER

746 Louisiana St., Vollejo, Calif. Cadet 1st Lt. Presented medal by Maj. Gen. A. J. Bowley, Corps Area Commander.

OREGON STATE

DON W. COONS

Delta Tau Delta; Captain Scabbard and Blade; Alpha Zeta, Blue Key, Right End, Varsity Football.

COLORADO STATE

JOHN T. ROONEY

Orin, Wyo. Cadet First Sergeant; Honor Sophomore, military work, 1937.

CULVER

MALCOLM N. MACINTYRE

Honolulu, T. H. Cadet First Sergeant. Varsity baseball and track. Glee Club.

LOUISIANA STATE

FRANK P. LATHROP

Reform, Ala. Regimental Sergeant Major. Expert Gunner, Captain, Demonstration Battery, 100% Discipline grade.

TEXAS A. & M.

JACK C. WEBBER

Arp. Tex. Cadet Master Sergeant. Distinguished Student, '37-'38. Honor Society, A. S. Mech. E., Economics Club.

CORNELL

ALBERT D. BOSSON

560 Concord Ave., Belmont, Mass. Asst. Mgr. Crew; Psi U; Seabbard and Blade.

UNIV. FLORIDA

WILLIAM I. WOOD

First Sergeant; Straight "A" in military. 6 semesters. Honor student. Engineering.

HARVARD

DONALD W. DAUGHTERS

Watertown, Mass. Right End, Varsity Football. All-American mention.

STANFORD

HAMPTON J. POOL

1635 Grant St., Berkeley, Calif. All-West-Coast Rugby; Varsity Football.

YALE

T. TALMADGE PEARSON

340 Forest Ave., Rye, N. Y. Chi Psi; Freshman and Varsity Crew squads.

UNIV. ILLINOIS

JAMES D. LIERMAN

307 E. White St., Champaign, Ill. Cadet Lieutenant; Connor Cup, 1936 and 1938; American Legion Medal, 1937; Alpha Chi Rho; Caisson Club; Pershing Rifles; Seabbard and Blade.

THE MEDAL

Extracts From an Epic

Herewith the JOURNAL *presents the report of Captain George W. Van Deusen* (*who, as Colonel, USA-Ret, died recently*) *on the operation of his mountain guns in the Philippine Campaign. Here is a description of unusually effective employment—in the face of great difficulties.*

Indeed, not long ago the JOURNAL *printed a picture of Colonel Van Deusen, in his uniform as captain and first baseman of the 16th Battery baseball team, sometime around 1907. The photo was titled—and as it turned out, with more truth than poetry—"There were giants in those days." There were, certainly, and Captain Van Deusen, his officers and men, who forced their guns through the jungle and cogon grass and dragged them through streams on the heels of the supported infantry, were the giants.*

This report is presented through the courtesy and cooperation of Colonel Oliver L. Spaulding, FA, who assembled it for the FIELD ARTILLERY JOURNAL.

MSP/ASM

Washington, D. C.
April 23, 1900.

The Adjutant General. U. S. Army,
Washington, D. C.,

SIR:—

I have the honor to report that, in compliance with Special Orders No. 217, Headquarters of the Army, A.G.O., 1899, I left New York City on the S.S. *St. Paul* on September 27th, 1899. Under the provisions of that order, it was intended that I should proceed to London, England, and superintend the shipment of certain mountain guns with their equipment recently purchased from Vickers, Sons and Maxim Co. for use in the Philippine Islands, acquainting myself thoroughly with their use and construction from actual observation at the factory, and then to proceed to Manila and report to the Department Commander for duty in charge of said guns. I reached London on the 4th of October, and the next morning visited the office of the firm in London. I found, as anticipated, that the guns, with part of the pack equipment and ammunition, had already been shipped by a Japanese mail steamer to Hong Kong, having been inspected under the direction of the U. S. Military Attache, Colonel S. S. Sumner. The remainder of the pack equipment would be ready for inspection in about ten days, while an extra order for ammunition would probably not be completed before the end of the month. It seemed to me that there must be some error in connection with this order for ammunition on account of the very large proportion of case, 1200 rounds, such a number being largely in excess of any estimated requirements, and I desired Colonel Sumner to cable regarding the matter. He did not think advisable, so I wrote a letter on the subject, trusting it might reach Washington in time to do some good in making any necessary change. On the 6th I went down to the Maxim-Nordenfelt gun factory at Erith, near London, accompanied by a representative of the firm. I was carefully shown all the details connected with the mountain gun, its mechanism, packing arrangements &c., every facility being given me to acquire any necessary information. The gun and mechanism were taken apart and assembled by employes, and then packed on the regulation pack saddle. After it had been explained to me. I took part in the work myself, and repeated it until I considered myself thoroughly familiar with

all the details. On the 9th I repeated the same work, and later proceeded to Dartford to inspect the process of manufacture of the ammunition and fuzes, all the details of which were carefully explained to me. I was notified that the remainder of the pack equipment would be ready for inspection and packing on the 10th. On that date I made a careful inspection of the saddles, ammunition hangers and boxes, and saw them packed ready for shipment on the Japanese mail steamer on the 13th. As the additional order for ammunition would not be ready for shipment before the end of the month, I did not consider that it was intended that I should delay in London for such a length of time, since the object was for me to reach Manila as soon as practicable and assume charge of the guns which had been already shipped. In order to gain time, I went by train to Genoa and there overtook a fast steamer of the North German Lloyd line, which had sailed from Southampton on October 9th, a day too soon for me to embark there, on account of the inspection of pack equipment on the 10th. I left Genoa on this steamer, the *Konig Albert*, and reached Hong Kong on November 15th. I had hoped to overtake the guns here, but upon visiting the U. S. Consul, Mr. Wildman, was informed that they had arrived a few days before, and had been transshipped at once to Manila, Gen. Otis having cabled that they were urgently needed there. I took the first steamer from Hong Kong, November 18th, and reached Manila on November 21st. I reported at once to the Department Commander, and was assigned to duty in charge of the guns, per S.O. 320, Headquarters Department of the Pacific and Eighth Army Corps, November 21, 1899, but was informed that there was no immediate prospect of the guns being required for actual service, and that it would not be practicable to assign any men and animals to me at that time for purposes of drill and instruction. I was directed to submit as soon as practicable my estimate as to the number of men and animals requisite to properly equip each six gun battery, which I did the same day. I remained on duty in Manila, reporting daily at Corps Headquarters, and spending most of my time at the Arsenal, looking out for the guns and equipment. On November 30th, I was instructed to prepare four of the guns, properly equipped, for shipment to Zamboanga with the 31st Infantry, U.S.V. They were placed under charge of Major J. E. McMahon, 31st U.S.V.I., 1st Lieut., 4th U. S. Artillery, who detailed a company of the regiment in charge of them, this company being commanded by Captain Stivers, a graduate of the Military Academy of the class of 1879. The working of these guns has been most satisfactory, as is shown by an appended extract from a letter written me by Major McMahon. Up to the time of my departure, these guns had not been used in the field.

On December 8th I was ordered to take two of the guns by steamer to Vigan and transfer them to some officer to be designated by General Young to receive them. I left Manila on the steamer *Romulus* on December 8th, and reached Vigan on December 10th. By General Young's orders, the guns were transferred to 1st Lieut. J. C. Lowenberg, 37th U. S. Vol. Infantry, formerly a 1st Sergeant of Artillery, and I gave him all possible instruction as to the use of the guns and ammunition. I have not received any direct report from him, but have been informed that he has had the guns in action under exceptionally severe conditions as to elevation and range, and that the results were more than satisfactory, in

every particular. I left Vigan on December 12th, and reached Manila on December 13th. On December 23d, I prepared one gun for shipment to Aparri, to accompany the 16th Infantry to that station, leaving only five of the guns in Manila under my immediate control. About noon on the 25th of December, I was sent for by General Schwan, and informed that Colonel Lockett was to go in command of an expedition against the insurgents at Montalban near San Mateo, and wished two of my guns. I was asked the minimum number of men necessary for the service of each piece, and said that there should be at least ten privates and two non-commissioned officers. A detail of this number was made from Battery "E," 6th Artillery. I was also informed that as there was a road all the way and the distance was not great, the guns could be hauled, and I would be furnished with one mule for each gun and a two mule wagon for ammunition and rations. When asked to designate a lieutenant to go in command. I requested to be allowed to go myself, as I was very anxious to have some practical experience with the guns. I was ordered to proceed to the Pumping Station, about eight miles from Manila, that evening, and report to Colonel Lockett there. The men and mules reported to me at the Arsenal about two o'clock, and I prepared my ammunition &c., and left Manila at 3:30. Reached the camp of the 11th Cavalry about dark in a heavy rain, and was ordered by Colonel Lockett to remain there till morning and then to proceed to San Mateo. Started on about 7 A.M., December 26th, and crossed the Maraquina River, the guns being ferried across on a small boat, mules and wagon fording. Reached San Mateo, about nine miles, at 11 A.M., and was informed that no further movement would be made until the following day. This delay enabled me to give the men of my detachments a little drill and instruction in the working of the piece, none of them having seen it until they reported for duty the evening before. The ammunition was carefully looked after and the guns cleaned and placed in perfect working order. At six the following morning. December 27th, I proceeded to Montalban, about four miles, where the enemy was strongly intrenched on the side of a mountain, commanding the road and river. By Colonel Lockett's order, I placed my guns in a field at a distance of about 1,500 yards from the nearest position of the enemy to cover the deployment of the Infantry. Fire was opened on the nearest trenches with shell, followed by shrapnel as soon as the approximate range was obtained, the fire being over the heads of the advancing Infantry line. As soon as this line was sufficiently advanced, my guns were moved forward to within less than a thousand yards and placed in a field where they could command the trenches on two sides. The enemy was soon dislodged from the nearest position and driven over the top of the mountain, being followed by a shrapnel fire. The last shots against this portion of the enemy were at a range of 3,200 yards, near the top of the mountain. At this range two shrapnel were exploded exactly in the spot from which the smoke of the enemy's rifles appeared as they fired. Not another shot was fired by this body of the enemy, nor was anything further heard from it. What the casualties were was not known as that part of the field was not visited later by our troops. About this time fire was opened on my guns from a field piece located in a gun pit about a thousand yards away. Ten shots were fired by this piece before any effective range was obtained, and then one projectile was

sent over my head. I then turned one of my guns on it and fired two shells. The second one silenced it for the remainder of the action. When the gun was captured later, it was found that the second shell had exploded within four feet of the piece, driving away the cannoneers so effectually that they never returned to the gun. This piece was being served under the charge of one Howard, a deserter from the California Volunteers and at that time holding the rank of Major of Artillery in the Insurgent forces. After silencing this gun and shelling the adjoining trenches until no return fire could be obtained. Colonel Lockett, who had remained with me up to this time, ordered me to withdraw my guns to the road in rear of my position and await further orders. While on my way back, I was met by the battalion adjutant of Major Brook's battalion of the 46th Vol. Infantry, who had been sent to request Col. Lockett to send the artillery to the assistance of the battalion, as it was confronted by some strong intrenchments. I at once proceeded to the place indicated, and found the battalion deployed in a rice field about 500 yards from the nearest trenches. I took up a position directly in rear of his line, and opened fire upon two sets of trenches, at 500 and 800 yards. The fire of the guns at this range was very accurate, and five rounds at each range was sufficient to silence the fire of the enemy and drive them from the trenches, so that when the infantry advanced they were empty. In the upper one five dead Filipinos were found, killed by the last shrapnel burst over the trench. This was the last position of the enemy, and the work for the artillery was ended. I withdrew to the road, and later in the day to San Mateo. The next morning I returned to Montalban to be on hand in case the guns were needed, but there was no further use for them, so I returned to my camp at San Mateo. On December 30th I was ordered to return to Manila. Left San Mateo about 6:30 A.M., and reached Manila about 1 P.M. The ferry over the Maraquina river was under water, so that the guns were hauled through the river, the water being entirely over the guns. During this action fifty-eight rounds were fired, forty-eight shrapnel and ten shell. The action of the ammunition was perfect in every way, there being no misfires, and every round being exploded as required by the setting of the fuze or on impact. The recoil, even after continued firing, was very small, not more than a couple of feet as a maximum, with little derangement of the firing position. The bores of the pieces at the end were practically as clean and bright as if they had not been used. I have not seen Colonel Lockett's report on this action, but he expressed himself to me as very much pleased with the action of the guns, so much so that he was anxious to have a gun and detachment permanently attached to his regiment for field duty.

On my return to Manila. I was notified to prepare to take three guns out in a few days with General Schwan's Expeditionary Brigade. Details of men were to be given me from Battery "E," 6th Artillery, and mules for packing, as the country to be passed over would probably not be practicable for hauling. I requested that the men might be excused from other duty and placed under my control, so that I might have a chance to fit the pack saddles, prepare ammunition and have some preliminary instruction. However, the regimental commander did not approve of this, but required the men to perform all duties, drills, guard, &c, with the battery up to the morning of departure, so that there was very little chance for proper preparation, especially

as the mules were not shod and turned over to me until seven o'clock in the morning of the day I moved out. However as the men were carefully selected, they soon learned the duties from practical experience. I was required to carry sixty rounds per gun, and was provided with twenty-seven pack mules, twelve for the guns and fifteen for ammunition. This allowed me no extra mules to replace any disabled in action or by accident. I requested to be furnished some extra pack mules to carry rations and to replace any disabled, but instead was given a four mule team which was able to keep with me only four days, after which rations were carried on the persons of the men and on the gun and ammunition mules. My detachment consisted of six non-commissioned officers and thirty privates, also three civilian packers.

I left Manila at 8:30 A.M., January 3d, 1900, and marched to San Pedro Macati, the starting point of the expedition. Remained there till the next afternoon, which time was devoted to drilling and instructing the men. At 2 P.M., January 4th, left San Pedro Macati and encamped that night on a hill above Laguna de Bay, near the entrance to the Pasig River. The next morning, left this camp and marched to Muntinlupa on the Laguna. Took one gun with the advance guard on this march, as resistance was anticipated, but no enemy was encountered. The next morning, left Muntinlupa with the cavalry column and engaged in a sharp skirmish near the town. The enemy was driven back and pursued to Biñan, from which place he was dislodged by an Infantry column which had proceeded to the town by a shorter road, the cavalry and artillery being delayed by two almost impassable fords, such that the guns and ammunition had to be carried over by hand, and replaced on the other side. On the 7th the command left Biñan for the interior of Cavite Piovince. I accompanied the advance guard again with one gun, while the other two were in rear of the main column. The command encamped that night at Silan, while my detachment encamped about half a mile from the town, there being a very difficult crossing on the trail which was not reached by the rear guns until dark, so that I preferred to wait and cross by daylight. The trail leading through the ravine in question was so steep and slippery that the Cavalry command lost two horses and a mule in making the crossing, and it was necessary for me to carry all my packs through by hand. Remained at Silan on the 8th, and on the 9th proceeded to Indan with two guns, one being left in Silan with the garrisoning battalion. While in Silan I obtained some axes and shovels from the engineer detachment, which I carried on my mules from this time, and which greatly assisted my progress by enabling me to make repairs to bridges and trails. My wagon had not reached Silan up to the time I left and I did not see it again until we returned to Manila. There were several difficult crossings between Silan and Indan, but a little pioneer work on the bridges and trails enabled me to keep up with the main column and reach camp at the same time. I was ordered to leave a gun at Indan, and to proceed with the remaining one on the 10th, with Colonel Gardener and a battalion of the 30th Vol. Infantry, in a southerly direction towards Lake Taal. Up to this time I had hauled the guns wherever practicable, but from reports received as to the nature of the trails ahead, I concluded that it would be a gain in time and a saving to both men and animals to depend entirely upon packing. During the remainder of this campaign

this especial gun which always accompanied me was carried entirely by packing, and, in fact, could not, in most places, have been carried in any other manner.

The command reached Alfonso on the 10th, and remained there until afternoon of the 11th, when orders were received to proceed to Bayayungan on Lake Taal. As no trail to this place was indicated on the maps, word was sent to Colonel Gardener that he could send the artillery back to Indan if he deemed advisable. A native said there was a trail practicable for ponies, so I requested to be allowed to attempt the trip, as, if necessary, I could turn back in case the trail was found to be actually impracticable. We reached the mountain above Lake Taal without any trouble about five o'clock in the evening, and I started down with my detachment about six, reaching the town at the bottom about eleven. In many places the trail had been worn down to almost a point in the soft rock by pony travel, so that it was difficult to even lead a large horse or mule through, and utterly impossible to do so with the pack or saddles on. In these places it was necessary to completely unpack the animals and lead them through, and then carry the packs and saddles through and repack on the other side. This was rather difficult at night, but fortunately there was a full moon, and the descent was accomplished in safety. The trail in places was poorly defined, so that some of the infantry column strayed away and did not turn up in camp until the next day. Some idea of the nature of the trail can be formed from the fact that the following day, a cavalry pack train coming down with rations for our command, lost five mules in making the descent by day-light. The men in my detachment worked exceedingly well, and followed implicitly the instructions given them. The command remained at Bayayungan on the 12th, in order to obtain rations. On the 13th we started along the north shore of Lake Taal and marched to Talisay, where we rejoined General Schwan and the main column. During this march, it was necessary to lead the animals through the lake for about three hundred yards, the water being about breast deep, there being no practicable trail on the shore. From Talisay, the command proceeded the same day to Santo Tomas, making a march of over twenty miles for that day. At Santo Tomas I was placed in command of the artillery of the brigade, ten guns, with Lieuts. Summerall and Buckey as lieutenants. The guns were—one 3.2-inch field gun, five Maxim-Nordenfelt mountain guns, three 1.65-inch Hotchkiss mountain guns, and one Gatling gun. Lieut. Buckey joined me at Talisay and Lieut. Summerall at Lipa the next day. We left Santo Tomas about four o'clock on the afternoon of the 14th, and marched that evening to Lipa, about twelve miles. The next day two columns were started out for Batangas over different roads. I sent Lieut. Buckey with one and Lieut. Summerall with the headquarters column, accompanying the latter myself. We camped at Ibaan that night, and proceeded the next morning to Batangas, which was entered with slight resistance. From Batangas two of the Hotchkiss guns were sent back to Manila by steamer, being no longer needed. Lieut. Summerall was sent to Rosario with a column on the 17th. On the 19th, at 4 P.M., Lieut. Buckey and myself were sent with a battalion of the 30th Vol. Infantry, under Colonel Gardener. We marched to Rosario that night over a very rough road, reaching camp about 1:30 A.M. Started on at 6:30 A.M., the 20th, and reached San Pablo at 7 P.M., making the total distance marched

in 27 hours about 38 miles. Men and animals were tired but otherwise in good condition. On the morning of the 21st, I was sent with two Engineer officers and a company of Infantry to reconnoiter some reported trenches about four miles from San Pablo, and report upon the practicability of turning them. We found the trenches as reported and upon going along the road further, developed some concealed trenches beside the road from which fire was opened upon our party of four officers and two privates at a range of about fifty yards. Two of the enlisted men were wounded, but the rest of the party escaped uninjured. We returned and reported to General Schwan, and he sent a battalion of infantry to endeavor to turn the position, directing me to accompany this command with one gun. Lieut. Summerall was sent with the advance guard of the main column with one 3.2-inch and one Maxim-Nordenfelt, while Lieut. Buckey with the remainder of the guns accompanied the main column. After pushing my way for several miles through a dense undergrowth and over very rough ground, an order was sent me by Major Cheatam commanding the column to turn back to the road, as the head of the column had reached a wall of rock down which animals could not be taken. This order was brought me by Capt. Crozier of the Ordnance, who had accompanied the column up to this point and who now returned with me, as he could lead his horse no further. In the meantime the main column had engaged the enemy and driven them from the position. Lieuts. Summerall and Buckey were both engaged. At the first shot from the 3.2-inch gun the elevating screw was broken and the piece rendered unserviceable, so that all the work was done by the Maxim-Nordenfelts, and it was reported to be very satisfactory. My detachment overtook the main column just after it went into camp at San Mateo, but the infantry turning column did not get through until late in the evening. The next morning Lieut. Buckey was sent with a column to Santa Cruz, while the main column proceeded through Lilio against Majayjay, which was reported to be strongly defended by the enemy. The 3.2-inch gun and the Hotchkiss were sent with the wagons to Santa Cruz, as the trail was said to be too rough for their use, and the two Nordenfelts taken with the column. On approaching the position, which was found to be strongly defended by trenches, a ridge was occupied by our forces about six hundred yards from these trenches, and the guns placed near the extremities of the line where they would have the best command of the enemy's defenses. Everything was prepared for action and small gun pits dug to shelter the men and ammunition to some extent. It was not deemed advisable to attack the enemy that day, so I was ordered not to open fire, and the following morning they retreated on account of a column of our forces having entered the town in their rear. On crossing the river to the position, it was found that our guns had a perfect command in reverse of their main works, so that our fire would have rendered them untenable. On reaching the town, I was ordered to take two Maxim-Nordenfelts and endeavor to overtake Colonel Gardener, who had been sent in pursuit of the retreating enemy. As he had an hour's start and the trail was extremely rough, I did not overtake him until nine that evening at the town of Luisana. One of the guns had been hauled as far as Majayjay, but on leaving that place, I found that nothing on wheels could travel over the trails. This detachment was short one mule, sent back on a

foraging expedition, but by using my saddle horse as an ammunition animal, I managed to pack the gun all right and brought the entire outfit through in good order. The next day we marched from Luisana to Pagsanjan, skirmishing occasionally with small parties of the enemy on the way. To enter Pagsanjan it was necessary to cross a deep river on a ferry made of small native boats. It was impossible to get the mules on this ferry so the packs and saddles were put on the boat, and the mules made to swim the river. The next morning, January 25th, Santa Cruz on Laguna de Bay, the end of the expedition was reached. From this point, one gun under a sergeant of the 5th Artillery, was sent with the 30th Vol. Infantry to occupy Tayabas Province, and Lieut. Buckey, with another, accompanied an expedition to the East coast of the Island, while Lieut. Summerall returned by boat to Calamba, his regular station. I remained at Santa Cruz until February 9th, when I was ordered to return to Manila by boat and report to Department Headquarters, the Expeditionary Brigade having been dissolved. Before leaving Santa Cruz General Schwan sent for me and told me that there would probably be no more field duty for me, as the actual fighting was over, and as my battery and regiment were in the United States, he thought that I was entitled to return if I so desired. I told him that I would not care to return if there would be any chance for further field duty, and he said he did not think there would be. After returning to Manila and remaining in the city for nearly two weeks with no work to do, and no prospect of any, I wrote a letter requesting that if my services were no longer needed for the duty for which I had been sent out, that I might be returned to duty with my battery. On February 23d the order for my return was issued, and I sailed from Manila on the sixth of March on the U.S.A.T. *Sheridan*.

