

# THE FIELD ARTILLERY JOURNAL

MARCH-APRIL, 1936

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# March-April, 1936

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# THE FIELD ARTILLERY JOURNAL

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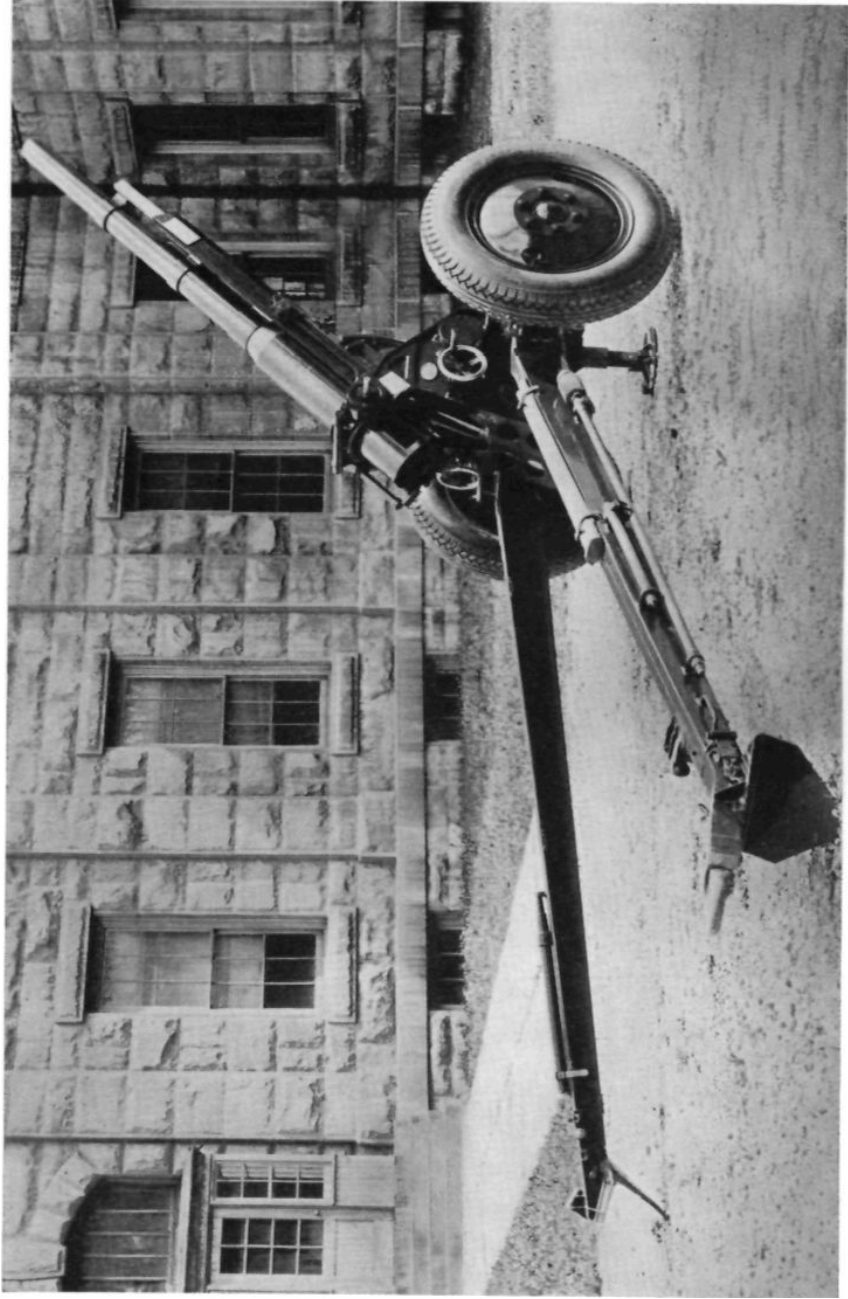
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THE NEW 75MM GUN CARRIAGE M2. SEE PAGE 145.

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VOLUME XXVI

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NUMBER 2

WINNER, PRIZE ESSAY CONTEST, 1936

## TRACE CHAINS AND CAISSONS FAREWELL

(From the notes of an American military observer with the 62nd Reserve Guards Division of the Dorianian Army during the late campaign in Central Europe.)

BY CAPTAIN JOHN P. ECKERT, FIELD ARTILLERY

**O**UR appearance at the 369th Komando was a diversion for the troops. As we arrived too late in the afternoon to find the commanding officer at headquarters, my good friend and guardian angel escorted me directly to the officers' mess. I soon understood his eagerness.

The officers' mess is one of the most admirable institutions in the Dorianian army. It almost makes war worth while. The Dorianian officer, it must be explained, conducts himself with much stiffness and formality in his official relations, but with none in his social affairs. The mess is his grand relief, a haven of camaraderie. On entering the place, each member, after removing cap, side arms and tunic, dons a peasant blouse, a loose garment resembling an embroidered pajama coat. Every komando affects its own distinctive design and trimming on the blouse. It is always worn in the mess club except on very formal occasions.

When an officer wears his off-duty coat it is extremely bad form to transact official business or talk shop. Outside of his mess the Dorianian may be excessively the soldier; inside he is delightfully the gentleman. I mention these things because I am convinced that they were an important element in the maintenance of the morale which certainly existed in the Dorianian army.

When we entered the mess of the 369th, it was enjoying a peak of exhilarated relaxation. There was a great shout and hoisting of beer mugs as my worthy guide appeared, evidence that he was well known and popular, although a minion of that suspected gentry, the General Staff. At the sight of my American uniform a

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temporary silence ensued. Then a pleasant middle-aged man rose from a card table and came forward to greet us, to whom I was presented. He was the commanding officer, Grenador Brunata. He had been advised about my coming, he said, and was pleased to extend the welcome of the command. He asked me to become one of them and participate in the manifest enjoyments of the mess. For the evening I was to be their honored guest.

My friend came to the rescue by begging them in my name not to make the occasion in any way formal. Later I learned that it is customary for even royalty to slip on a spare club shirt and become one of the boys. More shouts resounded, a couple of foaming steins the size of small GI cans were rushed to us, and by dinner time, having demonstrated a knowledge of their language sufficiently fluent to make everything I said highly amusing, I had become the lion of the party.

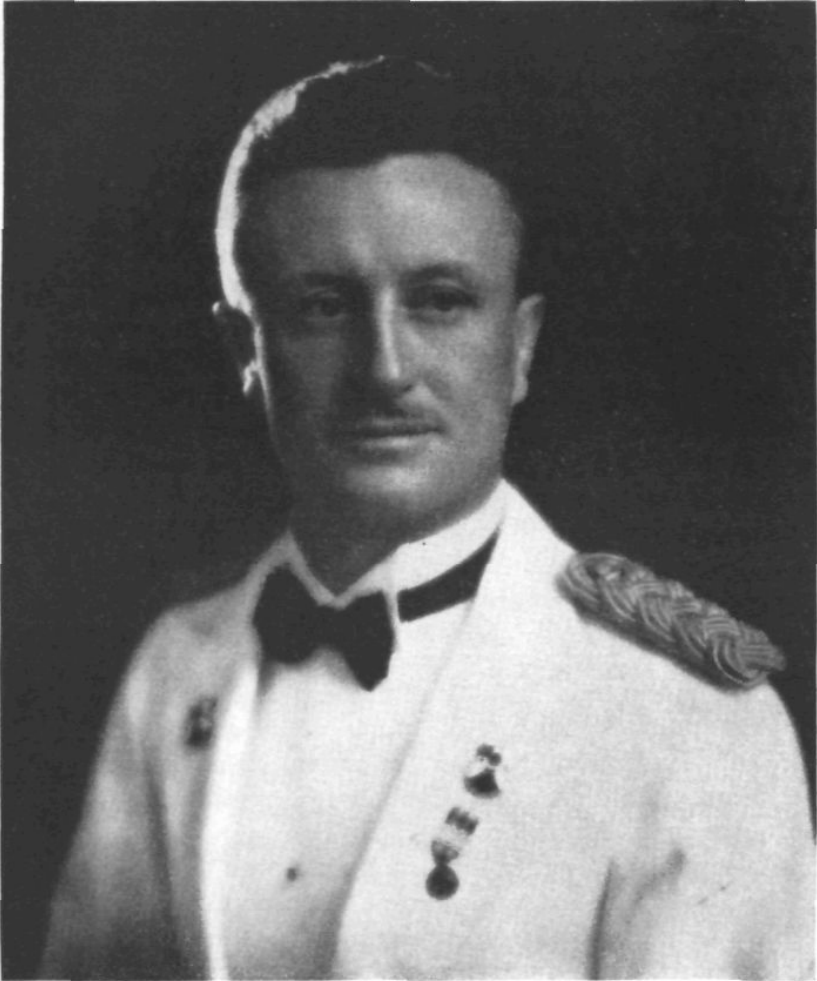
The following morning, before leaving, my friend confided that it was usual for a newcomer to present the mess with a little opening salvo of regards, say a case of champagne or a half dozen barrels of beer, which suggestion I lost no time acting upon, thereby acquiring full fledged brotherhood in the fraternity, with all declamatory rights and prerogatives.

My social relations with these fine fellows remained pleasant and agreeable to the end. Officially, of course, I was merely an observer. Although attached to komando headquarters, nothing whatever was proffered by me or expected in the nature of duty, or that could have been considered improper for one in my position. My personal sympathies in the political issues underlying the war were, and still are, on the side of Pochavia. They served as a check to any tendency to have social amenities color the accuracy of military observations.

The 369th Royal Artillery Komando was one of seven artillery units organically assigned to the 62d Division. Like other reserve units of the Doranian army, it had at the beginning of the war only a cadre of professional soldiers. Ten months at the front had converted it into a superb fighting machine.

Prior to the reorganization of the Doranian forces, this particular komando had been part of a regiment of horse-drawn artillery equipped with seventy-six millimeter guns. Its standards bore streamers commemorating service in a long succession of campaigns

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**CAPTAIN JOHN P. ECKERT, 16TH FIELD ARTILLERY AUTHOR OF PRIZE ESSAY,  
"TRACE CHAINS AND CAISSONS FAREWELL"**

Born in Washington, D. C. Received degree of A.B. from Catholic University of America, 1917. Entered service in 1917 as result of examination for provisional commission, Regular Army. World War service was with 16th F.A., 4th Division, at Camp Greene, N. C., and in Aisne-Marne, Vesle, Toulon, St. Mihiel and Meuse-Argonne operations, and in Army of Occupation on the Rhine. Subsequently served with the same regiment at Camp Dodge, Iowa, and Camp Lewis, Washington, with the 9th Training Battery at San Francisco and the 76th F.A. at Monterey. Took battery officers' course at Fort Sill, 1925-26. Coached polo team while on R.O.T.C. duty at Ohio State University. Recently returned from tour of service with 24th F.A. (PS), Fort Stotsenburg, P. I. Now with 16th F.A., Fort Meyer, Va.



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going back to the Middle Ages. Its personnel, drawn as it was from a horse-raising and horse-loving people, was steeped in the traditions of the mounted service. It greeted the motorization program, and especially the breaking up of proud regimental organizations, with profound dismay, not only for sentimental reasons, but because of genuine misgivings regarding the practical military value of the scheme. One distinguished officer rashly denounced the change as the work of fools and traitors, and was forced to retire. A number transferred to the cavalry and pack artillery. The survivors ostentatiously carried riding crops for many months after the reorganization.

Notwithstanding this indignation, it required but a few weeks of actual campaigning to convert the patriotic skeptics, and long before the date of my joining, the 369th Komando was reconciled to gasoline and oil. In fact, the erstwhile horseman who had protested himself out of active service, had on the outbreak of hostilities petitioned for active duty, had been given a brigade, and with distinguished energy made it conspicuous for motor-mindedness.

The 62d Division, when I joined, was beginning a period in rest billets as part of the reserve of the Second Army. Units were intensely preparing for an expected grand offensive. Thanks to the new strategic mobility of the division, it was possible to conduct training far out of shell range of the enemy. As the first incident of note recorded was the arrival of replacements, it is pertinent to state my observations on the replacement system in operation in the Royal forces.

Field artillery replacements are trained in a few large depots in the homeland, one for each army. Conscripts received at such centers have previously undergone a careful selection and classification, based upon former military experience, education, and vocation in civil life. All the men are first given a course in basic subjects, including dismounted drill, care of equipment, hygiene, gas defense, and elementary duties of the cannoneer. The length of this course is determined by the previous training and the aptitude of the individual; it averages four weeks. Then follows a longer period of specialization, the duration of which not only depends upon the soldier's progress, but upon the demands for replacements at the front. Every man is specialized in one, and one

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only, of the following subjects: (1) Communications, (2) Orientation and Fire Control, (3) Motors and Materiel, (4) Cooking and Mess Management, (5) Administration and Supply.

The proportionate numbers trained in each of these special groups depends upon battle casualty tables, those in the 4th and 5th categories being comparatively few. All instruction is centrally coordinated as to methods of teaching, subjects, texts and proficiency standards, by the Director General of Artillery at Grand Headquarters, who corresponds to our Chief of Field Artillery.

Batteries requisition replacements according to their needs under the categories listed above, as so many No. 1, so many No. 2, etc. When replacements arrive, they are accompanied by sealed records showing the period spent at the training center and the degree of proficiency attained, graded as "A," "B," or "C." Each man's rating must be attested by the instructor under whom the training was given.

