

29TH YEAR OF PUBLICATION

THE FIELD ARTILLERY JOURNAL

NOVEMBER-DECEMBER, 1939

ARTICLES: by Maj. Gen. R. M. Danford, Lt. Col. Wedel (German General Staff), Col. C. H. Lanza, and others.

SERIAL: by Brig. Gen. E. D. Scott (Part I)

CHRISTMAS STORY: by Guy Donn Farrell

ALSO: Foreign Contemporaries, Muzzle Bursts, and Other Short Features



PUBLISHED BIMONTHLY BY
THE UNITED STATES FIELD ARTILLERY ASSOCIATION

November-December, 1939

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VOL. 29

NO. 6

NOVEMBER-DECEMBER, 1939

THE FIELD ARTILLERY JOURNAL

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The United States Field Artillery Association

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Patron Saint of Artillery

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THE U. S. FIELD ARTILLERY ASSOCIATION

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ARTICLE II OF CONSTITUTION

"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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A MESSAGE FROM THE CHIEF OF FIELD ARTILLERY



As the end of another year approaches, the situation and the outlook as they affect the Field Artillery are quite different from what existed one year ago.

Today we live under the shadow of a great war, the outcome of which no man can foresee. Our present interlocking and interdependent world economy is such that when a great and a strong people make war at the bidding and under the control of a single despotic human being, force of extraordinary proportions may ultimately have to be consolidated against them in order to save all nations and all peoples from devastating injury or even complete ruin.

Thus while the present deplorable struggle continues, the military forces of our nation are under grave responsibility to work with increased vigor, determination, and devotion, to meet the wishes, and respond to the support, of our government and our people, by developing the highest possible degree of military efficiency and effectiveness of which they are capable.

Our own particular concern during this time of increased activity, is the Field Artillery. The organization of properly balanced combat divisions and corps, an achievement of inestimable value and importance to our Army, has caused, since last year this time, an increase of almost 50 per cent in the firing batteries of our Regular Field Artillery. Still further increase is in prospect. Transportation, not expected a year ago, is now on the way, and weapons of new manufacture and new design are being pushed for us by the Ordnance Department. Training opportunities and facilities for all components are being extended and increased.

Troop units of Regular Field Artillery organizations have had to contribute commissioned and enlisted personnel to newly organized regiments, battalions, and batteries. The reassignment of a great number of noncommissioned officers and men has been done with the idea of spreading the many enlisted promotions throughout the entire arm, as well as providing new units with trained cadres able to develop efficiency in the shortest possible period of time. Regimental and Separate Battalion Commanders, who have been called upon to contribute commissioned and enlisted personnel for the formation of these new units, have responded in a spirit that discloses a realization of the problems confronting us and a most inspiring eagerness and determination to solve them in a way that will reflect credit on the Arm.

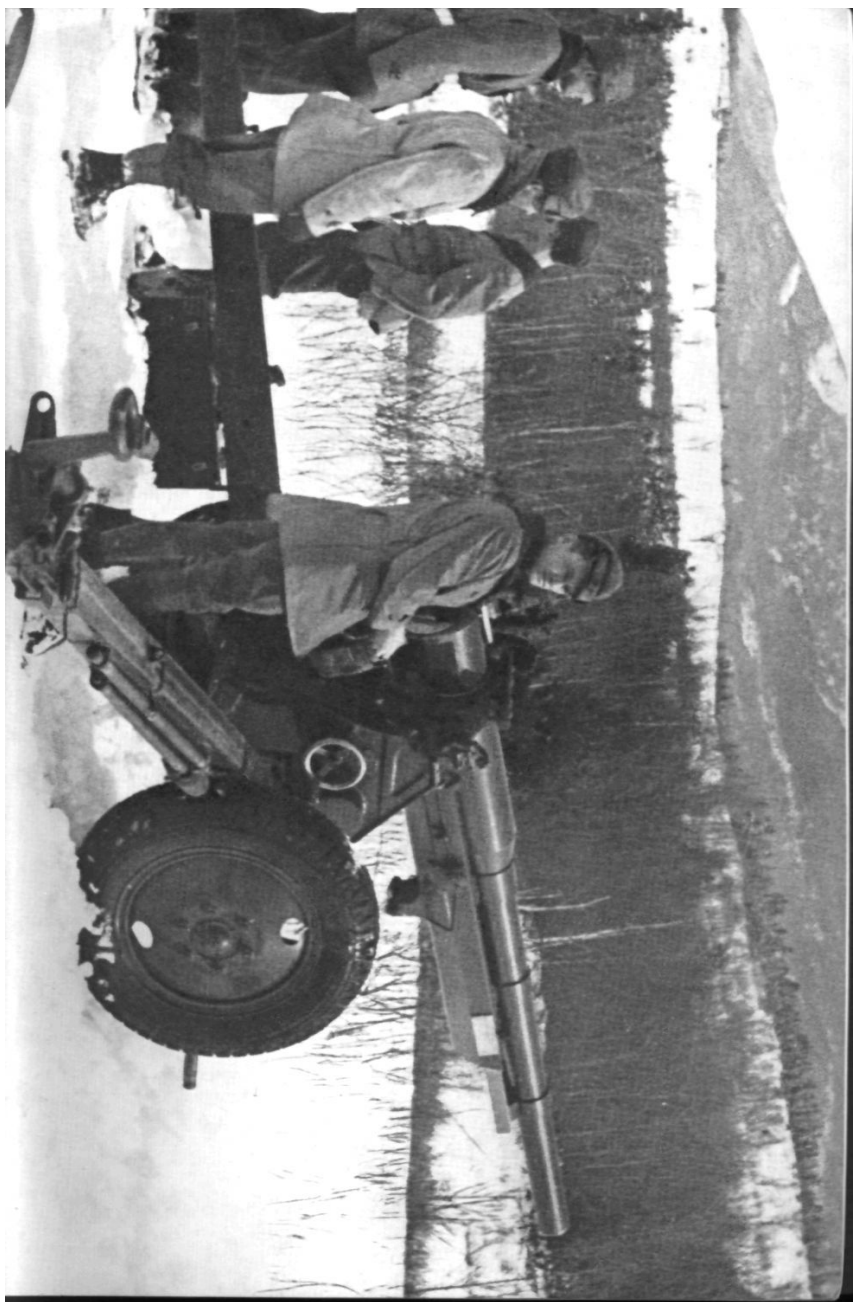
The New Year promises many and new opportunities for service and achievement. How can our organization, our equipment, our methods, our training be further improved or perfected? The divisional training camps, bringing as they do, a large number of Field Artillery officers together to concentrate on the task of developing combat efficiency and teamwork with the other arms, are bound to encourage and facilitate an exchange of ideas that will lead to improvement and progress.

In extending Holiday Greetings to all Field Artillery personnel at this time, may I express the hope that the New Year will bring increased efficiency to our entire National Defense, and a greater assurance of unbroken peace to our country.

R. M. DANFORD,

Major General, U.S.A.,

Chief of Field Artillery.



THE FIELD ARTILLERY JOURNAL

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Marching Animal-Drawn Field Artillery

BY MAJOR GENERAL ROBERT M. DANFORD

Chief of Field Artillery

WE do not like to advertise our failures. However, in a group such as ours, composed as it is of officers and men eager to learn, and possessing different degrees of experience and professional knowledge, a tragic blunder should desirably be used as an object lesson, so that a sorry loss can thereby be turned into an intangible or potential gain.

On August 17, 1939, a hot, muggy day, in the vicinity of one of our Army garrisons, a battalion of horse-drawn field artillery made a march of some 26 to 30 miles. During this march, and shortly subsequent thereto, 16 horses died of heat exhaustion. This calamity, to some degree, is a reproach upon the entire Field Artillery, its units, its instruction, its School, its commanders. It did indeed bring reproach and discredit to this particular unit in the minds of many civilians who witnessed the tragedy, or who heard of it from their neighbors or through the newspapers.

The proceedings of the Board of Officers, convened to investigate this occurrence, disclose several lessons to be learned. In the first place, it is probable that not a single animal would have perished had a clinical thermometer been used in watching their condition. There is no indication, however, that such an instrument was in the battalion, even in the hands of the veterinarian. At any rate, none appears to have been used.

Paragraph 622. Field Artillery Drill Regulations, 1916, reads as follows:

"On a march in hot weather a clinical thermometer is often of the greatest service, *since the horse's temperature is the surest index of his fitness to continue work.* The temperature of a horse under normal conditions is from 97.5 to 101.3 F. It rises with exertion. If this rise is small, there is no danger, but if it reaches 103 to 104, precautions must be taken. If there be a further rise to 105, work must be given up entirely."

In some way or other this gem of information was omitted from our present literature. It has been restored.

A driver, chief of section, platoon commander, and battery commander, should all feel their responsibility for detecting the horse that is in distress for any cause, including that of excessive heat. When overheated, the animal will almost certainly be panting. If he is panting and not perspiring, he rapidly approaches a dangerous condition. If he is panting hard and perspiring unusually freely, his condition may become dangerous. Under such circumstances, the careful watching of his temperature with a thermometer will almost certainly guarantee the saving of his life. Even in war when a marching objective must be reached at all costs, an animal should be cut out of a team or taken from under the saddle when it can be determined that his condition is dangerous. One might better do without him while his life can be saved, and he can thus be used again tomorrow, than to work him until he drops.

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Two gun batteries were involved in this loss of animals. Their horses were in harness at the early hour of 4:30 AM and were engaged in maneuvers until the march proper was begun at about 11:15 AM. During these maneuvers the animals had covered from 4 to 9 miles, some of it at the trot and gallop.

At about 1:30 PM both batteries halted, and each one used a half hour to feed grain. Such feeding was a serious error. A little hay only should have been fed under these particular circumstances and conditions. To quote again from the 1916 Drill Regulations:

"Never feed grain to a horse when heated or fatigued. Grain is a highly concentrated food that requires high digestive power. Abnormal temperature impairs the power of the digestive organs. If the animal has been worked to the point of fatigue, all bodily functions are for a time injuriously affected. For that reason he must be rested and his normal digestive power restored before concentrated food of any kind is given to him. On the other hand, hay being a bulky food, will not hurt a horse however heated or fatigued he may be."

How many times have we heard of some elderly gentleman eating a hearty lunch and immediately thereafter on a hot day, going to the golf course where, strangely, he suffered a heart attack. A full meal and a hot day, followed immediately by hard work or exercise are dangerous alike to horse or man.

About 1½ hours subsequent to the feeding referred to, one battery lost a horse. Thereupon this battery commander, upon reaching a stream very soon afterwards, displayed good judgment and sound common sense by going into bivouac, getting his animals out of harness, and resting them until about 7:00 PM. Further, this battery upon arrival at its stables at about 11:30 PM worked over its horses until after 2:00 AM, rubbing them dry, wiping them with hay, cooling them out, and finally

watering them. This captain, although he lost another horse after reaching his stables, and although it took the death of one horse to give him the danger signal, thereafter displayed sound judgment and good horsemanship that probably saved the lives of a number of his horses.

The other battery had lost two horses before it fed grain at about 1:30 PM. Within an hour after feeding it had lost a third one. However, it pushed ahead, although a little more slowly. Before reaching its stables, however, it had dropped seven more horses along the road. Four others died later. On arrival at its stables at about 8:30 PM. the animals, having been in harness for about 16 hours, received no rubbing down or grooming. They were turned into the corral, and the battery and its officers had all left the stable, according to the proceedings of the investigating board, by about 9:30 PM. A platoon commander of this battery, although some four or more of his horses perished, had noted during the entire march only one that seemed to be in distress. His ignorance of horseflesh made him valueless as a platoon commander at such a time.

The proceedings of the Board do not disclose whether the drivers and cannoneers performed the highly important duties prescribed for them at halts. This matter is well covered in Par. 240 of our present Field Manual. A supplementary paragraph taken from the 1916 Regulations (Par. 591) is as follows:

"In hot weather, especially on the march, it is very refreshing to the horse to have his eyes, nostrils, dock, and the inside of his hind quarters sponged with cool water."

On this march, watering appears to have been done in such way as to occasion no criticism.

"Never water a horse when heated unless the exercise or march is to be resumed immediately; if the exercise or

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march is to be resumed at once, water will be of the greatest benefit to the horse no matter how heated he may be."

There is one further lesson that should be mentioned with respect to this march. A rule so traditional in the Field Artillery, in fact in the Army, as to need no written regulation, requires a battery commander, on the occasion of unusual effort on the part of his unit, to see, on its return to camp or garrison, that the animals are thoroughly cared for first, the men next, the officers next, the "old man" last. Similarly, although majors must not command batteries, nor colonels command batteries nor battalions, those two in their respective echelons, complete their supervision and observation, and are released to take care of themselves only when their commands have completed all duties incidental to the unusual effort of the day.

* * * *

During the late spring of 1939 another battalion of horse-drawn artillery was observed when it was nearing the completion of a march that extended over a period of about ten days.

This battalion disclosed a large number of sore backs and sore necks, together with a few sore shoulders.

Sore backs, sore necks, and sore shoulders are absolutely avoidable. No field artillery unit commander should tolerate them. Their presence indicates nothing in the world but ignorance or carelessness or both, on the part of officers, chiefs of sections and drivers. The knowledge required to avoid them is so little—while the vigilance to avoid them is so great!

Here again, the literature which gives us the best and most complete instruction on this subject is found in the 1916 Regulations, although our present Field Manual and Field Artillery Books Nos. 130 and 140 are very good.

Two important and essential things are to be remembered:

First, *animals must be in suitable physical condition for any march or any unusual effort they are called upon to perform;* and second, *"every sore, every injury, every abrasion of the skin is due to a certain definite cause, which, if removed, can produce no further effect."* (Par. 175, FA Book No. 140.)

"The condition of a full fed, hard worked horse is said to be hard; that of the horse underfed and overworked, poor; that of the fat horse doing no work, soft." The animal in poor or soft condition is not only less resistant to fatigue and disease, but he is far more liable to harness, saddle, shoulder, and neck galls or injuries than is the animal in good or hard condition. Moreover, an injury or sore, having once appeared, and having occasioned scar tissue in its healing, is predisposed to appear again, and therefore requires especial vigilance in preventing recurrence.

Animals can be gotten into condition only by a judicious combination of sufficient good food and sufficient healthy exercise in which the daily work is very gradually increased, and the conditioning schedule continued over a long period of time. Shoulders and backs and necks must be hardened by daily work in draft, this work being very gradually increased from day to day. Indirectly shoulders, backs, and necks are hardened, and wind and limbs strengthened by "conditioning trots" wherein daily trot periods should be very gradually increased from about 5 minutes at the beginning of the conditioning schedule to about 20 minutes at its end.

Ordinarily with animals handled and cared for as is habitual in our field artillery organizations, six weeks in the spring is a sufficient length of time to condition them for the customary marches of from 25 to 30 miles, which are usual for our batteries during the summer training period. However, if forced marches are planned, conditioning therefor must also be planned, and will require an additional two to six

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weeks. Conditioning cannot be hurried. "To crowd much work into a short time under the impression that it will add to condition cannot be too strongly condemned; it does not harden muscle on the animal, but tends to reduce his flesh, to irritate his temper, and to render him liable to chill on return from work." Sudden spurts of work, when animals are not in condition, or when they should be following a conditioning schedule that calls for a very gradual increase of work and effort, will likely bring down some animals with laminitis.

Condition, therefore, is something that *cannot be neglected*, if sores and galls are to be prevented.

"Every injury to the back, shoulders, or other parts of the body due to harness or saddlery is brought about by friction or by pressure, or by a combination of the two. Friction rubs and so wears the part away; pressure partly or entirely cuts off the blood supply and so strangles the tissues."

In any field artillery unit, backs blemished by white blotches of hair are constant reminders of ignorance or neglect or both, on the part of officers, chiefs of sections, and drivers.

All sores must be caught in their incipency, and the gear, that is, the harness or saddlery, readjusted in some way so as definitely to relieve the friction or pressure. Thus if your shoe pinches your foot and is giving you pain, you change to a different pair, thereby relieving the affected tissues, and preventing the formation of a corn.

Similarly if a back shows the slightest evidence of strangled tissues, there are several effective ways to relieve the pressure and to spread it more evenly over the whole back. The saddle may be changed or a different pad put under it. A

change in the adjustment of the quarter straps in some cases is a solution. In others the addition of another blanket, the rider's bed blanket, on top of the saddle blanket might be effective. At any rate an animal's saddlery must fit him comfortably or he will be as fretful and irritable as you would be in a pair of tight boots.

If the hair is wearing off the skin of the shoulder, indicating an incipient shoulder sore, a raising, or a lowering of the breast collar, or changing the breast collar, or padding it, will effectively prevent the development of an ugly gall.

There are plenty of ingenious ways in which the gear can be readjusted, and the ingenuity of officers, chiefs of section and drivers should thus be utilized so as to hold all animals to their work and keep them uninjured by their saddlery.

At the end of each day's work, the officer in charge of animals should personally inspect every animal. He should see specifically that no incipient saddle, shoulder, neck, or harness galls are forming, or if they are he should see that the animal's gear is refitted.

A tried and effective rule for such officer to have is that if he, at his daily inspection, discovers an incipient sore, before it is discovered and brought to his attention by the driver or the chief of section, these two receive some little disciplinary punishment. It soon is amazing how interested these soldiers become in keeping their animals unblemished and how rare it is that any disciplinary punishment proves necessary.

Field artillery officers should be indoctrinated with the principle that saddlery sores are a reproach to any unit that depends upon animals for its mobility.



Bombs Fell on North Carolina

BY GUY DONN FARRELL

Editorial Note—The author claims that in every major essential and practically all the minor ones—he thinks—this story is true, to the best of his recollection and belief. It happens that the editor is in a position to corroborate some of it, for he, too, was present, on the other side of the river, attending to matters of radio and panels. Awaiting the word from the flying field, between which and the bridge lay the town of Gilead, N. C., he recalls the first on-the-way message that came to his earphones. It was, "First flight has taken off. May there be no bomb in Gilead."

THE adjutant turned to me.

"And you'll go, too," he said.

"Better pack your roll this afternoon, and get going, so you can report to Major Jung tonight. He'll need you in the morning."

"Me? Why, I can't go—for Heaven's sake——" There were a number of good reasons. My sister, whom I hadn't seen in years, was coming down to spend Christmas; I had to sing in the choir; this would be young Guy's first Christmas—he was only eight months old; a father shouldn't be away from his son's first Christmas.

It occurred to me that, sound as these reasons were, they couldn't be expected to influence an adjutant. I guess nothing

could have influenced him much anyway; he had already turned to an armload of correspondence the sergeant major was laying on his desk.

And all this, I thought bitterly, for the sake of the world's most useless bridge. I tried to think of other bridges in the world's history that might have been on a par with this one for sheer nonutility. Nope. Other bridges had broken down, been blown up, or been burnt. People had destroyed them because they didn't want other people, whom they disliked, to have the use of them. But this one was going to be busted for fun. Not *my* fun.

This was nearly a dozen years ago. I kept no notes at the time; I have forgotten much of the details; but it happened about like this:

There was a nice, fairly new, steel-and-concrete highway bridge over the Pee Dee River in North Carolina, not far from Albemarle. A power project called for a dam downstream, and in the course of time it became apparent that the dam would back up the water and submerge the bridge. So a new bridge was built, 2,000 feet upstream, and, of course, higher. Now, what to do, if anything, with the old bridge before it submerged?

The highway engineers thought it would be nice if they tested their stress

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formulas by breaking down the old spans, just to see if they could. They would fill tanks with water until the whole thing collapsed. Somebody wrote about it in a technical journal, and the army engineers said "Hold on! No use letting a good bridge go to waste without our getting some demolition practice on it. How about letting us have a span or two to blow up with mines?"

Well, that was reasonable, and someone wrote that up, too. Then the airmen got curious and inquired whether there would be a few spans left over, in which case they would be more than pleased to lay down a few dozen eggs, of assorted sizes, up to 1100 pounds, on this bridge.

It was agreed to, and presently the artillery garrison at the post where I was stationed, 114 miles from the bridge by road, but only 65 airline, was notified that it would be the base and airdrome for this project, and furthermore, that it would furnish a large detachment of officers and men at the site of the bridge, for traffic control, headquarters, communications, reception of distinguished visitors, and the like of that.

Since such was to be the case, with artillerymen doing the housekeeping, how about assigning *us* some spans, too, and we would shoot off at them with 155 -mm. projectiles, weighing 90 pounds, and 240-mm. projectiles, weighing 350?

A hasty count showed that the number of spans did not exceed those already assigned to destruction by other means, but we were promised that if we were very, very good, and the efforts of our contemporaries were correspondingly bad, what was left of the bridge at the end of a week of *schrecklichkeit* should be ours, to do with what we would, for a space of two hours.

And I was going to be sent up there to take charge of traffic on the west, or Albemarle, side of the river.

I arrived late that night, in my own car, with a buffalo lap robe I'd borrowed from somebody, for this was a week before Christmas, and man, but it was cold. The camp site was near the bridge, and the bridge, of course, was near the river, and near rivers camps are low, and when they are low they are wet, and this one was.

Pine boughs made a pretense of catwalks across the bog, but inside the tents Sibley stoves were roaring, and it was not too bad. Van threw a couple of sticks in the stove and burnt his finger on the door. When his cussing slowed down to mere desultory fire, he drew a map on the back of an envelope with a charred stick.

"And am I glad to have but one more day of this misbegotten detail," said he, "and that from now on you are the boy with the brass ears, because I have a hunch this is going to get worse instead of better."

"How come?"

"Here's how come — look at this sketch. Here's the new bridge — never mind the old one; you'll never get a chance to see it—and the roads. This road, leading away from the river, goes to Albemarle, twelve miles away. This one, on the west bank, paralleling the stream, three-quarters of a mile from the bridge, peters out a mile north, but runs into Norwood four miles south. Right now, when the planes are dropping 25-pound sand-loaded bombs, all you have to do is keep people out of the zone between the Norwood road and the bridge. When they start dropping bigger stuff, you'll have to enlarge the danger zone."

"How do you keep 'em out?"

"You tell the folks that live in the area they'll have to get out for their own safety."

"Suppose they don't go?"

"Then the planes can't drop bombs, the schedule will be tied up, and who do you suppose will be responsible?"

"I suppose, after exhaustive investigation,

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the choice will fall on me."

"You have a very quick mind, Guy, and I dare say you'll last until Wednesday, this being Monday. It is hard, indeed, that one with his career just begun, you might say, has a probable certainty of having it blasted inside forty-eight hours. Thank God it isn't me, because tomorrow night I'll be gone. You, alas, will remain."

"'Alas' is a good word," I told him, "and I never thought so until now. But tell me—how do you handle traffic?"

"Very complicated: very complicated indeed. At first we just stopped people at either side of the bridge during the alternate half-hour periods when the planes are bombing. But people are powerful curious, Guy. When they were allowed to go through, those coming across from the other bridge would pull their cars into the sideroads on this side, then walk down to the bridge to see what was going on. So, when we get the 'phone call, at the crossroads, from the bridge, that it's safe to let traffic through, we pass about twenty cars; leave a guard to halt the rest; load up a truck with men, and follow the twenty cars down to the bridge, dropping off guards at the sideroads. When we meet the traffic-control outfit from the other side, at the center of the bridge, we follow *their* twenty cars up *our* road, picking up our guards. This morning a fellow stopped his car halfway up the hill; claimed he had a flat tire, and wanted me to go on and let him fix it. I had a hunch he'd let the air out as an excuse, but it didn't work, anyway. Poor fellow had to drive out of the area on the flat."

"Well," I said, as I undressed to the extent of loosening my shoelaces, and pulled my robe up to my chin, "thank you very much. I don't know when I've had such an interesting evening. Ever. Call me for breakfast."

I wasn't as composed as I tried to sound, but a certain cure for insomnia is a

tent in bitter weather, with firelight flickering on the yellow canvas, and a light breeze rattling the stove pipe against the tent chains. Particularly if one has previously attained a nice, close chiffon-like atmosphere.

The next minute it was time to get up, and an orderly was trying to light a fire with wet wood. I didn't have time to observe this difficult and delicate task because Van was urging me to hurry—it was all of four o'clock, and if we didn't get us a cup of coffee right away it would be too late, because the truck was waiting.

"Scoff and off, fellow!" he shouted, but I wouldn't mount the trembling old 1918 model until I had a second cup. We were trembling ourselves, with the chill—ten above zero, in the sunny South, is cold—and when occasionally the truck and the truckload got into resonance, the effect was really something.

"What in hell is that?" I asked him as we crossed the new bridge to take up our toil, and I pointed at the balustrades, which, in the moonless night, seemed to be muffled in something on the downstream side.

"Sandbags," he told me. "All sandbags. All along here. Seven movie men have their set-ups here, and scores of big shots, by special permission from The Great White Father, ensconce themselves in these sheltered alcoves to watch the bombs go boom—or rather splash, since they won't drop warheads until today. By the end of the week large fragments may whizz by here; hence, sandbags."

"Hence," I added, "crowds of youth and chivalry on the bridge and the *tour* (plural for *tourus*) wondering why they can't stop and see the show too."

"Right," said Van. "Something you'll explain to them when they ask you—as they will."

We had crossed the bridge now and were halfway up the mile-long hill on what was to be *my* side. We stopped in

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front of a halfway house, which was run by a Mr. Hamburger.

"Mr. Hamburger wasn't doing any too well, anyhow," said Van. "So when I told him he couldn't do any business this week between the hours of 5:00 AM and 5:00 PM, he said that was fine; this was the time of year he hunted rabbits and drank whisky anyhow. He moved out and I haven't seen him since, but I always stop here and knock on the door, just on suspicion. This is in the danger zone."

No one answered the door and we moved on, off the road, down trails, and across two little streams, to the house of Mr. Woodlot. Mr. Woodlot and his family were among the very nicest people in this very nice neighborhood. They had a house, not in too good repair, two cows, some chickens and three assorted children. They were dressing the yawning, sleepy-eyed children when we entered, and invited us to have breakfast with them.

"Just had some," said Van, cheerily, "thanks. Same thing every morning now, Mr. Woodlot—come to your house when Christians ought to be sleeping, and ask you to be out of here by 5:30. The lieutenant here will be doing it from now on."

"Glad to meet you, Lieutenant," said Mr. Woodlot and Mrs. Woodlot. "Be seein' you."

"It's tough," said Van, as we left. "Their stock will be left unattended all day; the fire will be out when they return; Woodlot can't do any work; they'll just hole up with friends or neighbors until sundown."

"Do they get any payment for this?"

"I don't know. And don't you promise them any, or you'll be paying it yourself. There was a rumor around that the state highway patrolmen would handle this end of it. I haven't seen one of them."

"But look here. What right have I to ask these people to leave their homes?"

"No right in the world, my good man. Nor any shadow of authority. All you can do is ask them. Your job is to see that they are not present in a dangerous area. You are, presumably, saving lives—under orders."

I have not Van's breeziness and assurance, and I could see that my job had been made much easier by his missionary work in my allotted field. My friends of the danger zone could not have been any more impressed with Van's power to order what he requested, had he been the President.

We proceeded around and about, routing out the Pineknobs, the Elmtrees, and the Brickhouses. Mrs. Brickhouse was in better financial straits, apparently, than her neighbors, and she was correspondingly less accommodating.

"I predict trouble from Mrs. Brickhouse," said Van, as we left. "Trouble—and for you." We had not been invited in to warm ourselves, as had elsewhere been the custom.

The truck turned back to the main road, and shortly we were at the crossroads, where we piled out. Our communication detail, Sergeant Hill and Corporal Dale, attached their telephone to the field wire connected with the bridge, and joined us at the fire, already built by Corporal Griddle, who had preceded us on his motorcycle. Corporal Griddle was red-haired, short, compact. He had a 45 automatic in his holster, and a band, "MP," on his arm. Corporal Griddle, under our direction, was to be the Law West of the Pee Dee, and you could tell he took it seriously.

Mr. Crossroads, who lived not far away, strolled down and joined in the conversation. Mr. Drinkstand, who had a small pop emporium there, did also.

"Mr. Drinkstand, here," said Van, "is so pleased with the arrangement whereby we keep long lines of cars parked opposite his stand that he has offered to share the profits with me."

"No sir," said Drinkstand. "No such

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of a thing. I'm a-keeping all the profits myself. But I am right obliged to you fellers. Few days more and I'll be a blooming bondholder. How long is this here a-going to keep up?"

"I can stop it with a word," said Van. "But I'm leaving here at noon. You'll have to prevail on this officer here."

It was nearly eight o'clock now. A fine frosty sun was up, and an occasional car had passed by.

"Line test," said Sergeant Hill, on the 'phone. "What's that? OK. Close traffic. Acknowledged."