CONCLUSIONS

During my stay in Luzon I am convinced that I gave the Maxim-Nordenfelt 75-mm. mountain gun and pack outfit as severe a test as could be possibly given it in practical use. In many respects the circumstances were exceptional. The country traversed was probably as rugged as can be found in any part of the world. Cavalry officers who had been through Northern Luzon informed me that the Southern part was much more difficult to penetrate. The men furnished me were utterly ignorant of the gun and method of packing, none of them having had any previous experience with pack animals. The mules were many of them unaccustomed to packs and not acclimated to the country, having been off the ship only a short time. Consequently if the results obtained were satisfactory, it would seem that the gun would easily fulfill all ordinary service conditions.

ACTION OF GUN AND AMMUNITION

The behavior of the gun and ammunition in actual use was excellent in every particular. The mechanism for taking the gun and carriage apart is simple, easily understood and so strongly made as not to be easily disabled. The guns taken out by me were hauled over rocks, and through rivers so deep that the guns were entirely under water. Often they were upset and dragged for some distance in that position. On one occasion the mule carrying the gun jumped from a bridge at least twenty feet above a stream, striking on his back, that is on the gun, on a rock, without inflicting the slightest

injury on either gun or mule. At no time was any part of the mechanism in such condition as to interfere in the slightest degree with the perfect working and dismounting of the gun. It was thought by some that the elevating mechanism was so low on the carriage that, when hauled through mud, it would become clogged with dirt and unserviceable. This was thoroughly tested. The gearing mechanism is so simple that it practically cleaned itself, and even if not, the dirt could be easily brushed out with the fingers or a cloth. And, of course, when packed, which should be the normal method of transportation, there could be no danger from this source. The recoil was almost eliminated by the recoil cylinders and trail spade, and it was not found necessary to use the brake ropes on the wheels. Owing to the heat of the climate and newness of the guns, there was a very slight leakage from the cylinders but it was easy to supply this deficiency with cocoanut oil found at camping places, and water could be used if nothing else was available. I consider that the advantage gained by controlling the recoil much more than compensates for the extra mule required to pack the cradle.

HAULING ARRANGEMENTS

For hauling, the shafts furnished were unsatisfactory, being altogether too fragile. It is presumed that the intention is to haul the gun for short distances only over smooth roads, but the shafts are not strong enough for even that. Every pair used by me broke in a short time, most of them in several places, so that they were abandoned as unserviceable, and where hauling was continued, improvised arrangements were made with ropes, shafts from native wagons or from the 1.65-inch Hotchkiss gun. The castings of the shafts were very thin, cast about a wood centre, and full of flaws, Strength seems to have been sacrificed to lightness, although a few more pounds in weight would not make any appreciable difference in the packing arrangements. An improvement might be made in the method of attaching the shafts to the saddle, the present method causing too much strain on the breast strap and consequent chafing.

AMMUNITION

The ammunition used was perfectly satisfactory. Shrapnel and shell were the only kinds used, and they are the only kinds really necessary for the conditions existing in the Islands. Very few occasions will arise necessitating the use of case and even then, shrapnel will fulfill all the requirements, while for ordinary field use, shrapnel is the ammunition needed. For each 12 rounds taken, I considered 10 shrapnel and 2 shell as the proper proportion. There were no misfires, and every round burst, either on impact or as set for time. There were no premature explosions or failures. Although subjected to severe usage in packing, the ammunition was always in shape for use, and the metal packing cases were so excellently arranged that the shrapnel could always be carried fused ready for immediate use, without danger.

PACKING EQUIPMENT

With some few minor exceptions, the pack saddle is the best I have ever seen. The fair leather straps are rather light for hard work, and many of them broke. This was partially due to the buckles, and it would be a great improvement to substitute a lashing for the buckle. Of course the latter is more convenient with uninstructed men, but the lashing can be easily learned.

and then there would be no danger from broken buckles or straps cut out by the tongue of the buckle. The girth straps were all too short for our large mules, and it was necessary to double most of them. While inspecting the saddles at Erith I called attention to the length of these straps, and a number of extra straps were put in the boxes, although the people at the factory were sure the saddle straps were long enough. The cinches are of cord and I do not think can compare with our hair cinch. The main cinch should be broader. It might be an improvement to have a special saddle for the trail, so that it could be raised in rear. Otherwise the spade part is apt to hit the animal on the tail as he walks. It was necessary to prop up the rear of the trail by placing a blanket roll or some other support between the rear brace of the saddle and the trail, and to put on two or three extra lashings to secure it properly in place. This was the only load which caused any difficulty in packing. The others were very evenly balanced, and after being once properly secured in place, caused very little trouble on the march. The gun load, the heaviest, seldom shifted position, and the cradle, wheel, and ammunition packs would be carried all day without requiring any attention whatever. Two strong, even gaited mules were selected for the gun and trail packs, and after a couple of days' experience for men and animals, the loads shaped themselves so that they would not require attention for hours, although the animals were climbing the steepest hills, jumping ditches &c. The construction and fit of the saddle is far superior to any I have seen, so far as regards ease and comfort to the animal. On the trip through Southern Luzon. I started out with men who had no experience with packing of any kind, with saddles unfitted and with mules unaccustomed to packing. At times the saddles were wet and placed on the mules in that condition. On one occasion two mules jumped from a bridge into a stream, so that it was necessary to unpack them in the water, leaving the packs and saddles in the stream. These were then fished out and placed on the mules in this condition and the march continued for several hours. The mules were foraged on unhulled rice when it could be obtained, but often had to be satisfied with banana and palm leaves. The gun detachment which remained constantly with me traveled fully 260 miles under these conditions, making one march of nearly 38 miles in 27 hours. Yet up to the end of the expedition not one of my mules became disabled or exhausted, nor did I have a single sore back or saddle gall, the mules reaching Santa Cruz in fully as good condition as when they left Manila. During this time we were constantly with cavalry pack trains fitted out with aparejos, and the contrast in the condition of the mules was most striking and was frequently commented upon. The fact that the saddles are interchangeable is a great advantage, especially where packing is to be hurried and before daylight, as was frequently the case in my experience, a few candles furnishing the only light.

COMPARISON OF MAXIM-NORDENFELT WITH OTHER GUNS USED

For my own experience, and from conversation with other artillery officers, it is my opinion that a mountain gun of this or similar type is the gun needed for service in the Philippine Islands, and probably the only kind needed. The greater portion of the Islands is absolutely devoid of any practicable roads. In places where the Spanish government had constructed

fairly good roads, through neglect and the ravages of the climate these have become even more difficult than the ordinary trails. This state of affairs is greatly increased during the rainy season when, for months, a large portion of the country is practically impassable for anything on wheels. The 3.2-inch field gun, although fairly good in its place, must be hauled, and consequently is only useful in a country provided, to some extent at least, with roads. When accompanying a column, bridges must be repaired, banks to fords cut down, &c., all of which tend to delay the advance. Infantry officers anxious to push ahead are not apt to make allowances for these difficulties to be overcome by the artillery, and although fully appreciating its usefulness in actual combat, would make complaint if they were called upon to delay in the least to assist the artillery ahead. This happened frequently, although the artillery officers were doing everything in their power to overcome the obstacles and hasten the advance. Furthermore the gun and carriage did not seem to stand the rough usage it was called upon to undergo over well, and there was constant necessity for repair to elevating screws, vent bushing, &c. There was also great complaint as to the ammunition, especially regarding the shrapnel, there being many premature explosions, sometimes in the gun itself, so that it was not always considered safe to fire over the heads of the advancing troops. This was probably due to some accident in manufacture, and should be easily remedied. But I believe any system for field artillery of this class is radically defective which does not involve the quick firing principle and the use of fixed ammunition, this being necessary both for the proper protection of the ammunition, and quick and accurate service of the piece. The 3-inch Hotchkiss mountain gun was used to a considerable extent, and did some good work. But the packing arrangements for this gun are not satisfactory, and it was hauled whenever in use. I have never seen the gun packed, but am informed that the saddles are so poorly constructed that the back of the mule is galled in a very short time. Another objection to the gun is the excessive recoil, which, I am told, was often as much as fifteen feet, the gun being overturned. This would be a great obstacle to any rapid fire. The 1.65-inch Hotchkiss mountain gun I consider as practically useless for field work. It is too light and fires only a shell with a small bursting charge, while shrapnel is the ammunition needed. It is of practically no use against trenches, or lines of troops.

The 75-mm. Maxim-Nordenfelt gun seems to me to more nearly fill the requirements for a gun to be used in our Island service than any other gun of which I have knowledge. It is essentially a modern gun with all the modern improvements. The comparatively low initial velocity gives enough of a curve to the trajectory to render it more effective against trenches than the high power gun with a flat trajectory. Of course it has not the penetrating power of the latter, but still has sufficient to overcome any obstacles that are likely to be opposed to it. In the fighting for which it will be used, there will be no strong fortifications or walls to be beaten down, only trenches and light shelters, for which small penetrating effect will be needed and shrapnel practically the only ammunition. The gun is sighted up to 4,000 yards, and was fired by me with good results at 3,200 yards. No greater range than 4,000 yards will ever be required, and most of the fighting will be under 2,000 yards, at which short ranges the gun is very accurate

and effective. The shrapnel and shell used is quite heavy enough. 12.5 pounds, although a heavier one can be provided, if required, and a sight scale is furnished for the heavier ammunition. The ammunition used by me was made in England, the fuzes being of the Krupp pattern, and the action was perfect. I know of no reason why equally good ammunition should not be made in this country. The almost complete control of the recoil by the cylinders attached to the jacket is an advantage that can not be over estimated, if the gun is to be used under circumstances calling for rapid fire. The action of the cylinders is simple and they can be filled with water if no other fluid is available. The leakage was very slight, even under unfavorable conditions. The breech mechanism is very simple, opening by a single motion, and can be entirely taken apart without the use of any tools. The coning of the breech block is such that the largest surface is next to the powder chamber where the greatest resistance is needed, so that there is no danger of the threads stripping. In fact, all parts of the gun and carriage are so constructed as to combine strength and simplicity in the greatest possible degree.

On account of the jacket, one more mule is required for the packing than with the Hotchkiss. But the loads are so well distributed that there is very little danger of a mule giving out and there is not so much need for spare mules as with the other gun. The ammunition boxes are well balanced on the mule, and the ammunition is so well protected that there is no danger from accidental explosions, even though the mule should jump from a bridge or roll down a bank. One artillery officer stated to me that he considered the time taken to lead the mules into position and to unpack and put together the gun as a great drawback; that the 3.2-inch gun could be brought up at a gallop by six horses and unlimbered in a very much shorter time. This might be true if all conditions were favorable for the larger gun. But in a country with no roads, with ditches to cross and bushes to penetrate, it would seem to me that the advantage would be in favor of the led animals. When my unskilled detachment could unpack the gun and place it in the firing position within two minutes, I do not consider that this matter of time would be worthy of consideration, especially when balanced against the many places in which the mountain gun could be taken and used, where the larger gun would be absolutely unserviceable. Officers with whom my detachments served stated that they were thoroughly convinced that the gun could be taken wherever an infantry man could go without using his hands for climbing. If all the light batteries should be withdrawn from the field and replaced by a lesser number of batteries of these mountain guns, I am convinced that the artillery work could be much more effectively and creditably performed, and there would be no opportunity given for any complaint as to delay being caused by the artillery. My detachments were always ready in the morning before the infantry, and were often held back on the road by the foot troops.

ORGANIZATION OF BATTERY

As to the organization of a mountain battery, I was given no opportunity to test that practically, as I was sent into the field with three guns at the most, and before going was directed to designate the least number of men and animals with which I would possibly get along, and this number was given me at the moment of departure. I had no spare animals, and had one been disabled,

would have been compelled to abandon a portion of my outfit. By good luck, no such misfortune happened to me. On my way out to Manila, I obtained what works I could on Mountain Artillery, and formulated a plan for the equipment of a battery of six guns, which was submitted to the Department Commander on my arrival in Manila. In this plan, I estimated that each battery should have one captain, three lieutenants, total commissioned—4; one first sergeant, one quartermaster sergeant, one stable sergeant, one blacksmith, one saddler, two cooks, two trumpeters, six sergeants, six corporals, and ninety cannoneers. Total enlisted—111.

ANIMALS

For mounting officers, staff sergeants and trumpeters.	9	horses
For mounting cooks, blacksmith and saddler....	4	mules
Gun mules	24	"
Ammunition	30	"
Blacksmith and saddler outfit	3	"
Spare animals	15	"
Total animals	85	

In addition to this each battery should have a small pack train of about 15 mules to carry rations, etc., if the battery is to move as an independent organization, making a total of 100 animals. This is a much smaller number than given for the English mountain batteries, especially in India, but it would seem to be ample for all the ordinary requirements of service. The pack train could be cared for on the march by the quartermaster and stable sergeants, cooks, blacksmith and saddler.

The service of the piece and drill for these guns would be very simple, and any technical method would probably be subject to more or less modification to fulfil the requirements of actual service.* * *

Very respectfully,
GEO. W. VAN DEUSEN,
Captain, 7th U. S. Artillery.

The following cablegrams are to be found in the "Correspondence Relating to the War with Spain, etc.," Volume 2:

Page 936:

"A.G.O., Washington,
March 16, 1899.

"GENERAL OTIS, Manila:

Shall horses be sent with light batteries? *Mountain guns will be sent*, x x x

CORBIN."

Page 1039:

"Manila.
(Received July 26, 1899—la.m.)

"AGWAR, Washington:

Could use, in addition to guns on hand, x x x 12 Hotchkiss mountain guns, 1.65, with 5,000 shells for same. Use of heavy field guns in campaigning swampy country impracticable: request above be sent.

OTIS."

Page 1065:

"A.G.O., Washington,
September 8, 1899.

"OTIS, Manila:

Twelve mountain guns, 12-pounders, with ammunition-packing outfit shipped from London via Hongkong October 1. Vickers-Maxim pattern instead of Hotchkiss. CORBIN."

Page 1127:

"Manila.
(Received December 29, 1899—8:47 a.m.)

"Adjutant-General, Washington:

Colonel Lockett, with regiment, 2 battalions 46th, 1 45th, and company 27th Infantry, 2 *guns, Captain Van Deusen*, attacked enemy 600 strong on mountain stronghold beyond Montalban, northeast

San Mateo. Large number killed and wounded, 24 prisoners taken. Lockett captured 1 cannon, 40 rifles, 20,000 rounds ammunition, 500 pounds powder, arsenal fortifications, all food supplies and considerable other property. This captured point located on mountain trail and formerly supposed to be impregnable. Our casualties, Lieutenant Enslow, 11th Cavalry, and 5 enlisted men wounded, mostly slight; Private Mattson. L. 45th Infantry, drowned.

OTIS."

Page 1131:

"Manila.
(Received January 12, 1900—10:19 a.m.)

"Adjutant-General, Washington:

x x x Schwan's column, consisting squadron 4th, 1 of 11th Cavalry, 30th, 46th Infantry, and *6 Nordenfeldt guns, under Captain Van Deusen*, seized Binang, Silang, Naic, scattering enemy, who were severely punished. x x x

OTIS."

Extract from the Regimental Returns of the 6th U. S. Artillery:

"Battery E.— x x x A detachment of 1 first sergeant, 2 sergeants, 3 corporals, and 30 privates of Battery E. under command of Captain G. W. VanDusen, 7th Artillery, with two M———— N———— Mountain Guns left Manila, P. I., December 25, 1899; took part in an engagement with insurgents at Montalban, Luzon, December 27, 1899. Participated in the campaign of 'Schwan's Expeditionary Brigade,' in Southern Luzon from January 3, to February 10, 1900; skirmish at Montinlupa, January 6, 1900; engagement at San Pablo, Luzon, January 21, 1900. Returned to station in Manila, P. I., February 10, 1900. No casualties."

Extracts from Annual Reports of the War Department, 1900; Volume 1: Part 4—pp. 367-8:

"Montalban.
December 27, 1899.

"General Schwan, Chief of Staff,
Manila:

Yesterday the cavalry was sent to detour around north flank of insurgent's position and Johnson's infantry around south flank across mountain, 45th was sent up east bank of river. Johnson failed to get through last night; sent him this morning up hogback to turn south flank and supported him with one company 27th Infantry, and one troop dismounted squadron 11th Cavalry, Too, two battalions 46th Infantry, Lieutenant-Colonel Pratt commanding, up Montalban road; formed line toward east; *2 guns, under Captain Van Deusen*, between the two battalions of the 46th Infantry, opened fire upon the enemy's point. Insurgents were posted in strong fortified positions on both sides of the river. Had battery with one breech-loading cannon, supported by a battalion of infantry, just south of river where it comes out of the mountains. The attack was a complete success. Cavalry squadron got in rear of the flank by the hardest kind of work. Johnson's infantry is up on mountain yet. As the front attack broke the enemy the cavalry troop poured in withering volleys and sent him in a wild scramble through the brush. Lieutenant-Colonel Pratt pushed part of his command up mountain side, turned right of battery in brush, and found a breech-loading cannon. We have captured about 24 rifles, 20,000 rounds of ammunition, 500 pounds of powder, reloading outfit, and material for making projectiles. The opportunity was furnished and a great number of the enemy should have been killed. Tomorrow I will search out the hills and destroy the telegraph lines. The command which defended this position has been thoroughly scattered over as rough a country as I ever saw. Our casualties are, as far as I can learn, 1

officer and 2 men, 11th Cavalry, wounded, 3 men, 46th Infantry, wounded, and 1 man. 45th Infantry, drowned.

LOCKETT, Colonel."

"Montalban,
December 28, 1899.

"Chief of Staff, Manila:

After sending telegram yesterday, captured 10 additional rifles and some prisoners. Johnson's battalion, 29th Infantry, and Miller's battalion, 46th, still on the mountain. Have not yet received report from them. Carson's squadron moved toward San Jose by way of San Mateo this morning.

LOCKETT, Colonel."

"Montalban,
December 28, 1899.

"Chief of Staff, Manila:

Major Miller's battalion has just returned. It went back 3 miles through the mountains. Found no considerable body of Filipinos. The entire command is now in the vicinity of Montalban. Company of 45th Infantry on outpost duty at insurgent stronghold killed 3 Filipinos this a.m., and captured their guns. Filipino prisoners report insurgent troops without food and that they have no food supplies in the mountains. The strong insurgent fort north of the river and arsenal have been destroyed. We have secured 16 bales of telegraph wire. Shall I continue to hunt small insurgent detachments out of the mountains?

LOCKETT, Colonel."

"Montalban.
December 29, 1899.

"Chief of Staff, Manila:

Insurgent forces fronting Montalban were attacked by troops under my comhand and defeated. They occupied a front of 3 miles on both sides of the river in foothills and on mountain sides. We turned both flanks by troops sent out on afternoon of the 26th and smashed the center. Flying insurgents were intercepted by dismounted cavalry, which had circled north end of line, and were driven up mountains. The infantry which had turned left flank were on hand to catch them on mountains. Result was grand disintegration. Mountain side and paths are covered with dense thickets of bamboo, almost impenetrable. All the troops now in except Major Miller with five companies of the 46th. Will not be down until tonight or tomorrow morning. About 80 known to have been killed, several wounded, and 24 captured. The loss was necessarily much greater, but the men did not stop to hunt for bodies in dense grass and jungle. We captured their gun arsenal and quantities of ammunition, and supplies of all sorts have been captured and destroyed. We got their reloading outfit, telegraph instruments, lineman's outfit, and 40 rifles. The movement was a complete success. Our loss was 1 officer and 6 men wounded and 1 man drowned. Several cases of heat prostration. Major Carson's squadron was sent to San Jose, with four days' rations on pack mules.

LOCKETT, Colonel."

Part 6—p. 641:

"Schwan's Expeditionary Brigade. "Detachment 6th U. S. Artillery, with 3 Maxim-Nordenfeldt guns, under Capt. G. W. Van Deusen, 7th U. S. Artillery, x x x." p. 658:

"The artillery under Captains Reilly, Van Deusen, and Koehler, and Lieutenants Kenly and Buckey, was well handled and did good service. The guns employed were the 3.2 field Hotchkiss mountain, Colt automatic, Gatling, and the Maxim-Nordenfeldt. The Maxim-Nordenfeldt gave especially satisfactory results, and it seems to be peculiarly adapted to the nature of the warfare in these islands."

The guns in question, referred to as Maxim-Nordenfeldts, were according to the Ordnance Department reports, Vickers-Maxim 75-mm. mountain guns

(pack). The following extract is from the Report of the Board of Ordnance and Fortifications, dated October 31, 1900; p. 163:

"Rapid Fire Guns and Mounts:

The Vickers-Maxim 75-mm. mountain gun. — This gun was adopted as a type for the service to the extent of supplying the immediate necessities of troops in the field, and two complete 6-gun batteries with pack equipment and ammunition were purchased (in London) and sent to the Philippines for service test. Reports received from the artillery officers in charge of these guns having been favorable, two additional batteries were recently purchased from the manufacturers.

Extract from the Report of the Chief of Ordnance, 1900; p. 36:

"Mountain Guns.