During my "residence" with the 369th Komando, I observed the arrival and assimilation of eight batches of replacements. They were in practically all respects efficient soldiers when received, except in battle experience. Indeed, they had even been given a sort of artificial baptism of fire at the depot, where instructors returned from the front endeavored to reproduce battlefield conditions.

Every new contingent was received with a simple but impressive ceremony, in which the men were presented to the colors and given each his division, komando and battery barge. This event was eagerly awaited by the men, for until assigned to a specific unit, their collar and shoulder patches were blank.

Only once did I hear any complaint about a disproportion in the number of replacements per category. In that case a battery received three Motor and Materiel mechanics instead of Orientation specialists. The error was traced and a clerk at Division Headquarters was disciplined.

It will be noted that there is no special category for cannoneers. This is because men of all groups are given elementary gun drill as part of their basic duties. Vacancies in gun crews are filled by requisitioning a distributed surplus in other categories. The result is that all cannoneers are specialists in some other form of

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battery duty, and every specialist is an emergency cannoneer, although by no means an expert gunner. The Doranians believe that training of gunners should be done within the battery, but that the fundamentals of specialist training cannot properly be given in the field. Furthermore, there was a shortage of material; all serviceable pieces were at the front.

At the end of two months a brief report had to be rendered on each replacement, verifying or challenging the proficiency grade which had been submitted by the training center. Studies were made at Army headquarters of these reports, which studies ultimately resulted in promotion or relief of the instructor responsible for training the men. "By their fruits ye shall know them!" was the philosophy, and it offered no inducements to unload poorly trained replacements. The paper work required to keep this system in effective operation was not large, at least for the batteries. The BC simply made a notation on each man's card, signed it, and forwarded the cards, sealed, to Army headquarters.

Having disposed of the replacement system, we shall proceed to examine the so-called "revolutionized" Dorian artillery organization. The Dorian infantry division has a single field artillery brigade containing eighteen batteries of "Supporting Artillery" of four pieces each, totalling seventy-two cannon, exactly as in our service. Forty-eight of these pieces are of light caliber, twenty-four of medium, which is also in accordance with our practice. At this point the identity ceases. For when we examine the caliber, we find that all of their light "supporting" pieces are 105 mm howitzers; the mediums are 150 mm howitzers.

A second difference is in the existence of a separate group of twelve guns known as "Accompanying Artillery." These are in addition to the "Supporting Artillery" referred to above. They are flat trajectory weapons of 55 mm caliber, designed for anti-tank and other missions in close association with infantry front line units, to which they are attached in combat.

The third great difference is the interior organization of the brigade. The Doranians have no regiments or battalions. Between the brigade and the battery there is an organization which I have frequently referred to as the "Komando." This unit performs all the functions of our battalion headquarters, all the administration, command and supply functions performed by our

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regiment for one battalion, and even some of those retained by our gun batteries, notably mess and supply. How this is accomplished without bogging down the unit in battle will be explained later.

The organic artillery of the division is thus grouped into seven komandos—four of 105 mm howitzers, two of 150 mm howitzers, and one of 55 mm guns—with a grand total of 84 cannon. For administration and supply these come directly under the division. For training and tactical command they come under the artillery brigadier, whose headquarters is served by a "Brigade Control Battery." One section of this battery is an ammunition train.

Komandos are identically organized. Each consists of a "Komando Control Battery" and three firing batteries of four pieces each. The control battery is divided into six sections, as follows: (1) Administration, (2) Operations, Orientation and Liaison, (3) Communications, (4) Mess, (5) Supply and Maintenance, (6) Transportation. In battle it operates in two echelons, "Combat" and "Service."

The commanding officer of a komando, a colonel or lieutenant-colonel, is called the "Grenador," which literally means "shell-thrower." The second in command, usually a lieutenant-colonel or major, is the "Sub-grenador." With the exception of the Operations Officer, who is a major, other important staff officers are captains: assistants are lieutenants. The Adjutant supervises the first section, and is responsible for administration and personnel records for the *entire komando*. The second section is supervised by the Operations Officer, with one assistant for orientation and two for liaison. The Communications Officer is responsible for all forms of signal communications down to but not within the firing battery. The Mess Officer prepares and distributes meals for the *entire komando*. The Supply Officer similarly serves in the matter of all supplies. He has one assistant for munitions. The Transportation Officer, in addition to handling the motor vehicles of the control battery, operates a motor repair unit for the *entire komando*.

The above named officers are responsible directly to the Grenador for the training and functioning of their respective sections. For the disciplinary training of the control battery there is a captain, known as the "Batto," the Dorian equivalent of "BC."

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His specific responsibility extends to camouflage, gas defense measures and anti-aircraft defense. In garrison or billets he is in charge of battery formations, ceremonies, shelter and interior economy, and he commands the column on the march.

From the above, it will be seen that batteries are relieved entirely of mess and supply functions, as well as of most of the paper work connected with administration. The only individual retained for such work in the battery is the NCO called the "Administrative Agent" who keeps the komando service echelon apprised of changes and of replenishments needed.

The issue of food to batteries was made by truck, one for each battery. In the long run this entailed no additional hauling on the part of the komando, as it would have had to deliver the rations anyway. It simply delivered them cooked. After all, the number of officers and men in the komando, totaling 328, was less than two world war gun batteries.

Every mess truck had hanging over the side a long narrow water tank, kept at scalding temperature. Each soldier in lining up for chow was required to drag his mess kit through this tank from end to end as the line slowly passed, thus sterilizing the equipment *before* his meal, rather than afterwards. It was said that dysentery in the field fell off 75 per cent when this brilliant regulation was introduced. It may be interesting to mention that the Pochavians went one better by serving all meals in paper dishes which were burned after the meal. This innovation brought about the famous protest of Dorania to the League of Nations in which it was charged that the enemy was adding to the horrors of war by littering the battlefield with pie plates which the Doranian soldiers had to police up, some of which plates contained wholesome looking food impregnated with bacteria.

The centralization of services by the komando is accomplished without excessive increase of personnel in the control battery. The total strength of the battery and headquarters is sixteen officers, including medico, dentist and chaplain, and 105 enlisted men. The transportation is 16 trucks and 8 busses. In combat the mess, supply and administrative sections, called as a group the "Service Echelon," are moved off to the right flank rear, so to speak, where they function in a protected location unhampered by the direction and conduct of fire. The firing battery, relieved

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of these considerations and the personnel and transportation involved, is reduced to a very compact and mobile unit, exclusively devoted to the business of shooting. As the brigade headquarters in combat is always with division and really functions as an artillery section of division headquarters, the chain of command is reduced in fact to a division-to-komando-to-battery affair. In situations where the divisional artillery must be reenforced, komandos readily expand into groupments. Reenforcement is always made by whole komandos, which are attached to similar units of the organic artillery and are *subordinate thereto*.

The personnel of a 105mm howitzer battery consists of four officers and sixty-five enlisted men. It is organized like our truck-drawn battery, minus all maintenance departments except matériel and motors. The transportation is two cross-country busses (BC detail), and seven cross-country cargo trucks, medium weight 1 CP, 1 Wire, 4 Gun, 1 Motor & Matériel Maintenance). Specifications of the trucks are similar to our own. The howitzers, fitted with high speed axles and pneumatic tires, are towed behind the four gun section trucks. All tires have puncture proof tubes. Removable tracks are carried for negotiating bad terrain.

Trucks are interchangeable. Any of them can be used to carry the demountable wire-laying and recovery apparatus. Every one has a built-in water tank behind the driver's cab, emptied and filled from the outside; capacity fifty gallons. Every vehicle is equipped with a pair of folding steel brackets for the emergency laying of wire from small spools. A steel tow cable with loops and powerful springs at both ends is a standard accessory with each vehicle. No modifications of vehicles are permitted which would interfere for general purposes with their use in an emergency.

No spare vehicles are carried by units smaller than a division. A division mobile repair shop makes such field repairs as are beyond the power of the smaller units. To replace those utterly ruined, a pool of standard vehicles is maintained in army depots. Problems of training as well as repair and substitution are simplified by the fact that within any komando there are only two types of vehicles, the bus and the cargo truck. The size and weight of the latter depends upon the caliber of the gun, but trucks in each class are of identical pattern and manufacture.

Their howitzer is the standard box trail 105mm piece, with

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wedge type breech. It is equipped with a remarkably rugged panoramic sight,—bulky in appearance, but firmly mounted and free of lost motion, even on pieces over a year in campaign. No especial weakness was observed in this weapon. Officers who had served with the old high velocity field gun were especially enthusiastic over the elimination of mask clearance and dead space problems. The far greater destructive power of its projectile more than compensated for the slight additional weight of the carriage, and greater weight of ammunition.

As in other armies, the Doranians had conducted experiments with an all-purpose cannon. They had come to the conclusion that such a weapon was impracticable; that special weapons and technique were needed adequately to deal with the airplane and the tank. They took all anti-aircraft weapons heavier than 15mm out of the division, believing that the task of fighting high flying planes is one for corps and army artillery. For anti-tank purposes they brought out a highly mobile flat trajectory gun of 55mm caliber. One komando of twelve guns was put in their infantry division. This komando is the "Accompanying Artillery." Although a part of the artillery brigade, it was especially organized and trained for front line service, and was normally attached to infantry in combat. In this manner it was hoped to supply the need of the sister arm for fire on moving targets, thus simplifying the liaison problem, and leaving the bulk of the "Supporting Artillery" intact for organized and coordinated fires prescribed by the division commander.

The 55mm gun is employed by individual pieces, sometimes by platoons. Having a low carriage, it is easily concealed. Its split trail permits a wide sweep of fire. Using an improved flashless powder it fires two types of shell, one armor-piercing, the other a fragmentary shell with a super-quick fuse for use against personnel. It is towed to position behind a small cross-country truck, but can be manhandled for considerable distances by its cannoneers.

That this weapon accomplished what was expected of it is open to question. There is a great difference of opinion by the eye witnesses. The usual charges were made that infantry commanders often misused their attached pieces; by some it was alleged that they were more of a nuisance than a help. Their success seems to have depended upon the personality of the gun commanders.

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Some of them performed marvelous feats against tanks. The most decorated men in the Dorianian army are the survivors of these gun crews. Losses in personnel and matériel were extremely heavy, as with only one accompanying komando available in the division, it had to be kept in the front line continuously. It took a terrible beating. The conclusion of the high command was that there should have been more of these pieces. In the last month of the war, orders were issued to add another komando to each division. Some units of pack artillery were rushed in temporarily to fill the gap. Among field artillerymen there are many who contend that the sacrifice of the 55's was the bloody offering which turned the tide, in that it enabled the remainder of the artillery to devote itself to the tremendous concentrations of deliberate fire which smashed the enemy and won the war.

The above remarks are a summary of observations made and opinions collected during and after the final spring campaign. A picture of a komando in motion can best be given by narrating some of my own experiences.

After a few weeks in the pleasant little village of Kumposzt, things began to happen to the 369th Ex-horse. The grenador was ordered forward to join the brigadier on reconnaissance. That meant that the outfit would move into line again, perhaps after dark the same day.

On such a reconnaissance, a grenador is permitted to take only a single bus. As the vehicle is limited to seven passengers, including the driver, I made special note of whom he selected. They were three officers, Operations, Orientation, and Communications, and two sergeants, one a scout, the other an orientation assistant. Topographic equipment and lunches for twenty-four hours were loaded. The sub-grenador remained with the command.

At dusk the same day the Operations Officer returned in the bus with his scout, with orders to guide the komando forward to a rendezvous point. Battos were directed to precede the column with part of their details, each being permitted one bus and his wire truck. They moved out at once, guided by the scout. The Operations Officer remained with the main column, which followed within an hour.

It was dark when we left our village. I estimated that the column, minus the service echelon, occupied about 600 yards of road



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space when closed up on the initial point. As there was no moon, the maximum speed of march was about 20 miles per hour. All lights were disconnected except two special red tail-lights on each vehicle, very dim, deeply hooded, and set back well under the body. These were switched off when airplanes were overhead. White canvas squares were hung over the tail-gates. The march table must have been well worked out, because in spite of troops in front of and behind us, many towns and busy crossroads, there were no delays to speak of. We arrived at the rendezvous area before eleven o'clock, having traveled about forty miles in little over two hours. The column broke into battery units and took cover in a forest, in areas designated by the Orientation Officer, who had previously reconnoitered the place. The service echelon came up an hour later.

The command remained under cover the rest of the night and all the next day, while positions were selected with great care, and topographic operations were completed. I learned that all of the division komandos did not follow the above procedure; some of them remained behind in billeting areas during the reconnaissance and marched up into position in a single displacement.