By 8:30 ten cars were in line, and more were coming. The occupants climbed out to inquire the reason for their stoppage. Most were courteous; some were timid, and asked of others; a few were angry, and asked ingratically; all asked. Startled comments arose in the background.

"They're bombing the bridge . . . you're nuts, there's no war on . . . there is, too—see those soldiers? . . . when'd it happen? . . . Who we fightin'? . . . Aw, why don't you read the papers—the planes are just bombing the bridge for practice . . . but how'll we get across? . . . not this bridge, the old one . . . why can't we cross this one, then . . . 'tain't safe . . . (the drone of planes rose in the distance) . . . hey! There they come . . . let's go down and look!"

"Sorry, folks, no one's allowed beyond this point until we get word from the bridge."

"How long'll that be?"

"We never know. Sometimes twenty minutes; sometimes an hour. We'll pass you right through as soon as it's safe. Sorry."

Sorry . . . sorry . . . sorry . . . very sorry . . . I know . . . Even if you *are* a personal friend of the Governor, I can't do a thing about it . . . sorry. Yes, sir, I'd suggest your Congressman if you wish to make a complaint. He'd be the one, yes sir. No sir, he probably couldn't get any action in time. Sorry. You're in a hurry to get the

baby to a doctor, ma'am? I'll get some action on that right away. We have doctors at the bridge camp. Sergeant Hill—call up the bridge and have them send a medical officer up here right away. There's a sick baby—Oh, you don't want a soldier doctor? You want your own doctor? I'm sorry, madam, it will be just a few minutes — OK, Sergeant Hill. Traffic open. Acknowledge. Go ahead, folks. Traffic open for five minutes? Let 'em all through, but watch the time."

Three planes had passed and wheeled, and a rattle of small bombs made an interesting sound. People ran to their cars; jumped in; were off. Griddle led the way; we followed in the truck, shoeing the reluctant sightseers (including the woman with the sick baby, who was very exasperated that she couldn't stop and watch, just for a *moment*), posting Hill and Dale at the side-road exits, and proceeding to the bridge.

Cameramen had ceased grinding; newspapermen and other privileged characters were shuffling about trying to keep warm. A panel detail shifted the white cloths to new signaling positions; a radio operator spoke his monotonous piece; a party of technical observers were loading cameras into a truck—one of the small bombs had struck the bridge, and they were going down to get a picture of the effect. Major Jung, the Head Man of this project, hailed me from a sandbagged booth, and said traffic would remain open for about twenty minutes. We sent the truck back up to tell Hill to go to his phone; we'd have him halt traffic and then we'd clean up the route on our way back, when the word came.

It was like this all day, but in the afternoon I had a surprise. Frank jumped out of a newly arrived bus and said he had orders to report to me.

"Glad to have you here for company, Frank. Stick around and see the fun. I'm the senior here, so I'm responsible,

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you lucky devil. Unfortunately I'm not senior enough to have you do the work while I operate this job by remote control from the bridge. I wish I were. In the meantime, you are hereby appointed subsistence officer, as of even date. See if you can rustle up a drop of the creature agin the chill."

"Look here, Guy. If Frank's on the job. I'll go. You know your way around by now, don't you?"

"Goodby, Van. See you in cinders sometime."

When day was done, and shadows fell, I didn't try to herd the refugees back to the cold firesides from which I had driven them in the morning. I knew they'd find their way home all right. The men detached their phone, put out the fire, and crawled into the truck. Mr. Drinkstand closed the shutters of his emporium and the short bursts of fire he had been playing on his cash register all day, now and then interspersed with the refrain from "All policemen have big feet," ceased. The traffic sped by swiftly and unimpeded. I looked around for Frank.

He appeared about then, and with a doleful expression. "Did it ever occur to you," he asked, "that a fellow wearing a uniform is a Government man? There must be gallons of the wine of the country around here, but no one will turn hit a-loose."

"Never mind the details. Lieutenant." I told him. "All I want is results. Get some corn squeezin's to this CP by tomorrow noon or show me 50 percent casualties."

I showed him some that night, as we toasted our socks around the Sibley.

"Tomorrow," I said, "you're It."

"Why you buck-passin' So-and-So—what'll *you* be doing?"

"I'm going to take my own car and make a personal reconnaissance."

"What for?"

"I'm going to make certain that the people Van showed me to move out are

the only ones in the zone. Moreover, I'm going to take a census of the stock in the area, so I'll be fortified when, as, and if, the Mixed Claims commission meets."

"It's the very swellest alibi I ever heard of. It's puncture proof. Be my defense counsel sometime, will you?"

"I will," I promised him. "And soon."

But who was *I* going to use for attorney—just in case? I decided to draw a sketch of the zone and plot in the houses, roughly to scale and distance from the bridge. The bridge was still intact. The airmen were sharpening their eyes with small stuff, and on a tough target, too. They had been assigned a span on the west (or Farrell) shore. For safety purposes they flew streamwise, which gave them a very restricted shot. Ordinarily they'd bomb in the direction of the bridge, which would reduce their range dispersion.

What *was* the all-around dispersion anyway? What was the pattern at various heights, and at what heights were they going to bomb? It made a difference to me, who held the sack for the safety of the refugees. If a bomb stuck for a minute in the bombrack, it wouldn't make a great deal of difference to the shore, as the flyer would still be headed upstream. Of course, he was flying, too, toward the observer's bridge, 2000 feet distant, but the care of the observers was not on my shoulders. Broader and more capable ones were bearing that burden. But could anything happen sideways—so to speak? I decided it was not very likely that it could.

But how about that artillery firing? Here it was Wednesday evening, and Saturday, I knew, the guns would fire from the east shore. The data would be computed, of course, down to the last pore on a gnat's heel. But suppose the shells took a wicked bounce off the bridge or water, and landed in my backyard?

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Not very likely either. Yet I had taken part in some shooting on the water in Hawaii, and seen light artillery projectiles hit a wave at such an angle they ricocheted quite a distance beyond the expected point of burst. I decided to look into this.

I found that the matter had been anticipated, naturally. A 155-mm. howitzer had been emplaced so as to deliver fire with as steep an angle of fall as possible. The elevation was to be above 45 degrees. The howitzer wasn't constructed to do it, so it would be necessary to cock the piece up at an angle, in a specially prepared position, with a sunken trail. Then, because regulations forbade firing over the heads of persons, and it was not possible to move the piece back far enough from the river to hit the bridge from the position desired, except with specially reduced charges, the ballisticians of the regiment had previously done some trial firing with locally reduced charges and had modified the range-table elevations as a result. The projectiles, I learned, would fall very steeply in consequence, and since one doesn't encounter high waves on a river, the probability of ricochets was nearly negligible.

Yes . . . BUT!

The 240-mm. howitzer people were equally emphatic.

They *could* fire above 45 degrees, and would guarantee an angle of fall considerably greater than that.

I went to see Major Jung. "Is it your considered opinion." I asked this very much harassed man, "that it is a dead cinch these projectiles won't bounce off the target into my bailiwick?"

"It is not a dead cinch the sun will rise tomorrow morning."

"Well, should I move any more of the habitants from their homes and firesides than those within the area I have included on this sketch?"

"As I recall your instructions. Lieutenant—which, by the way, were not

issued by me—they said you were responsible for the safety of the people on your side of the bridge. Read 'em and weep."

This was true. In the Army you don't pass the buck, either up or down. You fondle it. In effect. I had been told that the situation was one where a superior, who had been asked for advice, was willing to give some if he had any, but was freshly out of that commodity because his own experience did not justify his superseding the judgment of one who, in the special circumstances, had more experience than he, since I was an artilleryman and he was not.

Was I to cause more people a certain and severe inconvenience, in order to remove an extremely remote chance that they would be killed or dangerously injured? This was something to sleep over, and I did.

In the morning I decided to compromise. There were three houses very near the crossroads, whose tenants I hadn't yet bothered. There were no more within 400 yards. If I got these three out, we'd have what I considered a good safe backing against errors.

I told Mr. Crossroads about this—that he, too, undisturbed so far, would have to move Saturday morning.

"Gosh, Cap'n, I hate to have to do it," he said.

"Can't be helped." I assured him.

"Well, if I must. I must, seems like," he said resignedly.

Mr. Drinkstand was up in arms.

"You mean you ain't a-going to holt them cars opposite my place Saturday?"

"No. we're going to halt all cars a half-mile farther up the road, and you'll have to get out early in the morning, I'm afraid."

"Why dang it, that's Christmas Eve, and people will be all over this road, and I expected to do a mint o' business, and how can I do it if my shop's closed?"

"Why don't you pack up some drinks and stuff that morning and move it up

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to the new halting place? I'm just as anxious to keep the drivers amused and entertained as you are. Furthermore, traffic will be stopped there for a solid two-hour period that afternoon."

"Oh, man—that's great! Won't hear no more holler from me."

The remaining family assured me they were going away for the week-end, so that would be all right with them. Fine.

I proceeded with my stock census and finished it about noon. For a distance of several hundred yards from the crossroads, as I returned, I could hear the high, excited hum of voices from the waiting cars, the imperturbable Frank in the midst of the throng, parrying their monotonous questions.

A salvo of heavy blasts from the bridge signalled that traffic would be opened soon, and the drivers returned to their cars.

"No squeezin's, no casualties, and no regrets," said Frank, belligerently.

"No what?"

"No, sir."

"That's better. Go sit down by the fire and I'll take over."

That day was much like others—hell in a rush hour. Our noncoms, comfortably snuggled next to the fire, nursing the field phone, had grown tired of their principal amusement, watching their superiors' embarrassment. Now and then we caught a sympathetic glance from their bored faces. Corporal Dale, a boxer of note, had even mumbled to me that the next fresh guy who didn't know enough to be polite to people who were only doing what they were told—"I'll bust him for the lieutenant, sir. It'd be a pleasure, sir."

We assured him that when and if we broke under the strain we would do our own busting. But I understood Frank's grin. This is the sort of thing that makes soldiering, which can be downright unpleasant at times, more enjoyable as it

becomes less pleasant. Or have I made myself clear?

But that day was over, eventually. Just two more to go. As we passed over the observing bridge, on the way homeward, we heard tales of fragments, from the big 600 - pounders, which had whizzed fearfully close. The target bridge looked a little damaged too. It was still up, but it looked a bit frayed around the edges, and sections of the balustrade were missing.

Next morning Mr. Crossroads assailed me.

"I just can't move tomorrow, Cap'n, that's all there is to it."

"Why not?"

"Well, for one thing, there's my old mother, 80 years old, just gittin' over a touch of pneumonia. She says she'd rather be shot than move, and I got to git to town to get her some medicine. So long."

"You mean that vigorous old lady that just went to the well for a pail of water a few minutes ago? Why, I've got a closed car here, and a lap robe, and tomorrow morning I'll load her into it, at six o'clock, and take her to your brother's house down the road."

"Well, that ain't all. There's an old aunt of mine—or some kind of kin, I reckon—lives with us. Just between you and me she's a morphine fien', and that's why I'm in a hurry to git to town and git her some. Be seein' you."

"No difference. I'll take her along with your mother."

"But that ain't *all*, I tell you. This aunt, she's got a daughter, lives with us too. She has this here epilepsy, and if'n she was to take down with a epilepsy fit in that car o' yourn, Oh, man, Oh *man!* I got to take off for town right now and git somethin' for the three o' them."

"Listen here, Mr. Crossroads," I told him, sternly, "Tomorrow morning, at six, have them ready. I'll take them to your brother's place. Tomorrow night, at six, I'll bring them back. That's all."

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"LISTEN HERE, MR. CROSSROADS," I TOLD HIM, STERNLY

That day, too, passed. At intervals the high whine of planes was punctuated with sullen booms that rocked the cars, gently, on their springs, a mile away. Now all the customers had to do was to listen to one of those, and their anxiety to get down to the bridge was considerably lessened.

But Saturday, the morrow, was the big day, when the planes would drop 1100-pounders in the morning, and then the bridge would be closed all afternoon for the artillery firing. And this on Christmas Eve, when the road, a state highway, would be thronged with traffic. Leave your windows open. I cautioned the householders, else the reverberations might shatter the panes. This, too, helped to make me popular among the dispossessed, facing

the prospect of returning, not only to cold firesides, but to drafty houses.

I had done everything I could think of, but ominous premonitions assailed me. Nonsense, I argued with myself, that sinking feeling in the pit of my stomach was due to too much gulped food; those frazzled nerves to more coffee than was good for me; those weak knees—what was it Turenne had said? Oh yes, "Tremble, knees; if you knew where I were taking you, you would tremble more." A wisecracker, hey? I wished the old Duc had my job for a few minutes. He hadn't anything more formidable to face than death in battle. "Dulce" (and something) "pro patria mori." Damned right. Damned dulce—in

comparison with what I faced if anything went wrong—even if everything went right. I was sick unto death of meeting the public. In a moment of panic I rushed to headquarters to see if by chance orders for my relief had arrived. They hadn't. I went to the medico and coughed pitifully in an attempt to extract some spiritus frumenti for my drooping morale. The medico had a hard face, no bedside manner—worse, no spirits. To hell with him. To hell with everybody. I drank three scalding cups of coffee and fell fast asleep.

"Merry Christmas to YOU, Merry Christmas to YOU." Frank was singing cheerfully, waving a sock gently back and forth in the yellow glow of the Sibley.

"To you, too, you nerveless and blackhearted son of slum and gravy." I told him, pulling my pants on one leg at a time, even as Washington, Scott, Grant, and Pershing, my distinguished predecessors, must have done.

Weather cold; track fast. Mr. Woodlot was swinging an axe by lantern light as we drove into his yard. "Go on in, boys,

go on in—get yourselves a cup of coffee," he shouted. "We're fixing to leave in five minutes."

"You're a swell guy. Mr. Woodlot." I told him, "and this is goodbye to you and a Merry Christmas, because, God willing, this is the last time you'll be seeing me."

He grinned. "Come again some time when we can *all* stay longer," he shouted. He was a sound citizen. I'd like to meet him and his sturdy brood again.

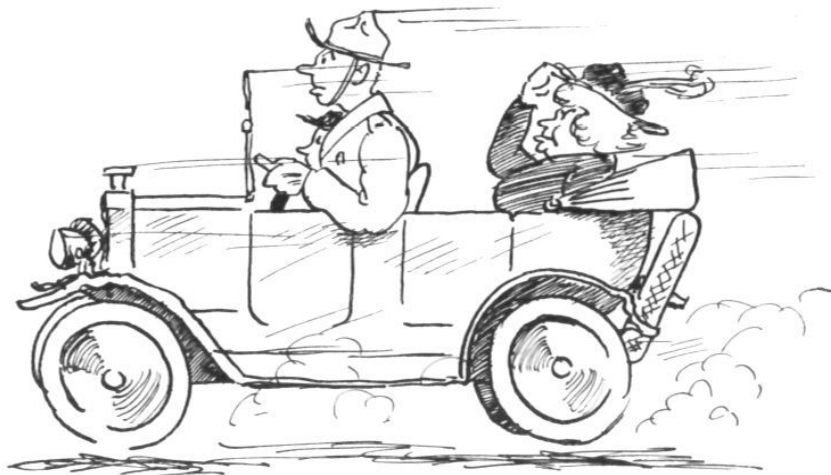
Mrs. Brickhouse was balky. "I declare," she said, "I don't want to move out of my house Christmas Eve. I just won't do it, that's all."

I let my eyes open to their fullest extent and assumed my most shocked expression. It must have terrified the lady. "Well, all right," she grumbled, "we're leaving, but you haven't heard the last of this."

The door slammed, and we were away.

At last it came time to knock on Mr. Crossroad's door.

It opened, and out filed, in order, Mr. Crossroads (very glum, with a shotgun on his shoulder. He walked past me and disappeared into the woods without



MRS. BRICKHOUSE WAS BALKY

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saying a word), an elderly lady, a middle-aged lady, and a youngish lady. All were silent and paid no heed to my cheerful bustling about. I piled them into the car; tucked the robe about them; drove four miles; herded my cargo onto a porch; hastened back to my post, thinking, "They were everything he claimed—and I thought he was giving me the run-around!"

Frank had things organized at the crossroads. We took up our noisy vigil. Big stuff was dropping this morning, and on our regular trips to the bridge between bombings we could see the shattered span that marked a hit. The observers were hunchbacked. Evidently they had pulled in their necks when the big eggs dropped just 700 yards away, and hadn't been able to straighten them out yet. Traffic surged through twice or three times, and then the word came that the bombing was over—the bombardment squadron was on its way back to the base, and now there would be nothing more until 1:30, at which time traffic would close until further orders, while the artillery adjusted. Splendid.

We posted a man in Albemarle, 12 miles away, whose orders were to *try* to halt cars, beginning at 1:15 PM, and advise them to take an alternative route. We posted another man on the Norwood road for the same purpose.

Then, our eyes gleaming, we turned to Corporal Griddle.

"Now, Griddle, you go three-quarters of a mile down the Albemarle road, and halt the cars at the Bull Durham sign there. Take another man with you to help. Keep communication with us by motorcycle."

"You're not going to run the phone line up there, sir?"

"That's right—we're not. This crossroads is our nerve center and our CP. Posts. Now, Frank, let us lunch at leisure, while the angry mob is held at bay by Corporal Griddle, whose surreptitious amusement at our frequent discomfiture

this last week has now and then plucked a sour chord from my heartstrings."

This was swell. I moved closer to the fire and began on a sandwich. Horns croaked incessantly up-road, and we chuckled over a mental picture of Griddle. The guns began. We were much too far to hear the whine of fragments, but we could clearly distinguish the characteristic shell burst, with the "click" that just precedes the "CRASH!" I think it was Frank who said it always sounded to him like a million dollars' worth of ten-cent-store china dropped a mile to a concrete floor, with one platter six inches in advance.

Peace. Perfect peace. The lighter howitzers had completed their adjustment; their fire for effect. The 9½-inch big babies had just begun to grunt. We were dropping off in a doze when there came a hell of a pop-popping from the west and Lochinvar Griddle slammed the brakes down hard.

"Did you hear that shooting up the road?" he inquired, breathlessly.

Of course we'd heard shooting. Rabbit hunters had sauntered along on the fringe of the zone all morning.

"What about it?"

"Listen. Lieutenant," said the corporal, his eyes round, "there's a million cars up there, and a million people, and a flock of drunks is having a gun duel right across the road, with the people between 'em!"

"Come on, Frank, let's get shot," I told him, and we hopped into my car and headed for the scene.

There were slightly less than a million cars, but about twice that many people and they all ran toward us when we arrived. After we got them calmed down, we made out something like this:

There's a fellow with a shotgun—lives in that cabin—see it?—just south the road, 'bout 75 yards?—he got into an argument with a couple guys that had a pistol, just north the road. The guy with the shotgun, he shoots one the guys

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north the road right in the guts. They taken him to the hospital in Albemarle—somebody, I don't know who. The other guy, north the road, he says he'll get the guy that done the shooting. He takes off through the woods. The shotgun guy, he takes off south the road, by his cabin, I guess. The sheriff's comin'!

We had to do something, of course, even if we had less authority to mix in than anyone else in the fracas.

"Let's go down to the cabin," I suggested to Frank, and as we started, Griddle ran after Frank and thrust his 45 automatic into his hand. "Don't take it," I advised him, but he did, sliding it into his pants pocket.

The cabin was a little one, the door ajar. We approached warily, from a flank, and peered in. It was empty.

What to do? We beat the woods, and presently, coming over a hillpath toward us, strode a young fellow with a shotgun over his shoulder. He was still some hundred or so yards distant, and I remember asking Frank, nervously, what was the range of a shotgun. I didn't, at that time, know.

"Put down your gun!" shouted Frank.

The boy paid no heed.

"Put down your gun!" We both shouted this time, and I think my voice was a little on the high side.

The lad halted. "I hain't gonna come no further," he announced defiantly.

Nothing could have suited us better. We advanced and grabbed him, Frank taking the gun, I frisking him for shells, and he collapsed like an old suit of clothes and burst into tears.

"I couldn't take it no more," he wailed. "He was a-slappin' me down and a-slappin' me down all the time. I got no right to keep takin' it from him all the time like I did."

The crowd surrounded us. I drove them back.

"Now, folks, you just go back up on the road and let us handle this. We can't do it if you get in the way."

They retreated obediently, around the cabin, and right back in front where our prisoner was. A long-goateed oldster argued with him.

"Willie, what-for in God's name did you go to shoot that feller? Willie, why did you, now? Tell me."

This would never do. I brought the captive to the road, sat him, weeping, in the back seat of my car, and closed the doors, awaiting the sheriff. I pulled down the curtains, too, for I feared the pressure of a hundred noses would shatter the panes. Three dozen people who said they were Willie's relatives insisted on shouting questions at him, but I got them appeased by telling them that Willie was entitled to a lawyer, and shouldn't be asked anything, in fairness, until he had one. My staff bustled around getting the names and addresses of witnesses. Or trying to.

Presently the sheriff arrived, smiling, calm, and judicious. "Mighty nice of you boys," he remarked. "Here, I'll take him off your hands."

We tore back to the bridge and I hopped to the 'phone.

"Major Jung, tell the general we had a small riot up the road a ways. One civilian shot another. The wounded man's on his way to the hospital; we've turned over the man who did the shooting to the sheriff. That's why we weren't at the 'phone the last half hour."

There was a short pause.

"The general says: Very good. Quite right."

We breathed long sighs of relief. But what about that other man, with the pistol, presumably gunning for somebody? Frank had picked up a description of him from the bystanders—quite large, a giant, wore a green velours hat, dressed in Sunday clothes, carried a handbag, drunk.

I listened to the description as I munched my interrupted sandwich, vaguely aware that something was causing me uneasiness. What could it be?

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WE TIPTOED AFTER THE DOOMED MAN

Oh, yes. There was a man walking down the road, between us and the bridge. What was wrong with that? It came to me, suddenly. No one should be here but ourselves; this was forbidden ground. But that was not all. The man was big, he wore a green hat, he carried a handbag.

"There he goes," I shouted. We leaped to our feet. The man was nearly 200 yards away now. He had craftily circumvented our outpost by passing north of it.

"Tell you what we'll do," I said. "Frank, you get in the front seat of my car with me. Hill and Dale, you get on the running-board. We'll coast down behind him. When we get close, I'll nod my head. You two jump out and grab him and we'll

follow and help you. All set?"

We slid silently down the hill toward our prey. He never turned his head. He didn't stagger, but he walked with slightly exaggerated precision down the exact middle of the road, never changing his pace, or giving any indication he was aware of our presence. I stopped the car; nodded my head. The noncoms got off slowly and stood still.

"Why didn't you jump when I nodded?" I whispered fiercely to Dale.

"I thought you said you was going to *shake* your head, sir," he whispered back.

We four conspirators tiptoed after the doomed man, and I would give six months' pay to have a movie of us doing

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it. Eventually we were so close there was nothing else but to gang him, and we did. He, too, collapsed and shed a bitter tear or so.

He had a .38 in the handbag, and marvel of marvels, a half-gallon bottle of sheerest white Old Busthead, vintage of day before yesterday. I emptied the pistol in my most officious manner, meanwhile noting with what consummate skill Frank deposited the bottle in the car luggage container without the men seeing it.

We were fairly close to the bridge, and the resounding burst of a 240-mm. shell reminded us. Frank and I in front, the captive between Hill and Dale in the back seat, we set sail for Albemarle at 50 miles an hour, hoping to overtake the sheriff and present him with another prisoner. We were pretty proud of ourselves, and waved gaily to Corporal Griddle as we passed him, neck-deep in customers, at the head of an interminable line of cars. At the outskirts of the town we picked up our sentry, very mournful because none of the car drivers he had hailed would heed his admonitions.

We paused at a street intersection, uncertain which way to turn. The prisoner roused himself and spoke his first word.

"Looking for the jail?"

"Why—yes."

"Two blocks to the right and turn right."

"Well—much obliged."

We made the second turn to the right—and got arrested for running over a fire-hose.

In only slightly less detailed form. I have told this story to former friends—former, because it is at this point they get up disgustedly and move away. But, so help me, Hannah, the jail was on fire.

A pair of Christmas Eve drunks had made themselves so obnoxious, in their second-story cells, eventually setting fire to their mattresses, that the fire department was called and was then

engaged in shooting below-freezing water into their cell windows from the street. And the cries of the outraged inmates had attracted the townfolk in great numbers. They were bent on learning new words, and it was a great pity we were too busy at the time to improve our own opportunities.

Listening to our excited story, the cop peered in at the prisoner.

"Why, I know *him*," he said, cheerfully. "He's a regular customer. Where you been, George? Ain't seen you in a week. But hold on, here. What charge you puttin' against him?"

I passed over the pistol, cartridges, and empty handbag. "Take him." I said hastily, "for—for—well, for being in a forbidden area."

"Okay," said the officer. "Come along. George. We got your old room waitin' for you."

Back again, at 50 miles an hour, to the now deserted telephone. Again I asked the major to report our actions to the general. The major seemed a bit testy this time. The general did, too.

"The general says," I was told, "Very good. Quite right. He also says—In the future will you please make an earnest effort to apply yourself less to the internal affairs of the State of North Carolina and more to the duties with which you are charged? End of message."

Ah, well. If the general reads this, he'll be hearing the story for the first time.

We administered a restorative to each other and piled some more wood on the fire. We seen our duty and we done it noble, anyhow, and it appeared there was nothing to worry about save the probability of being called back for witnesses at a possible trial. But here came Griddle again, followed in trace by an imposing-looking car, from which an equally imposing gentleman debussed.

"Take him, Frank. I'm going to finish

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this twice-interrupted sandwich, or else."

"This here's a guy got special permission to go to the bridge," muttered Griddle.

"Has he, indeed?" says my bold Frank, bristling. "Where is it?"

The gentleman was very suave, very persuasive. His good friend, the general, had personally invited him to drop in any time. He had been held up back on the road with the rest of the traffic, but he understood that was our duty—we didn't know he was coming. If he was a personal friend of the general, would he like to talk to him on the 'phone? Oh, not for the world would he disturb the general at so busy a time. Ha, ha. Just permit him to pass, please, and he'd mention our cooperation to the general. No, he had no credentials. Well, then, if we were so distressingly literal about our orders—a pity we couldn't exercise some discretion and initiative—he'd just wait right there until traffic was open.

"Oh, no, you won't," said Frank. "There are God knows how many people up there who saw you come down, and we're playing fair with them. Corporal Griddle, escort this gentleman back up the road, and to the end of the line, mind—and if anybody else tries to get by you, just shoot them lightly in the leg." He winked.

"Why did you say 'lightly'?" I grumbled, but just about that time the

firing was over. Church was out.

Oh. *boy!*

We kicked the fire out; took a final swig. Frank shepherded the detail home. I drove to pick up the Crossroads family, who entered my car silently and alighted from it in the same way, an elderly lady, a middle-aged lady, a youngish lady. In the gathering dusk. Mr. Crossroads appeared, shotgun over shoulder, and paid no heed to the "Merry Christmas" I ventured. I didn't blame him.

Major Tommy presided at mess. "I don't think the traffic detail had better go, yet," he said.

Major Jung said, "Why not?"

Major Tommy: "There might be things to do and—" he looked around to see Ernie, commanding the east shore, holding the water pitcher over his head.

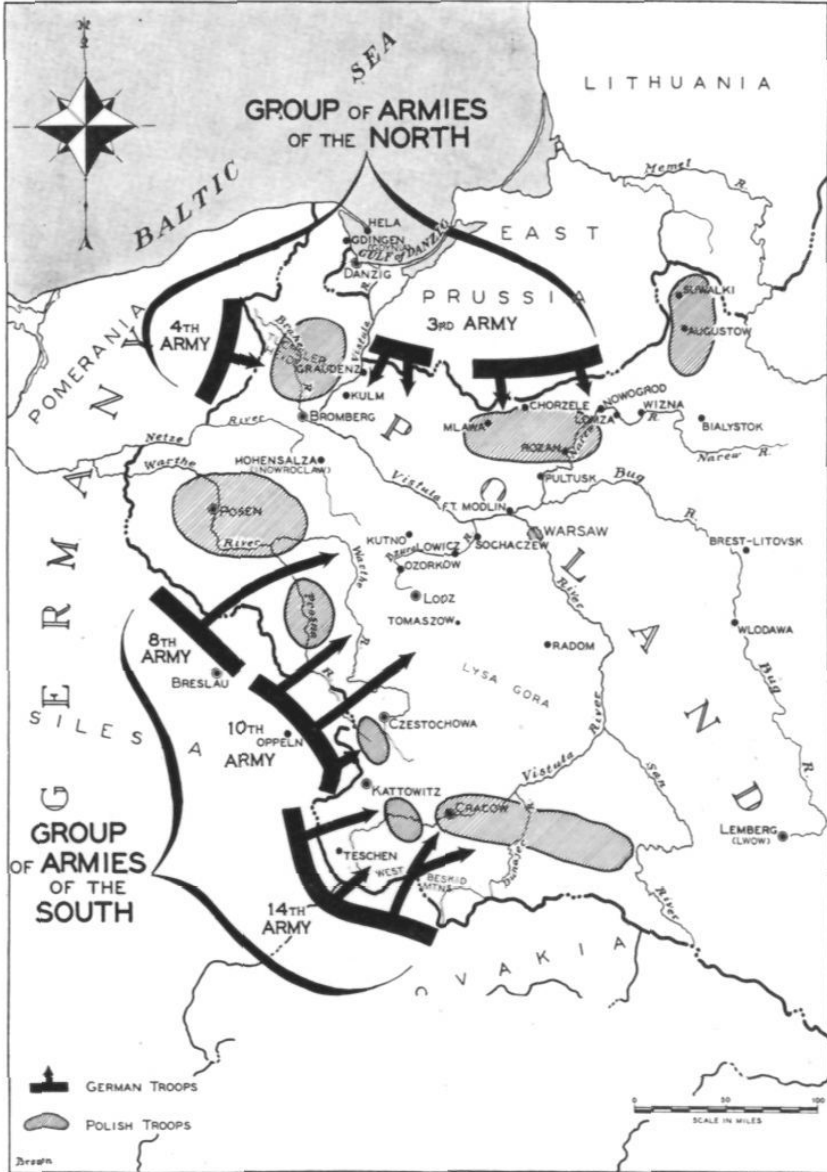
We were released, Ernie, Frank, and I. We headed homeward, caroling a merry stave.