"The last year brought a considerable demand upon the Department for guns of this class. Our Army previously had but little experience with them, though the Department had placed several batteries of them in the hands of troops in the Indian country at various times between 1887 and 1894, and has for over 12 years had a small stock of them in store. Officers found but little use for them and preferred the standard field guns. In a country which has roads, which is little encumbered with forests, and permits the ready movement of field guns, they will always be preferred, and the mountain gun is thus but one to be employed where field guns are impracticable. In response to requisitions from the Philippines, all the mountain guns on hand were sent to Manila, and two 6-gun batteries of 3-inch 12-pounder mountain guns were purchased by order of the Secretary of War from Vickers, Sons & Maxim, London, and also shipped to Manila with packing outfits. Another type of mountain gun which has been called for frequently is the 2-pounder Hotchkiss, caliber 1.67 inches, which has been furnished by the American Ordnance Company, of Bridgeport, Conn."

This was not the first use of pack artillery in our Army. We had it before the Mexican War; one battery was in action in that war; and it is possible that others had been used before that in Indian campaigns.

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Changes in the Office, Chief of Field Artillery

Lieutenant Colonel John B. Anderson has arrived, from Fort Leavenworth, to the office of the Chief of Field Artillery to relieve Colonel F. A. Doniat as Personnel Officer. Colonel Doniat has become the chief of the War Plans Section, relieving Lieutenant Colonel T. J. J. Christian, who is ordered to the field artillery of the 2d Division. Lieutenant Colonel Louis Hibbs, former chief of the Materiel Section, has been ordered to the United States Military Academy, and will be relieved by Major Rex W. Beasley, from the 1st FA, Fort Sill. The assistant Materiel officer, Major J. R. Sheetz, has been relieved to attend the Army War College. His successor is Major Jay W. MacKelvie, from the 83d FA, Fort Benning, Ga.

Moving Target Firing

EXPERIMENTS at The Field Artillery School in direct laying on moving targets with the new weapons, 75-mm. howitzer, and 75-mm. gun, M-2, have developed some interesting results.

Both pieces are designed to be used with the new elbow sight, which has not yet, however, been issued for the M-2. Artillerymen unfamiliar with this device will be interested in an account of its operation.

The elbow sight is seated on the right of the piece, and the cannoneer, usually No. 1, who operates the elevating handwheel, uses a horizontal hair in the reticule to lay on the base of the target. The reticule has no vertical hair, but has a series of stadia horizontal lines, each of which has a range etched on it. Both angle of site and elevation are obtained for direct laying, then, when the hair corresponding to the announced range is placed at the target base.

The gunner lays for direction with the panoramic sight, as now, but is concerned with the vertical hair, as there is no elevating handwheel on his side of the trail. By this means a high degree of accuracy in laying on a moving target can be maintained. The etched reticule range scale extends from 4(00) to 30(00) yards, and it is interesting to note that while the difference in mils of elevation between the last two ranges is over twice as great as for the mil-difference between the first two—that is, between 400-600 and 2800-3000—the reticule distance is but slightly increased at the longer range, and the proper range setting can be read with ease.

NO. 1 USING THE ELBOW SIGHT

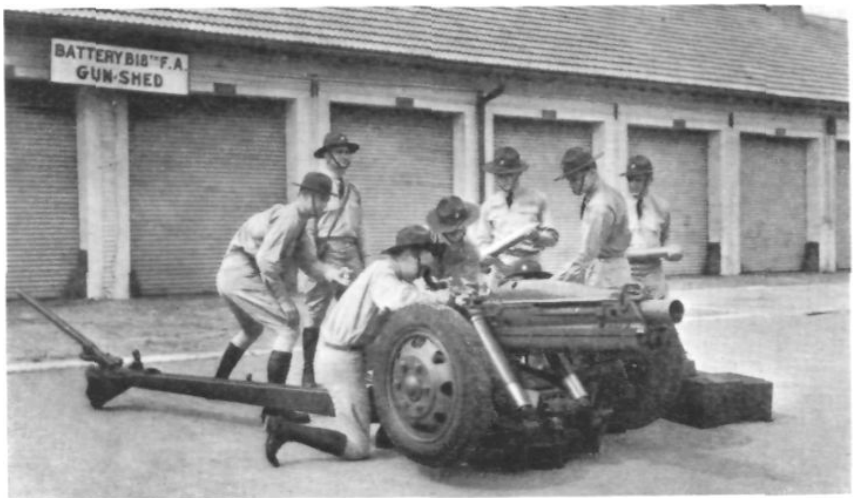
Using the new elbow telescope with the 75-mm. howitzer, for which it is issued, a battery of the 18th FA was "cited" in the Daily Memorandum of the Field Artillery School, April 7, 1938, as follows:

* * *

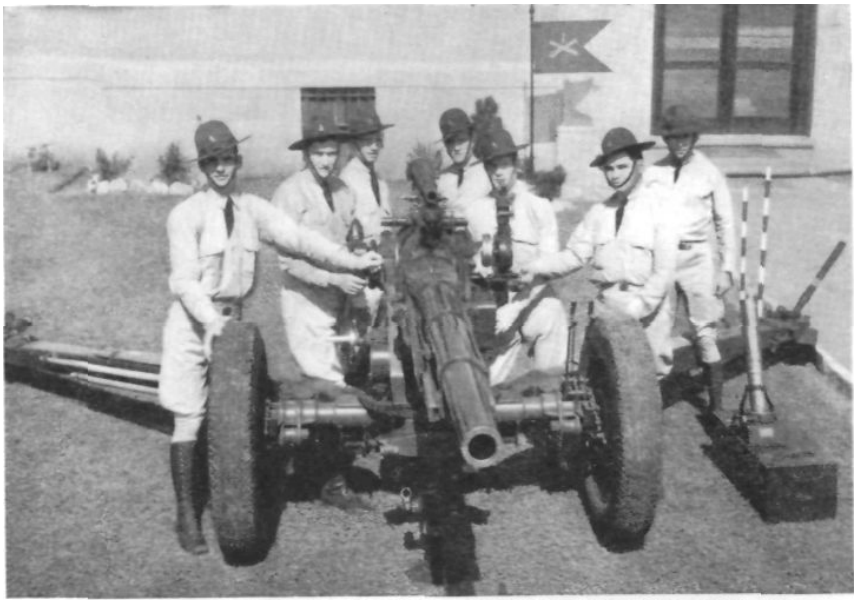
"MOVING TARGETS: The following constitutes a record never before approached, to the knowledge of the Gunnery Department: DATE: April 5, 1938. GUN CREW: 2d Section, Btry B 18th FA Sgt. O. C. Hill, Chief of Section; PFC R. L. Roberts, Gunner; Pvt C. W. Lefland, No. 1; Pvt. W. V. Whitsell, No. 2; Lt. Tisdale, Regular Class, conducting fire.

GUN: 75-mm. howitzer—firing precussion shrapnel. TARGET: Size: Smaller than Renault Tank. Speed: 15 MPH. Course: 500 yds. on 3-leg zigzag. Largest number of hits obtained on middle leg of course, where target was moving at about 60 Deg. from direction of fire. RANGES: Fire opened at 800 yds. Fire stopped at 300 yds. TIME EXPOSED: 1 min. 12 sec. ROUNDS FIRED: 19 (16 RGM). NUMBER OF DIRECT HITS: 10."

This battery was commanded by Captain



SERGEANT HILL'S CREW AND THEIR 75-MM. FIELD HOWITZER



SECOND SECTION, BATTERY B. FIRST FIELD ARTILLERY AND THEIR 75-MM. GUN. M2, WITH 37-MM. MOUNT

Left to right: Privates Clayton M. Kendrick and Dave Pool, Sergeant Lawrence C. White, Chief of Section; Private Oscar F. Pulis, Corporal Harold S. Frederick, Gunner; Privates Richard Byers and Frank H. Canady.

Homer W. Kiefer, with 2d Lt. W. C. Westmoreland as executive. Captain Kiefer reports that a week later subcaliber firing, with a 37-mm. mounted on the tube, obtained 14 hits out of 20 on a similar run. He points out, however, that, lacking muzzle blast and recoil to disturb the laying, this was not as conclusive as the service round firing.

Another unit of School Troops, Battery B First FA, armed with the 75-mm. Gun, M-2, employed 37-mm. sub-caliber for its moving-target shooting, as the elbow sight has not yet been issued for that piece. The gun crew, firing at a regular instruction session for the School, with a target assigned to 1st Lt. S. E. Otto, obtained 10 direct hits out of 13 rounds fired in 63 seconds, at a target 3½ feet high, moving at 20 MPH.

False ranges were used, because of subcaliber employment. Firing began at announced ranges of 1400 to 1900, and dropped as low as 600 before the command, "Cease Firing." A false site also was employed. The gunner, of course, could lay only for direction; the bubble had to be leveled by No. 1 for each round, since he had no sight. Firing began and continued with angle of site minus 20. Captain John M. Hamilton commands this battery and Lt. J. F. Ammerman is Executive. Lt. C. V. Clifton reported the firing for THE FIELD ARTILLERY JOURNAL.

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Fifteenth Field Artillery sends three privates, Robert A. Berman, Howard L. Burris, and Wilfred C. Ford, to become plebes at the United States Military Academy.

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First Classman Kenneth Glade, USMA, wins the Championship Jumping event at the West Point Horse Show, and with it the trophy awarded by the United States Field Artillery Association.

IN THE OPEN

Dry-point etching by Kerr Eby

Courtesy of Charles Sessler, Philadelphia

The French Had a Word for It, Too

BY CAPTAIN GEORGE D. VANTURE, FA

SOME years ago there appeared in the service press a brief article in which the infantryman author inveighed against the growing tendency in the military service to use "three dollar words" which few understood, instead of words of two syllables, intelligible to all.

Among the words mentioned was "liaison." It was the author's contention that the good old English word "contact" meant the same thing, and was more readily understood by the multitude.

If that infantry officer's opinion is shared by many of his brothers-in-arms—and I fear it is—then perhaps we have some clue as to why the ideal of the close "Infantry-Artillery Team" has, up to now, failed of materialization. We don't speak the same language.

There is no single English word that means the same thing as liaison. The French had a word for it—and we took it into our language long before the advent of the World War. Not into our military language, however, for we most frequently encountered it in the breezier novels. I will not dwell on the implications, which are, however, significant.

But the French used it to express the relations they desired between their Infantry and Artillery.

During the twenty years that have elapsed since the War, the field artillery seems to have been left entirely alone by the other party to the liaison.

The field artillery has striven mightily—much progress has been made—but the ideal is far from fulfillment, and the impasse will remain until the infantry realizes that it isn't just "contact" that is needed. Liaison can be attained only by mutual cooperation.

During the first few years that followed the war, the artillery seems to have taken liaison to mean contact, too, for they looked on the problem as one of communication only—as every second lieutenant who served in either the Second or Hawaiian Division, or on any post at which infantry and artillery engaged in joint maneuvers, knows only too well.

In those days the idea was to get communication, and it had to be wire—"The radio won't work." Tables of organization and equipment provided for neither personnel nor equipment for solely liaison purposes. Types of equipment and numbers of personnel engaged were as varied as the commanders of the various units.

I vividly recall one maneuver in which I was a battalion liaison officer. My detail consisted of forty enlisted men scraped up throughout the entire battalion. All, including the liaison officer, were girded with three coils of outpost wire each, one over each shoulder and the third around the neck or waist, whichever suited the wearer's fancy. This wire was supposed to be laid by the creep, crawl, and tug method, because the brigade commander stated that mechanical means of laying wire could not exist on the forward part of the field of battle. The general claimed that since the infantry had found it impossible to maintain wire communication further forward than the battalions, there was no point in the artillery trying it.

If necessity is the mother of invention, then laziness can lay claim to fathering a few of them, for after a few lieutenants had engaged in this manner of laying wire, there was a deluge of

improvised wire carts—that progressed successively from hand to horse to motor pulled gadgets, all clever no end—but none adapted by the branch as standard.

The artillery soon found that a definite detail was needed for liaison, and tables of organization were revised to contain in each light Bn two staff officers specifically assigned for liaison duty, and each with a definite detail of enlisted men, and with specific equipment. These details have been revised from time to time as the full realization of the word has dawned upon us.

The detail we now have seems satisfactory, except that there are only two of them in each light FA Bn, and there are three infantry Bns. Field artillery regulations provide for improvising the third detail when needed.

In maneuvers, the "war" is generally over when the infantry commits the reserve—that third battalion. In war, when the commander commits his reserve, he has taken his final decision. Then — if ever — is liaison needed between the artillery and that third battalion, and I cannot believe that it can be adequately provided by any improvised detail.

The field artillery has also realized for some years now that the liaison officer should NOT be the junior second lieutenant, as so often used to be the case. Whatever his rank, he should be an excellent shot and have a good knowledge of infantry tactics.

The development of radio — particularly the radio telephone—also helped in the artillery's solution of the communication part of the problem. It would appear that the present tendency is to regard the radio as the primary communication agency for liaison.

Concurrent with the problem of communication was the no-less-important one of target designation and fire control.

The first premise was that the location and nature of the target was to be made from the front lines—usually by the liaison officer—to the supporting artillery. This target was then assigned to a battery and the fire conducted by the ordinary procedure. This presented many difficulties. First, there was the difficulty of designation. If the target were visible from the forward location of the liaison officer and from the OP of the adjusting battery, there still remained the problem of describing its exact location. The same piece of terrain has an annoying habit of looking entirely different from two different points of observation. What may appear to be a very prominent terrain feature from one point of view may be relatively obscure, if not invisible, from another. Many methods were tried and it was soon found out that this could be done only if a large-scale map were available and the target designated by coordinates. Since it has been almost universally agreed that such maps will not be generally extant, it can be readily seen that this was no solution of the problem. Since it was difficult to have the forward observer describe the target location to a person in the rear who adjusted the battery, the next most obvious solution was tried: Have the liaison officer, who is in a position to observe, adjust the fire. Such procedure was more satisfactory than the one previously described, but because it required direct communication from the front lines to the firing battery, either by wire or radio or combination of the two, it put an added strain on the already overburdened communication system. Also, since the liaison officer made his adjustment using the conventional terrestrial observation methods under the most difficult of setups, the result was that effective fire was not put down on the target without much undesirable delay. From these two experiments it

could be seen that the liaison officer was the logical person to adjust the fire—but something must be done to speed it up and simplify his problem of adjustment.

The Field Artillery School, in the development of the Liaison-Gunnery method of fire adjustment, that is, having the ground observer adjust by air observation methods, seems to have a satisfactory solution.

The technique of this method is familiar to all artillerymen and unimportant to infantrymen. Suffice it to say that it is so simple that at The Infantry School much success has been had in teaching noncoms of the 83d FA to adjust fire by this method in relatively short time. As for speed, once the infantryman has pointed the target out *on the ground*, effective area fire can be brought to bear upon it in less than five minutes.

So much for a recital of the artillery's part in the development of Liaison.

They have: (1) Provided in their tables of organization a definite liaison detail with express personnel and equipment; (2) developed a method of conduct of fire which is simple and promises to bring effective fire promptly on the target *when, as, and if designated by the infantryman who wants it;* and (3) adopted a communication system which seems to insure more or less permanent communication, and which is being improved all the time. This, however, is simply a prelude to liaison. We can now talk to each other. What will we talk about?

During the several years that I spent at Benning, both as a student in The Infantry School and as an officer on duty with the demonstration FA Bn. I found out that the infantry officer was as interested in the artillery end of the proposed "Infantry-Artillery Team" as the field artilleryman. The only reason he didn't attempt to do something about it was that the impression existed that liaison was exclusively a field artillery problem. In field exercises, whenever the liaison officer with his detail reported forward and announced that he had communication with his supporting Bn, the liaison problem was over. The infantry commander simply marked little goose eggs on his one-inch-to-the-mile map, designating where he wanted his prearranged artillery fires, and took the liaison officer's word for it that they would be dumped down just where he wanted them without further ado. Since the ammunition was mostly synthetic there was no way of disproving the claim.

Let us assume that there are some machine guns holding up the advance of our assaulting infantry battalion, and the infantry battalion commander wants fire from his supporting artillery.

For the purpose of illustration, let us reach into the can and take the message that usually comes out in any well-run field exercise:

"Base Point 400 left 600 short; machine guns; can observe."

What is the eye-witness source of this enlightening bit of information?

Surely the eagle-eyed liaison officer from his providentially appointed point of observation has not located these machine guns "in the vicinity of the big lone pine tree" for, if he knows anything about infantry tactics he knows they don't put them there if they can help it. No, the probability is that he received this information from the infantry battalion.

And did the infantry commander, surveying the field of battle from Olympian heights see one of his assaulting companies abruptly brought to a halt by a withering blast of hostile machine gun fire? Probably not.

Whence cometh *his* information, then? I think that in most conceivable situations we may deduce that it came via

runner from the company commander, who in turn got it from one of his forward platoons that was temporarily behind the eight ball.

And did the infantry commander get his message in the verbiage of our above-quoted message? We may answer that in the negative, too, for in all probability the infantryman doesn't know what a base point is. The probable location that he received from the runner was that it was "ovah yondah."—or, if he's lucky, he may receive information that it is in the woods on SOANDSO hill—said woods occupying many acres of area and requiring a regiment of artillery, no less, to cover with zone fire.

Two points then introduce themselves: Why shouldn't the infantryman know what a base point is, and what's more, where it is? Why shouldn't he know that the base point (or reference point) is simply some point in his zone of advance that the artillery uses as a point of origin for locating targets and areas of fire?

It's ritual that infantry orders contain reference to such terrain features as "Line of Departure," "Main Line of Resistance," and "Boundary Between Bns." It's also ritual that the field artillery order start off with the designation of the Bn reference point. Surely it wouldn't overburden the infantryman, including the platoon commander, to be taxed with learning the location of one more terrain feature — the reference point of the artillery battalion that is in direct support of him. And if the artillery battalion commander chose, he could make the reference point and his initial base point the same thing. Then the person who is best able to say—the infantry element that is actually up against it—could send back word that some machine guns that were in a clump of woods about 400 yards to the right and 600 yards over the artillery base point were holding him up, or if not that, he could say "about 500 yards SE of the base point."

The other point is about the definite location of the machine guns. They are in a large woods, too great to be covered by the fire of one battalion. Since the fire must be delivered by the artillery available, *somebody* has to guess, or deduce, as to what particular part of that woods he would put his guns in, were he the enemy. The first guesser should be that commander who is best in the position to judge, either the company or Bn commander, surely not the liaison officer, for if left to him, he will probably take the most prominent tree in the woods and cover an area of fifty yards on either side of it and let it go at that.

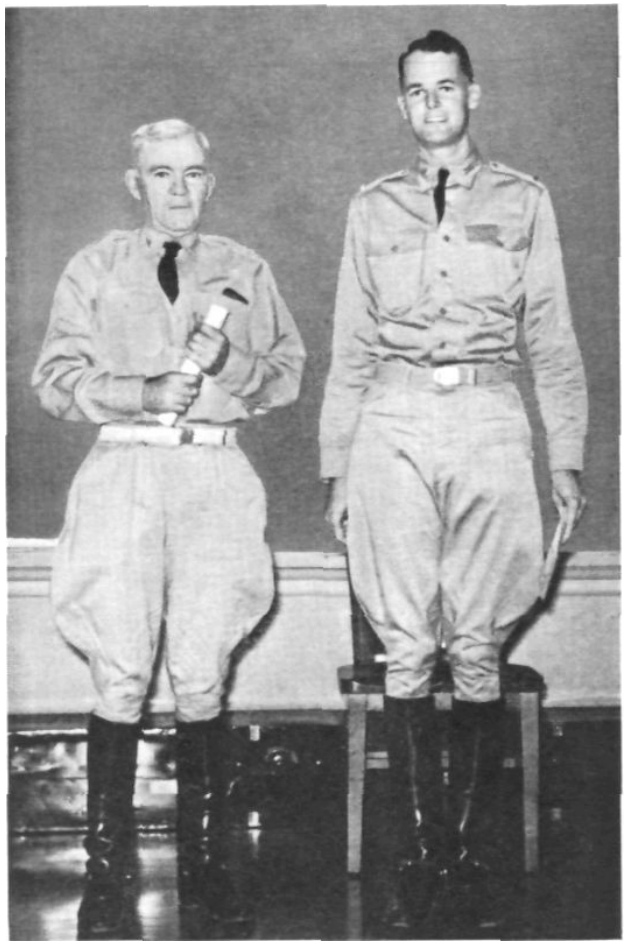
I made the statement that the present liaison gunnery method of fire should bring down a concentration on the target within five minutes after it has been identified on the ground. There is bound to be much more time between the time the assaulting element is held up and the time the message gets to the point of observation of the artilleryman who is to adjust the fire. Any saving in time must be done by shortening this interval. It can be done in two ways; by letting the artillery carry their liaison still further forward to include the assaulting companies, or by the infantry taking up the problem and making artillery liaison in the manner suggested.

Since the infantry themselves have ruled it not feasible to carry mechanical means of communication further forward than their advanced Bns, it is not reasonable to assume that the artillery would have any better luck. And mechanical means of communication are most essential to efficient conduct of fire. Therefore, it would seem that the artillery and infantry have some more getting together to do. We now have "contact." Let's try something else.

The French had a word for it.

Let's try LIAISON.

Prize Thesis Award



The winner of the 1938 Prize Thesis Award of the United States Field Artillery Association, is First Lieutenant John William Hansborough, FA, recently graduated member of the Regular Class, The Field Artillery School, whose subject was "The Antitank Gun."

The illustration shows Lt. Hansborough receiving the Association's fifty-dollar check from the Commandant of the School, Colonel Augustine McIntyre, FA, who is also Vice-President of the Field Artillery Association.