Hostile aviation was very busy that night; in fact, every night. Low flying planes came over the forest and some bombs were dropped, but pursuant to orders there was no answering fire from the troops, it being hoped that the presence of the unit had not been definitely determined. It probably had not, as the bombing was rather desultory and there was no severe artillery fire directed at our hiding place, which was well away from crossroads. Gun positions were occupied the second night, during a drizzling rain. Trucks were forced to use traction devices in most cases, but there was no instance observed of guns not getting into position. The ominous hum of planes, the spectacular rockets and dazzling flares that brightened the front, the rattle of machine guns, the whine and crash of shells, the smell of gas, the endless passing of machines, the voices of struggling men in the darkness as minor crises were met and overcome, the gooey mud and the saving wise cracks, all these brought vividly back to mind my experiences of eighteen years before. I reflected that things hadn't changed so very much since World War days. Then I thought of the comfortable ride on a cushioned seat I had just completed in two hours over a distance

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which used to require two long nights in a saddle. No, there were no longer horses to groom, feed and water when the march was done; no harness to clean; no kicking, plunging teams to disentangle from barbed wire in the darkness. True, but were there not motors to inspect and repair, tires to change, gasoline and water to be fed to them, and grooming to be done with a grease gun instead of the curry-comb and brush? And so throughout those first few days I marveled more at the things which had not changed than at the innovations. The similarities made one forget the differences. For great and little changes there certainly were.

In the first place, the greater numbers and efficiency of all types of aircraft had forced the ground troops to a mastery of the art of camouflage and a perfection of camouflage discipline that the World War never knew. Troops were trained to take cover and to keep cover until it was instinctive. Vehicle drivers understood that to be able to hide one's car or truck was just as important as being able to drive it. A battery commander was disgraced if his position could be detected on an airplane photo taken by friendly ships. Mechanical equipment was greatly improved.

Troop movements were by sudden bounds, followed by periods of absolute quiescence. Although mobility had increased somewhat faster than power, there was far too much defensive power on both sides to permit a continual scuttling about of armored vehicles. In spite of the machines, men were as human as ever, and they took to holes in the ground when the projectiles came too fast. There they hid, nursing their potential mobility, until one side or the other had secured a preponderance of power. Then out dashed the machines again.

I was primarily interested in artillery technique and equipment. Perhaps the most noteworthy development was the accuracy of unobserved fire, an inevitable result of the intensity of modern combat. In spite of every conceivable effort to secure observation, the greater part of the organized and coordinated fires of the artillery had to be delivered without it. Darkness, terrain masks, fog and smoke made dependable observation from terrestrial OP's the exception and not the rule. Aerial adjustment for light artillery continued to be impracticable. Anticipating such conditions, accurate maps of the zone of operations were possessed by both sides. Orientation personnel was the first forward on reconnaissance, and

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was busily preparing charts, running traverses and locating place marks before the guns arrived. Their labors were lessened by the efficient service of army survey detachments, which located triangulation stations and distributed information to the troops concerning them.

All of the refinements mentioned herein were noted at one place or another during the initial occupation of position of the 369th Komando. Batteries occupied position under cover of darkness, fog, or artificial fog. There was a minimum of confusion, traffic congestion, misunderstanding of orders, and clashes of authority, which not only spoke well for the training and discipline of the troops, but indicated a high order of staff work.

The Doranians love to simplify long titles to short code forms. The habitual use of these in orders and telephone conversation saves much time. For example, they use the Greek letters Alpha, Beta, Gamma, Delta to distinguish the four batteries, Delta being the control battery. Phonetically, these Greek sounds are more clearly articulated than the Dorian alphabet. A formidable title such as "The Battery Commander, Headquarters Battery and Combat Train, First Battalion, First Field Artillery," becomes simply "Batto Delta, First." The Transportation Officer of Battery "A" is "Moto Alpha," the Executive of Battery "B" is "Primo Beta," and the Reconnaissance Officer of Battery "C" is "Conno Gamma." The terms are easy to remember, easy to say, and easy to write.

In the komando area, batteries Alpha and Beta had positions in the edge of a ruined village. They were able to camouflage their CP trucks in close proximity to the guns. Gamma was more exposed. "Batto Gamma" had to park his command truck at a considerable distance, removing his charts to a thicket near the pieces. The direction of fire was obtained from an orienting line.

The komando CP truck was hidden under a shed in the village. It was equipped with map tables, telephones and folding chairs. A novel feature was a set of canvas curtains that unrolled to form a light-proof and gas-proof chamber, lighted by electric lamps connected to the truck's ignition system. There were also side curtains on rollers which could be guyed out to form awnings on both sides, either for sheltering personnel or enlarging the CP. It must be remembered that the Dorian army carries no heavy tentage.

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In spite of these ingenious accommodations, I noted that dugouts whenever available were used instead of the truck.

As soon as the gun batteries were in position, all free trucks, usually five from each battery, were sent back for more ammunition. To save the transfer of loads, the Munitions Officers frequently arranged for the delivery of ammunition directly to firing positions by the ammunition train, sending the komando trucks as a single convoy back to the army refilling point. In such cases it was so timed that enough ammunition train trucks were available in the area for the emergency displacement of the pieces.

Two liaison details went forward. They communicated with komando by radio only. Terrestrial observation of two kinds was sought; the primary from liaison officers well forward; the secondary, or general observation, from the best possible OP near the guns. Forward observation was usually the better, but neither gave results approximating those we are accustomed to in peacetime service practice. The terrain was flat or slightly rolling, with numerous wooded areas. The only elevated lookouts were in the tops of trees. The enemy was quite as efficient in the art of camouflage as we, so nothing could be seen of troops or military positions. Even terrain features at any distance were hard to distinguish because of mist. However, enough could be made out on ordinary days to permit registration on terrain features. When this was impossible the observers employed high burst ranging, at which they were most efficient. When the sector was active, smoke hid everything.

Meteorological message weather corrections were not much used by the Dorian light artillery. They preferred the simpler "K" coefficient method, which they maintained was not only easier to calculate, but more accurate and dependable. Adjustments on animated targets from rear OP's were rare; those from forward OP's more frequent, although the 55mm guns took care of the majority of such missions. The most important fires were barrages and concentrations sent down by brigade on map overlays. Data were measured from charts, corrected for weather and other factors by "K" adjustments. Where observation was possible the fire was checked and corrected as laid down.

Of necessity, orientation operations were carried out with great care and exactitude. Airplane photographs were supplied daily.

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The standard battle maps issued were planographed in colors on a sort of cloth-fabric paper, tear and stretch resistant. However, for the determination of accurate data, the artillery relied upon specially built charts.

The firing chart used by the Dorianian artillery is unique; it contributes in no small measure to the accuracy of their unobserved fire. It is basically a four-ply wooden board, the grain of the layers being of course opposed. On each side is cemented and pressed a cream colored surface of waterproof cellulose composition, smooth but not polished, so that it retains pencil and ink lines. After an ageing period, the edges are cemented to exclude moisture. Then the board is run through a machine which engraves upon both sides an absolutely true 1:20000 grid. Four holes are bored through the corners to fit the brass thumb screws on the standard plotting board. The finished charts, which are about the thickness of beaver board, are then packed five in a metal case for issue to the troops.

This piece of equipment eliminates all errors due to distortion and wrinkling of paper maps and charts, and relieves the troops of the tedious labor of constructing accurate grids in the field. It can be exposed to rain without injury. It is considered by the Doronians to be quite as important as good gun sights and accurate calculation of data.

A light telescopic alidade was supplied all units, including batteries. It was made of metal, was carried in a case about three inches square by eighteen inches long, and was both simple and accurate. The telescope had a magnification of about six diameters, with an eyepiece set off at an angle of forty-five degrees from the horizontal, permitting the operator to sight a distant object while bending over the table. One did not have to be a contortionist to use it. Contrasted with this excellent instrument, our own open leaf alidades are too crude and hard on the eyesight, while our more elaborate ones are heavy, cumbersome and inconvenient.

Another gadget which I had never seen before was a portable camouflage net for use over the plane table. The framework consisted of a single upright, with a scissors cross-piece which opened to form the roof. It was covered with a light netting and patches of scrim. The corners were guyed by cords attached to chainman's pins. The whole outfit could be set up or knocked down in thirty

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seconds, and when packed was not much larger than an umbrella.

Officers and orientation NCO's were equipped with a pocket aiming circle, approximately the size of our old prismatic compass. Although it was not issued with a tripod, I was amused to see the various ingenious substitutes invented by men and officers to take the place of one. I discovered that within the riding crop or swagger stick carried by most officers there is a bronze dirk with a screw top on which the aiming circle can be fastened after the dirk is stuck into the ground.

Their standard aiming circle with tripod is built along the lines of the French Goniometer Boussole, although somewhat larger and generally improved. They had scissors telescopes without double vision, which was something interesting to see.

In signal communications the telephone remains supreme. Nothing radically new was presented. They had a smaller and lighter field telephone than our 1918 models, and minor improvements in switchboards and wire laying devices. Twisted pair was issued on standard steel spools ready for use on motor reels. Routine splicing and preparation of wire was reduced by the use of lock-tight plug and socket connections. All telephones, switchboard distributing panels, and inner wire terminals on spools were fitted with sockets, while outside ends of wire as issued were fitted with plugs. Upon the exhaustion of one spool, another could be plugged in without splicing. Short lines for use at CP's were kept on small frames, and fitted with plugs at both ends. The plug-socket connection could not be pulled out until released by a finger spring on the plug. By means of this simple device the establishment and recovery of wire lines was greatly speeded.

Buzzer telegraph supplemented the telephone over the longer trunk lines, especially the brigade-komando circuits, being superimposed on the telephone system by the simplex and phantom methods.

Flag communications were absolutely taboo in the Dorian army, being considered of too little value to justify a clash with camouflage regulations. Ground panel signals were likewise prohibited. Lamps were occasionally employed, but only after the setup was approved by the camouflage officer in each case.

Radio was strictly controlled. It was the chief reliance of the liaison detachments. Liaison sets, of which there were four in

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each komando, were characterized by small size and limited range, but great selectivity and directional effect. There was an exclusive wave band reserved for artillery liaison, and sufficient frequencies so that no two liaison teams on a corps front had to use the same setting. On the march these sets were used for column control.

For secondary communication with brigade, as well as for occasional work with aircraft, each light artillery komando was equipped with another more powerful set. It was usually silent, as wire communication and messenger service handled ordinary brigade traffic, and light artillery komandos seldom employed airplanes for adjustments. Radio channels had to be kept clear for the medium and heavy units which depended upon aircraft. Systematic air-jamming by the enemy and the necessity for cryptographing made the general use of radio for command purposes impracticable in the smaller units.

The first air attack I witnessed stands out in my memory most vividly. Battery Beta had just taken the road. It was about nine o'clock at night. There were seven vehicles in the column, temporarily closed up because of a collision ahead. Planes could be heard as usual. Suddenly the whole vicinity became bright as day from a parachute flare. A few moments later a second flare was floated directly over us. Almost immediately three ships in succession roared down the column, from our front to rear, flying at about 100 feet altitude, both machine guns working. As each ship passed over the convoy it dropped a string of fragmentary bombs. Then it disappeared into the night.

The suddenness of the attack would have been demoralizing to troops not used to such visitations. To the veterans of Battery Beta it was old stuff. With the first appearance of the flare, the column broke up according to set routine. Odd numbers kept to the right, even numbers turned as far as possible to the left. Where it was possible to get entirely off the road, every other vehicle on each side moved off. Within a few seconds there was no single column for the flying marksmen to rake. The armored tail gates came down with a bang, the auto-riflemen hopped to position thereunder, while the other men dismounted and scattered to both sides of the road. The first ship was upon us before we were set, but the second and third were received by a torrent of auto-rifle fire. What damage was done to the planes could not be seen. A quick

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check and report disclosed that casualties sustained by the convoy amounted to two men slightly wounded and one wheel damaged, all by bomb fragments. First aid was given while the convoy moved on.

This was a typical attack. Casualties were sometimes more severe; in two instances I saw ships shot down. Often after a spectacular ear-splitting swoop no casualties were reported or damage discovered until later. But the ground troops were not stampeded by the noise. Riflemen vied with each other on being first to open fire. In general the troops feared the bombs more than the machine gun fire.

The terrible and mysterious things predicted of chemical warfare by the sensational press of all nations failed to materialize on the battlefield. In this again, defensive measures kept apace of offensive. Heavier and more frequent concentrations were met by better masks and chemical resistant clothing and equipment. Devices for distributing neutralizing agents in areas contaminated by persistent gasses were effectively used by all arms. Some new gasses made their appearance, but none were surprises. An exception was the celebrated "Anti-motor mist" brought out by the Pochavians, which in strong concentrations would stop an automobile engine. Laid down along certain valley highways, it caused delays to motor convoys until the Doranians attached chemical filters to the air intakes of all vehicles, whereupon the gas caused no further trouble. Malingering by feigning gassing was almost eliminated in the Doranian army by the simple expedient of making it a court-martial offense to be gassed. The burden of proof was on the gassed patient to show that he had used all reasonable measures to protect himself.

Before concluding this account of the Doranian artillery, it may be of interest to append a few remarks about the people they were fighting. My knowledge of these worthies is drawn from intelligence reports and opinions current in the ranks of their arch enemy.

It is generally known that the sudden outbreak of the war caught the Pochavian army in the midst of a reorganization. Part of their artillery had been motorized, but the bulk of the 75mm divisional guns were still animal drawn. They retained the conventional organization of division, brigade, regiment, battalion and battery throughout the war. The staggering initial reverses they



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sustained demonstrated that they were outmatched in both mobility and fire power by the enemy, and that their command organization was unwieldy.