"You have a very fine bass voice, Guy," said Ernie. "I don't think a better bass could be selected by throwing a stone into a large crowd."

"Nuts to you, fellow. If I can get three more miles an hour out of this crate I'll be home at midnight in time to sing in the choir."

I was.





MAP 1: THE PLAN

The German Campaign in Poland

BY LIEUTENANT COLONEL VON WEDEL
General Staff Corps, German Army

THIS article confines itself to an account of the military campaign in Poland during September, 1939. It must be left to history to pass judgment on the entire ramifications of these events.

On the basis of der Führer's directives the commanders in chief of the Army, Navy, and Air Force launched and conducted the campaign.

The Land Operations

In compliance with instructions issued by Colonel General von Brauchitsch, commander in chief of the Army, the operations of the German forces began at 4:45 AM, September 1, 1939. Two groups of armies had been organized to carry out the operations:

(1) The Group of Armies of the South, under the command of Colonel General von Rundstedt;

(2) The Group of Armies of the North, under the command of Colonel General von Bock.

The southern army group comprised three armies: the Fourteenth Army, commanded by Colonel General List; the Tenth, commanded by General von Reichenau; and the Eighth, commanded by General Blaskowitz.

The northern group included two armies; the Fourth, under General von Kluge; and the Third, with General von Küchler in command.

The operations in Poland were designed to destroy as much as possible of the Polish Army in the territory west of the Vistula. Furthermore, by advancing the exterior flanks in the north and south so that they would extend to the country beyond the Vistula, the High Command intended to prevent from the outset any Polish attempt to establish a defensive

line along the banks of the Vistula.

In a war which would find Germany engaged on two fronts, the Polish High Command had hoped to conduct a successful defensive until the support promised by Great Britain had taken effect. The Polish General Staff also intended to assume the offensive and defeat certain parts of the German forces on the Eastern Front.

The Polish concentration took place in four armies. Resting on the strongly fortified line of the Narew, the Polish Army of the North concentrated its forces in the area between Lomza and Mława. German intelligence reports indicated that it intended to invade East Prussia from the south, simultaneously with an attack on East Prussia by another Polish force from the east—that is, from the approximate region of Suwałki and Augustów.

A second strong Polish army was concentrated in the Corridor. Its mission was apparently to take Danzig by surprise and subsequently to invade East Prussia from that direction, jointly with the attacks delivered from the south and east.

To support the concentric offensive on Danzig and East Prussia, the largest Polish army was closely concentrated in the region of Posen. The province of Posen protrudes into German soil in the shape of a blunt wedge, flanking the southern boundary of the province of Pomerania and the northern limits of the province of Silesia. Should the Polish forces in Posen retain the initiative during the early days of the campaign, they would be a serious threat to the flanks of any German offensive

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MANHANDLING TRANSPORTATION ACROSS MUDDY ROADS

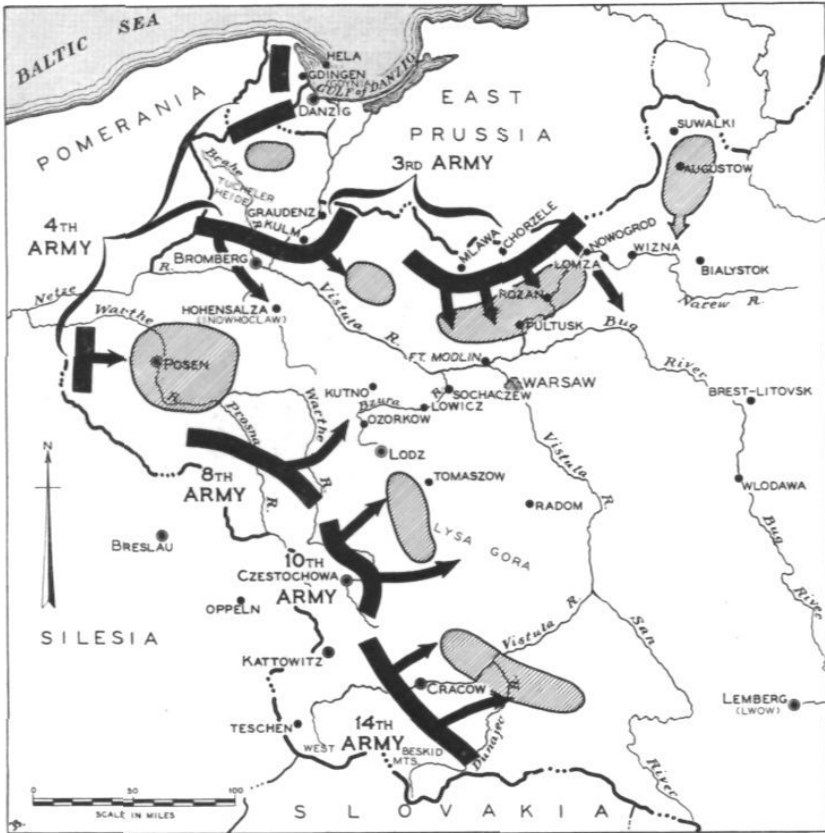
launched from the directions of Pomerania and Silesia. However, the German attack developed with such rapidity that it took the Polish forces completely by surprise. Thus threatened in flank and rear, the Polish contingents in Posen were forced to withdraw to the east before they had a chance to put up any serious resistance. The Polish Army of the South was concentrated in the area of Cracow and Lemberg (Lwow). Certain elements were assigned the mission of establishing a line of defense near Kattowitz, in order to protect the vital industrial district of Upper Silesia. The mission of this army was defensive. The Polish High Command apparently believed the Army of the South and the units designated for the protection of the industrial region to be strong enough to ward off any German attack on this front, especially since the terrain in many places lent itself well to defensive action.

However, before the Polish High Command had a chance to convert its operations plan against Danzig and East Prussia into action, the German Army

suddenly seized the initiative. The blow struck the individual Polish armies and the entire Polish dispositions in flank and rear and, from the outset of the operations, seriously threatened the Polish lines of communications and railroads far in the interior.

The German operations developed as follows: Bavarian and Austrian mountain units of the Fourteenth Army, on the right of the Group of Armies of the South, shattered the stubborn defense of the Polish forces which were holding the passes of the West Beskids, and captured the line of fortifications extending on both sides of Teschen. Silesian and Austrian units penetrated the strongly fortified positions south of the industrial district of Upper Silesia after a brief but bitter fight. Keeping constant pressure on its opponent, the Fourteenth Army thrust the Polish forces across the Dunajec and the San. Cracow, Przemysl, and Lemberg were taken. The Tenth Army, composed of troops from all parts of Germany, took up the advance from the region east of Oppeln and pushed on to the Polish positions

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MAP 2: SEPTEMBER 4TH

along the Warthe, after hard going through the border country which had been devastated. Overrunning the hostile front on the Warthe, the Tenth Army wiped out large Polish forces at Czestochowa and in the area south of that city. The army continued the pursuit into the region of the Lysa Gora and Tomaszow. An attack conducted astride the Lysa Gora blocked the retreat of Polish units that were trying to escape across the Vistula. Tank units penetrated the Polish lines at Tomaszow and headed for Warsaw, reaching the city by

September 8. Within a week, the Tenth Army covered a distance of around 140 miles, as the crow flies, notwithstanding strong resistance in certain sectors. Moreover, the Tenth Army destroyed strong Polish elements in the vicinity of Radom.

The Eighth Army, advancing from the region east of Breslau, overcame the delaying action of Polish forces along the Prosna and forced the crossing of the Warthe, a natural defense sector reinforced by permanent fortifications. In close pursuit, the Eighth Army thrust

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MAP 3: SEPTEMBER 14TH

back Polish forces on both sides of Lodz, forcing a withdrawal in the direction of Warsaw. The army then occupied Lodz and took up a position on the Bzura, between Lowicz and Sochaczew. This operation blocked the retreat from Posen and the Corridor. As a result there developed a great encircling operation: the Battle of the Bzura. Desperate attempts on the part of the beleaguered Poles to penetrate the German lines failed with heavy losses.

A joint operation of elements of the Fourth, Third, Eighth and Tenth Armies,

under the direction of the commanding general, Group of Armies of the South, led to the destruction of the main force of the Polish army at Kutno and in the country northeast of that locality, where the Vistula bends to the west. This battle resulted from the effort of the Polish army concentrated originally around Posen to retire to the east and to head off the German advance on Warsaw. However, the Polish operation failed owing to the speedy advance of the German Tenth Army and its earlier arrival at the Vistula.

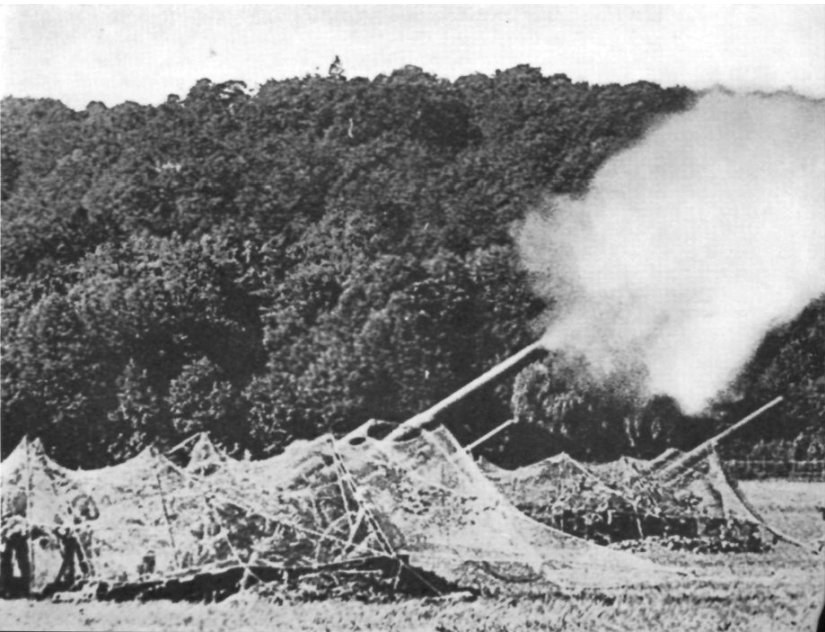


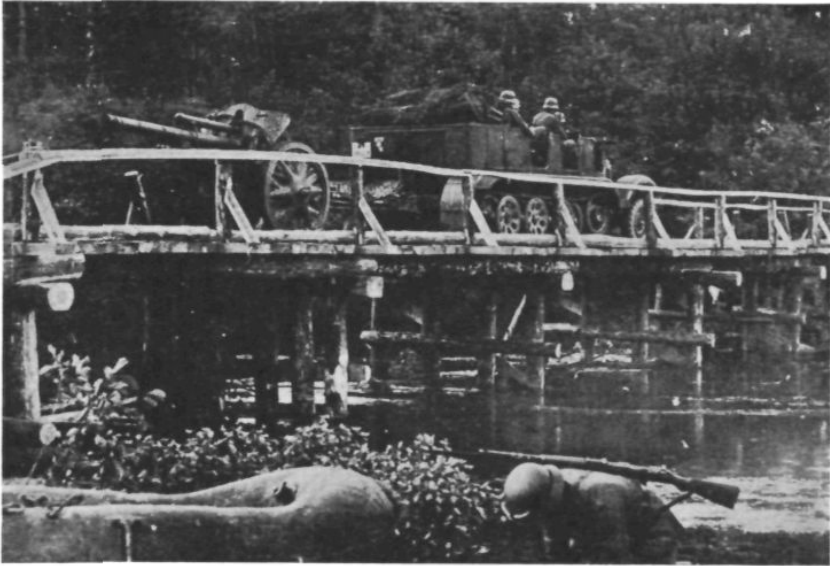
International News Photo

GERMAN 105-MM. DIVISIONAL HOWITZER MOVING INTO POLAND

GERMAN FIELD ARTILLERY IN ACTION IN POLAND

News of the Day Newsreel—International





MOTORIZED ARTILLERY CROSSING THE BRAHE OVER A TEMPORARY BRIDGE

This ten-day operation of the German armies is a picture packed with drama. Moving from the direction of Bromberg, the Fourth Army kept pushing the enemy to the southeast by way of Hohensalza (Inowroclaw), where the Eighth Army had already blocked all passages south of the Bzura. The Third Army, advancing from the north, closed the circle and frustrated the last hope of escape by way of Fort Modlin. Finally, in the east, divisions of the Tenth Army closed the vast circle at the gates of Warsaw—thus shutting off entirely the largest Polish army. The encircled Polish troops tried desperately to shatter the ring. An initial attempt to break through at Ozorkow ended in failure. The Poles made a final attack in a southeasterly direction, and German troops now had to show their mettle on the defensive. Meanwhile, the Eighth Army had cut off Warsaw from the west and southwest. Beginning with September 25, this army conducted the attack on the city from that front. Warsaw surrendered forty-eight

hours later. The Fourth Army, as part of the Group of Armies of the North, invaded the Corridor from Pomerania, in the area north of the Netze, and moved in the direction of the Vistula to a line on both sides of Kulm. Following in the wake of a tank thrust, the army gained the western bank of the Vistula to establish contact with East Prussia within forty-eight hours after outbreak of hostilities. Pomeranian and Brandenburg infantry broke through the heavily fortified Polish positions on the Brahe. A battle in the Tucheler Heide (Tuchola Heath) resulted in the destruction and capture of several Polish divisions and a cavalry brigade. In the northern part of the Corridor, Fourth Army units simultaneously isolated the Polish port of Gdingen (Gdynia, recently renamed Gotenhafen) and captured it later in joint action with naval forces. After seizing the city of Bromberg and crossing the Vistula with remarkable speed, the army continued the advance astride

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MAP 4: SEPTEMBER 18TH

the river in the direction of Warsaw.

Parts of the Fourth Army were successfully taking part in the Battle of Bzura, but the great mass of this army was sent to the German left wing. After having proceeded on Bialystok and Brest-Litovsk, they established communication near Mlodawa with troops of the Fourteenth Army which came from the south. So a second wide outer ring closed around the Polish Army.

The Third Army, advancing from East Prussia, joined West Prussian units in bitter fighting and captured the fortress of

Graudenz. In hand-to-hand combat. East Prussian infantry broke through the strong fortifications at Mlawa and the Polish line of positions along the frontier south of Chorzele. Heavy fighting ensued at Pultusk, Rozan, Nowogrod, Lomza, and Wizna, where the Third Army forced the crossing of the strongly fortified Narew, East Prussian *landwehr* regiments distinguished themselves in these engagements. Continuing its rapid forward movement, the army forced the crossing of the Bug and pushed on in the direction

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105-MM. HOWITZER IN ACTION IN POLAND

of the Warsaw-Bialystok railroad. Then the main body turned toward the north and east fronts of Warsaw.

The German armies gained their objectives in a remarkably short period of time. The commander in chief of the Polish Army departed for Rumania, without awaiting the final outcome of the military operations. The garrisons of Warsaw and Modlin surrendered September 29. The naval base at Hela was the last strong point to surrender.

Approximately 70,000 prisoners, some 40,000 horses, 1,000 guns, almost 8,000 machine guns, 500 grenade projectors, and 120 antitank guns fell into German hands, besides a wealth of other war materials.

The Air Operations

Two air fleets of the German Air Force, commanded by Generals Kesselring and Löhner, participated in the Polish campaign. The mission of these two air fleets was to conduct strategic air warfare in cooperation with ground forces as directed by the commander in chief of the Air Force. Field Marshal Göring.

The air fleets struck first at the Polish air forces and their ground organization. The aviation units bombed one airdrome after another, both west and east of the Vistula. Their bombs damaged and destroyed hangars, barracks, flying fields, and grounded aircraft. Other attacks were aimed at aviation plants, ammunition depots, and so on. The Polish anti-aircraft artillery and pursuit aviation were unable to hinder these operations. By September 2, the air force had full control of the air over Poland.

Beginning September 3, the air force units were employed in an increasing measure against Polish lines of communication on the front and in the rear. They destroyed railroad lines and stations, bridges and roads. By preventing the reinforcement of Polish units and their movement from one part of the front to the other, the air force lent highly effective support to the advance of the German armies.

The activities of the air force contributed largely to the speed with which resistance was overcome in the Polish

THE GERMAN CAMPAIGN IN POLAND

fortresses, especially Warsaw and Modlin.

In addition to this indirect support, the air force also lent direct support to the ground forces. Both bombers and fighters constantly attacked artillery positions, fortified zones, troop concentrations, and troops on the march or detraining or detrucking. Air-transport squadrons supplied the friendly ground forces with motor fuel, ammunition, and rations.

This continuous employment of the air force made high demands upon the flying personnel and the materiel, and that force cooperated efficiently with the ground forces throughout the campaign leading to a rapid success.

The Naval Operations

Units of the German Navy blocked the Bay of Danzig and so prevented any communication by sea with Polish ports. Virtually all Polish naval forces in the Baltic were destroyed or captured. The German training cruisers *Schleswig-Holstein* and *Schlesien* supported the land operations by firing on Polish coast artillery positions located south of Gdingen and on Hela Peninsula.

Conclusions

When compared with the results, the German casualties may be regarded as small. In this connection, Chancellor Hitler stated in his address to the Reichstag, October 6, 1939: "According to figures available September 30, 1939—which will hardly be subject to any major changes—the casualties of the Army, Navy and Air Force, both officers and men, are: 10,752 dead; 30,322 wounded; and 3,409 missing."

The losses of motor transportation, tanks, and so on, likewise were small.

To what may the surprisingly swift success of German arms in the Polish campaign be attributed?

In addition to the remarkable performances of the German forces, it was the splendid cooperation of all arms and especially the close coordination of the land and air forces which contributed to the speedy and successful conclusion of the campaign.

The Polish soldier was tenacious, stubborn and brave; yet he failed because of the incompetence of his leadership and the shortcomings of his organization.

All arms shared equally in the successful operations. Their peacetime training proved its worth during attacks on hostile positions quite a few of which were strongly fortified. In addition to the rapid advances by the mechanized and motorized units, the infantry's accomplishments both in combat and on the march were outstanding. The crossing of rivers and streams confronted the engineer units with most difficult tasks, owing to the destruction of many bridges.

The German combat regulations, aimed as they are toward instilling self-reliance and initiative in the individual, were found sound in every respect. The German soldier also showed superiority in the field of close combat. That means a great deal, for in many instances the Polish soldier revealed himself an obstinate fighting man.

The equipment of the German soldier likewise proved to be entirely adapted to wartime conditions. Whereas in 1914 the equipment of the German troops necessitated modifications after the very first engagements, we can say today that the arms, ammunition, and equipment of all arms fully meet the requirements of modern war.

In the campaign the troops did not have to revise the tactics they had learned in peace. Their combat training satisfied the demands of war. That was especially true of the systematic training of the individual soldier in the exploitation of the ground and in camouflage.

Operations of a German Armored Car Platoon During the Pursuit of the Polish Army September 16, 1939

BY LIEUT. COLONEL TRUMAN SMITH, Infantry

Explanation

THE following is the account of the operations of a German armored car platoon conducted during the afternoon and night of September 16, 1939, in the area south of Brest-Litovsk. The story was told by the lieutenant and a sergeant of this platoon over a German short-wave radio station and was heard in the United States on the evening of November 6, 1939. The unit was not identified by the speakers, but from mention of its garrison it is known to be one of the armored car companies of the Third Motorized Reconnaissance Platoon, garrisoned in Stahnsdorf, outside Berlin. This is confirmed by other information to the effect that the Third Panzer Division, of which this unit is a part, was operating on September 16th in the vicinity of Brest-Litovsk.

The German strategical situation on September 16th was as follows: Polish resistance had broken down over the entire front. The larger portion of the Polish armies were surrounded on this date near Kutno and in the city of Warsaw. Coming from East Prussia, the Third Panzer Division and other German units had struck southeastward from Lonza, and in an advance of unusual speed had reached Brest-Litovsk on the 15th. The citadel of Brest-Litovsk was still holding out on this day. South of Warsaw other German armies had crossed the Vistula River and were advancing on Lublin. In this area the Polish forces opposing the Germans had begun to disintegrate and were retreating in several isolated columns toward the Bug River, which they hoped to cross to the south of Brest-Litovsk. Far to the

south in Galicia German troops had already crossed the San River and were advancing toward Lemberg; the Polish forces were offering only slight resistance.

Story

The lieutenant commanding the armored car platoon stated that on noon of the 16th he received orders at Brest-Litovsk to take his platoon and push southward on the west bank of the Bug River toward Wlodawa and Chelm for the purpose of interrupting Polish east-west communications across the Bug River. His platoon consisted of 5 armored cars, 3 of a heavy type and 2 of a light scout model. The heavy cars were equipped with radio and were armed with a 2-cm, heavy machine gun and a light machine gun. The scout cars had 2 light machine guns each. There was attached to his platoon a lieutenant of a pioneer battalion with two soldiers and a certain amount of demolition equipment. They left Brest-Litovsk at about 2:00 PM and pushed southward toward the village of Kalisz, at which point there is a wagon bridge across the Bug River.

In the village they found about 50 Polish soldiers, only half of whom were armed. No resistance was offered by the Poles, who surrendered when called upon to do so. The lieutenant left one of his light scouting cars with orders to find some conveyances and take the prisoners back to Brest-Litovsk. The wagon bridge across the river was found to have been destroyed by the Poles.

He then continued southward on the west bank of the Bug River. At Damaczwo-Malsto another bridge was found in a burned condition. Continuing

OPERATIONS OF A GERMAN ARMORED CAR PLATOON IN POLAND

southward, he came, about 7:00 PM. to the vicinity of Wlodawa. Here he found two bridges across the Bug: a wagon and a railroad bridge in good repair. He stopped his platoon, and the Engineer lieutenant and his men soaked both bridges with gasoline and set them on fire. While they were engaged in this work he heard a locomotive whistle to the south, indicating the approach of a train from the direction of Chelm. He at once directed his heavy armored cars to positions from which they could fire down the track. Within a few minutes a long train appeared from the direction of Chelm. The locomotive was at once engaged by the 2-cm. heavy machine guns of the two leading armored cars. The boiler of the locomotive blew up after a few shots and the passengers of the train sought to get out as best they could on the side away from the armored car.

The lieutenant noticed, however, that at the rear of the train there was a second locomotive. He then directed the sergeant commander of one of the heavy armored cars to move forward to positions from which this second locomotive could be put out of action. This was done and in the course of half a minute the second locomotive was blown up. A large number of soldiers now approached the armored car platoon with a white flag and offered to surrender. The lieutenant, however, had no place to put them, so after disarming them he told them they were free. He decided, however, to take two prisoners back to Brest-Litovsk and forced them to ride on the running boards of two of his armored cars.

As it was now pitch black he decided to return to Brest-Litovsk. This proved an extremely eventful trip. Twice during the return journey the platoon was fired at by Polish machine guns from ambush. The two Polish prisoners on the running boards were killed. No antitank guns, however, were encountered and about

midnight the armored car platoon arrived back at its unit at the outskirts of Brest-Litovsk.

Comment

This little incident illustrates the possibility of the use of an armored car platoon in a pursuit phase of war when enemy operation has largely disintegrated and the opportunity is offered to small aggressive units to accomplish important strategic results. The destruction or damage of the two bridges at Wlodawa was in itself a strategic result of great importance to the German armies in that it burned to the retreating Polish army one of their main avenues of escape across the Bug River. This strategic result was accomplished by a very small unit operating independently and much in the manner in which a cavalry demolition patrol would have acted in the past.

The distance covered by the patrol in 12 hours from Brest-Litovsk to Wlodawa and back to Brest-Litovsk amounted to approximately 120 km. (75 miles). This is far in excess of any distance which a mounted cavalry patrol could have covered in like time.

The lack of opposition offered by Polish detachments to this armored car patrol is probably indicative of the demoralization which affects all retreating armies. The Polish small arms were ineffective against the armor-plate of the armored cars and there were apparently no Polish antitank weapons in this entire rear area, hence the German armored car patrol escaped without casualties after the accomplishment of its mission.

It is also of interest that this armored car platoon found the roads in the Polish rear area undamaged and entirely passable for its vehicles. This is believed to be also typical of conditions in a pursuit when the pursuing troops have penetrated well into the rear areas of their enemy.

Camouflage for Field Artillery—Two Views

I—BY CAPTAIN PETER RODYENKO

Corps of Engineers (Res.)

PROTECTION against hostile observation seems to be one of those many lessons which, having been learned in warfare, are forgotten in the times of peace. This fact was apparent to this writer during the recent maneuvers at Plattsburg, New York, where he functioned as Camouflage Officer for the First Army.

In the majority of cases inadequate steps were taken by the Field Artillery to provide protection against hostile observation. Inquiries made by the writer indicated that little or no instruction in camouflage had been received by the participating troops, and, in the few exceptions where such instruction had been given, it had been imparted by unqualified individuals or by others whose experience was based on practices and techniques now obsolete. There was a general ignorance of basic principles.

The attitude of the commissioned personnel was as a whole one of indifference regarding precautionary measures; lack of time was given as a reason, and it was quite frequently inferred that maneuvers should not be confounded with actual warfare; another excuse, often heard, was in the shape of a very elastic interpretation of the order that "no trees should be cut down."

On the other hand, the enlisted men showed great interest in the technique of protection against hostile observation. This was evidenced by the frequent complaints made to this writer that no instruction had been given previous to and during the maneuvers.

Two common misbeliefs were frequently encountered by the writer: First, that a knowledge of camouflage was not necessary, since in wartime such

work would be done by specialists assigned to camouflage troops; and second, that camouflage was a mysterious art, requiring intricate structures and painting, designed and executed by individuals assumed to be crossbreeds between magicians and Rube Goldbergs; also that additional work done in absence of aforementioned "camouflage troops" was not worth the trouble anyway, these being just maneuvers and live ammunition not being fired.

Camouflage is a misnomer. Used originally in the French army to denote concealment by means of smoke, the term became popular in the Allied armies and was used to include any measure taken against hostile observation. The French used many artists to do work of this kind. Many of these temperamental fellows let their imagination run wild: they followed theories which are known to be fallacious as well as impractical. Today, complicated contraptions have been discarded in favor of plain commonsense practice. Yet, the term, *camouflage*, with its implications, has "stuck." In the Russian army, camouflage is called *maskirovka*—masking—which term, while lacking the mystery, more aptly expresses the mission; that is, to mask something against hostile observation.

As a matter of fact, the only camouflage troops provided in our army are the camouflage battalions, which consist of specialists whose duty it is to instruct troops, observe and inspect this work, and, occasionally, to assist in the procurement of supplies needed for large installations. There is one GHQ battalion, the 40th Engineer Battalion (Camouflage, GHQ), which this writer

CAMOUFLAGE FOR FIELD ARTILLERY—TWO VIEWS

commanded for several years and which performs this work in the GHQ area. Four army camouflage battalions, the 601st, 602d, 603d and 604th, are provided at the rate of one unit for each field army. The working unit is the camouflage platoon, consisting of one lieutenant and eight enlisted camoufleurs. A platoon is to be allotted, probably, to an area occupied by two of the new type infantry divisions. The chances are that in times of war divisional field artillery will, at most, be able to obtain the services of two enlisted specialists, who occasionally will "drop in" for a brief inspection and to offer advice. The troops requiring protection will have to do the work. It follows that a knowledge of camouflage technique should be possessed not only by the artillery officer but also by the noncommissioned and other enlisted personnel.