The author was born in Eufield, Illnois, in 1908. He attended Oak Cliff High School, Texas, and was a member of the Junior ROTC there, graduating in 1925. He furthered his field artillery experience while a member of the senior ROTC unit at Texas A. and M. Appointed to the Military Academy in 1927, he was commissioned in 1931, and assigned to the 12th Field Artillery at Fort Sam Houston. In 1933 he was detailed to the Ordnance Department, and graduated from both the Basic and Advanced Courses of the Ordnance School as well as securing a Master of Science degree from Massachusetts Institute of Technology. Prior to attending the Field Artillery School he was on duty with the Proof Department of the Ordnance School. His experience thus qualified him to discuss with authority the subject of his thesis.

NOTES AND COMMENTS

By J. S. W.

A New Italian Military Journal

ON January 1, 1938, the excellent Italian military journals, *Rivista di Fanteria* and *Rivista di Artiglieria E Genio*, were combined in a single monthly called the *Rassegna di Cultura Militaire*. The new monthly is published in two sections, one containing articles of general professional and cultural value, the other being devoted to the special arms. Needless to add, the journal is entirely official and published by the authority of the Ministry of War, under the able direction of General Rodolfo Corselli.

War and Peace

As an example of the cultural quality of the new Italian publication, the first article of the January number—War and Peace by General Corselli—is significant. He notes the desperate tenacity of the human race in its age-old struggle to avoid the scourge of war, stating that the masses have always loved the material blessings and tranquil inertia of peace, even of a servile peace, and that they rebel only against peril and risk.

In the 3,400 years since the earliest recorded treaty of peace, there have been at least 1,500 peace pacts, treaties, articles of confederation, alliances, and arbitration agreements. The fruits, however, of these noble and generous efforts toward the progress of civilization have been meager. During this same period of 3,400 years, there have been only 268 years of complete peace. In our own times, the constitution of the Hague Tribunal failed to prevent the Russo-Japanese War, the Balkan Wars, and the World War; and the League of Nations, organized as the hope of mankind, has not solved a single truly important problem between nations. Its only energetic action, that against Italy in favor of Ethiopia, was followed by the complete conquest of the Abyssinian Empire and the withdrawal of Italy from the League.

How can all this be explained? Is war an inevitable and fatal phenomenon of nature to avoid an overincrease of population? This conception is hardly new, but the real basis of war is much simpler and more logical and comprises merely the natural selfishness of man and the economic necessity which drives him. He acts through egoism and need, through passion and interest. No other causes need be sought.

Each people represents some governing idea in various periods of its history. Since these ideas are necessarily limited and exclusive they are naturally hostile, aggressive, and tyrannical. From the clash of such ideas sprang conflicts like those of ancient Rome against the barbarians, the Crusades, the various religious wars, and the French revolution. But the first need of man is to live and the economic causes of war are the most pressing. Countries like Italy, Germany, and Japan with limited natural resources and increasing populations are driven to expand at the expense of nations who possess more than they need. The expansion may be commercial, or by immigration, or by war itself.

Fatal or divine, war has a sure and well-determined place in the social life

of humanity. In the words of Mussolini. "History shows that war is a phenomenon which accompanies the development of the human race. Perhaps it is the tragic destiny of man, as maternity is that of woman."

Is war only a curse and an evil? Not all are agreed on this, and statistics can be produced to support any contention. It is indisputable that war produces and develops means that are of tremendous value in the peace time development of civilization, also that human ingenuity and endeavor are at their highest under the impulse of war. There is a spirit of sacrifice, pride, and joy of service unknown in times of calm. It is this spirit that engenders the immense pride of veterans and their strange, nostalgic desire to again experience their war emotions. What is one man more or less, young, old or what not, in ordinary life? Few succeed in emerging from the mass by their own efforts. The value of a brain or a soul is given by the amount of lace on a cap or some other sign of economic well-being or salary. But in war the common man reveals himself as a veritable Titan. Familiarity with death brings refinement of thought, nobility of sentiment, a sense of brotherhood and solidarity. The spirit of man shines brightest in the midst of danger and sorrow.

From another standpoint, war may be regarded as a social tonic to counteract the political, physical, and moral impurities that infest a nation in time of peace. The more civilized the people, the more warlike becomes the state. In Europe, military supremacy has been the heritage of the most civilized and intelligent people, for decay in military virtues means decay in all the rest. As Mussolini has said. "I do not believe in perpetual peace. A people is only great and noble when it is not afraid of war."

One may reasonably conclude that war is a natural phenomenon of human activity; a needed instrument for preserving mankind from degeneracy; and, hence, a necessary factor in human progress.

Modern warfare has no lines of demarcation between combatants and noncombatants. The advance of science in the development and perfection of weapons and the means of organization and control have produced the nation in arms, in which no one is exempt from duty except the aged and sick. Cripples must serve in some capacity and the fair sex must take over the work and services of men who have gone to the front.

There is nothing new in this—it is merely a return to the times when whole tribes went out to battle. There must, however, be a new and more inclusive military and moral preparation for war. The national education must produce a citizen and soldier, disciplined and patriotic, with a firm sense of duty and complete faith in his leaders and in himself.

General Corselli closes with a quotation from Theodore Roosevelt: "Unjust war is abhorrent, but woe to the nation which is not ready to fight against an aggressor! Woe to the country whose sons are not willing to fight in time of need!"

* * *

General Corselli's gifted article has a sadly reminiscent ring to those familiar with the writings of Hegel, Nietzsche, Treitschke, and Bernhardi, prior to 1914. German *Kultur*, Italian *culture*—of such stuff wars are made.

●

Honor Battalion in Illinois National Guard attendance figures for May—3d Bn., 123d FA, 98.7%. Among 100-percent attendance units were Btry. E, 123d FA, and Btry. E, 124th FA.

Fish Hash

BY MAJOR SOUTHWORTH LANCASTER, FA-RES

I FIND it marked in my diary that on the 6th of August, 1918, my outfit was withdrawn from the line somewhere along the Vesle River. In the events of twenty years ago, which few people understood and most are trying to forget, the routine relief of an artillery regiment concerned only a small number at the time, and would concern nobody today if it were not for the further entry in the diary of the words: Canned salmon.

The canning of salmon is a large and no doubt honorable business. It is getting into the news because the Japanese are said to be poaching on the salmon runs just over the treaty limits, and because the new Bonneville Dam is making it hard for the golden fish to go up river to the usual spawning areas, if that is the proper name. It must be in your consciousness because you see rows and rows of cans stacked neatly on the shelves of your favorite grocery, and although you never buy them nor see anyone buy them, there is always a fresh row when you do your next day's errands.

But in this time of twenty years ago, the Government was using I don't know how many cans every day, partly because there were plenty of salmon canneries and partly because trimly boxed cans stowed well on ships and packed well in cars and trucks. There may also have been some idea that fish should be part of the Army ration. The Government's responsibility ended when the cans were dumped at the battery kitchens. At that point the cooks took over.

Readers, do you know canned salmon? Not salmon in salads, nor in the nice little sandwiches which are so refreshing in warm weather, but crude naked salmon, fifty cans at a time, browned in a pan four feet square or pounded into a fish hash with dehydrated potatoes? Readers, if you do not know, remember, when you are offered such a dish, to choose instead a cracker and a glass of water, for you will choose wisely.

The outfit to which my diary refers is described in the cold records of the War Department as advancing so many miles and expending so many thousand rounds of ammunition, but the recollection is blurred with time. Except for the broiling sun, the acrid dust, and the big blue flies, the chief horror which still clings to the thought of those tremendous far-off days is canned salmon. Replacements, still sticking to their training-camp vocabulary, spoke of goldfish; the outfit never used that term—theirs was shorter and less printable. What quirk in the supply chain dumped so much Pacific Coast fish into the escort wagons of a single regiment, nobody knows. Some other troops must have gone free, and never known their luck. But so it was. And as the outfit rumbled back along the stony roads, one idea was paramount in every mind, namely, a chance for food which had never been taken out of the western waters.

I think the march began at 10 in the evening and finished about 5 in the morning. It was raining, of course, and the slithering shuffle of tired horses merged with the dull rattle and pound of the heavy carriages trailing behind. At our backs pale misty flashes marked in the sky the line of the front which we were leaving. The wet smell of the rain, of the soaked earth, was a background for the wet smell of wet horses and wet

saddlery. In short, it was like any other rainy night. And therefore it eventually ended.

So we find the outfit miles back from action, with the first signs of a rain-freshened sun making early-morning shadows on rows of carriages, neatly parked; on rows of horses, neatly fed; and on rows of men, not so neat, watching with wolfish eyes the hesitant smoke from the rolling kitchens. No line of children, waiting before a theater till they might enter and behold Mickey Mouse, was ever so tense as those hungry men, reviling the laggard cooks, and counting the minutes that must elapse before they might attain their hopes. As the First Cook stretched out his arm and grasped the oven door, a breathless hush descended, like those moments in the stadium before the kick-off. The oven door opened, its fruit was drawn forth, and behold—yes, you've guessed—two four-foot pans of golden-brown salmon.

There are some situations which cannot be described.

When reason finally returned. I became aware that a friend was holding me by the arm and saying:

"There's a rumor of a canteen over here in the town. It probably isn't true but we might as well find out about it. Perhaps they have crackers or something."

It seemed a slim chance because our score in that subject had been 4 canteens in 11 months, but it was worth a try. Saddle-weary legs, pushing a mile and a half, brought us to the town, and through the town, to a stone house, with a roof, which incredibly was the canteen. A bare room. A bare shelf. A bare wooden counter, protecting from the brutal soldiery two uncertain ladies dressed in what was probably service uniform. Humbly we approached.

The elder of the ladies smacked her hand sharply on the counter.

"We haven't anything for anybody!" she snapped, burst into tears, and vanished behind a curtain.

Her less elder colleague locked distressed.

"You musn't mind her," she apologized. "She's been up all night."

"I'm so sorry," said my friend tactfully. "I hope she can have a nice nap now."

"She's really all right," her assistant assured us earnestly, "but I don't suppose you boys have any idea of what it means to be up all night."

"No," answered my friend, "it must be rather terrible. But is there any chance of getting something to eat?"

"Boys," said the lady, and she really was quite nice, "you're just in time. I'll get you our last two cans of salmon."

●

Colonel Oliver L. Spaulding, FA, Chief of the Historical Section, the Army War College, was recently awarded the degree of Doctor of Laws, by University of Michigan, his alma mater. The institution thus honored one of its sons noted for authorship of many important works and researches in the classics.

●

Master Sergeant Raymond Spencer Sifdol, Office of the Chief of Field Artillery, has been admitted to practice before the Supreme Court of the United States, fitting climax to legal studies on his own time which began 23 years ago when he was secretary to former Vice-President, then Brigadier General, Charles G. Dawes. He has also passed the examination for appointment as Warrant Officer, USA, and his change of status is expected shortly.

Night River Crossing

ALMOST unusual opportunity for witnessing a maneuver was presented observers by the Engineer School, Fort Belvoir, Va., on the night of May 25-26, 1938, when a river-crossing demonstration took place at Occoquan Creek, near Colchester, Va.

The four ground combat arms, infantry, cavalry, engineers, and field artillery took part in this two-sided exercise. The problem was to span the creek in the face of the enemy, at a spot not far from where it empties into the Potomac, and is slightly over 500 feet wide, an imposing distance, particularly at night.

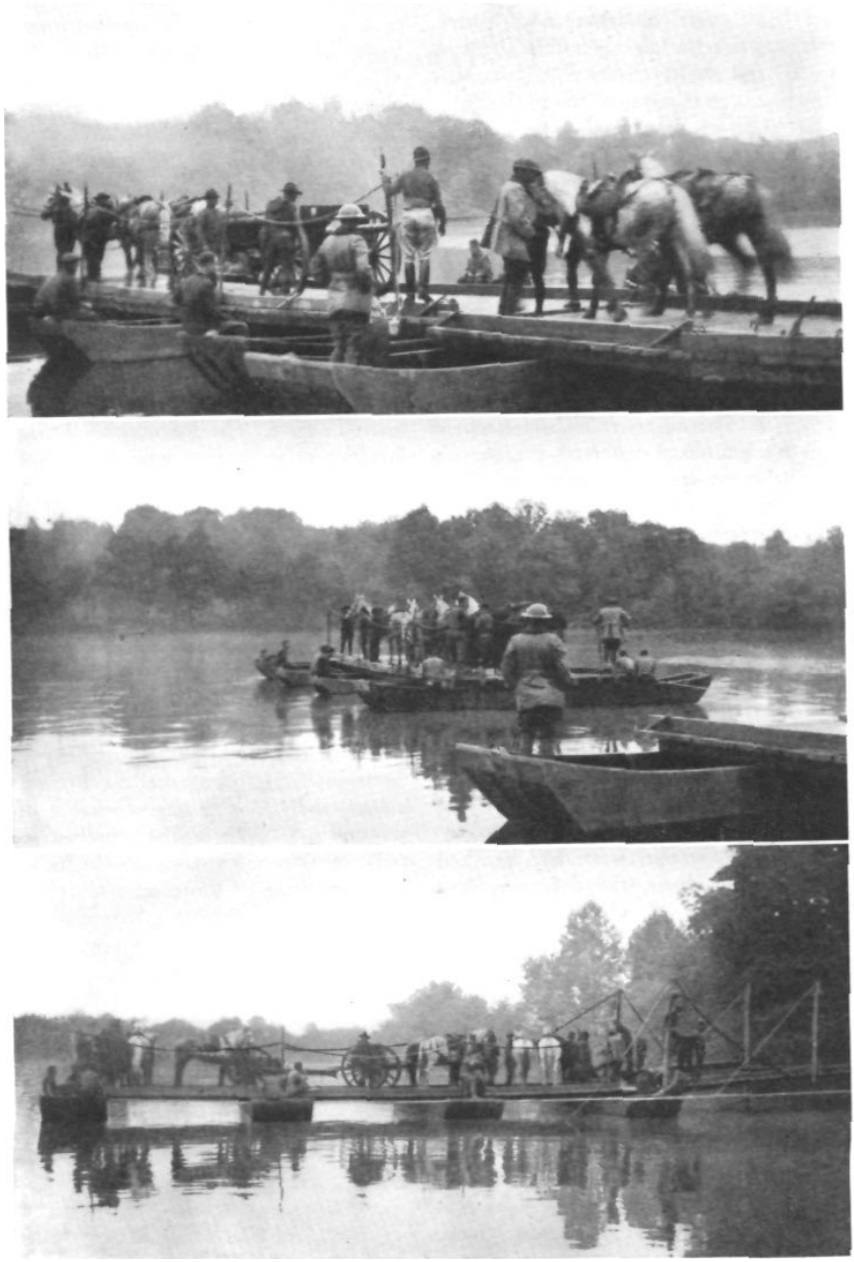
Observers, including those from the War Department General Staff and the office of the Chief of Field Artillery, were messed in the field at 5:30 PM the preceding afternoon, made a forward reconnaissance, and returned to attend the issuance of the orders of the infantry battalion commander, whose troops, acting as the covering force for the regiment, were to launch the assault at 2:00 AM. Companies K and I. 12th Infantry, abreast, were the assault units. They were to meet units of the 5th Engineers at a forward-assembly area a half mile from the river and from there were to carry by hand the new-type assault boats, 11 per company, to the launching point. The attack was to be directly supported by artillery, represented by one battery, C, from the 16th FA, Ft. Myer, Va.

The observers and students of the school were then taken to the south bank of the river to listen to the estimate and orders of the defending commander, whose mission was a series of delaying actions, initiated at the water's edge. A troop of the 3d Cavalry, Fort Myer, with a platoon of machine guns attached, formed the defending forces. The commander had sited his guns to obtain grazing fire over the area through which the boats must pass.

The plan contemplated the attack seizing the heights immediately beyond the river, upon which the engineers were to assist in maintaining the impetus of the attack by establishing a footbridge, a heavy ponton bridge, landing stages, and a ferry.

The night was still and overcast with clouds, presenting ideal conditions for defense. The absence of even a slight wind to rustle leaves and grasses, or to confuse shadows on the water, demanded the utmost in march and form-up discipline on the part of the attacking troops.

The observers walked from the bivouac area to near the forward assembly point, and watched the long files of infantry swing down the steep hills to the assembly area. They were unanimous in commenting upon the ominous appearance of troops in combat kit vaguely seen at night, and in the splendid discipline that marked their moves. Not a whisper was heard, nor the rattle of equipment. One group accompanied the squad that carried the leading assault boat to a launching point. These assault boats nest in trucks; weigh 190 pounds each; will carry eleven men with four to five inches of freeboard, and are provided with handrails for carrying, along the gunwales. At intervals, and seemingly without command, the squad would halt, and change sides, shifting the weight. Despite the darkness and the uneven ground, the rate of march appeared to be nearly 120 steps a minute. Engineer guides, two per boat, carrying paddles, accompanied each



TOP TO BOTTOM—LOADING, CROSSING, UNLOADING
(Note lead teams athwart ferry, front and rear.)

boat. With a minimum of confusion the boats were launched and loaded, the engineer paddlers sending them silently and swiftly toward the opposite shore. It was impossible to learn at what time of the crossing their movement had been discovered by the enemy. Blank rifle and machine-gun fire opened from the hostile shoreline, and continued while the boats returned for the second wave. Save for the supporting artillery, the attackers were silent during this phase, while the boat occupants of the first wave formed up on the opposite shore to drive the machine guns back. (Later, at the critique, the defending commander stated that his guns had, opposite the assault of one company, discovered and fired on seven boats at a range estimated to be 75 yards. The boats themselves, he said, were difficult to see; their presence had been disclosed by moving shadows on the water. Probably, in the presence of even a slight wind, these shadows would not have appeared. Furthermore, this firing failed to disclose four boats of the 11 launched, and it is possible that these had already landed and their occupants were prepared to outflank the pieces firing.)

When the second wave had reached the opposite shore, the defenders had ceased firing and withdrawn, their saddled horses, nearby, taking them swiftly to the second position. Observation of the heights beyond having been cleared, the engineers, still working in pitch darkness, no flashlights or smoking permitted, brought their heavy ponton wagons to the shore and started the ferry landing stage. One of the assault boats had carried a heavy line across the stream, another had unreeled wire communication. An artillery liaison radio had maintained communication with the battery. At dawn, two artillery sections were brought to the shore, and shortly after daylight were ferried across. The infantry footbridge, farther downstream, meanwhile had been completed, and the reserve company was crossing. The ferry stages were being made the nucleus of the heavy bridge.

Following breakfast and the critique, the observers and students went to the highway bridge and watched the pontons support the passage of several trucks, one of 7.5-ton weight, a platoon of artillery, and the cavalry troop.

It would be difficult to comment too favorably upon the excellent arrangements made to give the observers opportunity to witness the smallest details of this most unusual—in peacetime—exercise of the combined arms.

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Maryland's 110th FA (Colonel Beverly Ober), spends seven days at Richmond, Va., studying the scene of the great operations of the War Between the States.

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Ohio's honor regiments in drill attendance for February and March were, respectively, the 136th and 135th Regiments of Field Artillery.

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Basketball team of 124th FA, Illinois, wins championships of 33d Division, taking 50 of 60 games played during season.

●

Captain Herman H. Harder gives up command of Battery D 122d FA, Illinois, because of change of residence, after fifteen years. His successor, 1st Lt. A. H. Gastreich, has served with the regiment since 1908.

New Names for New Maps

BY "SURVEYOR"

DURING the past few years maps have been passing through an evolution at an accelerating gait. New forms of maps have appeared, and old ones are being discarded. Each new baby—and some will grow up and become our daily companions—needs a name. All of us, of course, are interested, or will be interested in the names, yet there seems to be reluctance in proposing them.

Army Regulations 100-15, published in 1927 and amended by subsequent changes, announced that the map SCALES adopted as standard for use by the military forces of the United States would be as follows:

a. 1:20,000 (approximately 3 inches = 1 mile) terrain map, for classroom use in conference and map problems. This is a topographic map showing the terrain in greater detail than is possible on the tactical map. A map of this scale for any extended area in which military operations are under way cannot be expected in time of war, and consequently the use of this map should not be permitted in training in the field.

b. 1:62,500 (approximately 1 inch = 1 mile), tactical map for general use in field operations. A complete topographic map, of sufficient detail and accuracy to facilitate the study and conduct of tactical operations over extensive areas.

This is the general purpose map for field operations, and when supplemented by aerial photographs and fire control data sheets, provides all the topographical data which will ordinarily be available in time of war.

c. 1:500,000 (approximately 1 inch = 8 miles. (1) Strategic map.

d. 1:1,000,000 and smaller scales—Geographic map.

Since the publication of these Regulations other forms of map have become more commonplace and new ones have appeared; the Regulations are no longer abreast of development and will probably soon be revised. Worthy of mention is the aerial photograph, singly, or in its various mosaic combinations; another is the multilens composite which name has been given to a lithographed reproduction of a single exposure of a many-chambered camera covering a wide area, a recent innovation which offers some promise of replacing the conventional tactical map (which exists for relatively few regions) and of assisting the Field Artillery in its fire-control problems in the earlier stages of hostilities.

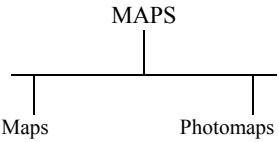
What is a map? Webster, if authority is needed, defines a map as (1) a representation of the surface of the earth, or of some portion of it, showing the relative size and position, according to some given scale or projection, of the parts represented; (2) anything suggestive of, or representing like, a map. Such definitions are broad enough to include aerial photographs of the earth's surface.

At the outset, then, it would seem necessary to decide upon names whereby the photographic type of representation could be distinguished from the conventional form of map to which we are more accustomed; generic names, so to speak, are needed. Names must be short and easily pronounced or they will not stick. In this situation, plenty of combinations suggest themselves. For instance, we might use "photogram" and "topogram," or "photograph"

and "topograph." But outweighing all argument there is the common-sense objection that it is ridiculous to invent a new name for an article with which we have been familiar for so long and which already has a convenient three-letter name which no amount of propaganda could shake off. So it must be accepted that the name "map" will persist so far as the familiar graphic article is concerned.