The Pochavians made haste to offset their disadvantages, using such weapons as they had. Light field howitzers other than mountain guns they had none, but they were able to secure from sympathetic neutrals a liberal supply of 75mm field guns modified from World War armament. They rushed their motorization projects to completion. They increased their fire power by adding two more guns to every light battery in service, thus increasing the total number of guns per division from 72 to 108. Difficulties in the voice control of six guns per battery they overcame by means of loud speakers. This device was ordinarily used to amplify the voice of the executive, but could be connected to the telephone net, permitting direct commands to the gun crews from the BC. They are said to have tried out radio telephone communication from liaison officers direct to guns, with indifferent success.

Although retaining the conventional chain of command, the Pochavians found it necessary to simplify tactical control by temporarily short-circuiting some of their echelons in battle. For example, they sent firing missions directly from brigade to battalion. As to the effectiveness of Pochavian fire I can testify that it made itself extremely disagreeable twenty-four hours of the day. Long range interdiction and harrassing fires were so accurate that the Doranians found it necessary to abandon certain crossroads and stretches of highway altogether. As it was impossible to prevent hostile fire, the Doranians induced it to be distributed and wasted by the wholesale construction of camouflaged highways and less perfectly camouflaged dummy highways, and every battery commander was required to erect at least two fake gun positions for every one actually occupied. To carry out the deception, dummy positions were occasionally occupied by individual pieces or platoons for the execution of short missions.

Doranian infantry was thoroughly instructed to take advantage of the flat trajectory of the enemy field piece by keeping in the dead space zones, and was indoctrinated with the idea that in an advance it was safer the closer it got to the enemy guns, providing it kept out of sight and hugged defilade.

Some Pochavian officers with whom I conversed were of the

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opinion that their organization and armament was superior, the point being that the Doranian 105mm projectile was not much more effective than the 75mm against troops in well constructed dugouts, whereas in the open six 75mm projectiles would cause more damage and demoralization than four 105's. Nevertheless, the majority of their artillerymen grudgingly admitted that Dorania had the advantage. As one field officer ruefully expressed it, "One must prefer what he has when he has nothing better."

Both armies were equipped with electrical directors in their anti-aircraft artillery. The Doranians had none with their divisional komandos. The Pochavians employed this device with a few of their units, reputedly with great success, but the amount of artillery so equipped was small and could not materially affect the outcome of the war.

In one department the Pochavians were admittedly superior, their excellent mountain artillery. In the rugged terrain of the eastern sectors the invaders were held at bay. They frankly attribute failure to the fact that their motor drawn matériel was outmaneuvered and outshot by the ubiquitous little howitzers the Pochavians were able to snake at will over the narrow trails of that region. Had the vanquished nation possessed more of these remarkable pieces, there might have been a different sort of peace treaty, for they had been found to be valuable as infantry accompanying weapons as well as for purely mountain fighting.

In summing up the factors that decided the outcome of the short war between Dorania and Pochavia, it cannot be said that victory was due to superior wealth and resources. The vanquished enjoyed a superiority in both of these. Nor can it be attributed to any surprise mechanical innovations. Perhaps it can be said that Dorania was favored with a more aggressive and efficient leadership, and that she demonstrated a better execution of things all along the line. She seemed to beat her adversary to the draw. Her motorization program was completed when Pochavia was beginning. She won the early frontier campaign by a faster mobilization, and an exploitation of her strategic mobility. Pochavia was only saved from utter ruin by a desperate rear guard movement to her heavily fortified third line, deep in the interior. There she courageously threw in her reserves and demonstrated that entrenched power can checkmate the new mobility when there are

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no flanks to get around. But in the final spring test Dorania produced the decisive preponderance of power and morale. Having breached the line in the western lowlands, she was prepared to turn loose her speed with terrible effect. A whirlwind envelopment rolled up the line. Paralysis of railroad terminals and rear communications was accomplished by a tremendous aerial attack; demoralization proceeded by the lightning infiltration of the whole hinterland with aggressive detachments of machine gunners transported in trucks and armored vehicles, and even by the landing of small garrisons from transport planes at critical places, some of which were equipped with accompanying artillery pieces. The political collapse was sudden and dramatic. While the eastern army of Pochavia was actually gaining ground in the mountains it was furnished the incredible news that the capital had fallen and the war was officially over.

It may be argued that fourteen months' hostilities between two secondary agricultural states cannot be taken as a guide to the conduct of war by first class industrial powers. But do not forget that these belligerents were backed by great continental coalitions whose active interest and military assistance was but thinly veiled. As in a laboratory experiment, lessons were learned by the great beholders behind the scenes. If I were asked to state what these lessons might be, insofar as they affect my own branch of the service, I would modestly venture the following opinion:

The battlefield demonstration of the swift, all-weather, cross-country motor vehicle requires a readjustment in the balance of fire power, mobility and communications. A mobility never before known, both strategic and tactical, is created by this mechanical hauler and carrier. By its elimination of horses, drivers, caissons and limbers, it presents us with a great saving in road space and personnel. Just what to do with this gift is a vital problem. Will the artillery keep most of it in the form of mobility as did Dorania, or convert a larger part into fire power as Pochavia did when she increased her guns per battery from four to six?

An analysis of what happened in this war will show that Dorania, although adding to her division twelve accompanying guns, still retained the greater share of her savings in mobility. She achieved a decisive augmentation of fire power in an entirely different way, by substituting for her field gun, piece for piece, a

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howitzer of approximately the same mobility and range, throwing a projectile of larger caliber and far greater destructive power; a weapon possessed of a trajectory steeper at both ends and hence more effective for divisional purposes.

Communications is adversely affected by increased mobility. Devices to speed the establishing of wire lines must be adopted, for despite the difficulty of maintaining wire systems in battle, it is evident that they are still the most dependable form of electrical communication. Radio must be reserved for those channels where it is indispensable,—air-ground and infantry-artillery liaison. Sets not absolutely necessary must keep off the air. Wire will have to be issued like ammunition, to be laid and abandoned.

Dorania has shown that fire power, mobility and communications, all three, may be improved by a variety of technical refinements. She resolutely departed from precedent in simplifying her command organization, and she centralized her service functions along permanent lines, whereas her opponent resorted to temporary field expedients. Her system of training replacements demonstrated its superiority as soon as casualties began to mount. Attention to such apparently trivial details as the phonetic quality of words, to euphony and brevity in titles and military terms, were shown to have paid big dividends in time saved and errors avoided. Standardization of equipment facilitated training and the service of supply. Improvements in technique in the delivery of unobserved fire are said to have contributed as much fire power to the Doranian division as the addition of twenty per cent more cannon. It was verified that the mobility of the best machines will be worthless unless traffic is regulated by perfect staff work. Lastly, both belligerents demonstrated that in the presence of modern aviation the slightest neglect of scientific camouflage would result in swift and certain destruction.

A significant lesson to artillerymen is Dorania's near debacle in the eastern mountains. In criticizing the poor showing of her troops in that sector, it must not be forgotten that the old 75mm field gun would have been at even greater disadvantage than their new howitzer. It was a matter of improper transportation, not of the firing inferiority of the weapon. Events there showed that there is no satisfactory substitute for the horse and mule in mountainous country. Moreover, a modern pack howitzer was shown to

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have valuable emergency uses elsewhere, both with and without its animals.

In concluding, I regret my inability to touch upon the relative merits of the air services, of infantry tactics and weapons, and of propaganda and intelligence agencies, each of which has been cited by commentators as being the prime force in the war. But I submit that if ever an army succeeded in gaining an artillery mastery over an enemy at the critical times and places, Dorania did obtain it. And when such an ascendancy is known and felt throughout the rank and file of any army, *Morale*, that elusive *sine qua non* of victory, will take care of itself.



# FEATURES OF THE FIRST ARMY MANEUVERS FROM AN ARTILLERY VIEWPOINT

BY COLONEL ALLEN J. GREER, FIELD ARTILLERY

THE maneuvers held at Pine Camp, New York, in August, were primarily a problem in concentration, supply and administration of five divisions—the 1st Division, Regular Army, and four belonging to the National Guard. They were not tests of the Guard units and since the members of these organizations came fresh from their civil pursuits for their two weeks' annual training, this fact was taken into consideration, and none of the exercises called for long marches for which the men under the conditions could not be expected to be physically fit. The field exercises were all meeting engagements; the first ones being division against division, the last ones being corps against corps. It was announced that the desire was to inculcate the principles of "open warfare."

The great value of having commanders and their staffs from the division down to the battalion actually function as they would in campaign was manifest to all, and this feature with the mechanics of tactical operations were the fundamental objects of the maneuvers.

Viewing the maneuvers as an umpire attached to headquarters of an artillery brigade certain features seemed particularly outstanding.

I. Motor transport has given troops in war a strategic and tactical mobility greater even than in the days when the Mongol cavalry of Genghis Khan conquered nearly all of Asia and Eastern Europe. The 26th Division came from Massachusetts to the Pine Camp Area by motor in two days, some units traveling almost six hundred miles. This shows what concentrations can be made for battle and what vast opportunities will be offered in the future for great turning movements against the enemy's flank and rear. Unless an army's flanks are secured, as they were on the Western front, future wars may often see such surprises and disasters as happened to the 11th Corps when Jackson struck its flank at Chancellorsville.

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II. There is more or less of a general rule in our service during maneuvers, that if the attacking infantry has a superiority of strength over the defender of three to two, the attack is allowed to progress. This is a very dangerous doctrine to teach, for without such a preponderance of artillery support that the defending infantry is thoroughly smothered by fire, attacking infantry cannot by frontal attack drive from position infantry equipped with modern automatic weapons, who make use of natural cover alone. Even during our Civil War, with the weapons then used this could not be done. For instance at Fredericksburg. Lee used only 20,000 of his army in a naturally strong position with scarcely any intrenchments, yet drove back with terrific slaughter Burnside's force of about 80,000. The fire power for the opening phases of a modern attack must be supplied by Corps and Army artillery, yet at the maneuvers neither was present, for the obvious reason that we had none available. Conversations with many infantrymen have convinced the writer that the necessity for adequate artillery preparation for their own offensive operations is not appreciated generally by the infantry, and many of them still believe they can advance against an enemy in position under their own fire power.

III. While our Service Schools insist on personal reconnaissances by all commanders in every situation, this doctrine may be carried to an extreme with great loss of valuable time. This was frequently observed during the maneuvers when hours were wasted by successive reconnaissances by division, brigade and regimental commanders. For instance a division attack order is issued in a meeting engagement.—Normally, the artillery brigade commander—except for the general reconnaissance made with the division commander, on which he should always go as one of his most essential staff officers—need immediately make no other. All that he has to do as brigade commander is to assign general areas to his regiments and designate the units they are to support with special missions. Regimental commanders in turn can assign map areas to battalion commanders and designate which regiments they are to support. The maps of the maneuver area were the usual Geological Survey sheets with a scale of 1/62500. They were found to be quite accurate. However, in future campaigns we may expect to have at all times reasonably accurate maps, for in addition to those obtained locally, containing certain control points,

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we shall have the photographs made by our Air Service, and these two combined should give a detailed picture of the terrain such as we rarely have had in the past. Using such maps, assignments of areas and missions should always be practicable. However, battalion commanders must make a personal reconnaissance before putting the batteries into position.

IV. Even during maneuvers liaison between artillery and infantry frequently failed. Several times it was noted that artillery battalions could not tell the locations of the infantry front lines they were supporting. This was due to poor telephone service, but the primary cause was the distance between the guns and the infantry firing line. With our present flat trajectory light gun and the difficulty of securing defiladed positions close to the front this situation will always exist.

V. While Regular officers appreciated the difficulties of those who prepared the exercises and the necessity of artificial situations, still certain of these are apt to create false impressions, particularly among Guard officers. For instance all the exercises involved meeting engagements, and commands marched with the old orthodox but now obsolete advance guard formations. With modern air service and motor transport, meeting engagements are only remotely possible. In every instance, had the troops been properly equipped, there would have been sent forward a screen of motor vehicles carrying men armed with automatic weapons, that would have nullified the purpose of the problems.

Motorized artillery, notwithstanding its high degree of mobility, took its assigned place in column as of old, where motorized elements should never march now. It is a useless strain on motors and men. They should move forward by bounds, the closed up infantry clearing the road during the time.

VI. While artillery batteries, during the exercises, were always assumed to have four guns, the National Guard units had only two. No assumptions were made for the Infantry, only their actual strength, about 60 to the company, being considered. In the Artillery of the Regular Army we are much more fortunate than is the case in the Infantry. Artillerymen think in terms of guns, infantrymen, in numbers of men. Our batteries in peace and war consist of four guns. An infantryman, with a company of 65 men in garrison, can with difficulty imagine one with a strength of over



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200, and his experience in dealing with such an organization, hence his ability to do so, is most limited. The lack of experience in handling large commands has always been a characteristic of our Army. There is small doubt that this was one of the greatest causes of failure to execute Lee's able strategic plan by his lieutenants, most notably the great "Stonewall," during the Peninsula Campaign.

The term "open warfare" so frequently used is believed itself to be a misnomer. In the spring of 1863 General Lee made obsolete "open warfare" by intrenching whenever in the presence of the enemy. The Union troops rapidly followed the example set, and the final campaigns of the Civil War, Grant against Lee, and Sherman against Johnston, were the classic origins of trench warfare, and such warfare will always be found when troops are war-tried and trained.