Before going into the matter of technique, let us ask the question: Against what kind of hostile observation does field artillery require protection? The answer is terrestrial (occasionally), and aerial.

This article will discuss only aerial observation, which is divided into visual and photographic observation.

The modern observation plane travels at a speed of about 200 MPH. The observer has been given a definite mission, say, to spot field artillery. He knows what a gun looks like when seen from the air. He also knows that artillery usually operates in batteries of at least four guns. Therefore he will be on the lookout for something that shows identical characteristics in groupings of four or more. Now, even if clumsy and unskilful attempts have been made to cover up some guns and/or make them look like something else, the observer will be in a quandary. The speed of the ship and his position therein will prevent him from thinking things over and then having another look, as he will be miles away by the time he has made up his mind.

Hence, visual observation from the air is not to be regarded as of great danger to the artillerist, although no chances should be taken. We should consider that the observer is experienced, has sharp eyes, and may be looking for us in a definite area.

Defense against aerial photography presents a more difficult problem.

Although oblique photos have some value, the vertical photo is more commonly employed for locating hidden installations. To secure this type of photo, an aerial photographic camera is placed in a hole in the floor of the ship. Suspended within a gimbal, the camera may be kept level without much effort; and if the lens is held parallel to the ground, even if the ship has to bank slightly, there will be a minimum of distortion. The photographer will determine exposure and shutter speed, set the camera accordingly and then throw a lever which operates the camera by means of electricity from a small generator provided for this purpose and connected with the engine of the ship. He also will set the interval between exposures so that the camera will automatically take pictures at the desired interval, in a continuous strip with a 60% overlap.

These overlapping prints may be used for study with the stereoscope. The altitude at which the pictures have been taken is immaterial, as the negatives may be used for enlargements that show more details than would the contact print, if the picture was taken at a high altitude. Occasionally filters are used. In most cases the photographer will use a filter to cut the haze and thus obtain a clearer picture. The color of the haze varies with geographical location. In this country, the haze is of bluish color, hence the photographer will use the "Minus Blue" filter, a piece of yellow glass. The haze in China is yellow, probably caused by suspended sand particles, which would require a bluish filter,

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while the Central European haze is reputed to be greenish-blue, requiring a filter of glass with a yellowish-red shade. There are other filters that have the purpose of picking up specific colors but this matter should not be given too much attention or concern, as the aerial photographer intent on detecting camouflage by means of color filters would have to take several pictures of the same object, with several filters for comparison. This takes not only time but is decidedly dangerous, as a ship flying repeatedly over the same area is bound to draw attention and fire from the antiaircraft artillery. Color photography is not yet sufficiently simplified to be of practical value in the field.

However, aerial photographic technique has been developed to such an extent that pictures may be taken, developed, printed, and dropped where they are needed within 40 minutes from the time of exposure.

It is obvious that the artillerist will have to know what his weapon looks like, as well as its accessories and echelons, when seen from above, so that he can take steps insuring protection. He also should be familiar with the technique followed by the reader of aerial photographs.

With a powerful reading glass that reader will go over a print inch by inch, looking for shadows with regular outlines which indicate the presence of human handiwork. Nature is never regular in its outlines. From the shape of the shadow he can judge the shape of the object which throws it. This shadow will show in a dark gray shade—*value* in the argot of the camoufleur. Shadows are longest early in the morning or late in the afternoon. They are shortest at high noon. He also will look for anything strange in the texture of the terrain. Once he sees something suspicious, he will study it until he has determined its character. If this method is not adequate, then he will procure another

print from the same strip of overlapping pictures and place them side by side under the stereoscope until they register, whereupon he will obtain a three-dimensional effect which will show him what he has located. If the details are too small, he will have enlargements made and repeat the procedure. Then he will mark the spot by ringing it with a pencil and send it to the proper officer, say G-2. If information has to be transmitted over the telephone because of distance and if he knows that the other party is in possession of identical prints, then he will apply a simple atlas grid with a ruler and pencil and merely refer to the "coordinates" by informing the recipient to look for artillery in the NE corner of B-3, or, mentioning the subdivisions, at B.4-3.6.

The print will be identified by the inscription in the lower left-hand corner. This notation, in abbreviated form, contains all the information required. For instance:

06-Cam-97 (3-15-39,8.30A) (12-600)

Upton

means that Exposure No. 6 of a camouflage mission executed by the 97th Observation Squadron at 8:30 AM on March 15, 1939, at Camp Upton, New York, was made at an altitude of 6000 feet with a lens of 12" focus.

Every artillerist, commissioned or noncommissioned, should be able to use the stereoscope. With the perfection of the multilith apparatus which, even in field, can quickly turn out thousands of fairly good reproductions of aerial photographs, it is believed that aerial mosaics thus reproduced will be available to the commanders of even the smallest units. These reproductions, which are not made by the screen system (halftone), and therefore under a reading glass or stereo show many details, are of immeasurable help not only on reconnaissance but in general study of the terrain. This was appreciated during

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the last maneuvers by those who had taken the trouble of becoming acquainted with the use of aerial photos and mosaics. Unfortunately, these individuals were few: the great majority preferred to use maps. Maps are frequently out of date; a recently taken aerial photograph is by far more desirable to the artilleryman who is studying the terrain.

The stereoscope can be simple or very elaborate. For use in the field, the simplest, most practical, and least expensive type of stereoscope, providing also sufficient enlargement, is a simple pair of cheap spectacles with bi-convex lenses. These can be bought in most department stores for about fifty cents.

The credit for this discovery belongs to Colonel Ralph T. Ward, Corps of Engineers, First Army Engineer, now on duty at Headquarters Second Corps Area at Governors Island, Says Colonel Ward:

"Your two eyes constitute the real stereo instrument. The optical instrument used (like spectacles) merely permits you to get magnified or reduced images or to merge stereo pairs that are more or less than interpupillary distances apart. The simplest, least expensive, and most suitable stereo for the small unit commander is a pair of reading spectacles with lenses marked 5.00/8 which can be purchased in chain stores in many states. Anyone can stereo.

"Try this exercise: Focus your eyes on distance, or, in other words, look at something on the other side of the room. Now, place one finger in front of your eyes, still looking at distance. If you see indistinct images of two fingers, you can stereo and you can convert a stereo pair into a relief map if you make a real effort."

Put on the spectacles and hold the pair of photographs before your eyes. You cannot stereo identical photos: they must be "overlaps"—taken from slightly different points. Move the two photos about until the two images coincide. You

will be surprised how strikingly they "stand up."

It takes patience to acquire the knack of using the eyes for stereoscopic purposes but it is worth while trying, in view of the great value of being able to study the terrain from aerial photographs. The stereo will reveal characteristics and advantages of the terrain impossible to see while on the ground. In brief, the stereo view obtained is identical with the one an observer would see from his ship, if the ship were stationary.

Regarding shadows, the matter is very simple. If the outlines of a regularly shaped object can be concealed by "overshadowing" their shadow with the shadow of something that is naturally found in the terrain, the job is done. It follows, of course, that the precautionary measures taken must be shifted during the day as the shadow travels. The shadow of a gun and caisson may look rectangular. Now, if a few branches or bushes are placed between the sun and the gun and caisson, the shadow of the materiel will lose its regular outlines and will blend with the shape of the trees or branches. It is still simpler to place the guns in the shadow or shade of trees, if they happen to be available. No further measures have to be taken as regards the shadow.

The matter of texture also has to be given consideration. The texture of a terrain is determined by the nature of the soil or vegetation, or by other objects which throw different kinds of shadow. Every tiny stalk of grass will throw a shadow and the millions of various kinds of shadows, each of them different and registering differently in various shades of gray on the photographic print, will determine texture. Some of these objects will absorb light more than others and there will be still other objects which, while also throwing a shadow, will reflect light. As an example: A silk hat, made of velvet-fur,

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when smoothly brushed, will look shiny, although its color is still black. The reason is that the millions of fine hairs which form the "beaver" have been flattened out by brushing and thus reflect the light strongly. If the fur is ruffled in places, it will show dark, as every one of those tiny hairs will throw a minute shadow and the multitude of these shadows will show as a change in the texture.

The same thing, but in reverse order, takes place in terrain where vegetation throws shadows. Flat rocks, gravel, and turned soil will photograph whitish, not only because of their lighter color, perhaps, but mainly because their surface is smooth and thus reflects the light. If tracks are made in a grassy spot by men or vehicles, these tracks will invariably show on the photograph taken from a mile and a half above, even if these tracks may not be visible to a terrestrial observer, unless he happens to be a trained Indian warrior or an Australian bushtracker.

Hence the surface of the objects placed by humans into the terrain must conform to the texture therein. War machinery, like most material made by human hands, has smooth surfaces which will reflect light. It makes no difference with what kind of color they may be painted.*

This writer believes that natural cover is the most desirable type of camouflage. The availability of this should be ascertained by the artilleryman before putting his guns into position and he can do this only if he is trained to look at the terrain not only with the eye of the artilleryist but also with that of the camoufleur—to put it simply, he should not only look out for his field of fire but for his own protection as well. *Neatness and regularity* are dead give-aways and one of the major sins committed by battery commanders is the desire to have

*The subject of camouflage paint is discussed more fully in Part II.

the guns neatly lined up so that the executive officer can see from one point of vantage what is going on at every gun.

Inappropriate or unskilful camouflage is worse than no camouflage at all. The proper manner or procedure would be to study the terrain to determine what protection it may offer; if there are trees



THE TREES WOULD HAVE FURNISHED BETTER COVER

with a wide spread, then the guns should be placed directly under such trees. During the recent maneuvers this writer observed several cases where such cover was not exploited. The guns were left in the open; whereas only several feet away from the guns, the crews were lounging under trees and enjoying a smoke.

The terrain should be disturbed as little as possible. It must be assumed by the artilleryman that the enemy is in possession of aerial photographs taken by him of the terrain before the battery moved in. The procedure is to take additional aerial pictures of the terrain after troops have moved in and then to place the picture taken before, together with another one taken after, under the

CAMOUFLAGE FOR FIELD ARTILLERY—TWO VIEWS

stereoscope. If something that wasn't in the terrain "before" is on the photograph taken "after," it will cause a persistent and irritating flicker which will draw the attention of the reader of the photographs, cause him to take another picture of the strip taken "after" and obtain a three-dimensional effect of the intruder with a result that can be imagined.

When natural materials, like small trees or branches, are used to camouflage materiel, great care should be taken to remember that the protection is to be used against observation from overhead, and sufficient materials should be placed on top of the gun, in a simple manner, so that they can be quickly removed when firing is to commence.

During the Plattsburg maneuvers this writer was frequently told by laymen observers that certain batteries were well camouflaged. According to their statement the technique was so very good that the guns could not be noticed even if one was only a few feet away from them.

However, an inspection made by this writer of such installation almost

universally proved that the saplings and branches had been placed around the guns, and hardly anything on top of them!

A frequent objection made by artillerymen against placing their guns under natural cover is, that the branches of trees and bushes interfere with the firing, on account of being too close to the muzzle. However, nothing is simpler than to tie a rope or a piece of wire to the interfering branch so that it can be yanked out of the way when firing commences; or it can be cut or sawed half through, so as to be broken off in a second or two.

Field artillery batteries are issued the Camouflage Equipment unit which contains four large fishnets 36 by 44 feet in dimension. These nets have proved to be effective if properly used. However, from his observations during the maneuvers and before, the writer is led to believe that the personnel that used the nets proceeded under the assumption that the harmless fishnet has magic properties. They stretched even barely trimmed nets over their guns and let it go at that.

The principle of the camouflage by the use of fishnets is based on the screened-in front porch of an ordinary residence. The people in the street, who pass the porch, cannot see who is on it, while the fellow who sits on the porch behind the screen can see everything that is going on in the street.

The explanation is that the light in the street is reflected by the screen back into the eyes of the observer, who therefore cannot see beyond the screen.*

Another method of camouflage is to "make more than there is," by providing dummy batteries at appropriate locations, thus cutting in half the chances of being hit. But—such dummy installations must be installed just as carefully



**HOWITZER DISCLOSED BY REFLECTION
FROM BRIGHT SURFACES**

*Proper use of nets is discussed in Part II.

as the actual battery in order to deceive the man behind the stereoscope.

The reason for placing overhead cover close to the ground is the proven fact that an object will throw shadows of the length of from three to six feet for every foot above the ground at various times of the day, the maximum lengths of shadows appearing early in the morning and late in the afternoon. Hence, an object standing about ten feet above ground, as does an ordinary army truck, will throw shadows of from 30 to 60 feet long and, therefore, motor vehicles require camouflage technique of their own. Therefore, the closer the object is to the ground, the shorter a shadow it will throw, which means reduced chances of detection and also less manual work for the troops concerned.

From the foregoing it can be seen that camouflage is by no means an intricate art or black magic, but plain commonsense combined with some training in judging terrain as regards the



UNSKILLFUL USE OF ALMOST BARE NET.
NOTE ALSO TRUCKS IN OPEN

possibilities of natural cover it offers. It requires, however, practice and experience which must be acquired in times of peace and not left to the last moment.

II—BY LIEUTENANT R. S. ARNOLD *Corps of Engineers*

FIELD Artillery Officers know the general principles of camouflage. However, few have had the opportunity of using other than hasty methods of concealment, and fewer still of seeing the results of their technique from the air or in aerial photographs. Some field artillerymen may question the applicability of camouflage principles which were evolved during the World War of 1914-1918 and which have remained unchanged despite advances in the airplane, more widespread use of the stereoscope, and the advent of better cameras and sensitive panchromatic, infra-red, and color films. One of the principal duties of the writer during the past two years has been the development of new camouflage methods and

materials for field artillery, anti-aircraft artillery, machine guns, trucks, aeroplanes, and individuals. In addition, the writer served as assistant camouflage officer for the Antiaircraft Artillery Brigade during the Joint AA-Air Corps Maneuvers and assisted in concealing airplanes at Mulberry Island in 1938. This experience has shown that the old camouflage principles are still entirely correct but that there are many tricks in their application which do not appear in the books. Tests have resulted in the development of camouflage materials better than the present standard ones.

Guns located in a straight line at regular intervals attract the attention of the aerial observer and are quickly found in the aerial photograph because regularity

CAMOUFLAGE FOR FIELD ARTILLERY—TWO VIEWS

does not occur in nature. Hence guns should be spaced at different distances and staggered as much as permitted by the mission and not less than about 25 yards. If the pieces are staggered less, as they usually are, the line of the guns will still be a straight one to the observer 10,000 or 20,000 feet in the air. A saw blade looks like a straight line at 100 yards.

Doctrine says that a battery should not be located along the edge of a woods, and that guns cannot be hidden unless some natural cover is used to assist artificial camouflage. This confliction can be settled only by the individual battery commander. However, since it is difficult to conceal the battery in the open, it may be better to conceal it in the edge of the woods and risk being shelled. Of course the ideal solution is to take a position among scattered trees or bushes.

Camouflage discipline means the difference between success and failure in concealment and is even more important in its relation to other camouflage considerations than doctrine indicates. It begins with reconnaissance and ends only when the position is abandoned. The party reconnoitering the proposed position must avoid making tracks which will show from the air even before the guns are brought into position. Reconnaissance should include selection of routes for getting the guns into position, including points for unlimbering the pieces and the routes for ammunition supply. Instructions should be given to a good noncommissioned officer, who should wire in roads and paths *before* the guns come up; and a camouflage guard should be posted *before* the arrival of the battery to see that no trucks or persons go outside wired roads and that pieces are unlimbered at the proper points and manhandled into position. If time does not permit installation of wiring before guns go in, additional camouflage guards should be posted to enforce camouflage discipline

until wire goes up. The importance of camouflage discipline when the position is occupied cannot be overemphasized. Remember that the battery is ordinarily detected not by spotting the guns from the air, but by locating general areas of activity—a lot of new turn-arounds and tracks. If there is not a great disarray made in the vicinity of the battery, many errors in erecting camouflage, in garnishing nets, and in selecting materials can be made without giving away the position, but if the battery area is "messed up" upon its occupation no subsequent camouflage can be of any use.

The Joint Antiaircraft GHQ Air Force Maneuvers at Fort Bragg in the fall of 1938 offers an excellent example of the disastrous results of poor camouflage discipline. Six three-inch antiaircraft batteries were emplaced under similar conditions. All but one wired-in paths and enforced discipline and all but one escaped detection during the entire maneuver. The one spotted and photographed by the aerial observers was picked up by the fresh tracks and paths made in the vicinity of the guns although the exact locations of the guns themselves were not found.

It has been stated that the position should be occupied before the camouflage is erected. Some state that the camouflage should be put up first. Although erecting the camouflage first is proper in a defensive situation which is to change to offensive in a few days, under ordinary conditions, it is like putting the cart before the horse. The battery must first be ready to perform its mission; hence it is difficult to imagine a battery commander taking time to erect nets before his guns are brought up. Ordinarily, the routes will be selected and wired, the guns will then go in; camouflage will be put up when time permits. Since movement into position ordinarily takes place at night, camouflage

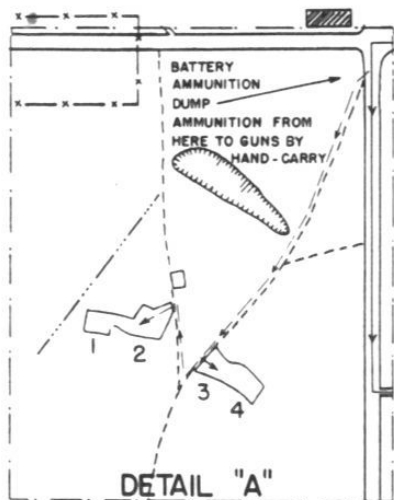


FIGURE 1
GUNS ARE AT 1, 2, 3, 4

erected before daylight usually will be effective.

Camouflage discipline does not end with wiring paths and roads and keeping personnel and vehicles within the wires. It includes keeping fresh foliage in the nets when natural camouflage is used, keeping trucks from stopping at the battery and thus giving away the position, and doing all cutting of camouflage material at a distance from the position. It also includes keeping rear echelons under cover, avoiding production of smoke from kitchens during daylight, forbidding unnecessary use of lights at night, and general maintenance of the position, such as keeping spoil under the nets and nets taut.

Figures 1, 2, 3 and 4 show, respectively, a map of a camouflaged battery position, a photograph of the area before the battery moved in, a photograph of the camouflage during the winter, and a photograph taken during the summer. The area had been used for a full year when the photograph in Figure 4 was taken, yet the position is well concealed

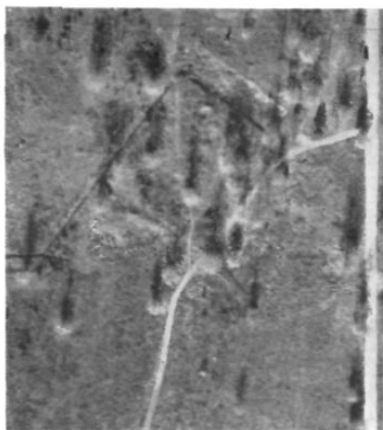


FIGURE 2

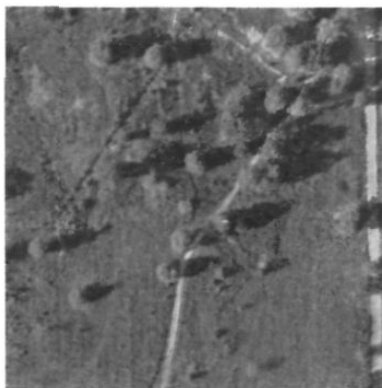


FIGURE 3



FIGURE 4

CAMOUFLAGE FOR FIELD ARTILLERY—TWO VIEWS



FIGURE 5

from the air at 10,000 feet or higher because of the absence of tracks. Discipline was enforced by signs and wired roads and paths. Figure 5, a low altitude oblique of the position, shows some of the wiring. The effectiveness of the position can be judged better by Figure 6, taken from 10,000 feet, since this picture shows the camouflage at a scale more nearly approaching what may be expected in war.

Tests show that the fish net or chicken wire, garnished irregularly, thinned toward the edges and erected flat over the gun and emplacement, still constitutes the best means of artificial camouflage. Some tests were made with a paper material called *visinet* having a mesh of about $\frac{1}{4}$ inch. It was thought this material could be used as a drape to conceal trucks and possibly as a flat top for guns and similar installations. The material was fairly good as a drape for hiding vehicles, but not as good as a fish net (See "Camouflage for Vehicles," *Military Engineer*, Sept.-Oct., 1939). When used as a flat top the visinet net was too transparent to hide the shape and shadows of the object underneath but was sufficiently dense to cast regular shadows and show straight edges. In addition the visinet lacked texture and from the air looked somewhat like a golf putting green. When the visinet was made irregular in shape and had holes cut in it in an attempt to give texture it became even more transparent, still cast shadows

and looked like a golf green out of which a few divots had been taken.

Two points should be emphasized regarding the use of the flat top—it should be kept taut and as close to the ground as possible. If the net is not taut, the pattern of the wire frame supporting the net will show through and give away the position. The net over gun 1 in Figure 3 was not pulled taut and the spiderweb shape of the supporting wire can be seen.

To keep the shadows as short as possible, the camouflage should be erected close to the ground—not over six feet high when the guns are not dug in and not over four feet high when they are emplaced. A net erected over an unemplaced gun is higher and hence more likely to be seen, not only because of its longer shadows but also because of the black hole seen under the edge of the net from the oblique. Figure 5, showing two nets erected over unemplaced guns on the left and two over emplaced guns on the right illustrates this point. The black hole shown can be concealed by using an embrasure made of bushes but care must be taken that the embrasure is not made so thick that it casts black shadows under the net which will show up from the air.

Choice of camouflage material is of less importance than discipline and choice of position. Natural materials are available locally, simplifying the transportation problem, and foliage is always the proper color whether panchromatic,

color, or infra-red film is used for aerial photography, or the position is being sought by an aerial observer. Natural materials, however, must be put in the net so that the branches or grass stand erect since foliage is much lighter on the bottom than on the top, and it must be replaced frequently in the summer as the foliage wilts in a few hours in the sun and then looks different from the air. The best camouflage material is uncut foliage; every effort should be made to use it. Experiments have been conducted to find methods for preserving foliage by some method which is practical for use in the field, but so far no satisfactory method has been developed to a point where it can be put into general use. In winter, natural material seldom need be replaced. At a battery position built at Fort Belvoir, Virginia, last winter, one gun was camouflaged with fish net garnished with natural material—leaves, dead grass and dead branches—and the material successfully concealed the position for several months (See gun 2, Figures 3 and 5).

When natural material is not available or its use is not practicable, artificial material is used. The net is garnished with strips of cloth about 3" wide and 5' long, woven irregularly into the net, and the ends are allowed to hang down below the net six or eight inches. The ends cast shadows, and give the whole net texture, making it look darker and more natural to the aerial observer and in the aerial photograph. The present standard material for camouflage is burlap. Unfortunately this material is made of jute, which is not produced in this country. It was recently learned that burlap finishers in the United States are already having difficulty in buying burlap and its price is going up because of demands for the material for sandbags and, probably, camouflage material in the

present European War. In addition, jute rots very fast, probably because of fermentation. It was therefore decided to try domestic cotton goods in place of burlap. Tests showed that 7-oz, cotton osnaburg is more durable and fully as good as burlap for camouflage. It can be dyed or painted by spraying, dipping, or brushing. Osnaburg was used to camouflage guns 1, 3 and 4 in Figures 2, 3, 4, 5 and 6.

At present, oil paints of various colors are issued for camouflage purposes. These paints have serious disadvantages—they tend to shine and thus show up too light from the air; they must be either carried ready-mixed or thinned with oils or gasoline, making it necessary to carry additional supplies in the field; and they are a serious fire hazard, since nets painted with oil may ignite by spontaneous combustion when rolled up unless special precautions are taken to dry them thoroughly before rolling. Experiments have been conducted with cold-water casein-bound paints for camouflage. These paints are non-combustible, require only water for mixing, do not shine and are available in a wide assortment of colors. *Muraltone*, a cold-water casein paint in paste form, has

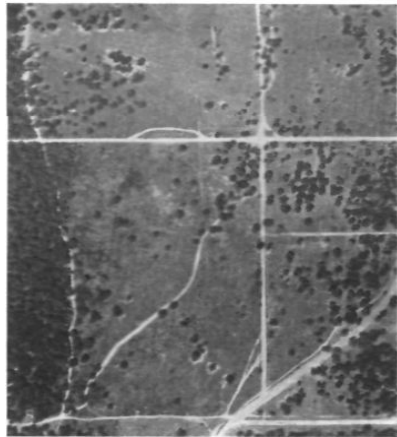


FIGURE 6

CAMOUFLAGE FOR FIELD ARTILLERY—TWO VIEWS

been found satisfactory. Its main disadvantage is that materials dipped in it must be dried in the shade, and hung up vertically because the pigments tend to separate if dried too fast or if the material is horizontal. It is believed, however, that Muraltone's disadvantages are outweighed by its advantages. All artificial material shown in the figures accompanying the article were either dipped in or sprayed with Muraltone.

Muraltone can also help to make concealment more simple by using it to paint vehicles, guns, and other equipment, instead of the commonly used lacquer. The latter reflects so much light that frequently a gun can be seen right through a garnished fish net. When on an observation flight during the Fort Bragg maneuvers the writer was vainly looking for a three-inch AA gun battery. Suddenly a flash of reflected sunlight came through the trees near the battery and the entire battery could be picked out. On landing it was found that another officer had seen the same bright object, so it was decided to investigate the source. It was found to be a lacquered wire reel about one foot in diameter lying under a tree—a harmless enough object yet because it was shiny and was not covered it gave away the whole position. Camouflage would be much simplified and conditions much more like war, if equipment were painted with flat, dull paints like Muraltone. For those who prefer their guns shiny in garrison and dull on maneuvers there are soluble cold-water paints available which can easily be washed off.

The color with which the artificial material in the fish net is painted seems to be more important than camouflage doctrine indicates. Tests show that in the winter, except when there is snow on the ground, a neutral brown flat paint or dye containing about 15 parts burnt umber and 1 part yellow ochre is suitable under almost any light conditions and against

most brown backgrounds. Figures 1 and 4 show how well this color blends with a winter background. In the summer, color is a different story. It is very difficult to secure a green which even closely resembles grass or foliage green. The doctrine that no camouflage can successfully conceal, without some natural cover, is certainly true in summer. If natural material cannot be used, artificial material should be painted a solid dark green to match the vegetation as closely as possible and the net must be tied in to some bushes or trees. When Muraltone was used, best results in the vicinity of Fort Belvoir were secured with a blend of 75% No. 1202 green, 10% golden yellow, and 15% burnt sienna. This shade was evolved only after several attempts. A preliminary trial was made by making small test strips in several shades of green. These were photographed and observed from the ground, and a net was painted to match the best shade. The net was photographed and observed from the air and was found to be too dark. It was lightened and was then too light. After the next correction it was excellent — practically invisible to the observer as low as 5,000 feet and impossible to detect on a photograph taken at 10,000 feet.

Artificial paints have a serious disadvantage in the green shades in that they do not reflect red and infra-red rays to the same degree as natural foliage. For example, the camouflage over guns 3 and 4 in Figure 4 looks too light on this print from a panchromatic negative. Yet in an infra-red picture taken the same day, the camouflage is black while the trees and grass are almost white. So far no paint or dye has been found which will match foliage in all types of photographs.

Concealment is made more difficult when there is snow on the ground. The snow on a net melts more quickly than on the surrounding ground and tracks are easily seen. No new methods for

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concealment under these conditions have been found. The best solution still is strict camouflage discipline and full use of natural cover. White cloth used with the fish net is of some assistance.

Modern methods of camouflage detection make concealment difficult except under favorable conditions. In stabilized warfare, when the enemy will photograph important areas frequently and compare photographs with those

taken previously to detect the slightest changes made, perfect concealment will be necessary to escape detection. However, under all conditions, by following basic camouflage principles, especially by selecting positions carefully and enforcing strict camouflage discipline, the battery commander will be far better off than if he used no camouflage and frequently will be able to escape detection completely.

FIELD ARTILLERY ASSOCIATION MEDALISTS



**ALABAMA POLYTECHNIC
INSTITUTE**
WALTER H. CHANDLER, JR.
Columbus, Ga.; Cadet Colonel;
Football team; "A" Club; Blue
Key; Scabbard and Blade; Delta
Sigma Pl.

Additional winners of the Field Artillery Association Medal in Field Artillery senior R. O. T. C. units were the students pictured here, who were selected as "outstanding in soldierly characteristics" in their respective units of the arm.