As for the aerial photographic type of map, a name was coined some years ago for the single vertical—"photomap." This is about as good as could be devised. It is brief, euphonious, or at least easy to pronounce, and descriptive. Is there any serious objection to extending it to cover all forms of aerial photographs of the earth's surface? It seems pedantic to insist upon a detailed descriptive name for each type of aerial photograph for use in everyday conversation. Rather, what is needed is a brief name without a paragraph of adjectives and limiting phrases. When technical considerations require, we can always fall back upon "single vertical," "controlled mosaic," "composite," etc.

Thus two broad generic classifications—maps and photomaps—seem to be indicated, yet this solution gives rise to a new objection. Under this scheme of general classification, a photomap is a map, but a map is not necessarily a photomap. This is unfortunate, but the arguments are strongly in favor of the solution to which we are led. Anyhow, we run into similar confusions every day without serious consequences. An Army officer is a soldier, but a soldier isn't necessarily an officer. When the Scriptures speak of "all men," they refer to women and men. So, for better or worse, here is the suggestion for general classification:



Maps which for more particular differentiation in technical discussion may be called graphic maps.

Photomaps which for greater precision in technical discussion may be differentiated as verticals, composites, mosaics (controlled, uncontrolled, etc.); these qualifying terms themselves call for standardization.

Consider now the classification of maps according to their purpose. It is noteworthy that in the Army Regulations scale rather than the purpose of the maps is paramount as a basis of classification, and the names "strategic map," "tactical map," "terrain map" are additional descriptive titles. With the coming of the photomap and its nonuniform and variable scale the old order changeth, and the purpose of the map must be paramount to the fickle scale. The names "strategic map" and "tactical map" are happy selections and might well survive; of course, a strategic map will be used for many purposes besides planning strategy, but this name, and a familiarity with the type of map which it designates, conveys a reasonably clear cut idea. Similar justification can be urged for the name "tactical map."

In the attempt to fill the void left by the omission of the Terrain Map, the Fire Control Data Sheet, to which the Regulations refer as a mere adjunct to the Tactical Map, has developed from the list of names and coordinates, such as was supplied on the Western Front, to become a contoured map of large scale, produced by photogrammetrical means, it is true, but bearing a passable resemblance to the departed. The cycle is being completed: A terrain map was desired, was found impracticable to produce by standardized

methods, was relinquished, and a new product born of new processes was shaped to meet the old demand. With it there has appeared a more hastily produced map bearing the tongue-twisting appellation "Provisional Fire Control Data Sheet." This, too, begins to resemble the Terrain Map save that no contours or elevations are shown. Just now it looks as though one or both of these types of maps will be in demand when large masses of artillery are to coordinate their fire with the operations of the infantry.

For these two articles there is manifestly a crying need for new names. Suggestions for renaming the Fire Control Data Sheet are: "Terrain Map," "Battle Map," "Fire Map," "Ordnance Map," "Control Sheet," etc. It has been objected that this is not a map made by conventional methods, to familiar standards of accuracy, but instead is produced by photogrammetry and is based upon an initially strong control which may peter out as it extends deeply into enemy territory with consequent loss of accuracy; a more accurately descriptive name should be sought. To this it may be replied that the article looks like a map, is used as a substitute for the Terrain Map, and is likely to be the most accurate map produced in war. When we call up the better half to carry our weary frame homewards from the office, do we say "Please bring the V-8 self-propelled gasoline-driven Ford phaeton"? No, we make use of a monosyllabic name that may have a more general application according to the dictionary but which, by usage, can admit of no misunderstanding in this particular application.

The artilleryman will mention this map many times daily, which is good reason for restricting the number of syllables to two if possible, three as acceptable, and four as limiting. If technical discussion requires, qualifying terms can be used to denote the accuracy and methods of production of this map. The suggestion "Battle Map" seems to be apt—the analogy of "Strategical" and "Tactical" maps being extended; and furthermore it is likely that these maps will be produced only for areas where a coordinated battle is planned. For the Provisional Fire Control Data Sheet the names "Advance Battle Map," "Plane Battle Map," "Hasty Fire Map" are suggestions.

So, the classification of maps according to purpose (*irrespective of whether they be maps or photomaps*) might be thus:

a. Strategical Map (of very small scale, say greater than 1:250,000, usually compiled and usually graphic).

b. Tactical Map (scale between 1:40,000 and 1:80,000).

c. Battle Map a contoured map 1:40,000 or larger scale, the Advance Battle Map being a temporary expedient).

Other and happier choices of names will suggest themselves. In the interest of brevity proposals are in order.

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The Field Artillery Polo Team wins from the Cavalry School team in straight games, overcoming a two-goal handicap in the finals to finish, 10-4.

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Lt. W. A. Lutz. 432d FA, 110 Milk St., Boston, would like to get a copy of the JOURNAL *for January-February, 1938. This issue was exhausted and there are none at hand, save for file copies.*

Field Artillerymen Win Soldier's Medal

"Eril L. Metevier (Army serial Number 6,129,010), staff sergeant, Headquarters, Headquarters Battery and Combat Train, Second Battalion, 7th Field Artillery, United States Army. For heroism displayed in rescuing an officer from drowning at Flamingo Beach, Culebra, Puerto Rico, January 22, 1938. While in swimming, Staff Sergeant Metevier heard a call for help from a man who was struggling in the rough waters, being rapidly carried out to sea by a strong undertow and in grave danger of drowning. Realizing his predicament, Staff Sergeant Metevier, with utter disregard of his own safety, ventured out into the heavy surf and with much difficulty kept the drowning man afloat until help arrived to bring him safely to shore."

Staff Sergeant Metevier was born March 4, 1909, at Concord, New Hampshire.

He first enlisted at Boston, Mass., for Field Artillery in Hawaii and served with the 13th Field Artillery from July 11, 1928, to July 10, 1931, at Schofield Barracks, Honolulu, T. H. All his subsequent service has been with the 7th Field Artillery.

In his present grade he is now Chief Radio Sergeant of Headquarters Battery, 2nd Battalion, 7th Field Artillery.

In his capacity, Staff Sergeant Metevier accompanied the Field Artillery Detachment, under the command of Major O. I. Gates, 7th Field Artillery, sent from Headquarters Battery, 2nd Battalion, 7th Field Artillery, as the Field Artillery contingent with the recently held Fleet Landing Exercise No. 4, in the Caribbean.

It was on this expedition, during the period spent on the island of Culebra. West Indies, that Staff Sergeant Metevier made his heroic rescue of 2nd Lieut. Gene S. Neely, U.S.M.C.

Awarded the Soldier's Medal for his heroism, the medal was presented to Staff Sergeant Metevier by Brigadier General Joseph M. Cummings at a review of the troops at Fort Ethan Allen, Vermont, held May 2, 1938, in General Cummings' honor.

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Private First Class Sidney R. Kinder, Service Battery, Twelfth Field Artillery, then a member of Battery C. of the regiment, was awarded the Soldier's Medal "For heroism displayed at Camp Bullis, Texas, May 10, 1934. The king pin of an escort wagon had broken, dropped the wagon bed to the road, caused the team to run away and threw the driver, head down and helpless, over the front gear. Noting the precarious position of the driver, Private Kinder ran directly in the path of the runaway team, grasped the bridles, swung himself to the wagon pole and halted the animals."

Muscle-Power Artillery

BY FLETCHER PRATT

THERE is probably no subject in the history of human armed conflict less understood than that of artillery before the invention of gunpowder; and probably no military truisms are more untrue than those which attribute the disuse of the medieval castle and the decline of medieval armor to Friar Schwartz's explosive invention. It was not the hand-gun, but the arrow, that caused mail to become too heavy for bearing; and it was not the cannon-ball, but the organization of permanent armies that could blockade a place till it fell without having to go home and harvest the crops, that brought about the downfall of the robber barons and their castles.

As a matter of fact, for many years—three quarters of a century, a century—after the first "bombards" appeared, there were still pieces of the old-style artillery in every arsenal that exceeded them in range, accuracy, mobility, and rate of fire; and the first effective appearance of gunpowder-charged field artillery was on the battlefield of Marignano, "when Francis beat the drunken Swiss" in 1515. It was quite without the benefit of guns in the modern sense that Constantine the Great broke down his adversary's center at the Milvian Bridge before launching his victorious charge; and long before explosive had been thought of Josephus, standing in the courtyard at the siege of Jotapata, saw a man's head dashed off by a missile from a Roman catapult four hundred yards away.

It is only when we realize that preexplosive artillery represented muscular energy stored up for sudden release, as explosive-powder guns represent stored chemical energy, that we shall obtain some understanding of its capabilities and deficiencies, what it accomplished and what it failed to do. As with other forms of muscular energy, that developed in muscle-power artillery suffered heavily from fatigue, and was violently affected for better or worse by climatic conditions; it was difficult to store large quantities of it, or to store small quantities for long periods, but the supply was always readily available and within its limitations, had a high degree of flexibility. And it was far more often used in field operations than a casual acquaintance with ancient and medieval literature would indicate, though perhaps this should not surprise a modern artilleryman. War correspondents have always concentrated on the more visible and spectacular achievements of infantry and cavalry to the exclusion of the cannoneer.

There are Biblical mentions of what later came to be called "engines" or "tormentors" but modern scholarship is pretty generally agreed that they were written late, and that the first genuine artillery was that produced for Dionysius, tyrant of Syracuse, when about to begin a war with Carthage in 399 B.C. He appears to have been a ruler with a singularly realistic turn of mind. War with Carthage was inevitable and he knew that his own city had neither the economic resources to outlast the Mistress of the Mediterranean in a long contest, nor the military resources to work out a quick victory. He therefore conceived he would have to win through special invention,

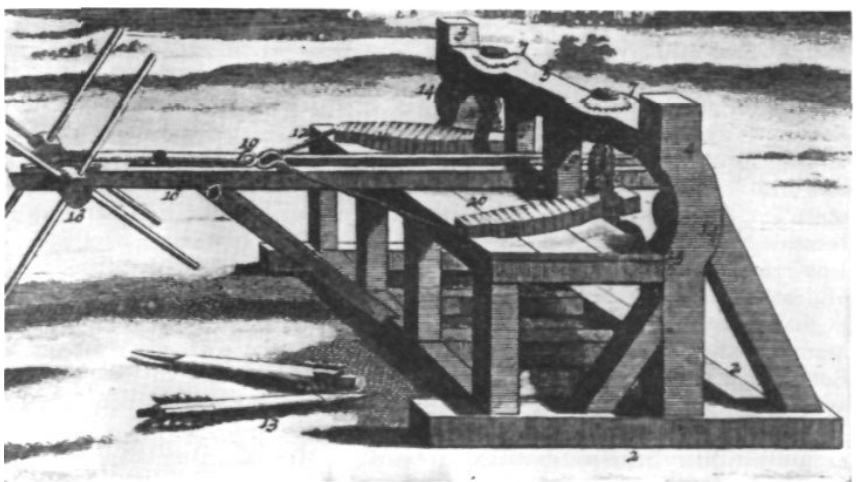
and called a congress of Greek scientific men to provide him with some new weapon.

They replied with the catapult, which is probably the most important invention between the discovery of the two-edged sword and that of the marine compass. It changed the whole slant of civilization, and gave the West permanent victory in its ancient struggle with the East. For up to the invention of the catapult the Oriental offensive, though slow, and marked by repeated disasters like those at Marathon and Salamis, had been irresistibly steady, and with Oriental colonies firmly established at Marseilles. Carthage, and on the Hellespont, seemed bound some day to succeed. That Oriental advance was, in its essence, based on the military qualities of the wall of sun-baked brick, which could be built to great height and thickness in a short time by the use of large quantities of unskilled slave-labor; and on the military possibility of submerging an enemy in the field with immense numbers of men.

But the catapult changed everything; at Tyre. Alexander the Great pounded to powder a brick wall forty feet thick with his catapults; at Cunaxa, he put mobile catapults into the field that stopped a charge of scythed chariots; and in Bactria he broke up the circling tactics of the desert light horse by the same means. The technical superiority of the West had balanced the numerical output of the East; and that balance was to be maintained, for the Orient lacked, and has ever since lacked, something quite as important as technical skill. It lacked the materials.

For the basic materials of the catapult were skeins of twisted tendon, which could be found anywhere animals grew large, and big beams of wood, which could be found only where forests grew large, that is, in Europe. Alexander had to carry catapult beams throughout most of his great campaign against the Persian Empire, and among his successors Eumenes lost a campaign because he could get no beams in central Persia, though it was the custom for the Roman legions to carry only the essential parts of their catapults with them and cut the beams from green timber, while operating in Europe.

The construction of a catapult took



SIEGE CATAPULT, WITH DARTS

a high degree of skill and it definitely was not what it has frequently been called, an overgrown bow. The frame was the first and central piece, built of very stout timbers, and like a picture frame, but with heavy bars running from top to bottom and dividing it into three sections, through the central one of which the missile would be driven, while the others were occupied by the skeins that supplied the driving power, the top and bottom of these outer section being bored to admit the skeins.

These skeins were the fundamental features of the apparatus. Three materials only were considered suitable for them in classical times, though in the Middle Ages others were added; the neck tendons of a bull, the hindleg tendons of a deer, and human hair. If tendons were used they were prepared by soaking them in water till they could be separated into threads; then they, or the hair that fulfilled the same office, would be laid out in oil, carefully parallel, and with enough tendons supplied to form a skein equal in thickness to the timbers of the frame.

This skein was knotted or gripped at both ends, a lever inserted at its center, and the skein twisted. It took considerable experience to learn when to stop the twisting so that the apparatus would give the maximum power yield. Among the Romans this moment was determined by the musical note the skein gave off when struck, and the engineer corps of the Roman Imperial Army, which handled matters concerning the artillery, always received training from expert musicians as a part of its instruction course.

Once the skeins were twisted they were inserted in the frame, locked top and bottom, and in place of the levers, a pair of arms of some tough wood inserted. They were the chief care and trouble of the ancient artillerist, requiring to be oiled daily and guarded with the utmost care. Even then, a spell of humid weather was sure to make the skeins slack off and require retwisting, breaking, or giving trouble in other ways. Constantine's artillery bombardment at the Milvian Bridge had to be broken off sooner than he wished because a storm spoiled his artillery.

To hold the missile, a channel was installed, projecting both backward and forward from the central hole in the frame, considerably farther in the former direction. It was usually fixed on a pivot which enabled the ancient artilleryman to lay his piece for train, though in the case of small fieldpieces, the whole apparatus would be pivoted at the base below the frame. Elevation was secured by raising or lowering the rear end of the catapult and wedging it in position.

At the rear end of the channel was a winch, around which ran a cord with a hook at the end of it. In charging the piece this hook was caught on the string, which extended between the two arms that passed through the skeins; a trigger arrangement released the hook.

All catapults had these characteristics in common, but at this point there was considerable divergence, though not along the lines which many modern writers have attempted to establish, by separately classifying the catapult and ballista, which were really interchangeable terms. One type threw stone, or baked clay balls, and therefore carried a sling at the center of the string. This was usually a siege-gun or a piece of naval ordnance. The Greeks favored this type; they were great sticklers for scientific perfection, and had quite early worked out the MV^2 formula. It did not seem to them theoretically right to take anything less than the best; and having discovered

that they could not increase the velocity with which their missiles travelled, went on building up the mass of these projectiles as long as they could build catapults that would carry the load.

As a result they produced some really large pieces, the biggest on record being one that Archimedes built for the Syracusan navy, which threw a three-hundred pound stone or brick ball to a range of perhaps 400 yards. A projectile of this size and weight would be enough to ruin one of the lightly built galleys of the ancients with a single hit.

The other type of catapult threw arrows or javelins, usually with long metal heads, and not infrequently feathered. Obviously, given the limited velocity of the catapult, the size of such projectiles and hence of the projecting weapon, was much less than with the ball-throwers. The Greeks, as usual, tried for the maximum; the largest arrow - throwing catapult of which there is any record was one used during the siege of Rhodes. Prince Demetrius of Macedon was the besieger, and we are indebted for the information about the machine to an anecdote. In one of his numerous attacks on the place, his storming column ran into a battery of javelin-throwers. The men were naturally in close order, but it still gives one a rather good idea of the power of the catapult when one learns that these weapons spitted many of the stormers in groups, three on a javelin; particularly when it is remembered that the casualties would presumably be carrying rather heavy shields and wearing bronze-scale armor. After the attack the Rhodians sent a flag of truce out to tell Demetrius that they had arranged his shrimps in groups for roasting and wanted him to come to the barbecue.

When the artillery idea got into Roman hands that practical race discarded the effort to arrive at a theoretical perfection and got down to the business of producing artillery that would be really useful.* Even for siege work, they built no such monstrous catapults as did the Greeks, concentrating instead on medium-weight catapults which would be portable, could be handled rapidly, and reach to ranges just sufficient to keep the artillerists safe from fire from the walls. Julius Caesar's ball-throwers at the siege of Marseilles fired from behind heavy shields and were, moreover mounted on wheels, being to all practical intents and purposes, tanks carrying siege guns.

The distinguishing characteristic of the Roman artillery service, however, seems to have been its mobility, and the concentration on dart-throwers that went with it, dart-throwers having both better range and greater accuracy for operations in the field. Already in Caesar's time each legion had a regular equipment of small wheel-mounted catapults, which were normally on the battle-line with the foot, and did service in covering fire and with preliminary bombardments before an attack.

Under the later Roman Empire the artillery arm was greatly extended; the legions stationed along the barbarian frontiers found missile-throwing weapons particularly useful in stopping barbarian raids, and the frontier posts from the North Sea to the mouths of the Danube always had fixed pieces on their walls and a regular equipment of light artillery to accompany troop movements.

The Romans seem also to have been responsible for the invention of another type of muscle-power gun, known as the *onager*. This is a kind of one-armed catapult, lying on its side, with a single skein running right and left

*EDITOR'S NOTE—This has to be done every once in a while.

ONAGER AND MOBILE CATAPULT

across the base of the frame and tending to force the single long and heavy arm into a forward or upright position. The onager had no bowstring, but the end of the arm itself was shaped into a spoon or provided with a sling, which held the missile. This arm was winched down and held with the usual hook; when the trigger was released the missile sailed away at a high angle.

The onager was thus strictly a siege gun, and became very popular for throwing things over a wall into a town. It had the advantage of taking projectiles of any size and shape, and since most of the houses in any given town under siege were likely to be of thatched-roof construction, the advantage of a weapon that would throw firebrands was obvious. And with the onager we leap suddenly to the Middle Ages before there was any other change in artillery.

By that time everything had changed; medieval walls were not the dried patty-cakes with which Romans and Greeks had to contend, but solid structures of European masonry, never less than six or seven feet thick, and quite beyond the possibilities of any muscle-power artillery. At the same time the art of building a good catapult seems almost to have been lost, and certainly these weapons had altogether disappeared from the equipment of mobile armies in the field, the barbarians who had taken over the Roman Empire regarding them, rather emotionally, as cowardly weapons. We therefore find few catapults in the Middle Ages; most of those are small dart-throwers, mounted on the walls of towns.

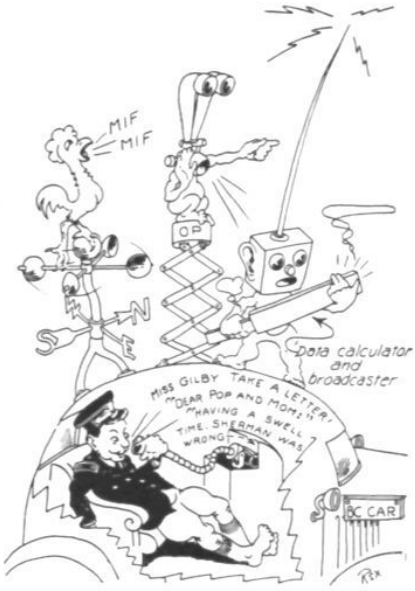
The Middle Ages did add one important weapon to the list, in the trebuchet, but this was built on an entirely new principle—that of the counterweight. For the trebuchet was nothing but an enormous seesaw, working on a pivot, which tossed great weights with a long arm when a still greater weight was allowed to bring a short arm rapidly down. Some enormous trebuchets are on record; Philip Augustus of France attacked Chateau Gaillard with one that had a counterweight of a ton, and Joan of Arc captured an even bigger one from the English at Orleans.

But the trebuchet was in itself a confession of defeat; when it is necessary to get over a line of wall instead of going through it, the defense is superior to the attack. And that was the moment when the gunpowder cannon entered the field.

One-Man Guns

MUCH of the time our illustrator has very little fun. He draws TOG triangles, or little bushes with what purport to be shell bursts nearby, or else he is deep in dusty tomes trying to come out with the correct type of chevrons worn in the Spanish-American War. Hard lines. This one was given carte blanche as a gun designer. He was told to imagine himself a Sunday-weekly thriller given the assignment of illustrating that weapon vaguely hinted at in Mr. William Hazlett Upson's article in our last issue, "Are Private Soldiers Necessary?"

If he has peered somewhat recklessly into the future, forgive us both. During the rest of the hot weather we will struggle with TOG triangles, or little bushes—with what purport to be shell bursts nearby.



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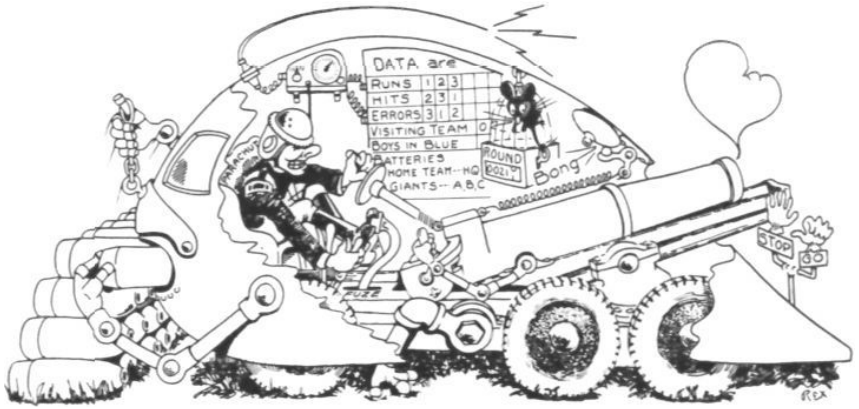

—AND EXECUTIVE

Counterbattery—Reed or Oak?