# THE NEW 75mm GUN CARRIAGE M2

BY MAJOR J. H. WALLACE, Field Artillery

THE annual report in 1933 of the Chief of Staff stressed the importance of modernizing of field artillery weapons, and each year thereafter he has laid increasing emphasis upon the importance of this project, particularly as it relates to the 75mm gun. In his report for 1934 he states, "The project should be promptly initiated since increased mobility in the other arms will be largely wasted unless accompanied by comparable increase in flexibility of artillery fire and the speed with which artillery units can be brought into supporting positions."

Such statements were withheld until the War Department was ready with a carriage which it felt was a finished development and upon which rearmament could be based. The original French 75mm gun, used by both the French and the Americans in the World War, is the Model of 1897. It was the forerunner of all modern field artillery and is without parallel in brilliance of conception. When the French boldly rearmed with it, preparing for the struggle which they knew was to come, the Germans ridiculed its complication. Some nine years later, however, the Germans adopted a gun of the same general type.

We rearmed in 1902, following the lead of the French, with the 3-inch gun, which was generally similar to their 75. At that time, and in fact until about 1913, very definite lines were drawn, even in the minds of Ordnance engineers, between guns for flat trajectory fire and howitzers for curved fire. The conception of indirect fire from concealed positions was new and the idea of a battery commander's separating his observation post from his battery position by more than a hundred yards was not even thought of seriously. This resulted in three thousand to four thousand yards being considered medium ranges, and seven or eight thousand yards, exceptional and used only when conditions of observation were particularly good. About 1913, as a result of improvement in field artillery means of communication and of considerable study on the part of Field Artillery and Ordnance officers, a development was started which resulted in what is known as the American 75, Model of 1916. In view of our experience

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**EACH PILOT MODERNIZED CARRIAGE WAS GIVEN ROAD AND CROSS COUNTRY TESTS TOTTALLING OVER 5000 MILES**

in development over the past sixteen years, it is not surprising that this American 75 was still an incomplete development at the time we entered the war, and the requirements for mass production made it necessary to adopt the French and British 75's for our light artillery.

Without detracting at all from the splendid performance of our artillery with these weapons, which, as a type, were then more than twenty years old, field artillerymen saw the vital need for certain characteristics of the gun carriages which those they had did not possess. Primarily, they were flat trajectory weapons. It was difficult to select suitable positions without separating the guns some distance from the infantry. With carriages which permitted of only 18 or 19 degrees elevation on horizontal ground without burying the trail, and much less than that when located on a forward or counter-slope, it was difficult or impossible to search enemy reverse slopes. It also required considerable preparation of the position in order to make quick shifts of fire. Accompanying guns and accompanying batteries were sent out frequently with the hope of assisting the infantry more directly. On numerous occasions this accompanying artillery was of little value because the gun carriage was not adaptable to this mission.

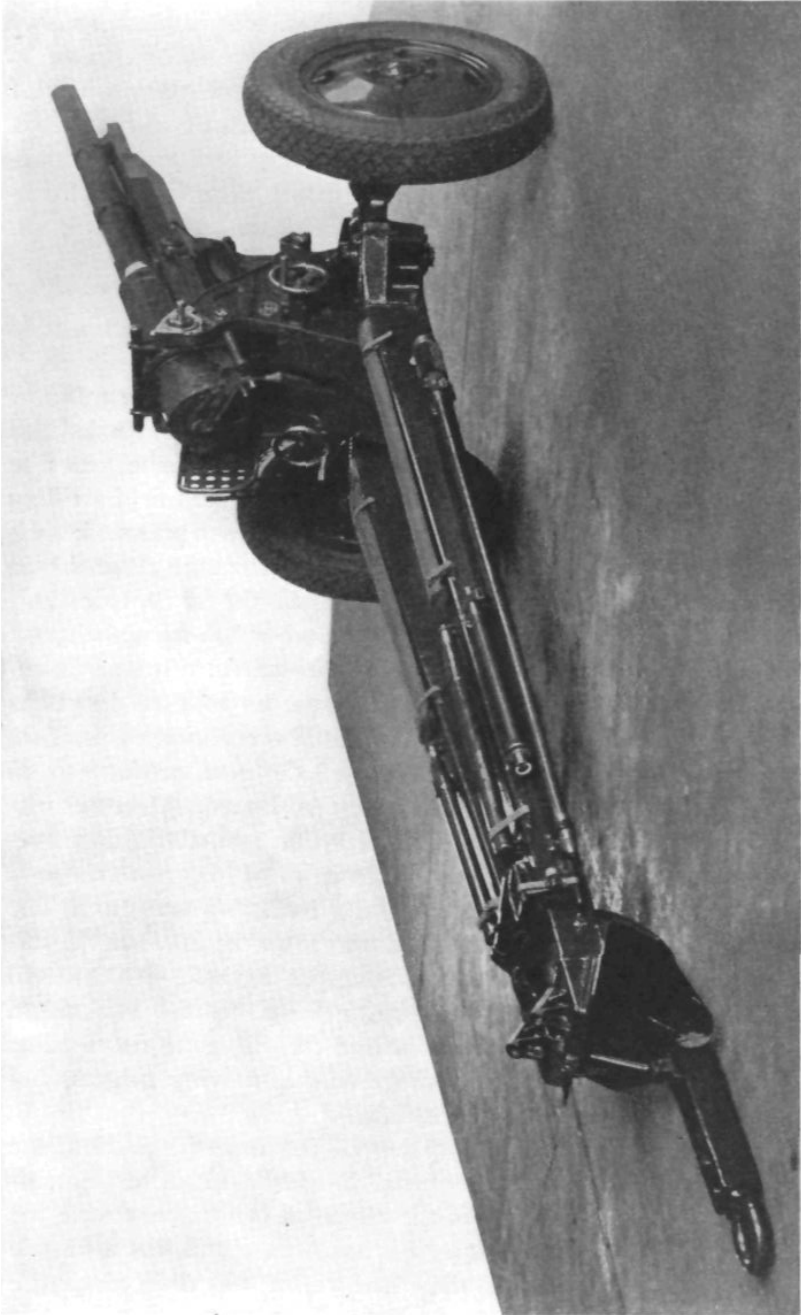
Shortly after the Armistice, a board was appointed to study the characteristics of existing weapons and to make recommendations

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as to what lines of development the ideal weapons, as they conceived them, should take. We are happy in being able to give Major General William J. Snow, our World War Chief of Field Artillery, credit for conception of the idea of such a board, and to the personnel of that board for having performed so magnificent a job that the Caliber Board Report has served, and continues to serve, as the basic guide in field artillery development.

Very determined efforts have been made to reach the ideal light gun proposed by the Board. No less than eight distinct types of new 75mm guns have been built by the Ordnance Department in the effort to produce a thoroughly modern gun, suitable in every way to meet the conditions of the war of tomorrow so far as they could be visualized. Although this Board recommended "all purpose" guns it has been determined that for some years to come, at least, anti-aircraft guns of this caliber and field artillery guns must have different characteristics. With our present knowledge of ballistics, 13,500 yards is the extreme range attainable in this caliber, using a supercharge, if from the same tube, uniformity is expected when using the reduced or sub-normal charge. The Caliber Board recommended 15,000 yards. Another compromise forced by our present knowledge as to gun design as affecting weight, width of tread, and rapid occupation of position, has resulted in limiting the traverse of the new carriage to 85 degrees instead of 360 recommended by the Board. After exhaustive experimentation and study, it is felt that no material improvement can be made upon the characteristics of the gun tube and chamber of the French, American and British 75mm guns. The new carriage, which has been standardized as the M2, has the following principal characteristics: 85 degrees traverse, —10 to +45 degrees of elevation, new on-carriage fire control equipment, which includes panoramic telescope and cross leveling features, as well as improved equipment for fire on fast-moving targets, and the ability to be towed at high speeds.

Since the new carriage provides 45 degrees of elevation, the value of our old system of reduced and normal charge ammunition is greatly increased. As the result of being able to use the elevations from 18 to 45 degrees, it has been found that a muzzle velocity considerably lower than that of our old reduced charge is not only adapted to the gun, but will be quite valuable. We



FOR FIRE AS A BOX-TRAIL GUN, THE LUNETTE DRAWBAR IS SWUNG FORWARD OUT OF THE WAY

## THE NEW 75mm GUN CARRIAGE M2

are still close enough to the World War to recognize the tremendous advantages from the standpoint of manufacture and maintenance, of being able to use in the new weapon the gun tube, breech block, and recoil mechanism, as well as the present stocks of ammunition of our present weapon. The old adage has a strong bearing here that "when it is not necessary to change, it is necessary not to change."

While not a part of this development it will be noted that the rollers and inclined planes are being replaced by recoil slides. Based upon extensive tests it is believed that this change, which is being made in all our M1897 guns, will not only improve the carriage, but its cost will soon be amortized through reduced costs of maintenance.

Applying the principle of the objective, the Chief of Field Artillery has consistently urged the importance of improving the combat characteristics of the light gun carriage, along the lines of the modernized carriage, and of avoiding alterations which did not have this end in view. The substitution of recoil slides for rollers is carried through into the M2 mount without change. Although recommended frequently by officers in the field, the substitution of panoramic telescopes for collimator sights on the M1897 has not been made because the sight mount, suitable for use on the old carriage, is not adapted to use on the new.

About three years ago, decision was made to motorize a large proportion of light field artillery, using high speed trucks as prime movers. To meet this situation, a means of adapting the old French and British carriages was developed whereby the wooden wheels of these carriages were replaced by pneumatic-tired automobile wheels. This modification of our carriages for high speed towing was never looked upon other than as a temporary expedient and was entirely apart from the broader development of a truly modern carriage with greatly improved combat characteristics.

As rapidly as appropriations permit, it is hoped to rearm the active batteries of the Regular Army and National Guard with these modern carriages. It will be noted in the pictures accompanying this article that gun shields are missing. This is the only main feature of this carriage that has not yet been decided upon in detail, and the shield development is well on its way to

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completion. Fourteen batteries of the new M2 carriages will be delivered to Regular Army units in the next few months.

Except for a difference in the length of the lunette shank or drawbar the carriages for horse-drawn and truck-drawn batteries are identical and in an emergency they can be used interchangeably.

The gun is normally to be fired with the trails spread and the prop lowered under the center of the carriage. This provides three-point support which gives stability to firing and makes it possible to occupy position on uneven ground. A means of levelling is provided on the carriage. The trails may be locked with either 45 or 90 degrees spread, and stops are provided to prevent excessive traverse when in the 45 degree position.

It may also be fired as a box-trail gun with trails together and resting on the tires. In this position, the elevation permitted is slightly over 20 degrees and the traverse 45 degrees.

Although the trails are somewhat longer than on the M1897 gun, this was found not to be a serious handicap in a road test, which in addition to about 1,000 miles at Aberdeen and at Fort Bragg, included a 4,500-mile trip of the test battery from Aberdeen to Bragg, Knox, Sill, San Antonio and return. It is doubtful that any new weapon has received a more extensive test before adoption.

The development of this carriage, broadly speaking, may be considered to have covered a period of over twenty years and represents without doubt one of the most notable developments of our Army. It has been proved by an exhaustive test to be rugged, simple, easy to operate, and adequate in every essential to solve problems unsolved in the last war, and to meet new conditions which have arisen since.

# NOTES ON THE OPERATION OF MOTOR CONVOYS FROM FORT BRAGG, TRANSFERRING MOTOR EQUIPMENT FOR THE 77TH FIELD ARTILLERY FROM THE EAST COAST TO TEXAS

BY 1ST LIEUTENANT CHURCH M. MATTHEWS, *Field Artillery*

*Prepared under the direction of Brigadier General Manus McCloskey*

**I**N THE BEGINNING. When the Commanding General, Fort Bragg, N. C., was first notified that he would furnish the convoy for the transfer of the motor equipment for the 77th Field Artillery, every effort was made to use an administrative unit for that purpose. Battery D, 17th Field Artillery was chosen for the nucleus, but it was found later that two convoys would have to operate simultaneously and independently, so the 36th Field Artillery was called upon to furnish the personnel for one of the convoys. The usual peace time service conditions prevailed, which found organizations short of officers, enlisted men on furlough, the C.M.T.C. in full swing, and Reserve officers reporting to the post for training. Therefore, it was impossible to form the ideal convoy as laid down by the Quartermaster Motor Transport School. There were not enough officers to form a complete staff, so the duties had to be combined. Officers and men, of necessity being detailed from various organizations, were in many cases strangers to each other. This meant that the officers did not have a full knowledge of the state of training of all the men under them. But these conditions in peace time are the rule, rather than the exception, so the lessons learned should be all the more valuable.

ADMINISTRATIVE DETAILS. Naturally, there was a mass of administrative details to be arranged before the convoys could get under way. Convoy detachment mess funds had to be established, supplies purchased for the mess, and ration money drawn from the Finance Officer. Itineraries had to be prepared; letters written to chiefs of police requesting escorts, and local distributors holding the Treasury contract for gasoline notified in advance. Conferences were held at Post Headquarters



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## NOTES ON THE OPERATION OF MOTOR CONVOYS

between the post staff and the officers of the convoy to cover thoroughly every conceivable situation that might arise.