**VIRGINIA MILITARY
INSTITUTE**
WALTER A. EDENS
Petersburg, Va.; First Captain
and Regimental Commander;
Captain of Horseshow and Pistol
teams.



YALE
THOMAS JAMES CAMP, JR.,
'40
Cadet Corporal; son of Lt. Col.
Thomas J. Camp, Washington,
D. C.



UTAH
RICHARD S. TANNER
Cadet Colonel; Scabbard and
Blade; Delta Phi; Merrit Battery;
EG; Pistol SS.



PURDUE
LAURENCE L. LYLES
El Pase, Texas; Senior Cadet
Colonel; Pi Kappa Phi; Pi Tau
Sigma; Scabbard and Blade;
Purdue Order of Military Merit;
University light heavyweight
champion (boxing) for three years.

Gunner in Luzon

BY BRIG. GEN. E. D. SCOTT, USA-RET.

FOREWORD

PRIOR to the Spanish War the artillery of the United States Army consisted of five regiments, each of which contained two light and ten heavy batteries. At the outbreak of that conflict two more regiments were added—the 6th and 7th—and in each of the seven the number of heavy batteries was augmented by two, N and O. These heavy batteries were intended for use primarily with the coast defenses but were armed and equipped as infantry. As such they had seen service in the Indian campaigns; part of the 3d Artillery served as infantry in the siege of Manila and throughout the subsequent Filipino insurrection; and all heavy batteries of the 6th Artillery served as infantry during the insurrection.

Light batteries (the forerunners of our present field artillery) were variously armed with howitzers, siege rifles, and the 3.2 field gun. Furthermore all had been trained with revolving cannon and Gatling guns, so that light artillerymen were the original machine gunners in our army. Various types of mountain guns were available for issue during special service; as, for example, in 1890 when six 1.65's were issued to Capron's Battery for the Sioux campaign. In 1898 the standard light field gun was the 3.2-inch, which fired a 13.5-pound projectile at a muzzle velocity of 1,680 foot-seconds. The light batteries (D and G) of the 6th Artillery, however, were armed with a new 3.2 which fired a 16-pound projectile at 1,425 foot-seconds. This weapon was superior in that it had a more curved trajectory and greater terminal velocity above 2,000 yards than the older 3.2.

Battery D 5th Artillery was organized

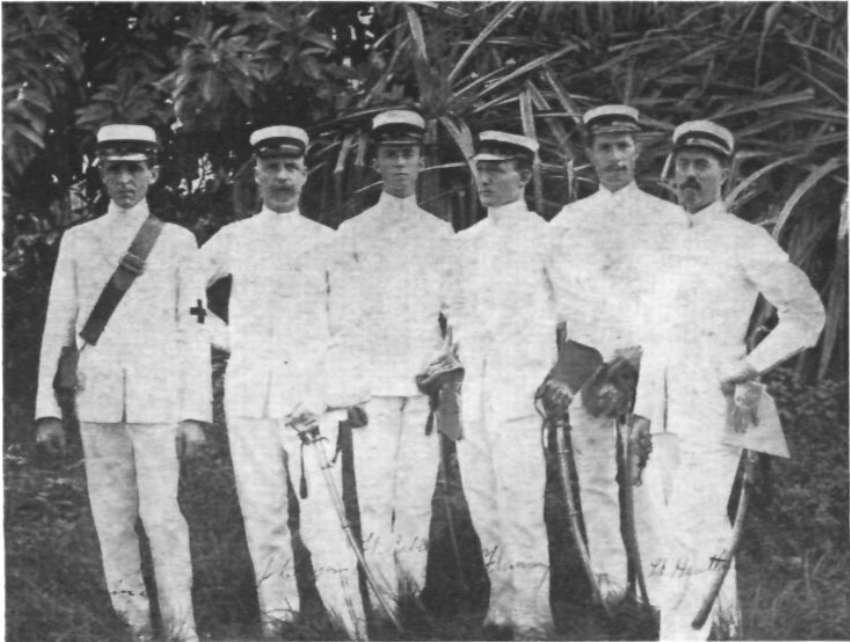
at Washington Barracks, D. C. (now the Army War College). At that time its officers were Captain A. B. Dyer and 1st Lieut. Harry L. Hawthorne, 2d Lieut. Ernest D. Scott joined the unit in May, 1898, 2d Lieut. A. S. Fleming at San Francisco in June, 2d Lieut. B. M. Koehler in December at Manila, and 2d Lieut. Conrad S. Babcock in January, 1899, at Manila.

In those days lieutenants commanded platoons; the senior was assigned to the right platoon, the next senior to the left platoon, the next to the center platoon. The junior officer commanded all the caissons. The platoon was a suitable combat unit, and could act independently. Thus in the Battle of Manila "Fleming's Platoon" was on the walls of Fort San Antonio Abad, then and thereafter with the 2d Division (McArthur), and was an independent unit. Similarly "Scott's Platoon" was an independent unit of the 1st Division (Anderson and Lawton).

Batteries D and G, having been formed into a provisional battalion under Major Frank C. Grugan, left Washington for the Philippines in June, 1898. They were without horses but fully equipped otherwise. There was a long and disagreeable delay on the windswept plains of the Presidio of San Francisco, but finally the voyage began on the SS *Peru*. Also aboard were six troops of the 4th Cavalry, likewise going to war on foot.

We were held up for two weeks at Honolulu owing to a Japanese scare. This was the result of a tense international situation which arose over Japan's protest at the annexation of Hawaii, General Elwell Otis and his staff came

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OFFICERS OF BATTERY D, 5TH ARTILLERY

Left to right: Dr. Quinn, Capt. Dyer, Lt. Babcock, Lt. Fleming, Lt. Scott, Lt. Hawthorne

aboard at Honolulu, eventually the international situation cleared, and we resumed our trip, arriving in Manila Bay on August 21.

Battery G was put ashore at Cavite to man the old fort. Later it was sent to Iloilo.

Battery D landed at Manila. In December the so-called "Astor Battery" returned to the States for muster-out, and we received all its equipment and material. The weapons of this battery were six 3-inch Hotchkiss mountain guns. They were formed into "The Separate Provisional Mountain Battery," which formidable title was generally ignored for the simpler "Hawthorne's Battery." Captain Dyer had assigned Hawthorne and Koehler to this battery.

Inasmuch as we only had 140 men in Battery D, they now became spread out

pretty thinly to man twelve guns, especially since they had to act as horses as well as cannoneers. Higher authority had sent up a 6-pony team from the Spanish arsenal for trial. Although this affair trotted a 3.2-inch gun and limber about the Luneta in great style, the captain would have none of it. And his gorge rose at the suggestion of using a carabao. Hence man-power constituted the only means of traction when we went to war.

BACKGROUND OF THE INSURRECTION

When Dewey smashed the weak Spanish fleet at Manila, he did the most logical, and in fact the only practicable thing to augment the results of this victory—he brought Aguinaldo and his staff from Hongkong to organize a native rebellion to overthrow the Spaniards on land. This Filipino leader established his headquarters in Cavite and issued



AMERICAN POSITIONS NEAR MANILA, 4-5 FEBRUARY, 1899

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arms from the Spanish arsenal. The rebellion spread rapidly and was everywhere successful. In an incredibly short time Spanish power in the islands was practically wiped out except for the force holding the beleaguered city of Manila.

Dewey could have forced the surrender of Manila at any time, but both he and his Spanish opponents were of the opinion that this would have been the signal for a general massacre of the Spanish troops and population. American action was directed, therefore, toward securing the city but doing so in a way that the Filipino armed forces would be excluded therefrom.

The first American troops to conduct land operations established camp a few miles south of Manila, between the bay and a deep estero which parallels it for a distance of half a mile. Opposite this the Spanish defenses consisted of a line of trenches connecting two block houses and a small and ancient fort (San Antonio Abad) on the beach. From there the front extended east, north, and finally west to the bay on the north side of the city. This portion of the line, which contained twelve block houses and other defenses, was covered by our Filipino allies. It was twelve times as long as that part which the Americans faced.

The siege was a dreary affair of rain and mud enlivened at times by exchanges of artillery or rifle fire. On the night of July 31, 1898, there were three rather prolonged fusillades of artillery and small arms fire. Next day both Spanish and American commanders published orders complimenting their troops for beating off determined attacks by the enemy. Neither side had been out of their trenches!

Finally everything being ready the Americans advanced to the attack of Manila—in *column of fours* on the two roads leading to the front and on the beach.

Had the advance been less rapid the Americans would not have overtaken the

retreating Spaniards, and there would have been no casualties. As it was, enemy rear guards fired on our men and forced them to take cover for a time. Then the advance was resumed. It continued through the defense system, the suburbs of Ermita and Malata, onto the open plain of the Luneta. Here the troops were within easy rifle range of the Walled City. But everything proceeded according to schedule. American staff officers entered the Walled City and went to the Ayuntamiento to receive the surrender. Navy staff officers arrived also. Leaving their boats unmolested they undertook to haul down the Spanish flag. The Spaniards interposed no objection to this, but there was some difficulty between the Army and Navy over it.

Soon the Army commenced taking over the Spanish defenses along the entire front and barring out their allies, the Filipinos.

Something went wrong in the American sector. Perhaps there was too great a desire to get from the mud of the trenches to the shelter and comfort of Manila. At any rate the Filipino troops were allowed to follow the Americans through the defense lines and into the suburbs. There they were stopped. Part of the suburb adjacent to Manila was designated as billeting area for the Americans; the Filipinos were allowed the remainder. The latter were bitterly disappointed at thus being excluded from their own capital.

Finally an arrangement was made whereby the Filipinos were to give up their billets in the suburbs, march through the city, and out the other side. They were not, however, to be allowed to pass through the Walled City. They marched down Calle Nozaleda, through our battery area, along the road east of the moat of the city, and on—several regiments of infantry, with bands playing and colors flying. It was little enough satisfaction and honor to accord

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them in view of what they had done to make possible the success of American arms. It spoke well for the Filipino government that they thus withdrew a possible source of friction with their allies. They were grateful to the Americans, and sure that when peace was signed the city would be turned over to them. Meantime the cleaning up of Spanish forces elsewhere could continue unhampered, as could the organization of civil government in the provinces.

Then one day it was made known that the Filipino flag was not a recognized emblem.

For months a number of small armed launches flying the Filipino flag had been plying the waters of Manila Bay. This was a convenient means of communication for native forces about the bay and up the rivers into the interior and to other islands. Dewey suppressed the use of the flag and seized some of the boats. Was that the sort of treatment to be accorded to allies? The Filipinos thought not.

By January, 1899, every tie between the races had been broken, the Filipinos knew that in all probability the pending peace treaty would give the archipelago to the United States, that then they would be expected to give up their whole country whose freedom they had just established by force of arms. The dreams of generations, so near fulfillment, were to be proven only dreams, the blood shed for freedom was to have been shed in vain. The new masters of their country were to be of a race who drew the color line, and had none of the sympathetic human qualities that made life under Spanish government rather pleasantly tolerable.

There seemed one alternative to submission to the domineering Yankees—attack them and drive them to their ships. Perhaps such a show of strength would lead to a treaty with the United States and to the latter's withdrawal. The Filipinos prepared to fight if and when the treaty

should be signed, if it sold them to the Americans.

During January the attitude of the Filipinos became threatening. Plots were hatched for the slaughter of Americans by natives in the city in conjunction with attacks from the outside. A few Americans who had gone through the lines did not return. House servants became provocative in their attitude toward their employers. Along the outposts the situation daily became more trying. Filipinos taunted Americans with profanity and obscenity recently learned from the latter. Filipino troops at drill deliberately crossed into American territory, the Americans yielding ground under orders, then returning after the Filipinos had withdrawn. To the Filipinos American forbearance was a sign of weakness or of fear. It was also so construed by the foreign residents. Their attitude toward us changed noticeably. English neighbors with whom we battery officers had been friendly now began to avoid us.

It was only a question of time before some hot-head would set off the fireworks. On the evening of February 4, 1899, the Filipino guard on the east of a short bridge exasperated the American sentry at the opposite end of the bridge beyond endurance. Shots were fired.

The Insurrection was on.

THE OUTBREAK

An Australian circus had been showing in Manila, in the northeastern part of the city. On that evening of February 4, I attended the circus with another officer of the battery, Lieut. Koehler. We were a bit apprehensive about being so far from our organization in such ticklish times, so we hired a two-horse victoria for the evening, and saw to it that the driver parked close to the circus tent. It was well that we did so.

The circus was a one-ring affair, the seats packed with soldiers. The performance



Scott's Platoon, Battery D, 6th Artillery (3.2-inch, man-drawn), lined up on Calle Nozaleda, ready to march to Battery Knoll. Lt. E. D. Scott is the man on the right in the center group of three.

was nothing exciting. As it approached the end, some young women were executing a dance number on a movable platform in the center of the ring. A soldier rushed through the entrance and shouted:

"All men to your posts! The outposts have been attacked and driven in!"

Silence. Then a roar!

Koehler and I were near the entrance. We went to it quickly. As we ran I glanced back. A brown flood of humanity was surging across the ring, engulfing the frightened dancers who made a little huddle of color on their platform. The wave burst from the tent and over the vendors of fruits and dulces who had been squatting outside; they and their wares were scattered in all directions.

We jumped in our carriage. A half a dozen soldiers piled in with us. Away we went at a gallop.

Soon we were beyond the crowd. The streets were strangely silent and deserted now. Only a pair of grim-looking

infantrymen leaning on their rifles at each corner. Our self-invited passengers dropped off at the nearest points to their barracks leaving we two lieutenants to go alone to Nozaleda Street.

Here we found officers and men awake and preparing for the field. Fleming had been in Fort San Antonio Abad with his platoon for some days. I had been quartered with my platoon with a battalion of the 1st Washington Volunteer Infantry at Paco, about a mile out on the Calle Nozaleda. After receiving some instructions from the captain, I went on with my carriage and joined my command.

That night there were sporadic attempts at an uprising in the city. Several Americans were attacked. Shortly after I passed along this very road a native tried to knife two American officers in a carriage. They were armed, and killed him. I was unarmed as I rode along. But the idea of danger did not occur to me at the time; and nothing happened.

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INTO POSITION AT BATTERY KNOLL

I found my platoon in readiness for the field. We carried out our orders to proceed to a previously selected spot, where we prepared for action. Here was a low knoll about six feet above the surrounding terrain, with an artificial appearance as if it were, perhaps, a long-abandoned preparation for a building site. This hard and grassy hummock, later known officially as "Battery Knoll," eventually became a military cemetery. It commanded a fair view of the country from northeast to southeast, and for a mile or more in depth. To the south the view was broken by bamboo and other clumps of timber about a quarter of a mile from the platoon.

By daylight we had seen Filipino troops in the first sector, and had located some trenches and other shelter. We suspected the southern sector to be occupied but had seen nothing. I placed my two guns in echelon so that each could fire in any part of either sector without endangering the other gun, and around each built a sandbag wall for protection of personnel.

These emplacements were V-shaped to provide cover against the whole enemy front, but had to be under 30 inches in height to allow the gun muzzle to project over the edge. A higher parapet with embrasure would have furnished better protection, but a quick shift over the whole field of fire would have been impossible and any kind of shift difficult.

Gunnery was simple in those days. One placed his guns in the best place to overlook the scene of action, stood between them with a pair of field glasses, and fired on the enemy if, when, and where he showed himself. About the only restraint on initiative was in using due care not to shoot into friendly infantry.

Our preparations complete, we sat down comfortably to listen to the sounds

of distant battle. From far off to the northeast there floated to us on the still air a low, muffled sound that was "independent rifle fire," punctuated by a succession of "whoosh, whoosh" which was volley fire, and at less frequent intervals the louder thunder of the Utah artillery. Only once was there a flurry of rifle fire in our own sector, off to the northeast near the river, and it was not repeated.

The firing had begun at the bridge over the San Juan near the Deposito (City Water Works). It had grown to considerable intensity there, gradually spreading left to the Bay on the north of Manila and right to the Pasig River. At length, deciding that rest was imperative, I made the men roll up in their blankets and get some sleep. I slept soundly on the bare ground until just before daylight, when some one woke me. Sounds of firing came from the same direction as earlier in the night.

FIRST ACTION

At daylight rifle fire was resumed in our sector to the left front. Presently Hawthorne's mountain guns opened up about a half mile away. A ground haze prevented our seeing anything at which it would be safe or profitable to shoot. A furious musketry action began to our right rear, and Fleming's guns were working fast, Lieut. Perry Miles was showing the Filipinos a taste of American valor by storming Blockhouse 14. The 14th North Dakota Infantry and 4th Cavalry (dismounted) advanced to near the hostile front trenches, but were unable to carry them and spent the day in this position.

I fired a few rounds at likely places in our left front and front, and silenced a trench about 1,000 yards directly to the front. We were all standing up and straining our eyes to make out any indication of the enemy, when the air was suddenly filled with a buzzing of

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U. S. Army Signal Corps

2-PDR MOUNTAIN GUN IN EMPLACEMENT

hornets. It was rifle fire from squarely on our right, coming from a long trench only 600 yards distant.

The men dropped behind the parapet. Staring eyes set in white faces turned toward their lieutenant. I had strange ideas in those days and remained standing upright until the situation cleared. Then I barked out some orders. I had often wondered how I would behave under fire. Once I had asked Lieut. Hawthorne, a veteran of Wounded Knee (where he had been wounded), what one's reactions were when under fire for the first time. I recall one bit of advice which he gave me: Drill and drill the men until they could perform their duties mechanically. Under the strain of battle they then could be relied upon.

So it turned out this time. The men responded to my orders, but they moved like automatons, their faces frozen, no sign of alertness. After we had fired one or two rounds the hostile fire slackened. It went mostly high over head—harmless. Little by little my men's wooden expressions relaxed, color returned to their cheeks, stiffness gave way to alert intelligence. Never on the drill field was service of the piece any smarter.

The situation was not without humor. While every man continued to duck

involuntarily when shots came over. I tried to keep my neck stiff and my head erect. The strain was too much. Finally I laughed. So did the men; they commenced to josh each other. I believe this did more to restore normal mental balance than anything else. There was a growing wonder that we were suffering no casualties, but even this had less effect than the ability to see the ludicrous side of it all.¹

Afterwards, and after long study, I learned that our day of battle at the Knoll was about the usual thing in warfare: Occasional activity, periods of inactivity, few targets—some certain, some doubtful, some pure guesswork. The advances of part of our infantry could be seen and were interesting to watch. Sounds of distant battle, so clear in the night air, almost faded out by daylight except for the muffled rumble of artillery.² Most of the time in our own sector there was plenty of noise and action from the Pasig River for two miles

¹Someone has figured out that in the Civil War it "took a ton of lead to kill a man." This is a pretty good thing to impress on young soldiers.

²An acoustic battle phenomenon often noted. During the day rising currents of air refract the sound up away from the listeners.

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around to San Antonio Abad on the bay.

Captain Dyer came out with the center platoon of the battery and put the guns in position off the knoll and to my left, but quite close by. It was early morning and there was little activity in our immediate vicinity. Sometime later occasional bullets came from our left rear, the direction of Manila. At first they seemed to be from a single rifle but the number soon increased, though the volume of fire was never great. The crack³ of the bullets was short of us, indicating that the rifles were over 500 yards distant. The direction of the shots indicated a front of perhaps 500 yards. The only place from which aimed fire could come was the village of Paco. Its rooftops became objects of scrutiny for us all.

A single shot focused attention in the direction whence it came. Then more shots were fired from another direction. Successive shots from the same place would reveal the general locality from which they were fired. But we did not succeed in locating exact targets.

Why no one was hit was a mystery. The men kept under cover when possible, but much of the time they were exposed because of demands for fire to the front. At last I concentrated my attention on the church in Paco, about 500 yards to our left. I was rewarded by observing what appeared to be a small puff of dust under its eaves. Everyone studied the church. There were more puffs, followed by the ping of bullets on the ground. What should be done about it?

General Thomas Anderson, sector commander, had arrived and looked on for some time. He said that some infantry should go in and clean out the church, but at the moment he knew of none who were available for the task. I proposed using our guns with shrapnel set at 1,000 yards. If they caromed off or passed through

³The ballistic wave set up whenever the projectile travels faster than 1,100 feet per second.

openings they still would burst near by. Percussion bursts inside the building would probably clear out the snipers, even though a fire might result.

The older officers were loath to destroy a church, but a sudden increase in hostile fire settled the matter. I was told to go ahead. A few rounds directed at the eave, and some more through the windows ended in that source of trouble going up in smoke. The sniping promptly ceased.⁴

Meantime our infantry occupied Santa Anna. The advance from there on San Pedro Macati masked further fire from our guns. We did do some firing over the heads of the infantry in the general direction of San Pedro Macati in order to spur the retreat of Filipinos who might make a stand there. It might have helped; we never knew. At any rate, our infantry met no opposition at the town. Sometime in the afternoon an order came to send a gun to the assistance of our forces to the southwest.

A DETACHED MISSION

When the Filipinos, prior to the outbreak, had agreed to withdraw from Malata and Ermita to a locality outside the line of blockhouses, they complied except for evacuating Blockhouse 14. This was at the center of the Spanish defense line in the old American sector during the siege. Not far from this blockhouse the Filipinos had constructed a trench system which extended from the estero to a point on the shore a little south of Fort San Antonio Abad.

As I have previously described, at daybreak on the 5th Lieut. Perry Miles rushed this blockhouse with his company of the 14th Infantry. In spite of severe losses he took and held the place.⁵

⁴It was while this sniping was going on that Lieut. Charles E. Kilbourne, Vol. Signal Corps, while exposed to the fire at short range, repaired a telegraph wire. For this he received a Medal of Honor. Kilbourne, now a retired major general, is Superintendent at V.M.I.

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This was close in front of the native trench system. Other troops on either side came up abreast of Miles, and everyone settled down for a long day of firing into the brush which screened the hostile works. The volume of enemy fire discouraged any further American advance.

In the afternoon reinforcements were sent into this sector, only to become scattered and immobilized in the wilderness in rear of the firing line. Plenty of troops were available but apparently there was no way to get any of it in motion forward. The axiom "You cannot *shoot* an enemy out of position" was being well illustrated.

My movement to support the infantry in this sector involved hauling one of my pieces back to the road, thence west a few blocks, and then south about a mile. The road was sandy. The trees and bamboo by the roadside afforded little shade from the tropical sun which beat down overhead. Any air that might have been stirring was cut off by the vegetation. Thus we made a march over a mile and a half, dragging the gun by hand. With the extra ammunition strapped to the limber and axle seats we had a load close to two tons. It was a trying task for nine men.

The first half mile was not so bad, but thereafter the road became worse, and fatigue increased rapidly as did the strain on morale caused by marching down an unprotected road straight toward the enemy lines. Halts for rest became more frequent. At times the men appeared to be on the verge of collapse.

An additional peril appeared—hostile fire. A rifle bullet causes a loud crack at a point in its flight estimated as about 500 yards from the muzzle. A bullet passing through bamboo causes the joint to explode with a quite similar sound. Naturally the men, hearing a number of

these bamboo pops, concluded that we were walking right into the enemy position. It was difficult to convince them otherwise, even though I, who had traversed this road twice before, knew exactly where the lines were.

Once a rapid fire of a dozen bullets came over us from the right flank. In that direction there were open gardens with a few native huts backed by bush and bamboo, not a hundred yards from the road. Pistol in hand we ran through the gardens to search the huts and bush beyond. We found no one.

Finally we reached the church at Cingalon. Here we met the first American troops; I think that there must have been half a dozen organizations represented in the crowd huddled in the shelter of the church and in the nearby ruins.

Ahead the narrow road continued for 300 yards where it seemed to terminate in the wall of green that flanked it on either side. And just there a low breastwork of Filipino construction crossed it. I learned that this position had been occupied most of the day, its fire keeping the road clear of Americans, but that for some time it had been vacated.

Much inquiry and a long personal reconnaissance behind our lines convinced me that our infantry were still on our side of the hostile trench system. They were so close to it, however, that it was out of question to fire on it. Even had there been no trees (which could cause premature bursts) it still would have been too dangerous to our own troops. Nevertheless I had been sent there to support the doughboys; wherever I went they were insistent that artillery fire was necessary to enable them to advance. So I did the only thing possible—fired from the road through openings in the trees in the direction of Pasay, and at other points in the enemy rear areas.

Direction and range were both a matter of estimation. Whether any effect was

⁵For this feat Miles was awarded the Medal of Honor. Now a retired brigadier, he lives in Staunton, Va.

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obtained I never learned. Fires did start in various places, and in an hour or so it became evident that the enemy was withdrawing.

During one of the lulls in our desultory firing—while we were waiting, hoping for something to turn up, with an artilleryman's uneasiness about the tabooed shelling of the woods—a Filipino soldier appeared in the breastwork down the road. He emptied the magazine of his Mauser at us. In a jiffy the road was cleared of Americans. He ducked down, but was up in a moment to repeat the performance.

Various soldiers tried to pot him but with no luck. For a while he remained out of sight. I was studying the place with my glasses when a soldier thought he saw something. He came up beside me and tried to point it out, extending his right arm over my shoulder with finger outstretched. A "pug" sounded in my ear. The arm dropped. I glanced around and saw that a bullet had smashed the man's shoulder. He felt no pain, and I directed him to a First Aid station just across the road. A few minutes later a tremendous outcry arose. Sensation had returned, and such a shrieking, sobbing and cursing I never heard. But he was soon on his way to the hospital.

Soon I grew tired of the futile efforts to plug our Filipino friend, borrowed a carbine from a 4th Cavalryman, and lay down in the middle of the road waiting for him. Presently he reappeared. We emptied our pieces at each other without effect. In a moment he was up and we were at it again. At my second shot his white helmet flew off and he dropped.

"You got him, Lieutenant!" and other exultant remarks came from the soldier onlookers. I felt a bit of pride as I returned the carbine. At that instant my antagonist rose behind his barricade, waved his helmet at us, and walked off to the left out of sight, dragging his gun by the muzzle. Evidently I had only creased

him. I often wonder what became of the fellow. He was a good man.

MURPHY'S CHIEF OF ARTILLERY

Late in the afternoon a noticeable slackening in enemy fire and the appearance of many conflagrations deep in his territory gave the correct impression that he was withdrawing. A general advance began which met with no opposition until after the town of Pasay was occupied. Outposts were established south of that place and the weary troops settled down for the night.

I trailed along with my gun and bivouacked in the plaza. The local garrison consisted of a battalion of the 14th Infantry under Captain John Murphy. Perry Miles, one or two others, and I decided to spend the night in a store on the display tables. It was the first time we had confronted native billets and we feared possible contagion.⁶ Presently an orderly came from the second floor of the building.

"Captain Murphy sends his compliments, and directs Lieutenant Scott to report to him at once."

To put it mildly, this was an irritation. What right had he to give *me* an order? He was not my superior commander. I was all for declining to go, but my companions advised me to comply. I climbed the stairs to what proved to be a comfortable living room open on three sides and equipped with two beds and several large chairs. In one of these the captain was comfortably seated.

I had never seen him before. He was a veteran of the Civil war, within a few months of retiring for age, and had a brogue as thick as if he had just come from the peat bogs of Ould Ireland.

Captain Murphy was, he informed me, in command of the town and therefore of my battery. All his life it had been one of his ambitions to command artillery,

⁶We soon got over that, and bedded down in any old shack, glad to get under a roof!

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that I was now his Chief of Artillery, and as such was entitled to quarters with him. One of his beds was at my disposal at once! So the junior officer of the garrison of Pasay spent the evening in a big cane chair and the night in a real bed—even if it did have a mosquito bar—while his seniors fought insects on a fruit table in the street! This was one of the times Lady Luck smiled.

Next day was one of idleness, and on the morning of the 7th we marched back to our barracks on Calle Nozaleda. A

number of foreigners enroute to their offices passed us. Each had a broad smile and cheerful greeting for us—a marked contrast to their offish manner of a few days before.

And how we enjoyed a bath, clean clothes, and good food!

In an early number of the JOURNAL Gen. Scott will continue his narrative, describing action at San Pedro Macati and the Pasig River expedition.—ED.



SPECIAL NOTICE

U. S. FIELD ARTILLERY ASSOCIATION PRIZE ESSAY, 1940

A prize of \$100 is offered by the United States Field Artillery Association for the best essay submitted by any Field Artillery officer of the Regular Army, National Guard, or Reserve Corps, on any subject of current interest pertaining to the Field Artillery.

The following rules will govern 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, 1940. 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.

Streamlined Convoys

BY LIEUTENANT COLONEL RAY L. BURNELL, FA

THREE recent motor marches made by the 2d Battalion 10th Field Artillery furnish an interesting basis for comparison between centralized and decentralized control. The first march, of approximately 1,200 miles, was conducted under the first method, conforming generally to the march doctrines set forth in Field Artillery Book 130 and Digests of Field Artillery Developments for 1936 and 1937. The last two marches, of considerably greater length, were made by individual driving: that is, each driver was "on his own" between rendezvous points.