BY *UT PROSIM*

A DUEL of the guns has always been desired and foreseen by the supported troops. "Keep the enemy artillery off me," asks the commander of his gunner. But as the cannon develop, they retreat along that elastic thread, their range, to crouch unseen in the woods and hollows. The infantry become the natural target of the gunner. The foot troops must move, and moving, expose themselves to alert observation. The cannon operate whilst hidden and in position.

In a remarkable account of the difficulties encountered in even such an ideal set-up for counterbattery as stabilized warfare on the Western Front developed, Colonel Conrad H. Lanza (*Counterbattery in the AEF*—THE FIELD ARTILLERY JOURNAL, *September-October, 1936*) writes: "We had from 600 to 800 batteries in line; according to our records, not over four were out of action at the same time from enemy fire. We daily lost some guns, equipment, or men from counterbattery; compared with the total strength present, these losses were insignificant, and in no way affected the tactical situation."

Undoubtedly many of those who read that article were somewhat taken aback on learning that counterbattery had not proved itself so powerful an influence as had been generally supposed. Perhaps they comforted themselves with the reflection that the science of ascertaining the exact location of hostile batteries had made great strides since the last war, and there was no need to concern themselves over any lack of efficiency in the next one.

If so, let them examine "The Artillery Information Service in Counterbattery," an article in *Revue D'Artillerie* for July, 1937, by the French Lieutenant Colonel Layral, translated by Colonel Oliver L. Spaulding, FA.

Colonel Layral approves of the trend toward more decentralization in the organization of counterbattery, but upon this decentralization and modification of organization, whatever its merits, we need not dwell, for counterbattery efficiency will suffer less from imperfect organization than from the difficult technical obstacles which it is to overcome before the vast quantities of ammunition consumed in its use can be justified.

Colonel Layral's article is a very thoroughly thought out treatise on a little-known subject, and it demands attention as being most advanced. Indeed, its very degree of advancement lays stress on my title, for we must not forget that the accurate 1/20,000 fire-control maps, which were, in most cases, our most precise tools twenty years ago, are ours no longer.

Under the heading of "Airplane Observation," Colonel Layral writes:

"The weight to be given to reports from air observers varies widely. It depends upon a great number of factors, which the artillery information officer must learn to evaluate; they may be summed up thus:

"(a) The map used by the observer. A gridded vertical photograph gives good accuracy, while an ordinary 1/50,000 map permits only a rough approximation.

"(b) *The number of planimetric details shown on the map*. The more numerous these details, and the more accurate, the better will be the interpolation.

"(c) *The qualifications of the observer and his knowledge of the country*.

This involves a psychological factor which the information officer cannot know until after working together for a considerable time. This suggests permanence of assignments of squadrons and observers to artillery units.

"(d) *The circumstances of the flight*—visibility, altitude, incidents, hostile interference, and the like.

"We may now inquire what is, under average conditions, the degree of approximation which may be expected from an observer in locating batteries. Two elements of accuracy may be distinguished—the probability of existence or occupation of the emplacement reported, and the degree of accuracy in the coordinates reported. As for the first element, it is a matter of common knowledge that an air observer always sees more batteries than there are—or, in other words, among the batteries which he reports, there are always some which do not exist.

"The most surprising thing to an officer newly assigned to the artillery information service is the high proportion of nonexistent batteries—sometimes approaching 50 per cent, without counting dummy batteries. Thus, in a series of experiments with batteries actually firing, 10 out of 24 reported by various observers did not exist.*

"The average error in the coordinates reported was nearly 100 meters [110 yards]. Other maneuvers have given similar results.

"For comparison, it may be noted that in 1918 the continuous advance in Belgium made it possible for battery commanders to check up on the adjustment and effect of their firing of preceding days. It was found, in two cases, that emplacements fired upon with 250 rounds or more, caliber 155, the fire adjusted from beginning to end by airplanes, were not occupied during the fire.

* * * *

"Balloon observation.—The weight to be given to information furnished from a balloon is very much the same as in the case of an airplane, subject to the following comments:

"The altitude of the balloon at the moment of observation is of especial importance; it makes the view more or less direct, and hence the location of targets more or less accurate. The balloon, it is true, is more vulnerable than the plane, and large areas are in a dead angle for it; but its observation, while at greater distance, is from a more or less permanent base, and use of the telephone is possible. In general, its observations are more accurate in range than in direction. To give a concrete idea, we may say that at an altitude of 1,000 meters, certain experiments have given the zone of indecision as a rectangle 150 meters long and 60 meters wide.

"The coefficient of probability of occupation of the emplacements reported is much the same as for an airplane observer.

"Air photography. — The assistance of the airplane to the counterbattery group is not limited to observation; it furnishes most of the photographs also. Calls for a photographic mission are generally sent out by an authority superior to the group (Intelligence Division, or Corps Artillery);

*Via his previously quoted article, Colonel Lanza interjects: "Infantry suffered heavily from artillery fire. They were often intrenched in the open, visible to enemy OP's, or in his air photographs. Our own air photographs frequently showed enemy infantry, but seldom batteries. In many cases the enemy had prepared his defenses in advance; this gave him a better opportunity to camouflage. Our men, being on the offensive, dug in where they could, and freshly turned up earth, if in the open, was usually discovered. Hostile artillery fire would then fall on our lines, and calls for counterbattery crowded our artillery CP's. When the counterbattery asked for was the silencing of a battery, the whereabouts of which were known only vaguely, the problem was difficult to solve."

but that group should always be on the distribution list, at least for photographs affecting its normal zone. The photographs, which will hardly be received in less than two or three hours after landing, should overlap by about two-thirds, to make stereoscopic study possible. The scale, which will vary even on the same photograph, is given approximately by the well-known formula, E equals f/h, in which f represents the focal length of the lens and h the altitude; it will often work out at about 1/10,000.

"The study of these photographs includes two stages — (1) reading and stereoscopic examination, (2) interpretation and reconstitution.

"The stereoscopic examination is made with the regulation equipment, and shows hostile works in relief. Reading, or comparison with the firing map and any previous photographs, reveals manifestations of hostile activity, with approximate locations.

"It remains to see precisely what these traces of activity mean; this is interpretation, always a difficult problem, and generally to be solved only by comparison of reports. It is only because other sources, such as the sound-ranging service, report guns in action in a certain region, that the information officer may infer that the trails and earthwork shown on the photographs really mean an occupied emplacement. Study of the map will also give good indications as to the probability of suspected emplacements. It is by this process that he may determine the precise coordinates of the target reported.

"Precise, to what degree? It is not within the scope of this article to go into the processes of reconstitution laid down in the regulations [French]; we would merely emphasize the words of the regulations: 'this work of reconstitution [restitution] can be done accurately only by the artillery topographic groups, or by the corps topographic sections.' The artillery information officer, using the regulation means, can identify on the photographs only a few points whose coordinates are precisely known, and sometimes none at all. He will often have to be content with the details shown on the firing map; and the accuracy of his coordinates cannot be greater than that of the map."

The author here enters into the intricacies of the use of the sound-ranging service, and he discusses its limitations as follows: "The field of action of the sound-ranging service covers a semicircle whose diameter is about equal to its front of deployment. Beyond this, its accuracy falls off sharply, even if the instruments function at all. The accuracy of the topographical operations, the reliability of communications, the various adjustments and the character of the material installations, are all factors affecting accuracy; and they depend largely upon the length of time the battery remains in the same position. The wind is perhaps the greatest enemy of the sound-ranging system [artillerymen please note carefully]; beyond 6 meters per second [13.5 MPH] the corrections to be applied become more and more doubtful, and beyond 10 meters the regulations [French] do not even mention them.

"Great activity of the hostile artillery, multiplying the number of records on the instruments, makes their analysis slower and more difficult, but lulls always come, when the work can be done more satisfactorily. Certain other conditions have an influence more or less definite upon the results to be obtained; among the unfavorable phenomena are the vibrations of the air in the heat of the day, or the presence of woods, villages, crests, ponds, swamps, and the like.

"The sound-ranging system, by means

of the triangles of error formed by its intersections, can form a general estimate of the accuracy of its determination. This accuracy is highly variable, according to conditions, but generally runs about 50 meters. It may reach 25 meters, or even less, and on the other hand unfavorable conditions may increase the error to 150 or 200 meters. Even where the location is not close enough to justify fire, it at least gives a hint to other agencies to get a closer approximation."*

* * * *

"Finally, this service is the best means for observing the activity of batteries once reported. It has in its files a diagram of each, formed by the right lines connecting the points where the muzzle wave transmitted by each observing station begins to register. By comparison, it can determine whether the battery is still in action. Occasionally it may be useful to inquire whether it finds any trace of a battery reported by some other agency.

"Other Sources.—The corps artillery information service has available all intelligence agencies of other units, of the air service, etc. It sends to the artillery information officer of the group all information that seems to be useful to it; and the group in its turn may call upon the corps for assistance.

"Finally, shell fragments, fuzes, etc., often serve to identify the guns used by the enemy, or to give information of the introduction of new types.

"(d) *Verification.* — Taking into account the properties of the reporting agencies, the artillery information officer must make a thorough study of the information received, and decide upon the weight to be given it. Often this will lead only to doubtful conclusions and uncertain accuracy. A single source can rarely give certainty. The existence and location of the objects reported must be verified and checked; this is the purpose of the comparison of various reports, which may lead also to a closer approximation to accuracy.

"Each item of information, as soon as received, should be verified by all means at hand. First, he should check to see if photographs received show any trace of the object in question. Suppose now that he has in hand several reports which seem to refer to the same object (a battery in action, for example) how shall he proceed to determine its coordinates? One process consists in constructing lines or surfaces which, according to indications from different sources, appear to be the loci of the object sought.

"Suppose a battery to be reported by a balloon, an airplane, and the sound-ranging service. Assume that under the existing conditions the rectangle of doubt of the balloon is 170 × 60 meters, the approximation of the airplane is 80 meters, and that of the sound-ranging service is 50 meters.

"Trace on the map a rectangle 170 × 60, with the longer side in the line of observation. With radii of 80 and 40 meters, and centers at the locations reported respectively by the plane and the sound-ranging service, strike circles. The area common to the three figures

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*Nevertheless, the limitations of sound-ranging are not so awesome as they might appear. The weather is the great handicap. It is not true, as might be imagined, that in the din of battle, continuous reverberations confuse the system. They belabor the ear, well enough, but the individual detonations are as precisely separated on the sound-ranging film as they are on the cinema film that, flitting past the eye, 16 frames per second, furnishes the illusion of motion. Expert integration of their calibrations, even if "slower and more difficult," will afford locations of hostile batteries, but the precision of these may vary considerably—mostly with weather conditions and what profiteth it the knowledge that a battery is concealed somewhere within an unprofitably large area? It makes a juicy bit for the card index, but a battery "seen" in the files is not yet a battery lost.—*Prosim.*

should be hachured. If now the weight to be given to each of the three sources is the same, the center of the hachured surface is the most probable location; but this will rarely be the case and it will be necessary to displace the point thus determined, according to the coefficient of accuracy assigned to each. This critical examination is often a delicate task, calling for judgment and experience, and the conclusions are not always unimpeachable. Many considerations may enter; and here the details shown on the map may help out. It may be desirable to trace the crest line on the diagram showing the construction of the loci. It is highly improbable that guns should be emplaced on an open, visible slope, or that on the defensive one battery should be placed directly in rear of another; it will be noted that certain observations are more accurate on the line of abscissae than on that of ordinates; etc.

"One problem which often arises, is to decide whether two sets of coordinates, close together, represent one battery or two. If both have been sent in from the same source, it may safely be assumed that they refer to two batteries; otherwise the second would have been reported as a correction. If the sources are different, we may conclude provisionally that both refer to the same thing; but immediate steps should be taken to clear up the uncertainty.

"Again, the information from either one of the sources alone may be insufficient, but a combination may give results. Cases of this kind are explained in the regulations.

"(e) *Results of interpretation; card files.*—As soon as an item of information comes in, the information officer communicates it to the group commander if its use appears urgent—checking first to see if there is any inherent improbability. Then, in all cases, he proceeds to a critical study to determine the weight to be given it, and he also seeks to verify. Sooner or later, further information will come in, which may serve to improve the accuracy of his location. It goes without saying, of course, that he will not wait for complete certainty before reporting the results of his interpretation; on the contrary he will report at each step to his group commander. But he should allow the career of each object reported, and should be ready at any time to give the information concerning it, up to date, with the degree of probability that it exists and is occupied, and the estimated accuracy of the coordinates given.

"To secure this difficult result with the least difficulty, the best procedure seems to be a card index, as described below. These cards are kept in various forms; some, in stabilized situations, include sketches, extracts from maps, photographs, etc. — in fact, are little works of art.

"The artillery information officer of a group can hardly be so ambitious; his index card may consist merely of a half sheet of paper folded in two. After the appropriate headings, it should show, in its separate columns—time, source, reported coordinates with coefficient of accuracy, interpretation by the information officer with coefficient of accuracy, and remarks. One of these cards may be built up as follows, each report on a separate line or lines.

"At 2.12 p.m. two ground observation posts have observed a flash. An accuracy of 100 (location within 100 meters) might be assumed; but the information officer is conservative, and reports simply the possible existence of a battery in the vicinity of the coordinates sent him, 08-44. He warns all his agencies to be on the alert for any further indications in that vicinity.

"At 2.33 p.m. three ground observers pick up a flash. The triangle of error is fairly small, and an accuracy of 50

might be assumed, but since a flash does not generally permit accurate plotting, the information officer confirms the existence of the battery with an accuracy of 100.

"At 2.57 the sound-ranging service reports what is evidently the same battery, with accuracy of 50. These two reports, based upon two different phenomena—light and sound—give a high degree of probability for the existence and location of the battery 08-44. This probability becomes almost a certainty when at 3.50 an airplane reports the same coordinates. Finally, at 4.30 the balloon which has been on the watch, and whose line of observation has an approximate bearing of 3,500 deci-grades, reports the battery, giving its coordinates as 07-45. This observer has generally given good reports, and his estimate is given a certain weight — rectangle 50 × 150. The information officer now constructs his loci as explained above, and reaches the conclusion

X=480.780 Y=254.445

Accuracy 30

In this example, which was an actual case, the true coordinates were

X=480.775 Y=254.475

"At night, neither plane nor balloon can give information, but ground observers and the sound-ranging service can follow the activity of the battery and keep the group commander informed.

"The columns on the card which are reserved for interpretation will show a steady increase in accuracy; this will make it possible to reduce the area to be swept by fire, if direct observation on the target is impossible.

"The cards are filed in increasing order of X, so that it can easily be determined whether an object reported is already known. The artillery information office should prepare a card for each battery reported before the action, and for each suspected emplacement. When coordinates very close together are reported, the same question arises as already mentioned—two batteries, or the same battery? It seems best to make two cards; it is easier to combine them later than to separate the records. As a practical rule, one might say that separate cards should not be made unless the positions shown by the coordinates reported differ by 200 meters.*

"*Distribution of results*.—The principal reason for the existence of an artillery information service in the group is to permit the immediate use of the information collected. Its chief should therefore immediately send all information, and also his interpretation of it, to the group commander, who will often not wish to wait for complete information before taking action. Moreover, the information officer should be in a position to follow the course of the counterbattery which he is assisting. If he is placed close to the commanding officer, he can more easily transmit his information and receive his instructions.

"Results should be sent also, without delay, to the artillery information services

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*Note that Colonel Layral's article, which searches the most technical and delicate means of obtaining the requisite information and using it wisely, lays bare no *material* advance in the science since the War.

(*Colonel Lanza: "Our counterbattery was more effective than the enemy's; we had twice as much artillery, and several times more ammunition, but it was not decisive. Experience convinced the high artillery command that an elaborate counterbattery service for locating enemy batteries, with a view to conducting fire on them, was not very valuable, as it did not discover much. It located many temporary firing positions, but these, unless counterbatteried immediately, might escape severe injury, as they would not contain hostile elements a few hours later."*)

Let us examine Colonel Lanza's earlierquoted statement: ". . . these losses [from enemy counterbattery] were insignificant, and in no way affected the tactical situation." Now artillery which does not affect the tactical situation has no rôle on the field of battle, and might better be left in the park. — *Prosim*.

of the corps and adjacent groups, and to division and corps commanders when the information seems of importance to them. Such reports, as a rule, may be made in the form of summaries at the close of the day.

"From time to time, in lulls in the action or before the preparation for an attack, it will be well for the artillery information officer to make up a full and complete list of batteries reported, in the regulation form. This will serve as a supporting document for the various authorities to whom information has previously been sent.

"Office organizations. Records.— Annex I of the Regulations [French] gives the tables of organization for the various artillery information offices. For the office of the group, there must be, besides the chief, at least one noncommissioned officer and one or two clerks, according to the size of the group.

"The material installation will be as conditions permit—small tent, vehicle, dug-out. The telephones should be next to the work table. The office should be as near to group headquarters as possible without interference or undue conspicuousness. Messages will ordinarily be sent by messenger, to avoid the delays and errors incident to the telephone.

"The following records should be kept.

"By the clerk.—A journal of operations, showing the information, orders or reports sent or received, with exact hour. The same clerk, or another, writes all messages dictated by the chief. This chief, assisted by the noncommissioned officer, employs himself with the card indexes and map.

"The use of index cards as a basis for interpretation of reports, has been discussed above. The map should show the batteries reported, in such manner as to give a clear idea of the deployment of the enemy's artillery, especially in the zone assigned to the group, of the accuracy of location, of the activity of the batteries, and of the nature of their fire. The regulations show the conventional signs to be used; these may be supplemented by the use of colored pencils Mention has already been made of the daily report to be made, and of the lists of batteries to be prepared if required. If photographs exist, they are numbered and filed according to map squares, for ready reference.

"While the chief of this service has no orders to give, he will often have requests to make—as, for example, when he wishes verification by the sound-ranging service of a battery reported by that service, on which he has no other reports; or, when he wishes a balloon to observe the activity of some other battery. He may, also, assist in the preparation of the group commander's orders to the observation agencies placed at his disposal.

"The picture thus outlined applies to the usual case, where the group has a certain amount of time for installation. According to the specified situation the action of the service and its chief may vary more or less, but the general principles will remain the same.

"*Conclusion*. — What results may be expected from such an organization?

"During the late war, there was no artillery information service at group headquarters. Today, such decentralization seems more and more necessary. Motor transportation will speed up operations in general, and will make it easier for the enemy to change the dispositions of his artillery. Information must be used very promptly; and it is natural that the group commander, upon whom the direct responsibility for counterbattery rests, would have at his disposal the agency which furnishes the necessary information.

"As a matter of interest, a summary of the results obtained by the procedure just described may be given. It will

approximate fairly closely to what may be expected in reality, since it is based upon observation of batteries actually maneuvering and firing.

"Out of 18 emplacements occupied, 16 were discovered.

"Out of 25 emplacements placed on the list of batteries, 9 did not exist (including 4 noted as doubtful).

"Out of the 16 emplacements discovered, the real position was for 2 batteries, within 10 meters:

2	. . . . .	25
3	. . . . .	50
2	. . . . .	75
2	. . . . .	100
3	. . . . .	150
1	. . . . .	200
1	. . . . .	230

"The number of non-existent emplacements may seem high; but if reliance had been placed upon reported coordinates alone, without the filtering process of the artillery information service, it would have been still higher. This would have resulted in waste of ammunition and reduction in the density of fire upon real emplacements.

"The remark of a general officer seems justified—'Counterbattery? It is the artillery information service.'"

And so, Colonel Layral concludes his discussion, having contributed materially to our knowledge of how best to solve a most perplexing problem.

It is evident that the solution must be approached by means of the most patient and arduous preparation, the most detailed coordination of the human equations involved — note the reliance placed on knowledge of the observer's qualities.

It is quite probable that, save after extensive periods of stabilization, this solution, incomplete and indecisive as it is, cannot be achieved.

Reference was made earlier to Colonel Lanza's account of effect of hostile counterbattery on our own troops. What was the mode of employment of the friendly counterbattery? According to Colonel Lanza, it was successful, in the main, only when large amounts of ammunition were available; then mass fire on suspected areas was employed. The areas were reduced by those portions visible, and by sections of terrain with slopes too steep for battery positions, swamps, lakes, and the like. The remainder, within 7,000 meters of the front line—which was assumed to contain that artillery most dangerous to our infantry—was given a good going-over.

On the face of it, this would appear to be a very expensive process, but it produced some results, whereas often a more delicate touch wasted many shells without coming close.

Often, in lulls, writes Colonel Lanza, where there was good reason to suspect that hostile guns were grouped in areas not too nicely delimited, from 12 to 36 batteries of 155-mm. showered down. But once, when one of these fires, in the Bois de Barricourt, had delivered 500 projectiles, it was found that three hostile batteries showed slight damage, although one lost all its animals, while two suffered severe damage, but could have gone back into action within a reasonable time.

The point is: If these were the batteries which were doing so little damage to our own artillery, was the game worth the 500 candles which might have been burnt on the hostile infantry?

Let us turn to later—not necessarily more modern—employment of artillery. Recent articles in *Krasnaya Zwesda* (Moscow) are of interest. One, of March 15, 1938, by A. Sukhow, treats of artillery experience in Spain. The other, of April 3, 1938, on Japanese artillery in China, was written by A. Sviridow.

We find that in the current warfare in Spain, closely coordinated attacks are made on very narrow fronts, with

airplane bombing supplementing artillery fire on the defensive installations—and probably doing the counterbattery all by itself, as artillery counterbattery, per se, is not mentioned.