CONVOY NO. 1. Upon its departure from Fort Bragg, en route to Fort Hoyle, Maryland, Convoy No. 1 consisted of 8 Dodge trucks, 4 × 2, 1 Chevrolet pickup truck, and 2 Reconnaissance trucks (Chevrolet station wagons). The personnel, assigned from the 17th Field Artillery, consisted of 2 officers and 69 enlisted men (includes extra drivers for trucks to be picked up at Fort Hoyle). Major J. H. Ball, a member of the Field Artillery Board, was also attached to this convoy to observe the road test of the experimental guns referred to below. It left Fort Bragg on August 30th, 1935, and proceeded to Fort Hoyle via Richmond, Virginia. At Fort Hoyle they were met by a convoy from Madison Barracks, New York, which had brought 18 Class "B" Liberty trucks, modified, and 5 Reconnaissance trucks (Chevrolet station wagons). Convoy No. 1 picked up ten of these Liberties, eleven similar ones from the 6th Field Artillery, and four of the experimental T-7 Guns, 75mm which were to accompany the convoy thereafter on an extended road test. This convoy returned to Fort Bragg, arriving on September 5th.

CONVOY NO. 2. This convoy was detailed from the 36th Field Artillery. When it left Fort Bragg, on August 30th, for Fort Hoyle, it consisted of 3 officers (including one medical officer) and 45 enlisted men (including extra drivers for trucks to be picked up at Fort Hoyle). The vehicles were 2 Reconnaissance trucks (Chevrolet station wagons), 1 Chevrolet pickup truck, 1 Chevrolet truck, 4 × 2, 4 Dodge trucks, 4 × 4, and 1 Ford Sedan. Convoy No. 2 proceeded to Fort Hoyle via Richmond, Virginia. At Fort Hoyle it picked up eight of the Liberties from Madison Barracks, the five Reconnaissance trucks from there, a 4 × 4 Marmon Herrington truck from Holabird, and thirteen tons of historical relics, intended for the Field Artillery School Museum at Fort Sill, from Aberdeen. It departed from Fort Hoyle on September 10th, traveling by way of Parkersburg, West Virginia, and Cincinnati, Ohio. Despite almost continuous rain, cool weather, and the hazards of the West Virginia mountains, this leg of the journey was accomplished without a mishap. While waiting at Fort Knox for the arrival of Convoy No. 3, the following vehicles were picked up: 5 Reconnaissance trucks; 1

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truck, pickup; 8 trucks, 4 × 4 (Marmon Herrington) and 2 trailers, A.A.M.G.

At Fort Knox, Major Alston P. Rhett, 36th Field Artillery, who had commanded Convoy No. 2 up to this point, turned over his convoy to the Commander of Convoy No. 4, and returned to Fort Bragg to take temporary command of the 36th Field Artillery.

CONVOY NO. 3. When Convoy No. 1 returned from Fort Hoyle to Fort Bragg, it picked up 5 Reconnaissance trucks, 1 pickup truck, and 2 trucks, 4 × 4. It also loaded 17 medium tractors in the Class "B" trucks. The personnel was increased by 4 officers (including one medical officer who returned to Fort Bragg when the convoy reached Fort Knox) and 63 enlisted men. It departed from Fort Bragg on September 10th and arrived at Fort Knox on September 16th. Its route was via Asheville, North Carolina, and Cumberland Gap, Tennessee. The mountain roads, combined with the big trucks and heavy tractor loads were a severe test for the drivers, and it was a relief to all concerned when the mountains were successfully negotiated. At Fort Knox, Convoys Nos. 2 and 3 merged to become Convoy No. 4.

CONVOY NO. 4. When this convoy left Fort Knox, Kentucky, it had the following personnel; convoyed vehicles, loads and materiel:

*a. Officers:*

Capt. Russell L. Mabie, 17th F. A., convoy commander.

Capt. Alfred B. Devereaux, 36th F. A., motor officer, and mess officer of the 36th F. A. Detachment.

1st Lt. Robert C. White, 17th F. A., advance agent, and mess officer of the 17th F. A. Detachment.

1st Lt. Church M. Matthews, 17th F. A.,

2d Lt. Theodore G. Bilbo, Jr., 83d F. A.,

2d Lt. Daniel H. Heyne, 4th F. A., section leaders and staff work.

1st Lt. William H. L. Westbrook, M. C., attached.

Major John H. Ball of the Field Artillery Board was attached for observation of the road test on the four T-7 Guns, 75mm, and the use of experimental transeiver sets, SCR 194-T3, with the convoy.

## NOTES ON THE OPERATION OF MOTOR CONVOYS

*b. Enlisted men:*

120 from the 17th F. A. (mainly from Battery "D," plus additional drivers).

44 from the 36th F. A.

2 from the Medical Corps, attached.

2 from the 1st Observation Battalion, attached.

*c. Vehicles:*

29 Class "B" Liberty trucks, modified.

20 Reconnaissance trucks (Chevrolet station wagons).

16 Dodge trucks, 4 × 2.

11 Marmon Herrington trucks, 4 × 4.

4 Dodge trucks, 4 × 4.

4 Chevrolet pickups.

1 Chevrolet truck, 4 × 2.

1 Ford sedan.

*d. Loads:*

4 T-7 guns, 75mm, towed.

17 Caterpillar Thirty tractors.

2 A.A.M.G. trailers.

13 tons of relics for the F.A.S. Museum.

ORGANIZATION. The convoy was divided into three groups: the fast, the medium, and the slow, with approximately equal number of vehicles in each group. Breakfast was at five in the morning. After breakfast the drivers and other personnel were assembled and given their route for the day. All of the officers had this information for several days in advance. Throughout the entire trip, the individual responsibility of each driver was stressed. The first section of the convoy departed at six daily, followed immediately by the second and third sections. Usually, the medium section arrived in camp an hour after the fast section, and the slow section an hour later. The last vehicle of the convoy was in camp by two in the afternoon, normally.

The advance agent, with a detail of 4 men to mark the next campsite, left immediately after breakfast and proceeded at an increased speed in a reconnaissance truck to locate the evening bivouac, contact the gasoline distributor, and arrange for food, fuel, and water.

The medical officer rode at the tail of the convoy, where he was available should an accident occur during the march.

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Since the weather was expected to be fair and warm for most of the trip, and cargo had to be kept to a minimum because most of the vehicles were already carrying loads, heavy tentage was not carried for the enlisted men. Cots were taken, and as a rule the men slept out of doors, except for stop overs at the various posts. When rainy weather was encountered, bivouacs with shelter for the men were obtained.

ROUTE. Convoy No. 4 departed from Fort Knox September 19th, en route to Fort Sill, Oklahoma, via Nashville-Memphis-Fort Smith-Oklahoma City. It arrived there September 26th, turned over the Marmon Herringtons to the 1st Field Artillery, and the historical relics to the Museum. In their place, six 6 × 2 Ford trucks and nine tractors were picked up.

The convoy left Fort Sill on October 2d and, traveling by way of Fort Worth and Austin, arrived at San Antonio, Texas, on October 5th. The motor equipment assigned to the 77th Field Artillery was turned over at the Normoyle Q. M. Depot, and the convoy headed homeward on October 9th. Its route was Houston-Shreveport-Jackson-Macon-Columbia-Fort Bragg.

The convoy arrived at Fort Bragg at 2:30 P. M., October 16th, and was met by the Commanding General, Brigadier General Manus McCloskey, his staff, Col. E. R. W. McCabe, 17th F. A., and the 17th Field Artillery Band. General McCloskey commended the convoy personnel upon having successfully completed one of the longest convoys on record without the loss of a man or a vehicle, and Convoy No. 4 came to an official end.

DAILY MARCH DISTANCES. Until the convoy reached San Antonio, the average daily march was about 125 miles. The reasons for this were: the slow section of heavily loaded Class "B" vehicles; an ample allowance for time to make repairs in the bivouac area; and time for gassing all of the vehicles. This length of march necessitated only one daily refuelling.

After the convoy left San Antonio it was composed of 30 modern light trucks and station wagons of comparatively the same speed characteristics, and the marches could be made longer. Assistant drivers were available, so that the physical endurance of the driver was not the determining factor. The time to refuel was not so long, and with a refueling at the noon halt, and another in the bivouac in the evening, the trucks had a cruising

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range of 300 miles. However, it was desirable to get into camp by four in the afternoon, due to the messing facilities and motor repairs, so the daily march was limited to about 225 miles.

MESSING. Two field ranges were carried to feed 181 officers and enlisted men. Hot breakfasts and hot suppers were served throughout the convoy. When the daily march was short, a hot lunch was served after the bivouac was reached. On longer marches, lunches were prepared in advance.

The amount of food that should be fed a driver at the noon halt is variable. On excellent, level roads in warm weather there was a distinct tendency on the part of drivers to doze, caused by the steady speed and a monotonous road. A large, hot meal at noon might increase this lassitude. However, hot coffee should be served, unless the weather is too warm.

Milk cans have not yet been issued at Fort Bragg for carrying water, so a water tank of about 150 gallons was installed in a truck. This gave excellent service, and it was found that one of the quickest ways to fill it was to utilize the nearest fire station. Incidentally, some empty fire extinguishers were refilled at a fire station without cost.

DISTANCE BETWEEN VEHICLES. To insure that civilians could double the column with the least delay, the *minimum* distance between vehicles was set at 100 yards. That may seem unnecessarily great to one accustomed to thinking of motorized columns charging down the road escorted by the motorcycle police of New York City. However, this trip was not a ten block sprint, but six weeks of daily marching. The 100-yard distance between vehicles seemed to give the minimum strain while still allowing control of the column.

RATES OF MARCH. Until our present highway systems are made more nearly fool-proof and death traps are eliminated, 35 miles an hour seems to be the maximum speed at present for safe, continuous travel for small units. Faster speeds are possible in emergencies, of course.

The difficulty for civilian traffic to double a column increases very greatly with an increase in the speed of the column, since the time for passing each vehicle increases, and the favorable opportunities to pass decrease.

This increased speed of motorized units threatens another old

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army custom. Suppose that you are the regimental commander and you sat beside the road to be sure all vehicles were rolling when the regiment pulled out of camp. When the last vehicle of your 320 has gone by, your column, with only 50 yards between vehicles, and greater distances between units, is stretched out to cover 16 miles of road space. At what time will you reach the head of the column?

REFUELING. Oil was carried on the convoy in drums, but the gassing of eighty-six vehicles, requiring sometimes as much as 2,000 gallons, presented a daily problem. The convoy had only two methods of refueling to choose from:

- (a) Commercial filling stations.
- (b) Commercial tank trucks.

In either case, the holder of the Treasury contract for each locality where gassing was planned had to be notified far enough in advance so that he could be prepared. If he owns enough filling stations and the convoy is small, the first system is better. However, all distributors do not own stations, or some times the stations may be so located that traffic will be blocked. If the pumps are few, and the convoy is large, this is the slower system.

The second method (commercial tank trucks), was used more frequently. A tank truck would be spotted in the bivouac area, or along the road at the noon halt. Ten milk cans and funnels had been carried on the convoy for this purpose. Each driver was responsible for filling his own tank and reporting the amount of gasoline used to the officer in charge. These figures were totaled to use as a check against the distributor's figures. By this method, 965 gallons were put into the trucks in 43 minutes, whereas, using one electric pump, it had taken two hours and ten minutes to put in a like amount.

The drawback to the second method is the problem of dirt eventually clogging the fuel system. Using containers and funnels which were exposed to road dust, lint from fatigue clothes, and other sources, it was only a question of time. The last leg of our journey found carburetor troubles increasing due to this cause.

The requirements of a truck-drawn light regiment on a tactical march will be enormous, and the difficulty of refuelling it will be added to by its roadspace. The answer may be in the use of five

## NOTES ON THE OPERATION OF MOTOR CONVOYS

or ten-gallon cheap containers, which may be thrown away once used. They could be fitted with a screw type cap to use with a flexible hose, or maybe a gadget like commercial companies use for pouring oil from sealed cans.

Every truck should carry a small supply of gasoline for emergencies, such as unforeseen detours or heavy going, and certainly every known truck with excessive oil consumption should have some spare oil.

**POLICE ESCORTS.** The Police Departments were most courteous and cooperated in every way possible with the convoy. Usually, towns of less than 25,000 population were not asked for escorts. Instead, men from our column were dropped off in advance at important corners or obscure turns to mark the route. The larger cities were notified in advance, the day and the approximate hour, each section of the convoy would arrive at the outskirts of town. The advance agent called the police and notified them as he passed through if there was any change in time or plans.

Escorts may be obtained in emergencies in a reasonable length of time. Once, after dark, and several hours behind schedule because of detours, an escort was obtained by halting the column on the outskirts of town, driving toward the business district, and picking up the first motorcycle policeman in sight. Time: fifteen minutes. Another time, all the motorcycle police of Oklahoma City were recalled from the State Fair upon an hour's notice to escort the convoy through the city. This emergency was caused by a steady downpour of rain all day, and the lack of shelter for our men at the scheduled bivouac. The Chief of Police went even further, and secured the city's Coliseum for the men to sleep in that night.