It was necessary, during a concentration of troops at Fort Lewis this spring, for the 3d Field Artillery Brigade to send truck convoys to move troops stationed at other posts. A detachment from the 10th Field Artillery furnished 88 trucks which assisted in moving units of the 38th Infantry from Fort Douglas, Utah, to Fort Lewis (1,948 miles), thence back to Pocatello, Idaho (1,627 miles). The country traversed furnished a fair test in that it varied from mountain passes to flat desert. In general the country was sparsely populated, but many small towns and a few cities were passed through by the column.

While we were preparing these convoys, the division commander, Major General Walter C. Sweeney, expressed his desire that the movement be made as quickly and easily as possible for the transported personnel, with a minimum of interference to civilian traffic. He stressed the necessity for safety; previous concentrations had been marred by serious accidents. Previously at Fort Douglas General Sweeney had required the 38th Infantry to eliminate set speeds and distances between vehicles during motor marches, in order to obtain the

objectives mentioned above. He had sold his ideas to us by his interest and sincerity; but before we actually tried them out we were still a bit skeptical because, like many others, we were still imbued with the notion that maximum control ought to be exercised at all times. After we had completed these marches we reached quite different conclusions from those previously held, and different, perhaps, than are held elsewhere in the service. These conclusions are set forth at the close of this article.

ORGANIZATION OF CONVOY

The column was organized the same for both marches made under decentralized control. It made no difference whether passengers were being transported or the trucks were empty. This organization was in conformity with the following table:

ADVANCE PARTY

- 1 reconnaissance car, containing the Reconnaissance Officer, 1 driver, and 4 route markers
- 1 reconnaissance car, containing supply officer, mess officer, supply sergeant, 1 marker, and the driver

MAIN BODY

- 1 pilot car (reconnaissance), with the executive, 1st sergeant, and the driver
- 1st section—11 trucks, including kitchens with mess personnel, and baggage trucks
- 2d section—10 trucks
- 3d section—10 trucks
- 4th section—10 trucks
- Mechanic's detail—1 pick-up truck
- 5th section—11 trucks
- 6th section—10 trucks
- 7th section—10 trucks

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8th section—9 reconnaissance cars, of which one was used to pick up markers

REAR PARTY

- 1 ambulance
- 1 reconnaissance car, with motor officer and motor sergeant
- 1 truck, wrecker
- 1 truck, pick-up, with mechanics
- 1 reconnaissance car, with investigating officer and 2 men

COMMANDER

- 1 sedan was provided for the commander, who rode wherever his duties required.

CONDUCT OF THE MARCH

Each section was under a noncommissioned officer, who was responsible for the personnel and materiel, inspection and servicing of vehicles, and the dispatching of vehicles. Each driver was responsible to his chief of section for the safety of his vehicle and the passengers, for the checking and gassing of the vehicle, and for keeping himself in proper physical condition to drive. Two or three assistant drivers were assigned to each section.

Before starting the march all necessary instructions were given, and, because of the simplicity of the method of marching, very little supplementary information or orders had to be issued enroute. The route of the entire trip was traced on a map and issued to all personnel, including drivers. In addition, everyone was furnished a mimeographed copy of the itinerary.

Trucks were dispatched by chiefs of sections at 30-second intervals. From then on, drivers were "on their own" until the next rendezvous point was reached, usually about 80 miles distant. They were required to observe all traffic regulations and to drive at a safe speed. They were their own judges in this matter, and understood that they would be held fully responsible in the event of any accidents caused by speeding. A maximum of 45

MPH was prescribed because some of the vehicles were not designed for greater sustained speed. Drivers were allowed to gain or lose as much distance as they found necessary, except that they were not to approach closer than 100 yards to the vehicle ahead of them. They were not to pass other vehicles except disabled ones.

In case of fatigue or drowsiness, drivers were instructed to halt and wait for a spare driver who would act as relief. Fatigue or drowsiness were not to be accepted as excuses in case of accident.

At halts, trucks were dispatched by chiefs of section without waiting for the column to close up. Time at halts began when the leading truck in the section stopped.

Chiefs of section rode in their sections wherever they could best exercise supervision. Usually they varied their position so as to check on different drivers.

At night drivers were required to be in bed by 9:30. Chiefs of section checked on this, and did not permit a man to drive the following morning who had not had sufficient sleep, or who for any reason was not in physical condition to drive. They were held jointly responsible with the drivers for any accident caused by violation of this rule.

Before the start of the march each morning, at the halts at the end of two-hour intervals, and upon arrival in camp, drivers were required to check their vehicles (including motors) carefully and report to their chiefs of section who in turn reported to the battery commander. This inspection did not take long, but it was systematic, and thorough.

The column commander rode the column at will in order to observe individual drivers. No driver knew when he was about to come under observation. The principle fault noted was that of going too fast down grades and cutting corners on curves. For the first offense drivers usually were cautioned, for the

STREAMLINED CONVOYS

second they might be "grounded." It was soon found that this punishment was considered severe by the men. Few drivers had to be relieved enroute. A number who were found to be unsuited for the duty were relieved without prejudice upon return to Fort Lewis.

Economy of men was stressed in route marking. Men were used only where there was danger of accident, or where an arrow or sign would not suffice. Metal signs with arrows showing the direction were used wherever possible. These signs were of distinctive color and were more easily recognizable than state highway signs.

Gassing was done at filling stations or from tankers enroute, or after arrival at camp, depending on the length of march. Three trucks found to be gasoline hogs had to carry a five-gallon can of fuel apiece, but the only other reserve carried was twenty gallons in the mechanic's section. Gassing on the road was accomplished without confusion or delay because only ten gallons was issued to each vehicle, and this required about twenty seconds for each. There was no jamming of vehicles except where

facilities were inadequate. Where two filling stations were available the situation was excellent.

Hot meals were served in the morning and evening, cold lunches at noon. Hot or cold drinks were issued with these lunches, at the noon halt.

The transportation which made the march was five years old, and insufficient opportunity had been afforded for preparation and overhaul prior to the start. Motor failures were numerous, yet the mechanical condition of the vehicles improved as the march progressed, and they were in better condition on our return than they had been prior to departure. These marches proved conclusively that all echelons have much to learn about care and maintenance, and that the Knox trophy test march of 150 miles is no real test of mobility of truck-drawn artillery.

A COMPARISON

The following statistical study gives a good comparison between marches made under centralized and under decentralized control.

Date	Convoy of 2nd Bn., 10th F.A., Fort Lewis to Boise, Idaho and return. August, 1938	Convoy of 10th F.A., Fort Lewis to Fort Douglas, Utah, and return. April 6, 1939	Convoy of 10th F.A., Fort Lewis to Pocatello, Idaho, and return. May & June, 1939
Type of Control	Centralized	Decentralized	Decentralized
Distance	1,179 Miles	1,948 Miles	1,647 Miles
Number of Vehicles	87	88 (a)	91 (a)
No. Marching Days	6	9	8 (b)
Total Truck Miles	94,352 Miles	171,932 Miles	152,166 Miles
Av. Days March	197 Miles	216 Miles	206 Miles
Maximum Days March	208 Miles	278 Miles	278 Miles
Av. Marching Speed	27.2 M.P.H.	36.6 M.P.H.	37.6 M.P.H.
Av. Speed entire time on road	23.3 M.P.H.	31.5 M.P.H.	32.6 M.P.H.
Gas used per 100 Truck Miles	7.99 Gals.	8.7 Gals.	8.2 Gals.
Oil used per 100 Truck Miles	1.6 Qts.	1.4 Qts.	1.4 Qts.
Cost of Gas per 100 Truck Miles	\$0.88	\$0.96	\$0.92
Cost of Oil per 100 Truck Miles	\$0.13	\$0.12	\$0.12
Repair and Maintenance per 100 Truck Miles	\$0.119 (c)	\$0.132 (c)	\$0.189 (c)

- Note: (a) Does not include 49 vehicles of 38th Infantry which marched one way.
 (b) Includes ½ day to grease, change oil and make 1,000-mile Technical Inspection.
 (c) Does not include cost of spare parts carried from Fort Lewis.

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CONCLUSIONS

Marches under decentralized control, of 250 miles per day, are a success, and I believe that they can be followed readily by National Guard and Reserve regiments for training purposes or for concentration. Some difficulty may be encountered in handling large troop movements on one road on account of increased road space, but I believe that the decentralized system with its large distances between vehicles will be necessary to prevent serious interference with normal civilian traffic in time of peace, or to minimize air attack in time of war.

Accidents are less likely under this system. The strain of following another vehicle closely is not present; the driver can devote more attention to other hazards. On our two decentralized marches we had only one accident in 400,000 truck miles, and this one was undoubtedly caused by the driver going to sleep, which might happen under any system.

This decentralized method of marching is no cure-all, and it cannot be applied to all situations. Its value in moving large bodies of troops has yet to be demonstrated, and in the movement of supplies it might be decidedly disadvantageous. Nevertheless there are many times when it will be superior to the centralized method, where vehicles move in a closed formation.

It is obvious that the increase in the rate of our marches has not kept pace with improvement in materiel and roads. It will be impossible to increase this march rate as long as vehicles are marched at set distances as though tied together with strings. We have failed to reach anything approaching our possible strategic mobility because of improper march training and unsatisfactory motor maintenance dictated by arm-chair doctrines and rutted conventions. Let us eliminate antiquated technique and restrictions. Then we will get real results.

Finally, here is a list of what I consider to be the advantages and disadvantages of the two methods of conducting motor convoys:

Advantages of decentralized control

(1) The average increased rate of march based on the time of the leading vehicle is approximately 10 miles per hour which is almost 40 percent greater than obtained under the centralized control.

- (a) Increases the distance of the daily march.
- (b) Decreases the time on the road.
- (c) Makes motor organizations more mobile strategically and possibly tactically.

(2) Increases the space between vehicles so that the column does not present a suitable target for attack aviation when this may be likely.

(3) Causes the minimum interference to civilian traffic on the open road and in passing through cities in normal peace time.

(4) Permits the column to pass slow-moving civilian trucks without stopping them or jamming the highway.

(5) Permits two motor columns marching on separate roads to cross each other at road junctions at the same time without entirely halting either column.

(6) Makes it possible for small troop movements to be made at night with lights on well-traveled roads without being detected.

(7) Makes gassing from civilian service stations simple and prevents jamming of vehicles or any appreciable delay.

(8) Reduces much of the strain on the driver (that of following another vehicle at stated distances) and reduces the danger of accidents.

(9) Requires more responsibility of the driver who, because of the initiative and responsibility given him, develops,

STREAMLINED CONVOYS

takes more interest and becomes a more valuable soldier for other duties as well as driving.

(10) It places more responsibility on non-commissioned officers (chiefs of section) and develops them accordingly.

(11) It actually makes marches less tiresome and improves the morale of both passengers and operating personnel.

Disadvantages of the decentralized control are:

(1) It requires more dependable and better trained drivers.

(2) Once on the road the commander has less control and less influence on his command for the time being.

(3) The length (distance) of the column is much greater making communication more difficult and

requiring a longer time for the column to close at the end of the march. (This time is not increased as much as might be expected because the trucks close at a faster rate.)

(4) It is more difficult to predict the exact location of the tail of the column at any given time.

(5) It may cause more difficulty in moving large bodies of troops on few roads. This remains to be seen.

(6) It loses its advantage of increased speed when marching over poor roads, difficult terrain or on short marches.

(7) The maximum allowed speed (45 M.P.H.) is close to the maximum safe operating speed of our trucks and it causes a greater strain on the transportation and possibly causes more motor failures.



NOTICE OF ANNUAL MEETING, U. S. FIELD ARTILLERY ASSOCIATION

In compliance with Article VII, Section I, of the Constitution, notice is hereby given that the Executive Council has fixed 4:45 PM, Friday, December 15, 1939, as the time of the annual meeting of the Association to be held at the Army and Navy Club, Washington, D. C.

The business to be disposed of will be the election of seven members of the Executive Council (of these, three are to be elected from the Regular Army, two from the National Guard, and two from

the Field Artillery section of the Officers' Reserve Corps) and the transaction of such other business as may properly come before the meeting.

Proxy cards are being sent to all active members of the Association within the continental limits of the United States, as required by the Constitution, and it is desired that they be returned promptly. Nominations may be made on the proxy cards, or from the floor at the meeting.



More one-hundred-percenters: The 104th FA Club (NYNG) has enrolled all its members in the U. S. Field Artillery Association.

Visibility in Range Estimation

BY LIEUTENANT EDWARD A. RAYMOND, FA-RES.

THERE is a tradition that an artilleryman ought to rely as little as possible on his instruments. Though these may be damaged in transit or by hostile fire, or do not arrive in time, data still must go promptly to the guns. Furthermore, our most recent gunnery text, with its use of estimated distances in calculating offsets puts fresh emphasis on the requirement that every officer of our arm must use his vision with skill.

Our eyes will serve us better if we will consider two factors which control visibility. These are *light* and *mass*.

Light is the more important, the simpler, and, in practice, the harder factor to appraise. Concerning it, the rule which we can use in judging distances is this: The visibility of an object varies directly with the amount of light which it reflects to the observer. The visibility of an object depends, then, upon the amount of light which falls on it, upon its refractive index or color, and upon conditions of the medium separating it from the observer.

Moisture, dust, or smoke in the atmosphere intercept light from the object under observation and make it seem farther away. Hence on a rainy day the writer is accustomed to deduct 10 per cent from any sizable estimated distance. The same effect is caused by glare coming from reflected light in an intervening area. Thus objects seem more distant when viewed, at normal artillery ranges, over water, snow, or sand. Light is also intercepted by molecules of oxygen and carbon dioxide. This accounts for improved visibility during periods of low atmospheric pressure. Observers should allow for this when at high altitudes or when the barometer is falling because of an approaching storm.

Color, being a phenomenon of light refraction, has a marked effect on visibility. The visibility of colors is determined from their position in the spectrum, ranging from red, the most visible, through orange, yellow, green, blue, and indigo to violet, the least visible. One fine summer day on a firing range in Vermont a yellow cow strayed into the target area during service practice. She suddenly appeared apparently beside a group of bushes on which my battery had just adjusted with a bracketing salvo. The first volley for effect was on the way as the animal came in sight. *Cease firing* was given hoarsely. We held our breaths. To our surprise the rounds fell a good hundred yards short of the cow. What had happened was that the bright light had been reflected much better from Bossie's tawny hide than from the dark green bushes, with the result that there was an optical *illusion* of equal ranges. Actually the cow was well beyond the target.

Visibility is also controlled by mass, the rule being: The apparent size of an object varies according to its distance and *to its position in the optical field*. Every artilleryman is familiar with the first half of that axiom, and makes use of it frequently. We are apt, however, to forget the portion in italics. When we focus our eyes on an object we form a triangle, with the object as the apex and the line joining our eyes as the base. This is a triangle in a horizontal plane. Since we do not have an extra eye in the middle of our foreheads as did Cyclops, we do not receive the same stereoscopic effects when viewing things in a vertical plane. Therefore, since a horizontal perception is a triangle and a vertical

VISIBILITY IN RANGE ESTIMATION



FIGURE 1
The vertical line appears longer
than the horizontal line

one a line, horizontal lines appear shorter than vertical ones (Fig. 1). An area marked by horizontal lines appears shorter and wider than its actual dimensions whereas one marked by vertical lines appears longer and narrower. Wide horizontal bands make an area look shorter and wider than narrow and horizontal bands, and narrow vertical bands make it seem taller and thinner. In cultivated areas these conditions are common. For example, an orchard or a field of shocked corn will produce wider bands than furrows or garden crops, and thus produce illusions which would lead to erroneous range estimation or improper selection of range changes when firing into such an area.

Furthermore, when the lenses of our eyes are tilted up they make an object appear to narrow deceptively at the top, and when tilted down to narrow downwards. This familiar effect is noted in camera views of tall buildings or in photos taken from an altitude when the camera is pointed down. We should remember, therefore, that objects on higher ground than the observer will appear smaller hence more distant. The writer allows a factor of 10 per cent for this effect when the angle of site is 30 mils or more.

Two additional principles apply to the effect caused by the position of an object in the visual field: The principle of distracted attention, and the principle of accustomed position.

When forms of more visibility surround an object it appears larger than it is; when it

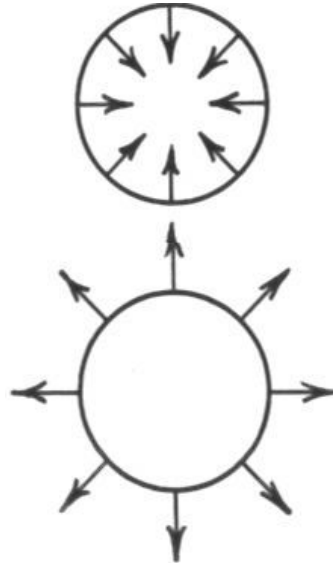


FIGURE 2
The upper circle appears
larger than the lower

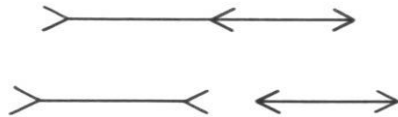


FIGURE 3
Horizontal lines are equal

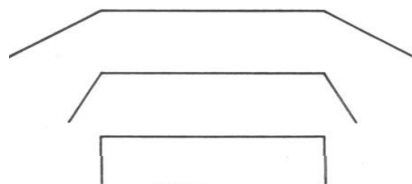


FIGURE 4
Horizontal lines are equal

has more visible configuration than the surrounding forms it appears smaller than its actual size. In addition, if surrounding forms distract the eye the object appears larger, whereas if the eye is drawn to the object the latter appears smaller (Figs. 2, 3, and 4).

Like a cat on a ridgepole, an object on the horizon appears greatly enlarged.

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We may be aware of this and allow for it when estimating ranges. Nevertheless there is a case where we still may be led astray: When the observer and object are on the same horizontal plane, an intervening hollow, most of which is visible, tends to pull the eye down one side and up the other, causing over-estimation of range despite the apparent exaggerated size of the object. On the other hand, if the intervening space is level or contains a hollow which is mostly hidden, we may get too strong a perception of fore-shortened foreground which will cause us to underestimate the range. Nearly all field artillery officers have experienced cases on the target range where they were in error as to the location of a target which appeared on a low crest beyond an intervening hollow.

Departure from preconceived form is exaggerated by the eye. This principle explains a phenomenon with which every field artilleryman ought to be familiar,

that if the surrounding forms mask most of an object they will make it seem farther away. A soldier will appear more distant if partly hidden by a bush; but when one entire gun section is seen, that being an entity, the size of the battery is not distorted.

Many officers, indeed most young ones, will confess to a slightly vacant sensation when attempting to estimate distances, especially when in unfamiliar terrain. Untutored practice will not always lead to skill in this art, either, for this is a case where repetition merely confirms the estimator in bad habits. Hence experience will only be beneficial when the observer understands and appreciates the laws pertaining to visibility as governed by light and mass, and by the principles of perspective. Better results will be obtained when the observer is conscious of what he is doing. Only then will he estimate, rather than guess, offsets, ranges, and dimensions of targets.



A Gentlemanly War

Recent press dispatches relate that belligerents on the Franco-German front have displayed signs saying "We won't fire at you if you don't fire at us." Evidently this method of making war is not a new one, as is testified by the following:

During preparations for the St. Mihiel attack by the American First Army in 1918, the army artillery planned to fire on important centers of communication where there were railroad centers, bridge defiles, narrow streets, command posts, and the like. One of the most important of these centers was Metz. It was felt that if German traffic through this point was stopped, the Germans would be seriously handicapped. There was only one gun which could fire on Metz. This was a French 340-mm. gun which had been manned by Americans. When the French learned that it was planned to use this gun to fire on Metz, they objected strenuously. They stated that earlier in the war the Germans had fired on Nancy with long-range guns; that this 340-mm. gun had been emplaced to retaliate by firing on Metz. Just before the gun was ready to fire the French had inserted notice in Swiss newspapers to the effect that if the Germans did not stop firing on Nancy they (the French) would fire on Metz. The Germans stopped firing on Nancy. The French considered that a gentleman's agreement had been made with the Germans, and they could not honorably fire on Metz.

Open Warfare

BY COLONEL CONRAD H. LANZA, FA

General Considerations

THE dream of military writers and leaders has been to win battles through maneuver. Students point to the victories won in open warfare by Frederick the Great, Napoleon, Washington, Lee, Grant, Stonewall Jackson, and urge modern successors to follow in their footsteps along the path marked out. They look forward to winning battles in the future as the generals of the past used to do.

Every country wishes to win battles in the next and succeeding wars; and is earnestly seeking the method which will assure this. But some believe that the days when maneuvers between large armies were possible are gone—not to return. Is this so?

Analyzing the grand campaigns of the past, we find that their open-warfare maneuvers consisted essentially in

- a. Attracting the enemy's attention to some direction or locality;
- b. Then secretly maneuvering in some other direction, or elsewhere;
- c. If the enemy weakened his front to meet the new movement, piercing his front; otherwise by fighting him on conditions unfavorable to him, by enveloping a flank, cutting lines of supply, and so on.

The foregoing type of maneuver was the rule prior to the 20th century. It gave decisive results, sometimes within a surprisingly short time. There is strong desire to continue on the same lines.

If the conditions under which campaigns have heretofore been fought are substantially the same at this date, a continuation of the past methods which have been successful might be expected. What were prime factors of open warfare

in the past? First, small armies operated in theaters of operation so large that there was space for maneuver, and choice as to the method of exercising it. Second, marches and maneuvers could be concealed from the enemy. There were other factors, such as slow rate of movements, but the two quoted were the essential ones.

Space for maneuver is now found only where fronts are not continuous; *secrecy* has nearly disappeared. Factors which are necessary for open warfare, and used to be general, are no longer so. These factors must be produced before open warfare is possible.

Small armies operating in large theaters of operation have freedom as to choice of action. Large armies with fronts continuous over long distances are limited as to action, to selection of sectors of attack, and the direction of axes of attacks. Considering modern facilities for observation and for transmission of intelligence, no maneuver, nor even a preparation for maneuver, can be entirely concealed. Where lines are continuous, an active enemy can usually determine in advance where main attacks are to occur, and the approximate date thereof. Only where space permits an opponent to have a choice of direction as to maneuver would there be difficulty in determining the next probable move.

Rapid successes, where campaigns and even wars were won through one happy maneuver such as that of Napoleon at Jena, or that at Austerlitz, are not now easily practicable.

Can open warfare and maneuver nevertheless be obtained in the future? Yes, they may be. Let us examine the possibilities.

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The World War of 1914-1918 was a war of attrition. The mission was to destroy the enemy's reserves and resources, until one or both were so exhausted as to make it impossible to continue the war. The mission was accomplished in November, 1918, at which time the reserves of the German army had all but disappeared. Under threat of a new offensive, in a new sector, where there were insufficient forces to make an effective resistance. Germany surrendered. Open warfare had been expected to follow a penetration of the previously intact front, but the end of the war interrupted this plan.

Many now believe that new wars between major powers will be wars of attrition, repetitions of the World War. If this method is again used, it may take considerable time to wear out the enemy's reserves and resources. This is admitted; responsible statesmen have announced that a major war could be expected to continue for from three to ten years. Its duration will depend on the rate of attrition forced on the enemy and this in return will depend on how rapidly offensives to wear out enemy reserves and resources can be delivered.

The force which can be deployed varies directly with the length of front. When a front is short, only relatively small armies can be engaged in battle; in this case it will take longer to exhaust the defenders. This means a long war if the combatants are well supplied with reserves and resources. Where fronts are long, greater forces can be utilized; if munitions and material are at hand, more attacks on a total wider front can be made. This would result in increased rates of attrition, and a shortening of the war. Consequently, nations rich in reserves and resources may prefer wider, or additional, fronts, in order that a decision may sooner be expected, by greater attrition on their opponents. Poorer nations may prefer a short, or single, front, in order that their more limited reserves and resources may last longer.

Whether a war takes three or ten years, an enemy's reserves and resources can not be completely exhausted, and his surrender thereby forced, without the attackers themselves suffering enormous losses. For this reason there are predictions that a great war will end civilization, by exhausting, and nearly exhausting, the reserves and resources of the losing and winning sides, respectively. This would reduce present standards of culture through destruction of male populations, and confine production of resources to war materiel and absolute necessities.

Some nations expect that this is what will happen. Those with superior reserves and resources hope that, by prolongation of the contest over years, their antagonist may be brought to impotence before they have quite reached that stage themselves. Such a result did occur in 1918.

Is there any other way to fight a modern war between major powers? Yes, there is. What is it? To force open warfare, in lieu of a war of attrition.

This is easy to say; the problem is, how can it be done if long, continuous fronts are established. Until recently solutions have been largely theoretical. Recent wars point to a practicable method. If a quick penetration of an enemy's front can be followed immediately and before he can reestablish a new front, by a deep advance into his rear areas, space for maneuver will become available, and there will then be opportunities for open warfare. This is the present theory of Germany and Italy, whose armies have been organized with such missions in view. There are precedents to support this idea.

The training doctrine for returning in this way to open warfare, provides:

- a. Artillery, large calibers in large numbers, and with plenty of ammunition, to breach opposing fortified

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lines within a comparatively short time;

- b. Mechanized forces to advance immediately through the breach opened by the artillery, and fight their way through hostile elements not neutralized by the artillery, as far as rear areas where space for maneuver can be found:
- c. The enemy's rear areas, having been reached, fresh motorized divisions to follow through the gap, and in conjunction with the mechanized forces resort to open warfare, by enveloping flanks, seizing lines of supply, and by other similar maneuvers.

The steps *b* and *c* may be combined; but *a* and *b* are essential, and must occur in the order named. Can this be expected to happen?

During the World War it was possible to break through the enemy's defensive lines. In the autumn of 1917, by means of a strong artillery preparation, followed by a tank attack, the British went through the German front near Cambrai. The first step was accomplished, but the second necessary step was not. No troops advanced beyond the enemy's shattered lines.

In March, 1918, German armies in turn ran through the British front. They used no tanks, but were supported by an exceedingly strong artillery fire which neutralized the defenders. Again there were no troops on hand to take advantage of this situation; the second required step was not started.

On 1 November, 1918, American troops broke through German lines, without tanks, by means of an efficient artillery preparation. There was an advance thereafter through the gap. The troops marched on foot; they covered only a few miles per day; and did not reach an area where maneuver by large forces was possible. The enemy succeeded in organizing a new continuous front. The instances cited

show that fronts can be penetrated; but in these cases only local tactical successes were obtained.

There were other places where penetration did produce decisive results. In November, 1918, the Italians pierced the Austrian lines at Vittorio-Veneto; and then destroyed the enemy's army by an able exploitation. This campaign was of extraordinary effect, but its value as a precedent is influenced by the fact that the morale of the Austrian army was poor.

In September, 1918, the Allies north of Salonica broke through the Bulgarian line, and in following rapid advances with open warfare maneuver annihilated the German-Bulgarian armies. Somewhat later Allied forces in Palestine smashed through Turkish lines, and by immediate following advances and maneuver accomplished the destruction of the hostile forces.

Fronts have been penetrated. If nothing more is done, only local successes result. If forces in sufficient strength *immediately* push through, decisive results, including complete overthrow of opposing forces, may occur. That this may be brought about in the future is the hope of nations who do not desire to fight a war of attrition.

Two schools of warfare are now to be found. One believes that open warfare where strongly fortified continuous fronts exist is no longer possible, may not be desirable if reserves are not greatly superior to those of the enemy. They believe that the war must be brought to a conclusion by exhausting particularly the enemy's resources by blockade and attrition, and his reserves as far as possible, before one's own have reached this condition. This method is practicable; the World War showed that it could be done. It means a long war and enormous losses of men and materiel. It is practicable as a policy only for nations which have superior reserves and/or resources to such a degree that

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it seems possible to exhaust the opponents, before one's own country has reached that stage.

The other school believes that the World War in no way proved that open warfare was impracticable between major forces. It believes that, provided penetration on a broad front followed by a prompt deep advance is made, open warfare will be possible, and that then there will be a return to war by maneuver, with possibility of decisive results being secured within a relatively short space of time. This school is favored by poorer nations, who feel that a war of attrition would be dangerous. They desire and seek a short war. They hope by superior leadership and initial superior equipment to penetrate the hostile front, as the first step to victory through a comparatively short war.

Some nations now intend to win their next war, not by the slow method of attrition, where the odds lie with the wealthy nations, but by a fierce attack, a break through the hostile front, following this by a rush of troops through the opening with a view to vigorous, destructive, paralyzing thrusts against lines of communication, and flanks and rear of enemy forces. Since this has already been accomplished,* it is believed that it can be repeated, notwithstanding new defensive weapons and conditions.