In China, a very puzzling situation presents itself. We are told that the Japanese are losing 25% of their artillerymen as casualties — contrasted with the German World War rate of 3% — and the inference is given that the Japanese are somewhat careless camoufleurs. Yet the latter have dominance in the skies, group their pieces physically close—which argues no lack of confidence regarding possible air observation—and are reported to have little difficulty silencing their Chinese artillery adversaries. Too, they emplace their pieces, it is reported, within a kilometer of their front, within two kilometers of the enemy, and perhaps suffer from the fall of many "overs" intended for their infantry.

Artillery ammunition is expensive—in money, cargo space, road length, and sweat. In general, the greater its caliber, the more it costs in these. It is nothing to be tossed into the blue—on suspicion, at small targets. We never have had enough of it, and we never will.

Let us, in our peacetime practices, artillerymen and infantrymen, weigh carefully each paper round we plan to hurl at an enemy battery.

In peace and in war, the infantry are comforted by the thought that all that racket in the rear, that swishing in the air, means rounds dumped on the hostile guns.

Does it?

Well, what would *you* do—drop any pretense at counterbattery? Naturally not. When a cold max is obtained on the location of a hostile battery, and it is reasonably certain of being occupied when fire is begun, that's a worthwhile target. But only then. Lately we have been told that dispositions in depth will be increased in future combat; density in the forward areas will greatly decrease. Very well. Every terrain has one characteristic—it has a road net, or at least a trail net. We know where the roads and trails are—and if we don't we'd better not guess about the hostile guns. But we know that the guns can move, the roads cannot. If the forecasts are true, the only dense targets will be found in the rear. They'll be found on or near the roads. Perhaps the rôle of heavy artillery in future preparations will be the interdiction of these roads to the extreme limit of range. A road, held by the enemy, in the direction of range is a worthwhile target any time, whether it bears traffic or not.

The same cannot be said about an unoccupied battery emplacement.

As the JOURNAL goes to press there comes to hand a most interesting article in the July number of the *Journal of the Royal Artillery* (Great Britain), entitled "Counter Battery in Mobile Warfare," whose conclusions are summed up as:

"Firstly—that whenever medium guns are few, to refrain from employing them on counter-battery tasks until the accuracy of their fire can be ensured. But when this can be done, ammunition supply permitting, to take every opportunity of crippling the hostile artillery.

"Secondly—that even when field guns are available and ammunition supply plentiful, it is optimistic to hope to neutralise more than a traction of the hostile artillery fire when shelling battery positions by prediction.

"Thirdly—that much can be done to neutralise the hostile artillery when it is most dangerous by engaging its O.Ps, and this only at the cost of a few guns and an insignificant expenditure of ammunition."

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Reports from medical experts with the Chinese Army classify casualties as one per cent for bayonet and small-arms wounds; nineteen per cent for airplane bombing, and eighty per cent for artillery projectiles.

Eminent Counsel

BY LT. COL. R. E. ANDERSON, USA-RET.

"YOU are hereby appointed defense counsel in the case of Private A. C. Kercorian, Battery A, Fourth Field Artillery."

I pulled this order, or a reasonably accurate facsimile thereof, from my box at regimental headquarters. Had I been a rising young lawyer my first legal case would have pleased and exhilarated me. As things were I was not pleased. Being the recently joined goat lieutenant on the Post, this simply meant more extracurricular work for me. Besides, the practical workings of a court-martial were a mystery to me. During my two months' service I had been very busy acquiring the field artillery vernacular and learning the reasons for the superiority of the field artillery. Some of the cavalry and infantry officers on the Post seemed to be very poorly informed on field artillery, and as a part of the educational program of the army I felt it my duty to engage them in conversation whenever possible and elucidate. Important things had to come first. Consequently I had neglected Military Law—apparently too long.

As a boy, I had attended several civilian court cases and had been very much impressed with the contests going on between the opposing lawyers. My deficiency as a lawyer was very apparent to me. But youth and optimism kept me from worrying. Any case where the commanding officer would detail such an inexperienced man as I to help the defense must be a very simple one. Probably one especially picked out by the Colonel for me to cut my teeth on. With a little luck I could persuade the accused to plead guilty and take a few days in the guard house. If, in addition, he should be fined a few dollars I would be willing to pay that myself, but was not quite sure of the legality of such procedure.

The Judge Advocate gave me a copy of the charges and specifications. He also gave me the severest shock of my brief military career. My client was charged with everything I had ever heard of and some things I had not. For some reason, murder was not included. I found, upon sarcastic inquiry, that it was purposely omitted on account of some technical difficulty. Desertion was one of the minor charges.

My self-confidence was not so strong now, so I hastened to that ever-unfailing friend—my battery commander. I explained to him that there was some mistake here, for the commanding officer surely would never detail a novice like me in a case where the aggregate sentence for the accused would be so large that he could never serve it on this earth unless he were especially well embalmed. But the battery commander was not impressed with my argument, and he informed me very tactfully that the commanding officer could usually be assumed to know what he was doing and that he did not accept insinuations to the contrary with good grace. He then assured me that there was no occasion for worry. All I would have to do would be to brush up on the court-martial manual and let the court take its course. The court, itself, he said, would safeguard the interests of the accused as its duty was to administer justice, not just to get convictions.

In a happier frame of mind I went to the guard house to interview the accused. Kercorian was a big, exceptionally

well built man, with innocence just radiating from him. Two minutes' conversation with him, or rather from him, made it clear that he was not guilty of anything. His eloquence would have made a college professor extremely envious. I regretted that he could not act as his own counsel, as he was obviously so much better qualified than I. At the conclusion of the interview my mind was entirely at ease, for it was evident that his testimony, all by itself, would easily clear him. It was so obvious that a great injustice was being done merely in keeping him in confinement, that, as I left, I had a vague idea that after the acquittal some one should apologize to him. I was a little uncertain, however, just who this should be.

Kercorian had given me the names of several witnesses on the post who could substantiate his testimony. So far as I could see his testimony did not need any substantiation, but still it was just as well to make sure. As I outlined Kercorian's testimony to these witnesses they seemed considerably surprised at some of the revelations, but gladly agreed to their correctness. I went over the case with them very thoroughly and everything fitted in.

Doubly to clinch the case I needed the testimony of one more witness. This was a woman who lived in the nearby city. On Sunday afternoon I set out to interview this last witness.

This was before the day of the common use of automobiles. There was a street-car line to town, but not knowing my way around, I called for the battery buckboard so I could be driven straight to the address. Regulations prescribed blue dress uniform for Sundays. Properly dressed and with a resplendent artillery cape draped about me, I went out to get into the buckboard.

It was unfortunate for me that I did not pay a little more attention to the reaction of the driver when I told him where to go. He came close to falling off his seat, but recovered, and asked me to repeat the address. This I did, very positively. He seemed inclined to volunteer some information, but my manner must have discouraged him and he drove the shining mules to the place where I had directed him.

The large, two-story house impressed me. Kercorian evidently had friends of a high type here, and that fitted in with the picture I had formed of him. As I rang the bell I detected a strong odor of perfume. A pretty girl, well but scantily dressed, a little rouged but not too much so, opened the door and conducted me into a well-furnished sitting room. But she was not the girl I was looking for and she disappeared. Soon another girl, also quite pretty, and with an obviously nice figure, entered. She was very much surprised to see me and was clearly agitated. I hastened to reassure her by telling her Kercorian had asked me to come and see her about being a witness at his trial. This had the wrong effect however, and made her more nervous. She proclaimed that she did not know any soldiers and that if she did she certainly would not act as witness for them. Somewhat mystified, I went on to explain that she surely would help her old friend Kercorian, but she broke in with, "Say, Mister, I don't know this bum and you tell him for me that if he gets hanged it's O.K. with me." This conquered my good nature and I told her very formally that if I deemed it in the interest of my client I would subpoena her. I am not sure that she knew what a subpoena was but she clearly considered it something undesirable. "You'll have a sweet time doing that," she retorted.

I came to the conclusion that she

would not be a very good witness, and left.

I was very much flattered the next day by the number of people who showed considerable interest in the case. Many friends even called me by phone to ask how I was getting along. They seemed particularly interested in my interview with the lady witness. This all seemed a little confusing, but it was nevertheless pleasing. Undoubtedly, I was creating quite a stir in my maiden effort as defense counsel.

Late in the afternoon, however, I learned the reason for all this solicitude on the part of my friends. On a Sunday afternoon, dressed up in blue uniform and cape, I had been driven in state right into the middle of the red light district.

I now began looking for a defense counsel for my own personal use. The Colonel was left with two alternatives: He could recommend a medal for extraordinary heroism above and beyond the call of duty, or he could court-martial me. I felt he would incline toward the latter. This was a severe blow. I had been looking forward to a brilliant career in the army and here at the very start I was put in the position of having to plead colossal ignorance in order to establish my innocence. But the expected summons from the Colonel did not come. It was not flattering, but it was very relieving that he assumed my dumbness without requiring any further proof. Kercorian was duly tried. The damning evidence brought out by the Judge Advocate did not worry me because I had my witnesses and the accused himself to fire back at him. My prestige was low but my zeal was still high and I objected to every question asked by the Judge Advocate just on general principles. Finally the president of the court told me just to sit down and keep quiet.

My own witnesses started off all right but cross-examination was too much for them and when the Judge Advocate got through I did not recognize them myself. Anyway, I still had my ace in the hole—the accused himself. With much eclat I put the accused on the stand—a mistake which I learned later every shave-tail makes at least once. I told him to tell his own story and he certainly did. It was a story that I had never heard anything about before and when the Judge Advocate got through with him it was evident that it was not much of a story after all.

My client was given a dishonorable discharge and six years' imprisonment. I had not been especially successful in my first appearance as counsel, but I still thought I should be given some credit for effort.

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Among members of our Association who completed the National Guard and Reserve Course at the Command and General Staff School this spring were Brigadier General R. S. McLain, 70th FA Brigade, of Oklahoma, Colonel Homer W. Hesterly, 116th FA, of Florida, Major Percy M. Hansen, 185th FA, of North Dakota, Major Edgar A. Boschult, FA-Res., and Major Robert T, Oliphant, FA-Res.

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Pistol Team of the ROTC, Purdue University, maintains firm grip on Chief of Field Artillery's Trophy by winning it for 1938.

Reviews

FROM SAINTS TO RED LEGS—By Major Gordon G. Heiner, Jr., FA. A. W. Munk and Co. Press, Watertown, N. Y. $1.00.

This is not the story of the good boy who joined the artillery and went to the devil. It is the history, both vital and amusing, of Madison Barracks, N. Y. The "Saints" was the nickname of Colonel Hugh Brady's church-going 2d Infantry, of Lundy's Lane. The "Red Legs," are, of course, the field artillerymen who now garrison the post.

Much as Captain W. S. Nye ("Carbine and Lance") found he could not write a history of Fort Sill without including that of the Indian Southwest, Major Heiner has had to take in a little more territory than that described in the metes and bounds of the reservation.

Sacketts Harbor, from the War of 1812, and nearby United States and Canada, is the scene of action, and on it stride principals with names well known to us: Presidents Monroe and Van Buren, Lieut. U. S. Grant, and many a spear-carrier in the century during which the Black Hawk, the Seminole, the Mexican, and later Wars caused surges of variously armed and uniformed troops through the post gates.

Many infantry regiments have garrisoned the Post since the days of Brady's Second, among them the 8th, 11th, 12th, 9th, 23d, and 24th. Their tours and commanding officers, and outstanding incidents of their stay are given. While at various times batteries of artillery have been posted at Madison Barracks, it was not until 1922 that units as large as the Second Battalion of the Seventh were stationed there. They were followed by units of the 5th and 25th, now the garrison. The history of their service and of their commanders is included in the volume, which concludes with the roster of officers on duty at the post.

The reviewers of the New York *Herald Tribune*, the Syracuse *Post*, and other papers, have been impressed with the historical value of this 80-page booklet, begun by the author at the instance of Major General Frank R. McCoy, and containing much original matter, never before published. The people of the section are newly intent with the import of their nearby associations, as a consequence. Both people and army are thus indebted to Major Heiner for making each aware of their mutual relationship.

The proceeds from sales are devoted to army relief.

The Command and General Staff School Quarterly.

The June issue of this publication contains 263 pages, and is liberally illustrated. No more complete and authoritative summaries of the current status of operations in the Spanish and Chinese theaters can be found than in this periodical. Ten pages are devoted to each in this number, a feature among the contents listed below:

THE FIRST BATTLE OF HISTORY.

MILITARY NEWS AROUND THE WORLD.

FOREIGN-LANGUAGE ARTICLES. Digests of important articles from foreign military periodicals; the remaining articles for each magazine are listed.

BOOK REVIEWS AND READING COURSE FOR OFFICERS.

LIBRARY BULLETIN. Books, recently

accessioned, which are of particular significance.

ACADEMIC NOTES, C. & G.S.S. Current School material, which affects instructional procedure or tactical doctrines.

DIRECTORY OF PERIODICALS.

CATALOG OF SELECTED PERIODICAL ARTICLES. A systematic review of the contents of selected military periodicals. Foreign-language periodicals are digested to a degree to furnish an adequate idea of contents and significance.

READERS' GUIDE AND SUBJECT INDEX. All subject-headings are arranged in alphabetic sequence and can be consulted like a dictionary. Note also List of Periodicals Indexed and Key to Abbreviations.

THE SPANISH CIVIL WAR.

THE SINO-JAPANESE WAR.

THE COVER.

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SPECIAL NOTICE

U. S. FIELD ARTILLERY ASSOCIATION PRIZE ESSAY, 1939

A PRIZE of $100 is offered by the United States Field Artillery Asociation 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 Executive Council of the Association, in announcing the essay prize, offers, in addition, a prize of $50 to that student of the 1938-39 Regular Course of the Field Artillery School whose required thesis shall be adjudged best by the Commandant of the School or by his delegates.

The following rules will govern the *essay* 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 competitor's names 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, 1939. 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.

Questions and Answers on Conduct of Fire

EDITORIAL NOTE: *By permission of the regimental commander, Colonel William H. Sands, the* JOURNAL *reprints, herewith, a portion of a booklet made up in Headquarters of the 111th Field Artillery, Virginia, for the instruction of officers. This digest was selected from the text of Field Artillery Book 161, "Gunnery," and Field Artillery Book 162, "The Firing Battery," and these are quoted verbatim wherever possible.*

The September-October number of the JOURNAL *will contain similar material, including type problems prepared at The Field Artillery School.*

IMMEDIATE DECISIONS TO BE MADE BY EACH OFFICER CONDUCTING FIRE

WHEN TARGET IS IDENTIFIED:

(1) What size bracket do I want before going into Fire for Effect?
(2) What is width of target in mils?
(3) How do I compute my initial data? (What size range bound do I make?)

WHEN FIRST SENSING IS MADE:

(1) Is my direction correct?—If not, what command?
(2) Is my distribution correct? — If not, what command?
(3) What is the next command for range?

WHEN READY TO GO INTO FIRE FOR EFFECT:

(1) What changes are necessary in direction and distribution to cover target?
(2) At what range do I start fire for effect?
(3) Is zone fire appropriate?

QUESTIONS

CONDUCT OF FIRE—GENERAL

1. What is "Conduct of Fire"?
2. When does artillery fire usually consist of **adjustment and fire for effect?**
3. What is the object of adjustment? Should it always be made by observation, if possible?
4. Is effect on the target desired during adjustment?
5. Under what circumstances is a careful preparation made, data corrected, and **a definite area covered by fire?**
6. What is the object of Precision Fire?
7. What is the object of Bracket Fire?
8. a. What does Bracket Fire consist of?
   b. What fixes the size of Bracket to be obtained before starting fire for effect?
9. What is Registration?
10. May Registration be by either Bracket or Precision adjustment?
11. What elements must be adjusted?
12. What method of fire and type of ammunition is used against personnel to destroy its combat efficiency?
13. Should the preparation of fire and adjustment against mounted troops be very rapid?
14. How about dismounted troops?
15. Suppose the enemy troops are entrenched?
16. When should fire for effect be commenced against enemy artillery in position, infantry cannon, or machine guns? How about the sheaf?
17. In axial conduct of fire, what is the unit of range change for a precision adjustment?
18. What would be the unit of range change for a bracket adjustment?
19. Upon what does the size of the first range bound depend during adjustment in axial conduct of fire?

20. With what range do you open fire if firing close to friendly troops?
21. If it is possible to sense the approximate amount of range error, should a corresponding range bound be used?

AXIAL PRECISION

ADJUSTMENT

22. In **Axial Precision** is the gunner's quadrant used?
23. How may adjustment be made?
24. Is each piece adjusted independently?
25. When may the adjusted elevation of the **1st piece** be used as initial elevation for the others?
26. When may adjusted elevation of the **1st piece** be used as **trial elevation** of the others?
27. What is the specific object of adjustment in this type of fire?
28. What is "trial elevation"?
29. How many sensings are sufficient to determine the trial elevation?
30. What is the method of fire during adjustment?
31. To what does the fork correspond?
32. When is it necessary to determine a new value of the fork?
33. Should the first round from a cold piece ever be used to establish a limit of the final bracket?

FIRE FOR EFFECT

34. Where is fire for effect started?
35. What sensings are desired?
36. May a shot fired during adjustment at an elevation later used in the first effect group, be considered as part of that effect group?
37. If the trial elevation is determined by a target hit, how many shots are then fired?
38. If the trial elevation is the center of a 1-fork bracket, how is the first group fired?
39. If the **first half group** are all in the same sense, how is the elevation changed?
40. Are new adjusted elevations determined after each group?
41. If the first group gives an equal number of overs and shorts, what is the adjusted elevation?
42. How is the adjusted elevation determined if the shorts and overs are not equal in number?
43. What fork is used?
44. For the second and other groups how is the adjusted elevation determined?
45. When should adjustment be commenced anew?

AXIAL PERCUSSION BRACKET

ADJUSTMENT

46. What is the essential element of Bracket fire?
47. What is a bracketing salvo or volley?
48. What is a mixed salvo or volley?
49. What is the usual procedure for adjustment?
50. How is the initial sheaf computed when fire is opened with one piece?
51. When is an open sheaf used for initial sheaf?
52. On which piece is the correction for deflection error based?
    a. How is distribution made?
53. How is the distribution corrected of a piece materially out of its place in the sheaf?
54. How is the sheaf adjusted?
55. What size range bracket is usually considered sufficient for adjustment?
    (Targets attacked with Bracket adjustment are generally transient and distributed in width and depth.)
56. When the target is fixed, of little depth and clearly visible, what size bracket is sought?
57. When the target is moving rapidly, has great depth, or is poorly defined, what size bracket is sought?
58. How many sensings are considered sufficient as a basis for a range change during adjustment?

FIRE FOR EFFECT

59. When is the fire for effect started?
60. When is verification of the bracket sought?
61. Should the mean line of fire pass through the center of the target?
62. Should the distribution cover the entire front of the target effectively?
63. What is the maximum front that can be covered without sweeping?
64. If all of target is not visible or if target is not fixed, what kind of sheaf is used?
65. What is the method of fire?
66. How is the bracket determined during adjustment covered?
67. When may zone fire be given?
68. Suppose a bracket has been obtained with a single sensing at one limit, and no rounds are observed in the sense of this limit during early fire for effect, what should later fire include?
69. At what limit should you start fire for effect, in the following cases:
    a. Moving target?
    b. Where a bracket is obtained with a single sensing at one limit and more than one at the other?
    c. If there are an equal number of sensings, **or** at least two sensings at each limit?
    d. If during range adjustment a bracketing or mixed salvo, or a target hit is sensed, this range is considered the center of the desired bracket. When the target is such that a 200-yard zone should be searched, where should fire for effect be started?
    e. Suppose in (d) the target is such that a 100-yard zone should be searched, where and how is fire for effect started?
70. When may the range fired be considered the center of the desired bracket?

TIME FIRE AS APPLIED TO ALL BRACKET PROBLEMS

ADJUSTMENT

71. What additional adjustment is sought in time-bracket fire for effect?
72. Should a short sensing of an air burst be accepted with caution?
73. Do the principles of percussion-bracket adjustment and fire for effect apply to time-bracket fire?
74. How is the height of an air-burst measured?
75. What is the normal height of burst?
76. How are bursts classified for sensing?
77. What proportion of airs and grazes indicates a zero height of burst?
78. If the average height of the airs is 6 mils or less, what does three airs and one graze indicate?
79. Is the adjustment in time fire, of deflection, distribution and range the same as in percussion bracket?
80. What height of burst is desired for adjustment?
81. How should corrector usually be changed during adjustment?

FIRE FOR EFFECT

82. How changed for effect?

DIRECT LAYING

83. In direct laying, how is the line of sight of each piece directed?
84. Is the conduct of fire the same as with indirect laying?
85. Why should the BC be on the windward flank of the Battery?
86. For targets other than tanks, how many guns are used?
87. How many guns for tanks?
88. Who is the only person to give the command "FIRE" when using direct laying at moving targets?
89. What is the method of fire against moving targets other than tanks?
90. What should always be remembered in computing the deflection for moving targets?

91. What is a rough rule for computing the initial deflection for moving targets?
92. If shrapnel is used, must the height of burst be adjusted promptly?
93. Are bold range bounds used?
94. What method of fire is used for fire for effect?
95. What preparations and precautions should be taken prior to anti-tank fire?
96. In anti-tank fire, what type of ammunition is used?
97. Who announces deflection corrections and range changes?