Naturally, a convoy can expect to be routed through the least traffic, which often means rough and bumpy streets. In our case, the Class "B" trucks were overloaded and there were no spare springs available. A very rough street, coupled with the necessity for each driver to keep closed up, might have been disastrous. This was explained to the escorts, and they rerouted the heavy section in all cases where it was necessary. The speed to be maintained, and the manner of blocking intersections, should also be discussed with the escorts to be sure that you both have the same



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ideas. If the leading vehicle can maintain a constant speed, and the column is well closed up no trouble should be had in crossing a city of any size.

When camping in the vicinity of a large town for the night, it is self-evident, that, unless there is a much more desirable camp site on the other side of town, it is better to camp just short of the town, and then cross in the early morning hours when traffic is light.

**PUBLICITY.** If the purpose of this trip had been publicity, instead of transferring motor equipment, all expectations could have probably been exceeded. Since the convoy usually arrived unannounced and unheralded, and bivouacked on the outskirts of large towns or in small villages, newspaper reporters contacted it only twice. People all along the route took the greatest interest, and there were curious spectators at all campsites, no matter how out of the way. Sunday camps were especially visited, and the guns, quite naturally, drew most of the interest.

Suppose that a war strength motorized battery made a coast-to-coast race against time for the purpose of determining maximum road speeds in emergencies, physical endurance of the averaged enlisted driver, messing on long marches at high speeds, and other useful data. There certainly would be no harm in publicizing such a test, and there might be some good results. To date the general public has had very little opportunity to see any romance connected with truck-drawn artillery.

**RATINGS.** The driver has more responsibility and need for reliability than is commensurate with his present grade. Large bus companies recognize this fact and offer bonuses to secure careful and excellent drivers. The Army should obtain the same result as the bus companies by giving a specialist's rating to the driver.

**ADVANCE AGENT.** It has been previously mentioned that staff jobs had to be combined for lack of officers. The advance agent for the convoy was also a mess officer, which meant that he could precede the convoy only by the lead he obtained from travelling at a greater speed. This lead was only a few hours at best, and he was always working against time to secure a suitable campsite, arrange for refueling, and see about food, water, and fuel, before the head of the column was treading on his heels.

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These could all be obtained more leisurely by an advance agent twenty-four hours ahead of the column. Small towns, while having an abundance of open fields, may lack such commodities as bread or meat in large quantities, and the large towns, just the opposite. This advance agent could keep in touch with the convoy commander by telegraph, relaying road information and location of camp sites, while receiving orders for rations. The advance agent found that most civilians could not grasp the magnitude of the camp site necessary for a column of 86 vehicles. He finally translated it into terms they could understand. He needed a baseball park.

MAINTENANCE. This could well have been entitled by the more inspiring words, "Keep Them Rolling." Too much cannot be said about the work of the motor officer and his crew of enlisted mechanics. Often the mechanics were up after midnight making repairs, using gasoline lanterns for illumination, and sometimes working in the rain. Nevertheless, every morning found all vehicles ready to move out under their own power. Spare parts were few, the issued tools were for 2d Echelon work, yet the mechanics had to consistently perform 3d, and often 4th Echelon, repairs. Some examples of the most anxious moments of the convoy follow:

Twenty-five miles from our camp at Jackson, Tennessee, a civilian truck sideswiped a Liberty loaded with a tractor. The Liberty swerved off the road, over a fifteen-foot embankment, turned turtle in the air, and caught on fire after it landed. Miraculously, the height of the tractor saved the driver and his assistant from being crushed, and they escaped without injury. The fire was extinguished, the truck and tractor were pulled back individually onto the road by a pair of Liberties, and the tractor was reloaded on another truck. The damaged truck was towed into camp that night, repaired, and was ready to roll the next morning.

A Liberty rear end went out in Arkansas. It was the modified type, and not only were there no spares on the convoy, but it was also doubtful if there were any short of the factory. The motor officer and two mechanics drove 106 miles to Camp Pike, Arkansas, removed a rear end from a salvaged war-time Liberty, returned,

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and installed it. It had a different gear reduction from the rest of the modified trucks, but it worked.

At Fort Sill, Oklahoma, the convoy acquired nine more tractors to haul. Eight of these tractors, with the military modifications, weighed seven tons each. The maximum allowable load for the Class "B" trucks was only three and one-half tons, so it was thought best at the time to tow these tractors loaded on 3-inch Gun Trailers which were obtained at Fort Sill. Although the speed for these trailed loads was held down to 12 miles an hour, the old, hard rubber tires on the trailers could not stand the weight and the speed. The tires became so hot that they literally began exploding and blowing off great hunks of rubber. On the first day's march from Fort Sill, these trailers actually limped into camp, having run out of spare wheels. Fort Sill was called that night and the Ordnance Officer agreed to come after the trailers, which were then at Jacksboro, Texas. The tractors were then unloaded in the dark from the trailers, and reloaded on Class "B" trucks, using an abandoned R. R. platform and such scraps of timber as could be found. The springs on the trucks were bent in the wrong direction by these loads and only the optimists of the convoy expected them to reach San Antonio, but somehow they stood the strain.

These were some of the outstanding calamities which threatened the convoy, and the lesser troubles have been omitted. However, it was rare when the mechanics did not find their time in camp fully occupied with minor repairs and adjustments. Also, due credit must be given to the assistance given by the Quartermaster repair shops at the various posts visited. At Fort Knox they even robbed their own shop trucks of spare parts in order to help the convoy.

One point was very clearly demonstrated on this trip: if line troops must perform 3d Echelon work on peace time marches and convoys, then proper tools, sufficient spare parts, and trained mechanics must be provided for line outfits.

### RECAPITULATION.

Total distance travelled (map mileage) .....	4,347
Total elapsed time .....	48 days
Number of days on the road .....	32

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Character of roads travelled (mileage):

Brick .....	6
Concrete .....	2,411
Asphalt .....	1,647
Dirt .....	169
Gravel .....	100
Oil surfaced .....	14

Mileage, a gallon (figured from map distance):

Reconnaissance trucks and pickups .....	15.5
Dodge and Ford trucks .....	10.0
Class "B" Liberty trucks .....	3.9
Marmon Herrington trucks .....	10.0
Ford sedan .....	16.0

COST.	<i>Allotted</i>	<i>Spent</i>	<i>Saved</i>
Gas and oil .....	\$4,000.42	\$3,470.46	\$529.96
Tolls and ferries .....	300.00	130.51	169.49
Repairs, motor .....	450.00	107.66	342.34
Water and camp sites .....	350.00	45.00	305.00
Fuel, light and power .....	175.00	00.00	175.00
Telephone .....	20.00	2.30	17.70
Telegraph .....	10.00	.62	9.38
	<hr/>	<hr/>	<hr/>
TOTAL .....	\$5,305.42	\$3,756.55	\$1,548.87
Serious injuries to personnel .....			None

# ROMANCE OF TECHNIQUE

BY CAPTAIN VORIS H. CONNOR, Field Artillery

When the swarthy son of Barca viewed the misty land between  
The olive covered ridges and the wave of Trasimene,  
To his ear arose the clashing of the weapons and the mail  
And the foottramp of the marching Roman legions in the vale,  
And his smile was dark with triumph and his Punic eye alight  
As he threw the host of Carthage from the ambush to the fight,  
As the hillsides swarmed with warriors, shone with helmet, axe  
and spear

And the war-cry of Numidia thundered on the Roman rear.

But he knew not half the triumph that would fire a leader's  
heart

Who had centered his protractor on a gridded firing chart,  
Who had marked his check LHs, reconciled C, S and D  
And had paragraphed his order, 1 to 5 and (a) to (z).

On his snowy Arab charger by the breach into Stambul  
Rode the arrogant descendant of the line of Ertoghrul,  
Free the horse-tails flew above him as he viewed with Turkish  
pride.

Pouring thru the Greek defenses his resistless Moslem tide;  
Turks from Anatolia's highlands, armed with bow and light  
jereed,

Beduins robed in flowing caftans mounted on the Nejee breed,  
Persians from the Gulf of Oman, Tartars from the Caspian coast  
And invincible and foremost, Islam's janizary host.

But the proud smile of Mahomet could not match the triumph  
glance

Of a leader whose inductance equaled his capacitance,  
As impedance reached resistance and the output madly soared  
And his alidade swung lightly round an oriented board.

## ROMANCE OF TECHNIQUE

From the snowy plains of Finland swept the icy tempests forth  
When against the lines at Narva rode the Madman of the North,  
Followed by his Swedish riders, casqued dragoon and plumed  
hussar,

To relieve his fainting city from the levies of the Czar.

High the heartbeat of the Monarch as he loosed his Northern  
horse,

As the Muscovites were shattered by the whirlwind of the Norse,  
As the troops of all the Russias fled in panic thru the snows  
And a mighty shout of welcome from the throat of Narva rose.

Not so high that monarch's heartbeat as he swept that Baltic  
plain

As the heartbeat of a mortal who had loosed the daily train,  
Had his road space calculated with the elongation known,  
And had tested the magneto and the shunt switch of his phone.

Do they say the days of glory forevermore are gone,  
That the Art has lost the romance that it had in History's dawn?  
It is false. What joy of triumph could a Shah of Ghaznee show,  
What pleasure of achievement could a Roman Caesar know,  
That were equal to the pleasure that would thrill a modern's mind  
Who had seen his base line plotted and an aiming point behind?  
Seen the independent site line and the blinkers burst to view  
And had heard the cipher humming o'er the clear C double U!

Hoist the storm flag of the Empire, Glory beckons us and Fame,  
There are still new worlds to conquer, graphic schedules still to  
frame!

There are Zamas still in waiting for a calculated K,  
There are Wagrams still to enter in the Journal of the Day!

# WARFARE IN THE EIGHTEENTH CENTURY

BY LIEUTENANT COLONEL J. M. SCAMMELL. *Infantry, N.G.U.S.*

## THE ARTILLERY

THE cannon made kings. The cannon unmade them. It was siege guns that by pummelling the castles of the nobles, gave kings their power. Field artillery transferred that power to the people. The first use of cannon in set battles was to frighten horses. As field pieces were multiplied in number they were used to frighten soldiers too. Finally the big guns wived the little guns, heavy ordnance was united in wedlock with light artillery, the artillery and the infantry met together and begat a new system of tactics. Field guns could do damage to soldiers and their shelters. In this development lay the seeds of Napoleonic warfare.

When Napoleon Bonaparte said that "The cannon has made a complete revolution," he referred to the artillery reforms of Gribeauval<sup>1</sup> and the new tactical doctrines derived from them by Guibert<sup>2</sup> and du Teil.<sup>3</sup> Said the latter: "The system of war has changed and consists in having armies well constituted, mobile, and able to maneuver."

According to Colin, "In the military instruction of the du Teil brothers one can always recognize the directing idea, the great principles of war, which dominated the strategy and tactics of Napoleon."

Prior to the reforms of Gribeauval, the role of artillery in field armies had been growing steadily in importance. The number of guns taken into the field had progressively increased. At the Battle of Rocroi (1643) the French had 12 guns to 23,000 men, and the Spanish had 18 to 27,000 men. Toward the end of the 18th Century the Prussians had 300 to 400, and the Russians as many as 600 guns in an army. In France, by the Ordinance of February 5, 1720, the artillery was organized into one corps, the Royal Regiment of Artillery, of five eight-company battalions.

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<sup>1</sup>Inspector General in the French Army at the end of the Seven Years' War.

<sup>2</sup>At 29, when with the rank of colonel he commanded a Corsican Legion, he published his *Essai general de tactique*.

<sup>3</sup>Du Teil the Younger. A division commander in 1793, he later commanded the artillery of the Armies of the Alps and of Italy, whence he was summoned to Toulon and given charge of the siege artillery as the superior of Napoleon Bonaparte.

## WARFARE IN THE EIGHTEENTH CENTURY

Companies numbered 100 men. A sixth battalion was added in 1756. In 1792 there were seven two-battalion regiments.

The number of guns and their weight hampered the movement of armies. Said General Lloyd:

"Ordinarily the artillery brigades precede the columns to facilitate their development, and to prevent the enemy from interfering with the formation of the line of battle. . . The only result is noise; but the real difficulty is that this ponderous column of guns with all their trains advances slowly, forever halting and slowing up the march of the troops by a thousand accidents, in such a way that rarely, almost never, do the troops arrive together on the ground where they should deploy."

In addition, there was the dilemma that ordnance powerful enough to effect material destruction was too unwieldy for satisfactory field use: whereas lighter guns which were able to maneuver with armies, lacked the power to destroy shelters. Soldiers everywhere squirmed to find a solution to this problem. The Austrians sacrificed power and range to multiply the number of lighter and more mobile field pieces. Frederick the Great gave two 6-pounders and one 7-pounder to each line battalion; in addition each brigade had a battery of ten 12-pounders attached; and with the army went forty 10-pounder howitzers. In France, in 1702. M. de Vallière proposed artillery of five calibers: 4-, 8-, 12-, 16-, and 24-pounders. The long guns were designed to be the armament of fortified places. The short 4-pounder *a la Suèdoise*, introduced about 1740 and firing from eight to ten shots a minute, was given to battalions in 1757.