Warfare has changed considerably since 1918. There are many who fail to visualize the developments that have occurred during the past twenty years. There is much more heavy artillery, and much more ammunition is being provided for the artillery. This means more powerful preparations by the artillery, upon which depends the success of a plan for penetration—a first necessary step. To oppose the artillery, fortified fronts are stronger, and in some countries long lines

of permanent fortifications protect frontiers over continuous fronts. On one side we have bigger and better guns, and more of them; on the other side, larger and stronger defensive positions.

Exploiting a penetration by advancing on foot and on horse can no longer hope to secure open warfare or possibilities of maneuver against an enemy having rail and motor transportation at his disposition. Only mechanized and/or motorized troops can push far enough through a gap and reach areas where space and freedom to maneuver can be found. Mechanized and motorized units to include divisions and corps are now available.

The war in Spain produced no examples of mechanized troops advancing through enemy lines and reaching areas sufficiently far back as to afford space for maneuver. The explanation has been that the Loyalists had neither mechanized nor motorized troops, and the Nationalists but one mechanized and three motorized divisions, and these only towards the end of the war. One mechanized division was too small a force to secure a deep penetration. There seems also to have been insufficient heavy artillery to carry the artillery preparation to a great depth.

Partial penetrations were obtained. These were at times repeated in the same location until the enemy was overcome. Guernica and Bilbao were examples of this kind of attack. In these battles the defenders were completely overwhelmed by extraordinarily heavy artillery fire and bombing, followed by advances of mechanized forces. Reports state that within the area covered by the artillery preparation, practically no life remained. The offensive used modern methods of attack with entire success, but the problem was affected by the fact that the rear of the defense rested on the sea, and there was no free maneuver space to be found in rear of the enemy's front.

The best present idea is that if a strongly defended front is to be broken

*Notably in Poland.

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to secure decisive results the gap must be sufficiently wide to enable several divisions to pass through. A single division in enemy rear areas cannot operate successfully against large hostile reserves which may appear from two, three, or four directions.

Mechanized divisions are indicated, to lead the advance and subsequent exploitations, where serious fighting may be necessary. Motorized divisions should follow, to consolidate positions and to reenforce mechanized divisions in battle.

Applied to modern conditions, the foregoing ideas are partly theory. Examples from previous and current wars indicate that if they can be made effective, very important results may happen. The offensive has now at its disposition better means, but the defense has also new and improved methods and materiel. It is necessary in attack to be prepared to overcome fortifications, permanent or field, underground cover, anti-tank weapons, improved obstacles, and so forth. These are designed to limit or stop the attack. It will require more experience to determine the possibility of penetrating modern defensive lines.

Let us consider defensive possibilities more carefully. There are two systems in use. The French have defended their frontier by the Maginot line, consisting essentially of a series of powerful forts located at intervals of from three to five miles. No two forts are alike. Some are built into sides of hills or embankments, others are underground, with tops of turrets just above the ground, others appear to be erected on stilts, as they are well above the surrounding terrain. The forts are supplemented by small advance and intermediate works, forming altogether a single defensive zone, supposed to be impervious to artillery fire and unbreakable by any kind of attack. The technical aspect of this question will not be discussed here. If the line does

hold there will be no invasion of France on the Maginot front. If the line fails to hold, open warfare may be open to an enemy, provided he advances through any opening made, before reserves can close around the gap.

The Germans have defended their west frontier by the Limes (Siegfried) line, more recently renamed the West Wall. It consists of four to six lines with a total depth of around thirty miles. Forts average about 110 to a kilometer of front; say about 20 to each of the separate lines. The theory is that a single line might be smashed and let a dangerous enemy through, but that a succession of lines having sufficient depth will make it impracticable for any one artillery preparation to neutralize all of them. German forts may not be as strong as opposing Maginot forts, but their number, and distribution in depth, increase the difficulty of neutralizing them so as to permit attacking forces to advance over the obstacles the forts defend.

Open warfare on land may be possible provided.

- a. Armies are operating where fronts are not continuous, and space and freedom for maneuver exist;
- b. Where fronts are continuous, condition *a* to be brought about by penetration and a rapid advance through a gap to areas where there will be space for maneuver.

When space for maneuver has been secured, the nature of the modern maneuver will differ from that of the past, because of

- (a) Rapidity of modern movements, caused by improved transportation;
- (b) Rapidity by which information is now obtained and transmitted;
- (c) New weapons, new munitions, and greatly increased quantities of ammunition.

This paper will not, however, discuss the *methods* of open warfare and maneuver

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with modern equipment. This is a broad subject, and deserves separate consideration.

Let us consider open warfare in the air.

The air affords wide possibilities for open warfare; such as, choice of missions, time, forces to be used and theaters of operation. It permits surprise to a degree unobtainable on land. What can open warfare in the air accomplish and how can it be best waged?

There have been two theories:

- a. Terrorize the civil population by bombing, causing frightful destruction and casualties, and thereby create a desire for surrender and peace;
- b. Bomb military establishments, such as terminals, lines of communication, airdromes, depots, and troops, to assist in the defeat of land forces.

There is little evidence that the terror method will produce decisive results. It has been a threat, exploited by the press, and it has caused fear. Extensive measures for protection of the people have been taken. What is the evidence?

First we have the war in Spain, with two examples—Madrid and Barcelona. Madrid never was seriously bombed, and only certain quarters were severely shelled. The Spanish war was a *civil* war: there was an attempt to spare the citizens, who in general had relatives on both sides. Barcelona was bombed repeatedly, but it was by small forces, usually operating from the Balearic Islands. Only parts of the city were bombed, and ordinarily only small bombs were used. On one occasion a few very powerful bombs were dropped, using a new explosive, believed to be German, but not yet identified. These bombs gave absolutely astounding results in the amount of destruction caused. They were apparently experimental bombs, and their further use was intentionally discontinued owing to the war being a civil

one, and to the desire not to create too much suffering.

In the war in China, bombing by the Japanese has been on a principle different from that employed by the Spaniards.

The mission of both parties in Spain was to *occupy territory* held by the opponent, until the entire country had been consolidated. For a civil war this is the customary mission. The mission of Japan in China has been to *occupy key points*. Except for these, intermediate territory was not necessarily occupied, but was controlled by use of air forces. This conflict not being a civil war, there appears to have been no special desire to spare the population.

The Japanese have occupied relatively few places. From appropriate centers they have operated air forces for fairly long distances. From Hankow, air bombardment squadrons fly to Chung-King some 500 miles, and to Cheng-Tu, around 540 miles away in air lines. Such bombings have been effective. They are no mean performance. The intervening country in China is not held, but its use is denied to the enemy, less small parties, by bombing larger forces before they are able to reach Japanese centers. On a much smaller scale the British have used the same principle on the northwest fronts of India and in Arabia.

The Japanese have frequently bombed cities. Their mission appears to have been not the destruction of the city, but to interfere with important CP's, troop assemblies, depots, and the like. In some cases large losses of civilian lives have occurred. Flimsy building construction has been the cause of serious loss, but the Japanese mission of inflicting terror may have been incidental.

At the time of the Czechoslovakian crisis in 1938, the press announced that it was the intention of the British and French, in case of war, to bomb German cities by operating a shuttle service of planes back and forth between France and Czechoslovakia. A similar plan was

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announced a year later in connection with the Polish crisis. Whether this alleged plan really was entertained by the responsible military leaders, was camouflage to conceal some other plan, or was propaganda, is not now known.

On the whole, to date there has been a lack of worthwhile results from bombing civilian centers.

On 1 September, 1939, Chancellor Hitler, on the part of Germany, publicly declared that as long as the enemy followed the same rule, his air forces would not intentionally bomb places without military importance; bombing would be confined to objectives having some military value. All great Powers promptly made announcements to the same effect, and it appears that in principle many cities and towns may escape some of war's horrors.

This rule, so eagerly and generally adopted, is in appearance indeed simple. It may not be so easy to apply. Which cities have no military importance? Those close to the front furnish shelter, supply, and transportation facilities which would apparently bring them under the classification of proper military targets. How about those not close to the fighting front?

Nearly all cities, and most small towns, have utilities, factories, road and railroad junctions, having military value. Cities which have a residential area distinctly separated from a business district might hope to have bombing limited to the latter. An attempt to spare residential areas seems to have been made in the early bombings of Warsaw in the Polish war, where the first targets appear to have been airdromes and railroads, installations on the outskirts of that city.

Unfortunately, most cities usually have objectives of decided military value in the center of their densest population; such as railroad stations and junctions; telegraph and telephone exchanges; government buildings which house the personnel

directing the war; and armories and other similar targets. It is doubtful whether residences of high officials will not be considered as so many CP's, and consequently legitimate targets. It is customary, outside of the United States, to billet soldiers in private residences. Do these buildings then pass to the classification of barracks, and become lawful targets?

It is evident that regardless of intent not to bomb civilians not engaged in the war, that because of errors in identification of targets, inaccuracies and dispersion of fire, and proximity of civilians to targets, death and destruction to civilians are bound to happen.

That people believe that cities can not escape extensive bombing and damage, is indicated by the evacuation of great cities. Voluntary evacuations are themselves an accomplishment of military value. It disrupts the economic life of a community to change the residences of a large part of the citizens. It reduces the productive capacity of offices and industrial establishments. It lowers morale. It requires that new lines of supply be opened to maintain the evacuated people in new and strange locations. If the government has to move, loses its files, has its personnel dispersed where it was before concentrated, the efficiency of its operation certainly declines. All this accrues to the advantage of the enemy. Bombing may sometimes be unnecessary; threats may accomplish the mission.

It is nevertheless doubtful whether bombing of civilian populations will be initially a major mission. No nation has an unlimited supply of planes, nor of munitions. It is unlikely to use them on missions not promising decisive results.

Present indications are that the best method of employing air forces is to concentrate on overcoming military forces on land, air, and/or sea. Here lies a wide choice of objectives; and

ample opportunities for open warfare and maneuver in the air, either independently or in conjunction with ground or marine forces. This method accords with the principle that all available forces should be directed against the opponent's main force.

Spain has afforded examples of what can be accomplished when air forces are used against ground objectives: Guernica and Bilbao. In these cases the attackers severely bombed the defenders. The bombing was closely coordinated with a heavy artillery preparation; and was immediately followed by a massed tank attack then in turn followed by infantry. The bombing and shelling was so effective that Guernica was destroyed; practically everyone in it was killed. No one was left to resist the tanks and infantry. A similar situation occurred before Bilbao.

There were examples in Spain of air attacks against naval vessels; they gave excellent results.

There have been numerous air combats in the air in Spain and in China. Some of these have been on a large scale; all have been open warfare in the air. Missions have been to destroy the reconnaissance possibilities of the enemy, to protect own ground troops, and to assist own offensives.

When Germany occupied Austria, and later Czechoslovakia, air forces immediately seized hostile airdromes. Ground troops did not move forward until it was known that there could be no interference from hostile air forces. The same plan seems to have been followed in the war in Poland.

Air forces are paralyzed when they lose their airdromes. They are absolutely dependent on these. This is the weak point in operation of air forces. An enemy may seize or destroy airdromes.

- a. If undefended, planes may land and debark troops;
- b. If defended, by driving off defenders by bombing and machine-gunning defenders, and then landing;

- c. Air infantry with machine guns and infantry howitzers may be dropped by parachute, and the airdrome then attacked by land, assisted by the air forces.

It suffices if the airdromes are occupied long enough to destroy gasoline, stocks of ammunition, and servicing facilities, together with such planes as may be caught.

Other operations by which air forces can cooperate with ground troops include reconnaissance, interdiction of roads and railroads, and destruction of wire lines and radio stations. They may drop air infantry in rear areas in order to destroy important stores, shelters, bridges, and the like. The assistance which air forces may render in war to ground troops is varied, with wide latitude as to locations and hours.

Reports from Poland indicate that principles previously tried out by German forces in Spain have been followed. Probably they have been improved upon. Initial operations of air forces have been directed to the destruction of hostile airdromes in order to neutralize enemy aviation. Depots, railroad yards, bridges, and other objectives have been blown up, and the enemy's supply system disorganized.

Where enemy's main forces are naval, air forces may have as their main objective the attack of ships, together with their bases, and the land utilities, oil supplies, and other utilities which provide munitions and facilities for operation. To date there is not much evidence as to what open warfare in the air against sea forces can accomplish.

There should be no preconceived ideas as to open warfare in the future. Open warfare is possible; but it will not be limited to the land. In addition to the sea, the air is open to all.

Open warfare is being tried in new ways. It is not yet known just what can

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be accomplished. The use of the air, of mechanized and motorized forces, and of strong artillery forces, open possibilities to an energetic commander which fully equal anything experienced in past ages. The old ways are certainly gone, they are no longer applicable; many texts had better be discarded. Surprises will occur in the future. Open warfare, if it occurs, will be different from what it has been. Where it does not take place, war by attrition is the alternative. A nation may have its choice as to open warfare, or the attrition method, or circumstances may deny a choice. But open warfare is possible.

The principle that open warfare may lead to a rapid decision has not changed. The application of this principle has.

A New Infantry Division for Open Warfare

The war in Spain gave Italy opportunities to test new formations, new weapons, new tactics. Full advantage was taken of this, and much valuable information was secured. Among other experiments, a new type of infantry division was tried.

At the end of the war, Italy had four divisions in Spain—the Littorio Division, which was mechanized, and three Arrow Divisions which were motorized.

The infantry components consisted of 8 or 9 battalions. As a result of tests at maneuvers held in the homeland in 1938, this number has since been reduced to 6 battalions, without reduction of artillery, resulting in an increase in relative strength of the latter arm. The battalions in Spain had a combat strength of about 600 each, giving a total in round numbers of around 5,000 per division, which number has since been reduced to about 4,000. These figures are two-thirds below the strength of American divisions of the World War period.

Each Italian division appears to have been furnished for offensives 8 battalions of 6-ton tanks, each battalion having 40

combat tanks. This gave 320 fighting armored vehicles for fronts of 3 to 4 kilometers — a very formidable force. These tanks had armor, proof against cal. 50 machine guns at ordinary ranges; they carried small cannon to fight hostile tanks should any be encountered. They were supplemented by about 80 tankettes per division, which were small 2-man 2-machine-gun tanks, similar to those used in Ethiopia, fast and with great crosscountry ability. They had little combat value against an enemy equipped with heavier tanks, or antitank weapons, but they were useful for messenger purposes and for minor warfare.

There is not yet definite information as to the organization of the division artillery. It was not all Italian; some was Spanish and some was German. For offensives, the Littorio Division had strong artillery support, but it is not known whether the artillery was supplied by corps or army artillery. The minimum number of guns was 100 to the kilometer. The preliminary shelling and the barrage was led by 220-mm. and 149-mm. howitzers. The lighter pieces were 100-mm. howitzers, 105-mm. guns, and 75-mm. guns. The latter type of gun appears to be gradually disappearing.

The number of hours' fire for the artillery preparation was a function of the number, character, and size of targets, and the depth to which the attack was to be pushed. The quantity of ammunition required per kilometer of front was about 300 tons per hour of fire.

According to witnesses, at least some of the artillery preparations were German-directed, and were fired in the same manner as would be expected in a war against a major Power. For example, after the infantry reached their objective, the artillery fire was shifted to where enemy reserves should have been, even when there was evidence that the enemy had no reserves. Accounts indicate

that the artillery preparations in number and caliber of shells fired per unit of front and of time, surpassed those of the late periods of the World War. The number of guns per unit of front, which was a maximum in 1918, had now become a minimum. More important, the average caliber of guns had increased; and rate of fire had greatly increased.

Artillery preparations were seconded by bombing. Careful coordination between the artillery and air force, as to selection of targets, and times, was insisted on. Both Italian and German planes were used, and were reported to have reached a high degree of efficiency as to accuracy of fire.

The Littorio Division was exclusively Italian. The Arrow Divisions contained Spaniards and a considerable number of Portuguese. The Portuguese officers in part belonged to their Regular Army, and promotions made in the field in Spain held good on return to duty in Portugal. Key positions in all divisions were held by Italians.

The Italian divisions were highly mobile, including attached artillery. In the December, 1938—January, 1939, campaign against Barcelona, the Littorio Division attacked continuously for fifteen successive days. When an attack on any one day failed to promise success, the division was pulled out of line that night and, through use of motor transportation, was attacking in a new sector the following morning. It was this rapid series of attacks, at well-chosen locations, which won the campaign. Attacks were not always successful, but from time to time a weak spot was found and smashed through. The Littorio Division was then withdrawn, while the motorized Arrow divisions or Spanish divisions exploited the opening gained. It was believed to be a waste of material to employ a mechanized division and its powerful special artillery for missions which could be accomplished by ordinary divisions.

After fifteen days of constant fighting, the strength returns of the Littorio Division had not sensibly changed. How did they do this? There was a rear echelon, of about the same strength as the total of the infantry battalions. The rear echelon daily replaced losses, and exchanged personnel with men in line. Front-line troops were thus maintained at table-of-organization strength. The men individually were given opportunities to rest, but the units stayed in line.

In attacks the infantry followed the tanks. The armor of the latter was proof against ordinary infantry fire. It was not proof against antitank guns, but the artillery neutralized most of these during the preparation. The mission of the infantry was to seize and hold the ground cleared by artillery fire, bombing, and tank attacks. The 600-man battalions, with their machine guns and infantry heavy weapons, could rapidly consolidate and defend a captured position against anything except a formal attack.

The Nationalist tactics of utilizing mechanized divisions on successive days, in constantly changing locations, was a surprise to the Loyalists. They had no effective counter measures ready to meet these new tactics. The Loyalists' intelligence service was unable to foretell whether an attack would be continued, or, if broken off, where the attackers would appear next. The defenders had no motorized troops; they were unable to shift divisions rapidly from one sector to another. On the Nationalist side, the Italians were the only troops motorized; Spanish divisions seem to have been moved by rail to support the Italians.

The Loyalists were also surprised and unprepared for attacks led by some 300 large tanks on a comparatively narrow front. Coupled with very heavy artillery barrages and bombings which neutralized the anti-tank weapons, the attacks were sometimes extraordinarily successful. The combination of strong artillery

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preparations and support, with armored vehicle attacks, constituted a team for which the Loyalists had no corresponding tactics. Until the last they used old, out-of-date tactics which could not stand against modern methods.

There is a wide difference of opinion as to the general value of the Italian-type division, and as to the particular divisions in Spain. Many British and French writers consider Italians as poor fighting material. They comment on the fact that in the Catalonian campaign the Littorio Division, after relatively small advances, was several times stopped by inferior forces. They attribute this to insufficient valor of the Italians. Not all writers agreed as to this. One French correspondent and several American correspondents attributed the fall of Barcelona primarily to the Italian divisions. The French correspondent particularly claimed that it was the continuous attacks of the Littorio Division, with its tremendous artillery support, constantly appearing in new and unexpected places, which broke the defense.

Reports from German and Italian sources admit that the Littorio Division did at times stop its attacks: they explain this as part of the new tactics, to strike swiftly and successively in numerous well-chosen sectors. They consider that this is the best way to employ mechanized divisions.

No reliable reports from Spanish sources have been found. There is some indirect evidence. General Franco publicly acknowledged the aid received from his Italian ally. On 12 January, 1939, the Duce stated to Mr. Chamberlain that he desired nothing better than to withdraw his troops from Spain, and would do it as soon as General Franco intimated that their services could be spared; no such request appears to have been made. In the reviews subsequently held at Barcelona and at Madrid, Italian divisions held the right of the line, and marched at the head of columns. The Spaniards apparently felt

that the Italians were honored and valuable friends and comrades.

In evaluating new tactics and organizations, not too great weight should be given to isolated instances. We still lack information as to details as to just what occurred in Spain. It is readily understandable that with modern roads and railroads rapid shifts of forces between sectors of the front are possible, and undoubtedly at times desirable. Maps of Spain indicate that in many cases, owing to lack of transverse roads, considerable detours must have been made. It is not yet clear whether ammunition and other stores for the new sector had been accumulated in advance, and if they were, why the enemy's equivalent for G-2 failed to discover this. It would be desirable to know what counter measures were taken, or could have been taken, by a competent leader, to meet constant attacks, launched repeatedly in changing sectors.

Some points yet remain to be determined. The following new points as to employment of the new type division seem to have been quite plainly demonstrated:

- a. Great mobility;
- b. Consequent ability to withdraw from line and to appear overnight in another sector;
- c. Reduction in infantry strengths; increase of artillery and tanks;
- d. Maintenance of divisions in line for at least two weeks' constant fighting, eliminating need of frequent reliefs;
- e. Use of mechanized divisions to lead attacks for penetration.

These things are important; they present new problems, new tactics, and new methods of maneuver and possibilities of open warfare.

Initiative in Open Warfare

Tactics and weapons have never been constant. To change them and thereby

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effect a surprise over the enemy, has been an age-long mission. Whenever a contestant in war initiated a change of tactics and/or weapons, he usually secured some tactical advantage, occasionally very decisive ones. There is nothing new in changing tactics and weapons, except that in this century the rate of change has been unusually rapid and continuous.

We have only to consider such changes as the introduction of aviation, chemical warfare, artillery preparations, and armored vehicles, and the results thereof, to realize the value of introducing new tactics and/or weapons, against which the enemy is unprepared. There lies the possibility of surprise, of securing open warfare, of overwhelming an enemy by unexpectedly presenting him with new tactics or weapons, for which he may be quite unprepared.

In Spain, the Nationalists (Franco), assisted by German and Italian leadership, initiated the changes of tactics which appeared in that war. Their opponents, the Loyalists, although they noted that their own tactics needed modification, failed to make changes, pending investigations, apparently never completed, as to just what would be best to do.

The Nationalists won the Catalonian campaign, mainly through substituting for old tactics, the new one of employing mechanized divisions, with strong artillery forces, to attack constantly in changing sectors over extended periods of time. The Loyalists stuck to the old tactics too long; they spent too much time studying the situation. This may be an excellent idea when peace prevails and time is available; but it may be fatal in war, when time is vital. Allowing the enemy to take the lead in initiating changes in tactics and weapons may be not only dangerous, but disastrous.

It is always important to retain the tactical initiative, and this requires

retaining the initiative as to changes in tactics and weapons. The side that can first bring out new weapons, new munitions, new quantities, and/or new methods of employing these, is likely to obtain startling successes.

During war a leader can not count upon having unlimited time for experimental purposes. He must make his decision ahead of his opponent. Old tactics must be thrown away as soon as they can be improved. There can be no waiting for instructions from higher authority. A commander in the field must accept the responsibility. He must act, must do the right thing before the enemy does. Otherwise he may lose the battle. He must act boldly—follow Napoleon's maxim of audacity, and yet again more audacity. It is the duty of a commander to be the first to employ new tactics and through them advance to victory. Nothing stays still in war—it is a dynamic phenomenon. The side which fails to produce new ideas may be left behind, may be doomed.

Initiative as to changes in tactics, and employment of new weapons or munitions, should be sought during a war. Subordinates should be encouraged to submit and try out changes. Insisting on blind obedience to doctrines, however good they may have been at the time they were introduced, discourages improvements, and may eventually lead to defeat. Neither tactical methods nor weapons last forever; the sooner those in current use can be replaced by something better, the sooner may a war be brought to an end. *Encourage the new idea.*

Commanders should avoid any tendency to insist on any particular tactical regulation. Circumstances alter cases. New methods, with a view to discovering something to surprise the enemy, should be looked for earnestly. Above all, precautions should be taken against being surprised by the enemy securing the tactical

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initiative, by unexpectedly being the first to employ some new tactics, and/or weapon.

Commanders must have imagination to devise new ways to surprise the enemy by changing tactics as fast as the enemy finds a way to meet the tactics in force. Failure to do so means a stalemate; means the opposite of open warfare. Open warfare is possible only if maneuvers can be initiated; from time to time some bold change in tactics is required.

Summary

1. Open warfare is possible, provided space for maneuver is available, either,

- a. Because fronts are not continuous; or
- b. By penetrating a continuous front, and with sufficient forces, reaching enemy rear areas where space for maneuver can be obtained.

2. To penetrate modern, defended, continuous fronts, large forces of heavy artillery with ample ammunition are needed to smash an opening. To crash swiftly through an opening before reserves can be assembled in rear thereof, mechanized and motorized troops are required, prepared to maneuver after passing through to the rear of the defended lines.

3. Surprise as to the place of attack may be secured by overnight assemblies of troops moved from one sector to another.

4. Every artillery preparation will not secure a penetration. Whatever the reasons, the remedy is, not to persist where the enemy's attention has now been directed, but withdraw, and if possible by next morning renew the attack elsewhere. Such a movement must be provided for in advance by clearing routes, and accumulating supplies and munitions in the new area.

5. Troops in battle do not necessarily require frequent reliefs. Individuals may

be relieved by exchange with a rear echelon; organizations carry on.

6. Open warfare and maneuver are not limited to land. The sea is open, and the air is entirely open. This profoundly affects strategy and tactics.

7. New types of divisions intended for open warfare require mobility and powerful artillery. The tendency is to motorize everything, increase the artillery, and decrease infantry components.

8. Air forces will be used primarily against enemy main forces, either directly, or indirectly by attacking communications, depots, and airdromes. Initially civilian populations are not likely to be objectives, but they may incidentally suffer severely from proximity to other targets.

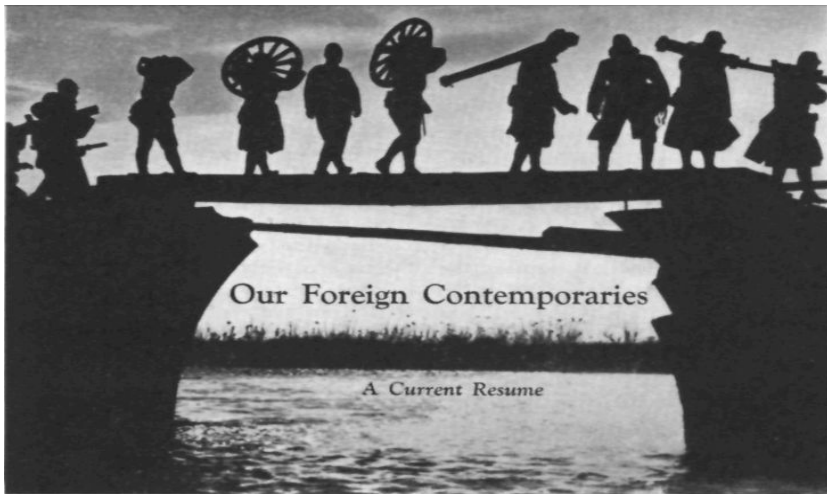
9. New methods of fighting have been developed; newer ones will be. The side which can be the first to devise new tactics and/or new weapons, and with them surprise the enemy, may obtain important tactical successes. It should be a main effort to seek for and retain the initiative as to changes in tactics and introduction of new weapons.

10. Some present texts as to the military art are partly obsolete. Modern commanders should never hesitate to discard old ideas and substitute something better.

11. Modern war, with its rapid change in tactics and weapons, requires that special care be exercised to prevent the enemy springing a surprise. He should be expected to try to do something which he believes will be a decided surprise, both tactically and as to changes in methods. There should be no preconceived ideas as to the enemy's probable action. Don't be caught asleep at the switch.

12. Open warfare to be successful requires,

- a. For the troops: Great mobility; powerful artillery.
- b. For the commander: Audacity and boldness.



JAPANESE OPERATIONS IN CHINA

(Digested from articles in the *Krasnaya Zvezda*, April 3 and 24, 1938, and February 8, 1939; translations by Master Sergeant Charles Berman, U. S. Army.)

General

The Japanese are fond of the enveloping form of attack, which they have copied from old German regulations. But in spite of their constant efforts to employ it in China they frequently were forced to make frontal attacks. This was because the Chinese, with their numerical superiority, were able to extend their flanks so as to avoid envelopment. In these frontal attacks the Japanese suffered numerous casualties and wasted much time; in spite of their great superiority in equipment they spent three months in capturing Shanghai. At Nankow they delivered repeated frontal attacks without avail, and finally had to make a wide turning movement which, threatening the Chinese communications, forced the latter to retreat.

The Japanese division advances to the attack in two echelons, the second prepared to exploit, with vigorous pursuit, the success of the first. The infantry attack is preceded by a powerful artillery preparation and an aerial bombardment.

Long-range weapons are employed against the Chinese flanks and rear. Tanks lead the attack and support the infantry.

Infantry advances to the assault in dispersed formation. The platoon and section are afforded tactical independence. Coordination of infantry weapons is given great attention. The Japanese have found an increased need for bayonet training and the use of hand grenades; hence they have increased the number of grenadiers in their infantry units.