Answers

1. The technique of placing artillery fire upon a selected target.
2. When fire on the target can be observed.
3. To determine, from the observed position of the burst and the target, the firing data which should be used to begin **fire for effect,** adjustment is made by observations on target whenever possible, but if target is invisible, then adjustment is effected on some object in vicinity, and a suitable bracket then assumed.
4. Yes, and adjustment should be continued during **fire for effect.**
5. When the fire on the target **cannot** be observed.
6. It is used for accurate registration and for destruction.
7. To inclose the target in a suitable bracket and then to cover the bracket thoroughly with fire for rapid registration and for neutralization.
8. a. 1. A bracket adjustment.
   2. Zone fire for effect.
   b. The mobility, visibility, depth and importance of target.
9. An adjustment on a selected point to determine data for use in preparation of fire.
10. Yes, depending on the time, ammunition available and degree of accuracy desired.
11. (a) Direction.
    (b) Distribution.
    (c) Height of Burst.
    (d) Range.
12. (a) Bracket methods.
    (b) H. E. Shell, fuzed to give the most effective fragmentation.
    (c) Chemical shell either alone or with other types.
    (d) Shrapnel at ranges not greater than 4500 yards, provided the height of burst can be adjusted.
13. Yes, and an **open sheaf** should be used for both adjustment and fire for effect.
14. The preparation and adjustment should also be very rapid, and an open sheaf should be used during fire for effect, which is started **when a 200 yard bracket has been obtained, or** when a bracket may be assumed as a result of a bracketing or mixed salvo, **or** a target hit.
15. Then there should be an accurate preparation of fire, which will facilitate the adjustment. If the target has little depth, a single range placing the center of impact on the trench is desirable. Fire for effect is commenced **when a 100 yard bracket has been established.** The sheaf is adjusted to fit the target.
16. When a 100-yard bracket has been established, if all the target is visible. The sheaf is adjusted to fit the target. During fire for effect, ineffective ranges are eliminated. If target moves, a deeper bracket is

searched, using an open sheaf. If all of the target is not visible, fire for effect is usually commenced with an open sheaf when a 200-yard bracket has been established.

17. The fork (determined from Firing Tables).
18. A 100-yard change in range setting **or** a change of elevation corresponding to a 100-yard range change. (**c** from Firing Tables.)
19. Upon the accuracy of the initial data, but it should not be less than the bracket sought.
    For instance:
    (a) One fork—
        for map data corrected.
        for a transfer of fire.
    (b) Two forks—
        for map data uncorrected.
        when using range-finder.
        when making a small shift.
    (c) Four forks—
        for estimated data.
        for data from map or air photo if gun and target are not located accurately.
        for data from small scale map.
    (d) Six forks (or more)—
        for rapidly moving target or one which is greatly distributed in depth.
    (The term FORK as above used, refers to unit range change for either precision or bracket adjustment.)
20. With a range which is **surely over** and the range is then decreased by small bounds until the short range is found.
21. Yes, in multiples of forks, but not less than final bracket desired.
22. Yes.
23. By battery, platoon, or piece.
24. Yes, and on its proper part of target.
25. When pieces are adjusted successively on the same target.
26. When the battery has been calibrated accurately.
27. To obtain a **trial elevation** for each piece.
28. The elevation to the center of a one-fork or smaller elevation bracket, taken to the nearest whole mil, **or** the elevation giving a target hit.
29. One at each limit of bracket.
30. (a) For a single piece—I round.
    (b) For a platoon or battery—salvo at sufficient interval to sense each round.
31. To the **initial quadrant elevation,** and is taken to the nearest whole mil.
32. After a range change of eight forks if a bracket is not obtained, the new value is determined, corresponding to the last quadrant elevation fired.
33. No.
34. At the **trial elevation.**
35. Groups of six for each piece.
36. Yes.
37. Five.
38. The six shots are fired in half groups of three.
39. It is changed ½ fork, or to the limit of the bracket in the proper direction, and enough shots are fired to complete three sensings at this elevation. The group is considered to have been fired at the mean of the two elevations used.
40. Yes, and the next group is fired at the last adjusted elevation.
41. The elevation at which the group was fired.
42. Find the difference between the number of overs and shorts, **neglecting** target hits. Add this number of twelfths of a fork to the elevation used if the shorts are in excess, subtract if the overs predominate.
43. The one which corresponds to the elevation at which the group is fired, and it is taken to the nearest mil.
44. In a similar manner, making ½ the change indicated after the second

group; 1/3 after third group; ¼ after the fourth and following groups.

45. If there are five observations in one sense in the first group for effect, and six in the same sense in the second. (Sometimes a change in powder lot or of ammunition will necessitate a new adjustment.)
46. Speed.
47. When the number of rounds sensed short is equal to the number sensed over.
48. When sensing of both over and short are obtained, but more in one sense than in the other.
49. To use one piece for adjustment (preferably an interior one) until a 400-yard range bracket is split or a 200-yard range bound is made, after which battery salvos are used to complete the adjustment. If data are accurate, and target fleeting, or observation difficult, use battery salvos from start of adjustment.
50. To fit the visible part of target.
51. When adjustment is started with the battery, unless accurate map data are used, or a small shift is made. Increases chance for a range sensing from first salvo.
52. On the piece most nearly correct, measure error and make correction.
    (a) By a change of Deflection Difference to the nearest mil, with reference to the piece most nearly correct for deflection.
53. By an individual deflection shift.
54. (a) To the visible part of target, if only a part of target is visible.
    (b) On a very narrow target with a converged sheaf.
    (c) A battery sheaf 5 mils or less in width is considered converged.
    (d) If entire target is visible, sheaf is adjusted so as to pass to fire for effect without a change of distribution.
55. 200 yards.
56. A 100-yard bracket.
57. A 400-yard bracket or greater.
58. One is sufficient.
59. After one sensing at each limit of the bracket **or** when a bracketing or mixed salvo **or** a target hit is obtained.
60. During fire for effect.
61. Yes, and the deflection is changed as necessary.
62. Yes.
63. That which can be covered by an open sheaf.
    Open sheaf equals 3 × Effective width of burst.
    Front covered equals 4 × width of burst.
64. An open sheaf.
65. Volley fire or volley fire sweeping.
66. Rapidly, using 100-yard bounds and then the intermediate ranges are included. 3200-3400 would be, 3200, 3300, 3400, 3350, 3250.
67. After **all** elements have been adjusted. In searching a bracket for the first time in fire for effect, the BC may, according to his own judgment, give the command for each volley or give the command for zone fire. If all elements are properly adjusted, zone fire will speed up the delivery of fire for effect; if further adjustment or verification is necessary, it is facilitated by BC giving the command for each volley.
68. A zone extending 100 yards outside the limit.
69. (a) If target is moving in the direction of range, fire for effect usually is started at the limit toward which movement is taking place.
    (b) Started at the limit at which only one sensing has been obtained,

to get prompt verification.

(c) Started at the limit last determined, to avoid delay in changing range setting.

(d) Started at the range which gives a bracketing or mixed salvo, or a target hit and the remainder of the zone covered promptly.

(e) It is started at the range giving a bracketing or mixed salvo, or a target hit, with two volleys in order to get prompt verification and early effect. It is continued at this range until a decided preponderance of the effect is observed either over or short, in which case, a range 50 yards in the appropriate direction is included.

70. When, during range adjustment a bracketing or mixed salvo **or** a target hit is sensed.
71. A mean height of burst which will give the most effective distribution of shrapnel balls at the target.
72. Yes, shrapnel may burst in air short of target, and yet be fired at a range which is actually over. A short sensing of an air burst should always be accepted with caution unless the burst is very low or below the target.
73. Yes.
74. From the bottom of the target to the top of the burst.
75. The height which gives the maximum effect at the target.
76. ***Graze***—A burst on impact with the ground.

Graze Above—A graze more than 2 mils above the base of the target.

Graze Below—A graze more than 2 mils below the target.

Air—An air burst below the base of the target.

A graze above is always doubtful for height of burst, and when sensed, the corrector is not changed for next round.

77. An equal number of airs and grazes.
78. A mean height of burst about 2 mils above the target.
79. Yes.
80. A low height of burst, giving from ⅓ to ½ of the bursts on graze.
81. If first salvo is:

(a) Lost, all G or all A. change 10 mils.

(b) 3 one sense, 1 other sense, change 5 mils.

(c) 2 A and 2 G, no change.

If corrector has been bracketed with 1 gun, change 5 mils if corrector change is indicated.

82. Use 2 to 4 mil height of burst, ¼ to ⅛ on G.

If last salvo for adjustment was:

(a) 2G, 2A, then Up 2 or 3.

(b) 3G, 1A, then Up 5.

(c) 3A, 1G, then no change.

83. Upon the point indicated as the target, thus laying the piece for direction and site.
84. Yes, except for the adjustment of the deflection and distribution.
85. To keep the blasts from obscuring observation, and for ease in giving and hearing fire commands.
86. The entire battery.
87. Each piece is handled individually by its chief of section or by an officer, as directed by the Executive.
88. The gunner.
89. By volley.
90. The first shots should be ahead of the target.
91. Measuring lateral movement of target while counting four in quick time cadence (2 seconds) will give the proper lead for a range of 1,000 yards, or the necessary change may be based on one mil for each mile-per-hour lateral speed of the target.

92. Yes, since the effectiveness of fire decreases rapidly as the burst varies from normal.
93. Yes, 400 to 800 yards, in order to obtain a bracket promptly.
94. Usually by volleys of two rounds.
95. (a) Assign observer to watch sector constantly with field glasses.
    (b) Put gun in concealed position for direct laying.
    (c) Put wheels on level ground—make trail trench with log if possible.
    (d) Set deflection at Pl. O-Drum 100 with piece in center of traverse—laid near center of sector.
    (e) Announce to gun squad type of ammunition and method of fire.
    (f) Compute ranges to all possible points and study terrain for approaches.
96. HE shell, short fuse, method of fire initially by one round.
97. The chief of section, or officer acting as C. of S.

(*To be continued in the September-October Number with* "*Lateral Conduct of Fire*").



GENERAL REILLY REPORTS ON THE WAR IN SPAIN

Advocates of newfangled warfare, mechanical robots, death rays, and the like, need not alarm us unduly. The old-fashioned soldiers are having a field day in Spain. There is no need to arise and rush to the nearest exit from panic fostered by the Sunday supplement military experts.

Brigadier General Henry J. Reilly, ORC, wartime commander of the 149th FA and the 83d Infantry Brigade, Rainbow Division, author of many books, famous war correspondent, son of the late Captain Reilly of "Reilly's Battery," postcards from Spain that in the near future he will tell all.

General Reilly promises us an article in a card from Zaragoza, dated June 7, in which he reports that he has been to the Segre, Ebro, and Mediterranean-Teruel fronts eleven times, witnessing seven attacks. He writes that artillery, besides being absolutely essential for infantry, is the worst enemy of tanks. Artillery superiority always plays the major part, and "*More fire* power even if *less* speed is the motto everywhere."

Moreover, he has also written the *Cavalry Journal*, promising them an article on the employment of their arm, in which he writes: "Cavalry is *not* a thing of the past. Neither has it got to take to gasoline and grease to exist. Horse cavalry is playing an important part. I had a long talk with General Monasterio, Chief of Cavalry (Nationalist), who says that in the beginning no general wanted cavalry; now all want it."

We look forward with interest to the reception of these articles.

First Field Fighters

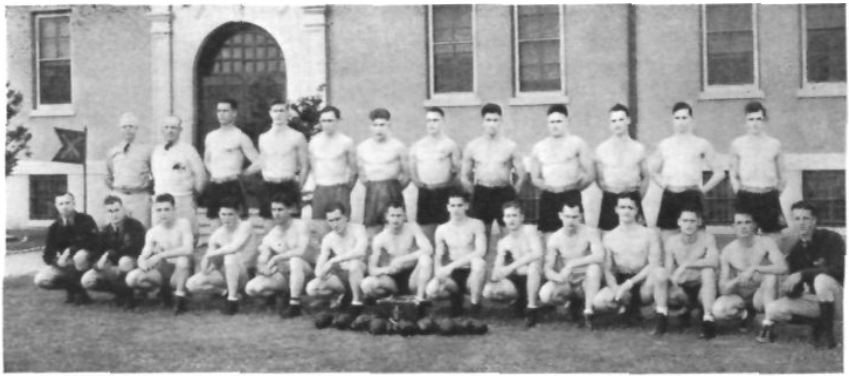
BY LIEUT. C. V. CLIFTON, FA

WITH a record of 50 bouts won, and 10 lost, the Boxing Squad of the First Field Artillery, commanded by Colonel Marshall G. Randol, won the Post championship at Fort Sill, Oklahoma, for 1938. Boxing under the N. C. A. A. rules, the squad, coached by Captain John J. Turner, piled up 1,225 points. The Eighteenth Field Artillery was second with 1,000 points, the 1st Bn 77th FA was third with 705, and the 3d Bn 29th Infantry, with only four men on the squad, made 200 points.

The competition ran for five weeks, with two programs a week. There were approximately 60 boxers entered in the tournament. In addition to the championship trophy, individual members of the squad won 9 gold medals for Class I, 6 silver medals for Class II, and 2 bronze medals for Class III.

The Commandant's Cup, a trophy awarded for points made in proportion to the enlisted strength of the organization, was won by the First Field Artillery because of the outstanding score. Ordinarily, a smaller organization would have won this cup.

Captain John J. Turner, the coach, gives the men all the credit for winning, but his reputation as a coach of boxing was already established in the Hawaiian Islands with teams winning the Division, Department, and Sector-Navy championships.



FIRST FIELD ARTILLERY BOXING SQUAD. POST CHAMPIONS FORT SILL, 1938.

Rear row, left to right: Colonel Marshall G. Randol, Captain John J. Turner, Private Cecil R. Greer, (Btry. "B"); William B. Bradley, (Btry. "A"); Ro, A. Barker, (Hq. Btry. 1st Bn.); Jack A. Lawrence, (Serv. Btry.); Doyle H. Marshall, (Btry. "D"); Pvt. Iel Sweeney W. Beyers, (Hq. Btry. 2d Bn.); Private Russell E. Glover, (Btry. "E"); James M. Pavillard, (Hq. Btry. 1st Bn.); Pvt. Iel William M. Kuykendall, (Btry. "A"); Private Charlie T. Taylor, (Btry. "B").

Front row, left to right: Corporal Marion L. Friar, (Btry. "A"); Private Arthur V. Hicks, (Btry. "B"); Jimmie L. White, (Btry. "E"); J. L. Cheshire, (Hq. Btry. 2d Bn.); Marion G. James, (Serv. Btry.); Pvt. Iel William F. Campbell, (Serv. Btry.); Private Hershel Cohea, (Btry. "A"); Pvt. Iel Terry O. White, (Hq. Btry.); Private Aulton E. Poe. (Btry. "E"); Edgar Taylor, (Btry. "B"); Pvt. Iel Billy J. Mileham, (Btry. "E"); Grover W. Nunn, (C.T. 1st Bn.); Pvt. James W. Christmas, (Btry. "B"); Pvt. Iel Charles H. Kennedy, (Btry. "D").

COOPERATION is the keynote of training in the Illinois area, as reported by Lt. Col. Hugh L. Carnahan. 856th FA (Horsed) of the 65th Cav Div, who has served with that regiment since he was a second lieutenant (and the regiment was the 465th Bn). Col. Irving Odell, CO, has arranged with the commanders of the Illinois National Guard Field Artillery to give his officers active duty training at camp, preceded by a month of drill with the units. This was done in 1935, 1936, and is the case this year. Last year the officers of the regiment trained the CMTC at Camp McCoy.

THE STRIKING etchings, on field artillery subjects, by the distinguished artist, Mr. Kerr Eby, which have been appearing in the JOURNAL are due to the courtesy and cooperation of Mr. Charles Sessler, of Philadelphia, who has supplied them for reproduction. These original dry-points may be purchased from him.

MAJOR John H. Fye, FA, is reluctantly surrendered to the Command and General Staff Course next month. He had this summer added 29 new members to the 26 he secured last year, for a total of 55, to lead the league. As a result, the following regiments are among the leaders in our Reserve file: the 316th, with 25 members; the 317th, with 25; the 318th, with 17; and the 863d, with 8. Among others who have recently sent in additional memberships are Col. L. S. Schmitt, 346th FA; Major C. S. Richards, FA; Capt. M. B. Barragan, FA; Major C. W. Bonham, FA; Capt. O. F. Sihler, 329th FA; Major E. R. Roberts, FA; the 119th FA (Michigan), and the 107th FA (Pennsylvania).

THROUGH WHAT this observer considers a most fortunate set of circumstances he became associated, a couple of years back, with a group of small-arms experts, gun-and-game editors, and people of similar proclivities, with whom he has lunched on Tuesdays for now a hundred times, and frequently joined at the shag end of the week for field tests. At the luncheons the air is full of shop talk, dealing with drams, grains, groups, and superelevations (complementary angles of site to you). Occasionally a familiar term, like ogive, drop, or remaining velocity, reflects a flicker of interest on the face of your observer, and the dean of this assemblage, a person of authoritative tone, says, "Halt! Gentlemen, I perceive we have awakened Mr. Krupp, here, from his nap. Kindly be more considerate in future."

It is true that much of this stuff goes over our head. But we have been impressed by the fact that our fellow-munchers, being given one or two factors, like muzzle velocity, or caliber, will leap instantly to a conclusion dealing with remaining velocity, or minutes

of elevation. They have visualized the trajectory, and only those who know with what great diversity calibers and loads, in rifles, pistols, and shotguns, appear on the shooting scene, will appreciate the extent of their knowledge.

To go back a little—at the onset of American participation in the World War, there was a great thirst for knowledge on the part of the amateur field artillerymen. They would read anything they got their hands on, and after having exhausted the matter-of-fact details of the four-volume FADR, they turned to Brigadier General W. I. Westervelt's "Gunnery and Explosives," and to a new book, just appeared, "The Training of Field Artillery Details," by the then Major Robert M. Danford, now Chief of Field Artillery, who was at that time PMS & T at Yale University. In the latter book, particularly, there were easily remembered formulas for calculating the elements of the trajectory (Such as, for determining the angle of departure, "5R (R + 3))." The young wagon-soldiers had a lot of fun with these, and it did not do them any particular amount of harm. In fact, although many of the formulas were applicable only to the ballistics of the three-inch gun, some, like the fact that the distance to the maximum ordinate is three-fifths of the range: the ordinate, in feet, is four times the time-of-flight-squared; and the angle of fall is one-and-a-half times the angle of departure, will work pretty well for other trajectories, even now.

Few, however, now concern themselves with these questions, the answers to which can be found in Firing Tables, not then the hip-pocket accessory they have since become. Further, there are now so many different calibers, velocities, and zones, that those serving with different weapons can meet on little common ground. Yet it is odd that big-bore shop talk, just as vehemently conducted as in any other group, should, perhaps for the reasons stated above, be devoted in such small part to the trajectory. Our communication specialists will talk a leg off you on the subject of superimposed circuits; motor men on octane ratings and rear-end assemblies, horsemen—but let us hurry on. Who is not an authority on organization or training schedules? Gunnery people, it seems, will argue lateral, transfers, and the like, but the visualization of a particular trajectory and its elements no longer bulks as large as once it did.

Why should there be this distinction between the big bore and the small? Undoubtedly it is because there is more small-bore firing. The small-arms people get together and compete—the cost being, comparatively, insignificant. They join the infantry, cavalry, marines, coast guard, and police at Camp Perry annually, and have opportunity to distinguish themselves among their fellows.

Be that as it may, however, when we artillerymen go out to that solemn and expensive occasion, service practice, we are pretty sure that the target assigned us to adjust upon is one that can be reached by the fire. It was fixed up that way in advance. What we can see from the OP is generally not in the battery dead space. There are sound reasons for this, but may it not lead us to erroneous conclusions when we select battery positions and targets in maneuvers when it is probable no verification fire will be delivered? Suppose that the force commander has assigned us positions in a general area, and ordered us to prepare to fire in another general area. Then, during the action, we are suddenly ordered to simulate fire on a target outside that area? How often does it happen that the supported troops are

told, "Too bad. We can't give you fire there until we change position?" Our guess is—not very often.

Every once in a while something is contributed to this JOURNAL which indicates that a little more acquaintance with the elements of the trajectory would be beneficial—like the photograph of the battery with all the guns in partial recoil from heavily charged blank rounds. This was a pretty picture, taken during maneuvers. The white puffs from the black powder charges were very nearly symmetrical—but the muzzles were obviously below that angle necessary to clear a considerable crest in the near foreground. Or the map to illustrate an article, whose light battery position was so emplaced as not to be able to come within hundreds of yards of enabling fire to be placed, even with reduced charge, on the "reserves forming in draw;" and sometimes, in map problems, not too much attention seems to be paid to the fact that while no dead space exists, according to contours, the trajectory is required to pass over crests shown in green. The height of the foliage thus indicated might exert considerable influence in case one were told: "Very well. Go out and shoot it."

Our small-bore friends (the adjective is used in no invidious sense) deal with simpler and flatter trajectories—but they know all about them.

MILITARY BOOKS

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

	Price (*Domestic postage included*)
FROM SAINTS TO RED LEGS—*Heiner*	$1.00
FIELD ARTILLERY: The King of Battles—*Maj. Gen. H. G. Bishop*	1.00
THE AMERICAN ARMY IN FRANCE—*Maj. Gen. James G. Harbord*	5.00
THE WAR IN ABYSSINNIA—*Marshal Badoglio*	6.00
CARBINE AND LANCE, A HISTORY OF FORT SILL—*Nye*	3.00
R. E. LEE—*Freeman* (4 vols., each)	3.75
A MODERN MILITARY DICTIONARY—*Col. Max B. Garber*—Cloth	2.50
—Leather	2.75
WHAT ABOUT THE AIRSHIP?—*Rosendahl*	3.50
THE POWER OF DIVERSION—*Griffith*	1.00
THE STORY OF RECONSTRUCTION—*Henry*	5.00
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CAVALRY COMBAT	2.50
MILITARY HISTORY OF THE WORLD WAR—*Col. G. L. McEntee*	7.50
GENERAL VON STEUBEN—*Brig. Gen. J. M. Palmer*	4.00
THE SIEGE OF ALCAZAR—(*McNeill-Moss*)	3.50
ARMY MESS MANAGEMENT SIMPLIFIED—*Maj. E. A. Hyde*	2.00
THE CAISSONS ROLL—*Hanson W. Baldwin*	2.50

A reduction of 10% will be made to JOURNAL readers who purchase any of the above books through the U. S. Field Artillery Association.

The Association is in a position to obtain for its members not only books on military subjects but biographies and fiction as well, at a reduction of 10%.

The United States Field Artillery Association
ORGANIZED JUNE 7, 1910

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