The foot soldier possesses considerable mobility. When pursuing a defeated enemy he is relieved of much of his impedimenta, and is taught to live off the country when possible. The infantry showed resourcefulness during unusual operations. In the fighting in the Tientsin-Puchow area, where many lakes and swamps were encountered, the infantry employed heavy machine guns and accompanying artillery mounted on rafts. During street fighting they utilized any material they could find as protection against bullets and shell fragments; frequently they used gasoline drums filled with concrete which they rolled before them in their advance.

Japanese mechanized units have been employing mostly medium 14-ton tanks and whippet tanks or combat cars of 3-tons

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International News Photo

JAPANESE MOUNTAIN GUN IN ACTION

each. The tanks were assigned initially at the ratio of one battalion of 40-50 tanks per division; the battalion operates as a unit. In some cases tanks have been utilized as mobile artillery batteries; as at the crossing of the Suchow River, where a group of tanks covered the crossing with fire. Sometimes they go far ahead to clear the path for the infantry. The lighter tanks are even used on distant reconnaissance, and to convoy the movement of supplies.

Sappers and engineers are used extensively, especially in mining operations; this has been made necessary because of the thick walls of old Chinese towns. Some chemical troops have been in action where nonpersistent gas or smoke was considered effective.

Artillery

The importance of artillery was confirmed by the experiences of the Japanese in China. The divisional artillery which was sent to China consisted (in each division) of a regiment of from 24 to 28 light field guns and from 4 to 8 howitzers. The mountainous nature of part of the terrain necessitated the use of considerable mountain artillery. This type of material was found useful in other

places also, where mobility over muddy or water-soaked country was required. On the Shanghai front two divisions had mountain artillery in place of ordinary field pieces.

The Japanese soon found it necessary also to transfer considerable heavy artillery to various theaters of operation. In the offensive this heavy artillery is usually assigned at the ratio of one regiment per infantry division; furthermore the organic artillery is reinforced by a detachment of anti-aircraft artillery and a battalion of motorized field artillery. Ordinarily the density of guns was about one gun per 140 yards of front; but in the fighting at Nanking and Shanghai the density was one gun per 45 yards of front. The artillery is required to clear the path for the advance of the tanks and infantry, neutralize hostile artillery, engage enemy tanks, disrupt communications, and attack reserves. On the defensive it is expected to inflict the greatest losses on the attacker without regard to its own casualties.

Infantry attacks were preceded by artillery preparations lasting from 2 to 8 hours, sometimes longer. In some

cases a bombardment of several days occurred prior to the assault on a town. This was necessary because of the thick walls.

Artillery fire was sometimes aided by aerial bombardment, but actual experience demonstrated that aircraft cannot replace artillery where a protracted fire is needed.

In some instances the Japanese planned a rapid advance without adequate artillery preparation; strong aircraft elements were attached instead. But the advance usually either became disorganized or bogged down. This happened at Guande, where the support of 50 planes did not suffice; the advance was held up until the arrival of artillery reinforcements. In attacking Chinese defenses along the Yangtse the Japanese used 24 heavy field guns and 60 planes, but the planes did not help, and more artillery was needed.

Because of the ineffectiveness of Chinese artillery the Japanese are able to place their batteries in the open, and there is a great deal of crowding in the positions. They make a show of camouflage, but it is poorly done, and would not serve the purpose if they were opposed to a force powerful in the air. As it is, the Japanese artillery suffers as high a casualty rate as the infantry.

Two artillery groups support a division in the attack, and from two-thirds to three-fourths of the artillery supports the main effort. Long-range weapons are adjusted by planes and balloons.

Where the Japanese employ tanks, their artillery fires on areas considered likely to conceal antitank weapons. Since tanks are employed as infantry supports, they are not accompanied by long-range fire into the rear areas. As soon as the tanks and infantry reach the hostile main line of resistance, the artillery fire is lifted.

As an attack progresses into a deep defensive zone, the divisional artillery passes to the control of infantry brigade commanders, and finally even to

regimental commanders. One-fourth of the artillery, however, is held out under divisional control to be used in repelling counterattacks. Pursuit is accompanied by artillery fire to the limit of its range.

The Japanese do not hesitate to regroup their artillery in the midst of an action where this is considered desirable. In defensive operations they often shift artillery to weak fronts. There are numerous examples of this. On the Tsande-Damin sector the light field artillery was transferred a number of times from one front to another, and disrupted the Chinese attacks with its fire.

At the decisive moments the Japanese employ massed fire with excellent effect.

ARTILLERY SUPPORT OF MECHANIZED FORCES

(Condensed from S. Krasnopevtsev, in *Voyennaya Mysl*, Moscow, January, 1938. Translation by Master Sergeant Charles Berman, U. S. Army.)

Medium tanks are armed with cannon of from 75 to 100-mm. in caliber, and heavy tanks with even greater weapons. Hence these vehicles really constitute self-propelled, armored field pieces. The major deficiency of this type of artillery is its "nearsightedness," which complicates its employment and renders difficult the control of its fire. Furthermore, the fire is limited to grazing fire. Thus the action of heavy and medium tanks is limited to fire at ranges from 1500 to 1000 meters, when in an encounter with other tanks. If the approach of the tanks to this short range is not prepared by true artillery fire they will never get this near to their opponents.

In addition to this, the fire of a tank in motion is inaccurate. The vehicle must be halted when it fires; in action against hostile tanks, part of the force must halt to prepare the attack. Certain artillery is needed. This artillery must be suitable for action against heavily

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armored vehicles (the French heavy tank has armor 55 mm. thick), therefore it must be capable of quick fire action and have high muzzle velocity. Since it must accompany tanks it should possess greater mobility and be easily capable of concealment. In order to accompany the mechanized force it should be self-propelled so as to insure instant readiness for movement from place to place, while at the same time having considerable elevation, traverse, and armor protection.

Artillery assigned to mechanized forces need not be capable of sustained support, but it must be able to render close support. Tank attacks move too rapidly to permit support by accompanying fire to any great range. The artillery itself must follow the tanks closely, and will be employed mainly as single guns within the combat formations of the tank battalion.

Support of the tank attack from distant positions by the concentrated fire of an artillery battalion will be possible only where the tanks are going up against a newly organized position in the hostile rear area. During these times the observers of the fire will be with the tanks.

USE OF HEAVY ARTILLERY IN ATTACKING FORTIFICATIONS

Condensed from article by General von Berendt, in "Artilleristische Rundschau," Munich, September, 1939. Translation by O. L. S.

Prior to 1914 the Germans had planned to reduce fortresses by deliberate siege methods. They had not realized what quick results would be obtained by the fire of their 42-cm. howitzers. The prompt reduction of Liege was a surprise to them, in spite of the fact that some of their officers had seen these forts prior to the war and had noted that the domes

were cracked and otherwise in bad condition.

As a result of this experience, General Steinmetz, commanding the siege artillery, proposed to bring his heavy weapons from the march directly into the firing positions at Namur, and let the infantry advance to the attack under their fire without going to the trouble of building approach trenches. These ideas were received with suspicion by many authorities, including the engineers. However, General von Gallwitz approved the plan, and it was duly carried out with great success. Sixty heavy guns were used.

The same procedure was followed at Maubeuge. The engineer commander demurred at attacking the strongest point, but General Steinmetz, confident now in the power of his weapons, brushed these objections aside. This fortress was bombarded by twenty-one batteries. Ammunition shortage prolonged the attack, but the fortress was reduced in nine days.

Thus in four weeks the heavy artillery had broken down three great fortresses as well as participating in other minor actions. General Steinmetz, as a result of his observations here, boldly broke away from all traditional ideas of fortress warfare, substituting an overwhelming artillery fire for lengthy siege methods. His death on September 15 interrupted his further development of these plans.

Today the art of building fortresses has shown a new tendency in which the old ring of forts has been abandoned in favor of a continuous line, fortified in depth. General von Berendt closes his article with the following interesting prediction: "The operations will begin with a breakthrough upon strong defensive positions — a task which we found, in the war, the most difficult of all. Here, too, a war will bring surprises, never thought of in time of peace."

THE FIELD ARTILLERY JOURNAL



MICHAEL V. GANNON

It is the painful duty of the Executive Council of the United States Field Artillery Association to announce to its members the death, on Monday, November 20, 1939, of Captain Michael V. Gannon, Field Artillery, late Secretary-Treasurer of the Association and Editor of the FIELD ARTILLERY JOURNAL.

Possessed of an unusually attractive personality, no one in our Arm had more friends than "Mike" Gannon. These friends often deplored the genuine modesty which led him to contribute the best fruits of his skillful authorship under a pen-name. Some of the finest articles in this JOURNAL over a period of several years were written by him under various pseudonyms. As *Guy Donn Farrell* he wrote deft and lively stories for *Field and Stream* which were enjoyed by thousands. THE FIELD ARTILLERY JOURNAL was an important, but not the only beneficiary of his eager energy and enthusiasm. His first interest was in his profession, and to it he devoted a quick, accurate mentality and a studious but intense nature which combined to produce talents of such excellence that only his fatal illness prevented him from enjoying the high military honor which he was scheduled to receive.

It is hard to say farewell to Michael Gannon.



"OVER HILL, OVER DALE . . ."

The Field Artillery Family Party in Washington, this year, was even a greater success, if that be possible, than its predecessors. Those who were present had a great experience; those who were not missed something. There isn't space here for a description, but one episode must be mentioned.

The older field artillerymen have known for years how the present chief was connected with the origin of our Field Artillery song; but many of the younger did not know, and few even of the older knew the details. General Danford, in his talk at the table, gave us a vivid description of the genesis of the song.

He drew us a picture of old Camp Stotsenburg, with its nipa quarters and its dusty trails, and the Second Battalion of the newly organized Fifth Field Artillery in garrison there. Then came orders for the First Battalion, at home, to relieve the Second. The natural corollary was a party, to celebrate the first meeting of the two battalions. This meant, among other things, a song; and as good luck would have it. Lieutenant Gruber was there. Enough said; Gruber wrote the music, others with him contributed words, and at the psychological moment in the Officers' Club at Camp Stotsenburg the song was introduced with enormous success. And here the Chief, who as Lieutenant Danford had been there, pointed out that the words, as then sung, ran—

*For it's hi-hi-hee in the Fifth Artilleree,
Shout out the number loud and strong. Till
our final ride, it will ever be our pride
To keep those caissons a-rolling along.*

This brought General Scott to his feet, breathing fire and slaughter. He told of the pride he felt, with the rest of the Fifth,

to know that the regimental song had been good enough to become the artillery song, even to spread throughout the Army—not to mention being taken up in a popular march, for that is another story. But he could not restrain his indignation to find, upon his return from France, that the song had been betrayed by its own friends, and that in place of the two perfectly gorgeous closing lines we found everyone singing the flavorless words—

*Where e'er we go, we shall always know
That those caissons go rolling along.*

Surely, a tame and flat substitute for the original, when one thinks for a moment how the field artilleryman does take his final ride.

Then another of the original Fifth took a hand. General Spaulding told of the first singing of the song in the United States; for he was at Fort Leavenworth when the battalion from the Philippines arrived. The field artillerymen there had strained every nerve to get an appropriate song for the home-coming, but had produced only commonplace stuff. But when the few red-legs had assembled—for the Field Artillery was small in those days—someone called Gruber to the piano; others of the homecoming battalion joined him, and they sang our song, fairly electrifying the party.

General Spaulding went on to second General Scott in the strongest terms, and to say that when in regimental command he had made it a point to see that every member of the regiment knew what the original lines were. But one regiment could not change the habit of the whole Field Artillery.

The Chief has started something: if we agree that we should get back our own, it is for us to keep it rolling.

—CHARTER MEMBER.

EYEWASH

Every time we have a big maneuver, and frequently during small ones, too, the troops go into a "model camp." Tent pegs are lined up with a transit; fancy bulletin boards, mess halls, recreation tents, and so forth, are built; whitewashed rocks garnish the edges of streets and paths; standards and guidons flap gaily in front of their respective sanctuaries.

So it was at the First Army maneuvers this year. Press reports state that foreign observers commented on the naïve way in which we avoided a realistic war atmosphere. Evidently this has been going on for generations. It has become a tradition in our army. I read in Captain Nye's *Carbine and Lance* that even during the Indian campaigns near Fort Sill the soldiers had to pitch their camps in neat rows and drag the company streets each morning.

The trouble with all this is that it gets into the blood. You think that when you are at war you will be more sensible, that you will introduce disorder into your bivouacs and motor parks so that they will be less noticeable from the air. But you forget. It hurts your very soul to see anything that is not lined up geometrically. And if you do not watch them, even your sloppiest vehicle drivers will invariably park their trucks in line.

I have always entertained an optimistic view of this phenomenon, thinking that when war came staggered parks and camps would be as common as staggered gun positions. Recently, however, my eyes were opened. I saw a photo taken in front of Montfaucon during the summer of 1918. Obviously the Germans were looking right down our throats; the hill of Montfaucon, then in German hands, and with Prince Willie's famous OP in the center, showed plainly against a cloudless sky. A German plane had just shot down one of our sausage balloons. Off to the right a shell had just burst on the horizon.

And in the foreground, *out in the open field*, were some American soldiers bivouacked in pup tents. Believe it or not, those tents were lined up in neat little rows!

When are we going to get away from this kind of nonsense?

—Donald Duck.



GADGET WANTED

I have just completed a gunnery subcourse in which I spent several hours figuring corrections of the moment. Now, admittedly the weather-correction fan is a boon to humanity, and I don't know how I could have gotten along without the dandy forms which were furnished to work the problem; but surely in this age of invention, can't someone build me a gadget which will do this work?

Maybe the word *gadget* kills the idea at the outset; I realize that there is considerable opposition to the use of devices, other than the hand, the field glasses, and the protractor. Therefore let us refer to it as a *gimmick*. It seems inefficient to me to apply weather corrections to firing data by an arithmetical process which is tedious, slow, and—whisper it gently—which often ends in error despite check and double check. I wish someone would devise a gimmick whereby I could set a couple of slides, a pointer, maybe turn a crank to a setting on a graph, and read my metro corrections in mils of elevation right off the bat; or, well, anyway, in a minute. And without appreciable error. I hear that the Germans have such a contraption; not a big one, either. Why can't we have one?

—Reserve Officer.

Some Forward Observations



REMARKS ENTERED ON proxy cards are tabulated, analyzed, and given the most serious consideration. Incomplete returns to date permit certain conclusions to be drawn. First, the fact that every article, story, and poem in recent numbers of the JOURNAL received some applause shows that past editorial policy has been sound, a very significant and satisfying bit of information. (Do not fear that it will lead to complacency, however). Colonel Lanza is still far in the lead as the most popular JOURNAL author. Other recent favorites include Brig. Gen. R. S. McLain, Captains Boyle, McNair, Gildart, and Handy; these are not all, of course.

A FEW FRIENDS have urged us to "keep up the good work" of maintaining changes of address from official orders, and even publishing these at frequent intervals. This would be fun, and we wish it were possible. But a real personnel office (which we are not) contains two or more officers and numerous clerks; and even then does not always have the latest dope on where the boys are. The JOURNAL staff consists of one girl who puts in full time (and more) and one editor, etc., who puts in part time. They couldn't keep up with current personnel changes these days even if they both put in double time.

Therefore, in order that you may receive your JOURNAL promptly, and to save the JOURNAL or yourself postage for forwarding, it is requested that you send in your change of address. Official orders at present are usually quite inadequate for our purpose in keeping up with our traveling subscribers.

FURTHERMORE, for this issue it is considered inadvisable to print the station list of regular officers customarily furnished in the last number of the year. Because of the time-lag in going to press, the list would be full of inaccuracies. At a future date, if and when the present situation "stabilizes," such a roster will be printed.

WE ARE TOLD that the linotype operator who was engaged in setting Brig. Gen. E. D. Scott's *Gunner in Luzon* (in this issue) became so engrossed in the story that he stopped work to discuss it with his boss. When anyone as blasé as a linotype-man stops to read what he is setting, you know the yarn must be good!

CAMERA FANS interested in seeing how their work looks in halftone should send their favorite snaps and time exposures to THE FIELD ARTILLERY JOURNAL. Acceptable photos will be paid for at page rates. Timely military subjects, especially those with a field artillery slant, are particularly desired, but all interesting material will receive consideration.

THE INDEX has been set in type and is being checked; but it is thought best to defer mailing it until the January-February number goes out, so that all items for 1939 will be included. Subscribers who are on the rolls *as of the date of mailing* will receive one copy free. A limited number of additional copies will be available at \$1.25 each.

Reviews

The Danube. By Emil Lengyel. Random House, 1939, 482 pp, illustrated. \$3.75.

"The Danube flows through twenty thousand years . . . across several civilizations." And at this time when the eyes of the world are concentrated on those countries through which the Danube flows, it is an enlightening experience to travel back through their incredibly complicated history with so competent a guide as Hungarian-born Emil Lengyel. A knowledge of the political intrigues and jealousies in which these countries have been enmeshed in the past, makes their present-day entanglement more understandable, and their future more interesting to contemplate.

Mr. Lengyel's history of the Danube begins prior to the rule of the Hapsburgs, and includes so recent an historical event as Germany's annexation of Czechoslovakia—the end of "the most successful democratic experiment in the Danube valley."

This book, in addition to being a most engaging travelogue and history, is enhanced by fascinating biographical sketches. For example, there is the picturesque Marie Theresa, mother of the Queen of France, Marie Antoinette, who fell victim of the fury of the Revolution. Emperor Joseph II, son of Queen Maria Theresa, who had for his role "a first-class mind, heroic intolerance, immense ambition, and a desire to save the world; but he was a hundred years ahead of his time and he failed heroically." There is a touching account of Napoleon's ambitions for his son. Franz Joseph I, who became Emperor of Austria in the stagecoach era and who lived to see the advent of the airplane, is discussed at length. Perhaps few royal romances have excited more imagination than that of Crown Prince Rudolph and Baroness Marie Vetsera,

which ended in tragedy in the Mayerling shooting lodge. These are only a few of the biographies included in "The Danube."

Whether or not we share Mr. Lengyel's belief in the feasibility of a "United States of Danubia," his theories in this respect are engrossing.

"The Danube" will probably be enjoyed as much for its picturesque language and sincerity of tone as for its timeliness. It is recommended to all who are interested in the past, present, and future of Central Europe.

—L. P.

Words That Won the War. By James R. Mock and Cedric Larson. Princeton University Press, 1939. 346 pp. \$3.75.

Colonel Lanza's two most recent articles in THE FIELD ARTILLERY JOURNAL have shown how a well-organized propaganda bureau may secure as great advantage as military action to the power that uses it astutely and aggressively. *Words That Won the War* tells how the Creel Committee on Public Information accomplished this for the United States during the World War. How to combine censorship with propaganda so as to safeguard military and naval secrets while at the same time bolstering the national will to win is a problem as great as that of successfully directing the forces in the field. The CPI did all this and more. It improved our position among the neutral nations, notably Mexico, and aided the Allies in undermining the German morale. Adolf Hitler in *Mein Kampf* testifies as to the effectiveness of this latter work. Messrs Mock and Larson have devoted considerable time to research in source material at the National Archives, and have produced an authoritative work. Individuals engaged in similar endeavor during future crises may well refer to it.

REVIEWS

Ahriman: A Study in Air Bombardment. By Brig. Gen. Oliver Lyman Spaulding, U. S. Army, Retired. World Peace Foundation, Boston. 143 pages. 50 cents.

No group of men has more good reasons for desiring peace than army officers, but the propaganda efforts of so-called peace societies have reached depths that make the average officer suspicious of their publications. The title "Ahriman" may also suggest the fanciful to a disturbing degree. Neither objection is valid in the case of this book. It is a scholarly synthesis of the subject of bombing of cities from the air, one which brings into a brief whole the general legal background of the subject, the actual World War developments and post-war theoretical developments, an inquiry into the results to be expected, the cost, and possible preventive action.

In the last chapter of his book, General Spaulding carefully states that he is writing on June 17, 1939 at 4:30 PM. Eastern Standard Time. Much of the evidence in regard to air bombardments of cities was inconclusive in June; it still is as this review is being written on October 26, 1939 at 8:00 PM. Central Standard Time, but much conclusive evidence may have been supplied before this is printed.

In recent years, every student at the Army War College has had issued to him early in the course a pamphlet entitled "Books: How to Judge Them and How to Use Them" based on a lecture delivered at the War College in 1922 by one Col. Oliver L. Spaulding, FA. Judged by the high standards set in that lecture. General Spaulding's book does not suffer.

The book has, of course, no specific field artillery interest other than the arm's pride in the distinguished author. An experienced Air Corps officer, who borrowed the book before this reviewer could finish reading it, returned it with the comment that it contains the best

discussion of the Douhet theory yet published.

Finally, about Ahriman. Don't worry about him. He only appears in the first chapter, and that chapter is only one page in length.—H. W. B.

Attack on America. By General Ared White. Houghton and Mifflin, 1939. 302 pp. \$2.50.

The author of the Captain Fox Elton stories writes a realistic account of what happens when the United States of today is invaded by a coalition of European and Asiatic powers. The book is not entirely a Jules Verne flight of the imagination, but rather a military estimate, couched in popular style, of what conceivably might happen to this not-wholly-protected land of ours. General White uses the fictional form of narration in order to reach a wider lay audience and to drive home his lessons in graphic prose. He knows his background, and he deals with units and weapons as they actually exist in the U. S. Army of 1939. His description of a heavy mechanized column, supported from the air, attacking the retreating American "streamlined" PID near Fort Sam Houston might have been taken from eyewitness accounts of what recently occurred in Poland. This is a good example of what a trained imagination may accomplish in the accurate visualization of future battle. *Attack in America* is a thriller which should hold the military reader and point an impressive moral for the civilian.

Fighting Fools. By Brig. Gen. James E. Edmonds. D. Appleton-Century Co., New York, 1938. 359 pp. \$2.50.

Not a new offering, but of renewed application and significance in these days of army expansion. Gen. Edmonds brings Upton's *Military Policy of the U. S.* up to date in a fast-moving book which combines history with argument for proper approach to our present and future defense policy.

THE FIELD ARTILLERY JOURNAL

The Long Arm of Lee. By Jennings C. Wise. J. P. Bell Company, Lynchburg, Va. 1915. 2 volumes, boxed, \$5.00.

Braxton Bragg. By Don C. Seitz. The State Company, Columbia, S. C. 1924. 544 pages, \$1.75.

Rebel War Clerk's Diary. By J. B. Jones. Old Hickory Book Shop, New York. 1935. 2 volumes, boxed, \$5.00.

The above three books, dealing with various phases of the Civil War from the Confederate viewpoint, were published several years ago and are now being sold at reduced prices by a New York dealer. They may be obtained through THE FIELD ARTILLERY JOURNAL.

The Long Arm of Lee is a detailed study of the artillery of the Army of Northern Virginia, including its materiel, personnel, training, and methods of employment, together with a history of its operations. Volume I is of added value because it contributes to the general history of artillery and ordnance development in America. The paucity of artillery literature of an historical nature makes this a desirable addition to the field artilleryman's bookshelves.

Braxton Bragg is the military biography of a field artilleryman who won his fame, initially, during the Mexican War; especially in the battle of Buena Vista where the handling of his battery was instrumental in winning this pivotal battle of the war. Bragg later became a full general in the Confederate Army. Although because of his somewhat acidulous character he was not a favorite with his contemporaries or with later writers, nevertheless a critical study of his career indicates that he was an officer of much higher caliber than is generally recognized today. Our largest field artillery post is named for him. Mr. Seitz's book is really a collection of Bragg's writings—both letters and official reports—without sufficient effort being made to evaluate these data. Therefore, the book, while worth reading and

having on hand as a reference, cannot be considered as a definitive biography of General Bragg. This has yet to be written.

Rebel War Clerk's Diary, since its first introduction to the reading public, has been widely recognized because it is definitely source material and should be at the elbow of every serious student of the Civil War. Furthermore, since it is a strictly contemporaneous account, it is full of interesting sidelights not generally found elsewhere.

Straight Tips for "Subs." Published by Forster Groom & Co., 23 Craven Street, Strand, W. C. 2, 1 shilling.

This booklet of 72 pages, about three times the size of a postage stamp, is a compendium of information for the newly joined subaltern in the British Army. It tells him where to buy his uniform, how to report to his first command, and how to adjust himself to the social and official phases of his new life. Although it contains mostly data on customs and courtesies of the service, there is also some professional information. While of small intrinsic value to the officers of our service, because of our somewhat different customs, this interesting little booklet is well worth a shilling. Furthermore it is full of amusing paragraphs. For example, here is what the author says about the adjutant: "The adjutant is your own particular scourge. He has been appointed for that purpose." It is rather surprising to learn that a subaltern must say "Sir" to all seniors except battery commanders. The paragraphs on troop leadership could well be taken to heart by all officers.

Survival. By D. Fedotoff White. University of Pennsylvania Press, 1939. 395 pp. \$3.00.

A detailed account of the experiences of a Russian naval officer during the period

REVIEWS

1914-1921. The portions of special interest to military readers deal with the transition of obedient, loyal Russian sailors to unruly revolutionists. Here was a mutiny which began only when the ships reached port; the infection entered from the outside contacts. The enlisted man of the Czarist navy apparently was indifferent, at first, to the Revolution, then confused and frightened by it, and finally an enthusiastic participant. The officers were placed in an impossible position. They, or at least many of them, wished to support the new government when they saw that the old order was obliterated beyond hope of restoration. But they could not abandon years of

training and tradition in discipline and the habit of command. They could not adjust themselves to the new attitude of their men. They became the objects of insult and in many cases suffered cruelty and death.

Mr. White's book drags badly at times because of the inclusion of much material of secondary interest. Nevertheless it is, in general, a worthwhile narrative of adventures which began with naval action against the Germans in the Baltic, passed through the author's service in the embassy at Washington, into the Revolution and, finally service under Kolchak in Siberia, with the bitter aftermath in a Bolshevik prison.

MILITARY BOOKS

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

	<i>Price (Domestic postage included)</i>
THE UNITED STATES ARMY IN WAR AND PEACE— <i>Col. O. L. Spaulding</i>	\$6.00
WARFARE— <i>Spaulding, Nickerson and Wright</i>	3.00
PEN AND SWORD IN GREECE AND ROME— <i>Col. O. L. Spaulding</i>	2.00
ELEMENTS OF ORDNANCE— <i>Lt. Col. T. J. Hayes</i>	6.50
SECRET AND URGENT— <i>Fletcher Pratt</i>	3.75
FIELD ARTILLERY: The King of Battles— <i>Maj. Gen. H. G. Bishop</i>	1.00
CARBINE AND LANCE, A HISTORY OF FORT SILL— <i>Nye</i>	3.00
R. E. LEE— <i>Freeman</i> (4 vol., each)	3.75
A MODERN DICTIONARY— <i>Col. Max B. Garber</i> —Cloth	2.50
—Leather	2.75
COMBAT INTELLIGENCE— <i>Schwiien</i>	2.00
INFANTRY IN BATTLE	3.00
THE INFANTRY BATTALION IN WAR— <i>Lt. Col. Walter R. Wheeler</i>	3.00
MILITARY HISTORY OF THE WORLD WAR— <i>Col. G. L. McEntee</i>	7.50
ROAD TO EMPIRE— <i>Fletcher Pratt</i>	3.75
ARMY MESS MANAGEMENT SIMPLIFIED— <i>Maj. E. A. Hyde</i>	2.00
TOMORROW'S WAR— <i>Stephen Possony</i>	2.50
NOTES ON FRENCH ORDNANCE, 1717-1936— <i>Hicks</i>	3.50
BOMBS BURSTING IN AIR— <i>Eliot</i>	1.75
WORLD IN ARMS— <i>Major R. Ernest Dupuy</i>	2.00
INSIDE ASIA— <i>John Gunther</i>	3.50
THE MEXICAN CHALLENGE— <i>Frank L. Kluckhohn</i>	2.50
CANTIGNY, A CORNER OF THE WAR— <i>J. M. Everts</i>	1.25
MEMOIRS OF THE CONFEDERATE WAR FOR INDEPENDENCE— <i>Heros Von Borcke</i> (2 Vol.)	7.50
FIGHTING FOOLS— <i>J. E. Edmonds</i>	2.50
OUR MAGINOT LINE— <i>L. Hartley</i>	2.75
THROUGH THE FOG OF WAR— <i>Liddell-Hart</i>	2.50
FIREARMS IDENTIFICATION— <i>Lt. Col. Julian S. Hatcher</i>	7.50
THIS FLYING GAME— <i>Maj. Gen. H. H. Arnold and Ira C. Eaker</i> (2 ed.)	3.00
AMERICAN CAMPAIGNS— <i>M. F. Steele</i> (2 Vol.)	8.00
THE ART OF RIDING— <i>Lt. Col. M. F. McTaggart</i>	3.50

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%.

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