At the La Fère Artillery School a professor of mathematics named Béliidor began to experiment with powder charges. He discovered that the charges commonly used were too heavy, and that by reducing the charge he could actually increase the range of the projectile. After twenty years of scientific work he was expelled for his pains; any fool knew that the more powder in a charge the greater the range! But by 1765 a field artilleryman named Gribeauval had completed a series of experiments to determine the exact charge of powder that would give the maximum range for each caliber of gun. Having established the proper relation between the propelling charge and the weight of the projectile, it became possible to design guns with the thickness



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of the walls of the tube in proportion to the strain produced by the explosion. With the thickness of the walls reduced, the tube and therefore the gun carriage could be lightened. Gribeauval also shortened the gun, improved the bore in such a way as to reduce the amount of gas escaping between the projectile and the tube, arranged the gun teams in pairs instead of in tandem, and reduced the number of calibers to three: 4-, 12-, and 18-pounders. Gribeauval not only lightened the field artillery so as to make it mobile, but he simplified it.

This was the beginning of a revolution. Now big guns could accompany an army where formerly nothing larger than an 8-pounder could go. And even the little 4-pounders, with a rate of fire three or four times that of the old, unwieldy guns, could smother and silence batteries up to and including 24-pounders! The old artillery, horse in tandem, maneuvering by batteries, offered a large, slow-moving target. The "New Artillery" with lighter guns, with short gun teams, coming into action at a gallop, with intervals between guns, offered a small and a fleeting target.

The new artillery could close in to 1,200 yards, out of range of the enemy's guns, mount most of its cannoneers and, using covered routes, gallop to within 800 yards of the enemy.

"Battery, HALT!"

The short teams swung half-right. The guns, brought into battery immediately, opened a brisk fire.

The speed with which these batteries could approach and go into action, the range of the guns (medium range, 1400-1600 yards), the surprise effect of a hurricane of accurate fire, gave them complete ascendancy over the guns of the enemy. Now ordnance of large calibers, formerly of use only in siege operations, could maneuver with other arms on the battlefield, could be used in close cooperation with them, and throw a weight of metal capable of demolishing the shelters of the enemy troops. The new artillery could destroy any material protection likely to be found on the average battlefield.

The Gribeauval guns, tested in 1765, were furnished to the French Army in 1774, and remained in use until 1825. Artillerymen were quick to recognize the influence upon the art of war; henceforth it would be possible to wage an active, aggressive, and a vigorous campaign. Lighter guns of long range, able to

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displace promptly, brought delaying actions and rear guard action within the scope of the tactician. The recognition of this power of a small force to contain and delay a larger for a considerable time, made armies flexible. A force could advance on a wide front, threaten everywhere, and yet concentrate for battle. The divisional system was in sight.

Garrison artillerymen brought to open warfare the principles developed by Vauban for the attack on fortified places. Gunners began to study infantry tactics. Everywhere there was a cross-fertilization of ideas. But the artillery officers were the first to develop the new system of combined tactics, and it was they who best understood it, because they alone were familiar with the characteristics of the new artillery and with its possibilities. The school of Gribeauval was appreciated by Guibert, but it was the chevalier du Teil who was its great spokesman. He was the first to set forth the basic principles of what we now know as "Napoleonic warfare."

Vauban in his siegecraft had taught artillerymen how to make a breach in fortress walls by concentrating the fire of their guns against a vital point. Officers from the siege artillery brought this concept with them to the field artillery. It is not *men* that good soldiers try to destroy in battle, but *armies*. When Guibert asked artillery officers how their arm should be used, they answered that their object was not to destroy lives all along the line; it was to overthrow a decisive portion of the enemy's front; and that this could be done by concentrating the fires of powerful batteries against this part of the line so as to create a breach and prepare the way for the assault of the infantry. By so doing one could achieve decisive results.

Du Teil was the first to advocate the doctrine that the guns should blast the way for the infantry:<sup>4</sup>

"One ought to concentrate the greatest amount of fire against the principal points. . . One ought to concentrate the greatest number of troops and a greater mass of artillery upon the points where the enemy is to be overthrown, while demonstrating against other points. . . It is by this science of movement, in the

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<sup>4</sup>But Frederick the Great foreshadowed it: "Die Artillerie-Officers . . . suchen sollen ihr Feuer wohl anzubringen, damit es von der Seite den Ort der Attaqua concentrirte." ("Artillery officers must seek to direct their fire in such a way that it will be concentrated from a flank against the point chosen for the attack.") *Militär Schriften*, 306.

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rapid and intelligent choice of positions, that the artillery will preserve its advantages over the enemy. It will continually concentrate its fire on the decisive points and will always keep up with the infantry."

The artillery, mated with the infantry and become its yokefellow in battle, began to study the tactics of that arm in order the better to support it. Before 1765 the artillery schools had been immersed in technical gunnery studies. After Gribeauval's reforms the artillery schools held two classes a week in the combined use of artillery and infantry in battle. After 1785 artillery and infantry battalions executed exactly the same drills; and officers of each arm were taught the tactics of the other, because "Artillery and other arms must mutually protect one another." Infantry officers, on the other hand, were required to become familiar with the effective ranges of the various calibers of guns, to know where they should go into position, and what results might be expected from their fire.

The boon of mobility had been conferred upon the guns; the cannoneers resolved to exploit this advantage to the full. They declined to be bound by precedents or to be held back by the dead hand of the past. Boldly they cut themselves loose from the shackles of tradition. While they adapted the principles of siege warfare to the uses of battle, they declined to adopt its practices. The power of cannon had been increased, not only as regards range and rapidity of fire, but by the mobility that made one gun the equal of many. The gunners declined to sacrifice this asset for the illusory advantage of entrenchments: "Every defensive founded solely upon entrenched positions is absolutely contrary to the true and solid principles of the art of war," was the teaching of du Teil.

With the guns able to keep up with and yet not impede the deployment of a field army, it became possible to dream of a war of ceaseless activity, and to a continual and relentless offensive. With artillery able to maneuver with the other arms, even on the battlefield, it became possible to achieve swift marches. Speed fostered secrecy, and secrecy surprise. Armies could be articulated, be made supple and flexible. They could be subdivided, each division having both mobility and the power to delay larger forces for a considerable time. Also, after victory,

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a resolute and relentless pursuit could be instituted—guns well to the front, barking at the heels of the quarry to bring it to bay again. Uninterrupted activity, unceasing, economized, and concentrated energy—these were the ideals sought, and the new musket and the new artillery had made it possible to realize them.

Such were the ideas incorporated in the *Artillery Field Service Regulations* issued April 1, 1792. After that year the artillery ceased to be a part of the infantry organizations and became a separate arm. This step led in turn to a new development: the creation of horse artillery. The idea was not new. Both Charles XII of Sweden, and Frederick II of Prussia, had sought to gain greater mobility for the guns by mounting all the cannoneers. The Gribeauval guns made this practicable. On April 17, 1792, seven companies of horse artillery were authorized, one to be attached to each regiment of field artillery, but available to be detached at need. Each company was composed of 76 men and of two captains and two lieutenants. This horse artillery was equipped with 4-pounder guns and 24-pounder howitzers. The first two companies were organized by Mathieu Dumas<sup>5</sup> at Metz, and one company was attached to the army of Lafayette and the other to that of Lückner. By December, 1793, there were nine 9-company regiments of horse artillery; so popular did this new arm become that the generals would have no other if they could help it.

Such were the developments during the time when "Napolleone Buonaparte" was learning the craft of making war. Napoleon read Feuquières, Guibert, and probably Lloyd, as these were the military works first placed in the hands of young officers. The young Bonaparte was the favorite disciple of the Baron du Teil, the elder brother of the chevalier. In 1788 he was the junior member and recorder of a board convened by the Baron du Teil, Commandant of the Artillery School at Auxonne, to study the fire of bombs from siege guns of 8-, 12-, and 16-pounders and from mortars of 8-, 10-, and 12-pounder calibers. Again, according to the Baron du Teil's daughter, Napoleon, in 1791, stayed four days with du Teil studying maps spread on large tables and talking shop.

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<sup>5</sup>A veteran of the American War for Independence, and a graduate of the revived general staff college.

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During the siege of Toulon Bonaparte asked the Committee of Public Safety to send an artillery general to lend the prestige of his rank and experience to the task of reducing the enemy forts. The chevalier du Teil, although in poor health at the time, was sent. He approved the dispositions made by his subordinate, but does not appear to have taken an active part in the siege. From these long and intimate associations it appears that Napoleon Bonaparte could not but have absorbed and digested the teachings of the du Teil brothers, which doctrines he later put into effect with such startling success.

The revolution begun by Gribeauval's discoveries and changes was not only a revolution in matériel; it was, above all, an intellectual revolution. It is not enough to possess new devices; the officers of the old Royal Army in France did not rest until they had exhausted the maximum of benefit to be derived from them. They were quick to throw overboard as illusory, attempts to smother the entire enemy front with artillery fire; and they sought and found surprise by placing a hurricane of accurate fire on the decisive point in space and time. They understood that mobility begets mobility as immobility begets immobility. When they took the guns away from the infantry battalions in order to concentrate their fire, they took away from the artillery the need for great supplies of ammunition, and long, cumbersome trains to furnish them.

The cannon has given sovereignty, and it has taken it away; or, rather, it has been science that has given us the guns, and it has been intellectual alertness that has taught us how best to use them. Toward the end of the 18th Century, soldiers were immersed in professional studies. They were aware of the best thought of their day and of the past. They were able to seize the spirit of their time and to make use of it to develop a tactics and a strategy in keeping with it. A young Corsican gunner, industrious and studious, reaped what had been sown by those who had gone before him. It was he who threshed the grain, winnowed the wheat from the chaff, took it to the mill of study, ground it between the wheels of reflection, and sold the product for an empire.

Before 1914 the nations had hitherto unheard of inventions. Soldiers had the experience of their predecessors to guide them.

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They had seen recent inventions tested even on the battlefield. They had all these advantages set before them. They ignored them all. Immersed in the artificial technique of their peacetime profession, blinded by routine, effecting to worship the innovations of times long gone by, they kept on repeating the litany which condemned the pharisees, never dreaming that they themselves had now become the pharisees. The blind led the blind. Both fell into the ditch.

Today there are the means for creating a new revolution in the art of war (it is still a useful art and still decisive in the affairs of mankind), but the blind are still leading the blind. There are motors in great numbers; yet we go afoot. There are semiautomatic rifles; and we still think of using them only to produce a greater volume of frontal fire. We have 75mm howitzers, we have light tanks—or at least blue-prints of them—we have armored cars (a few), and airplanes of speed and dependability hitherto undreamed of. Yet there is no speech of "the new this" or "the new that"—there is only speech of the things that are already dead but still unburied.

The Army must live, or we all may die.

# CRACKERS AND CARBURETORS

BY CAPTAIN GEORGE E. GRACE, 116th Field Artillery, Florida National Guard

SIXTY miles apart in the grey of the early morning, our two majors glanced at their watches. About them in the early haze could be dimly discerned the bulky outlines of many trucks, hooded with the canvas covers so much a part of army transport. There was an air of subdued hustle and bustle as noncommissioned officers put the final touches on the loading of personnel and equipment. Gradually the pearl of the summer sky faded to the translucent blue of a Florida morning. A station wagon door slams to shock the brittle silence. As the scurrying hand of each watch approached the hour six, a whistle shrilled, followed a moment later by an arm signal "Start Motors," and with sinuous writhings and quietly murmuring motors the first serial of each of two battalion columns was on the way for the 1935 field training camp of the 116th Field Artillery.

But I have jumped ahead of my story; it really begins almost three years before in the Officers' Club at Tampa.

In common with most who serve in the shadow of the scarlet guidon, and cater to the whims of that slim and exciting mistress, my lady seventy-five, opinion of the commissioned personnel of the 116th Field Artillery was divided as to whether or not the horse drawn regiment should be motorized. This question was settled for us with amazing dispatch in May, 1933, when thirty-two Chevrolet trucks and ten station wagons arrived and we were instructed to dispose of our horses.

The alacrity with which this melancholy duty was performed (after a hasty glance at our snappy new equipment) is a sad commentary upon human loyalty to an ideal. Officers, who a few weeks before had extolled the many virtues of faithful Dobbin, were equally vociferous in their adjective besprinkled praise of the motors, and shameful as it may appear, were calling upon heaven to witness that they had always maintained our collection of broken down hay burners should be replaced by automotive equipment. We were then ready to settle down and acquaint ourselves with our new type of transport.

Headquarters, one battalion, and the medical department detachment

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of this regiment are located in Tampa, the organizations of the other battalion and special units being scattered in various towns south and east of that city, and averaging about fifty miles distant from regimental headquarters.

The Regimental Commander, anxious to see how the vehicles would perform on the march, arranged with the State authorities for sufficient gasoline and oil for a road march to Jacksonville. The mean march distance to the Gateway City was about 250 miles, the round trip thus about 500 miles.

Officers and men alike gave their services, without pay, for the march and about eighty per cent of the command turned out. On the first day the march to Jacksonville was completed and the troops went into bivouac at Jacksonville Beach. The elements of the column returned to their various home stations the next day. Two minor accidents marred the trip, both of which were due to the inexperience of drivers in handling vehicles in convoy.

The wisdom of the Regimental Commander in having this test march was clearly apparent when we were called upon to transport our trucks to field training the following July. Five officers and the necessary drivers and assistant drivers were used on this trip. All heavy baggage of the command was transported in the trucks, and the guns, which had been equipped with Martin-Parry adapters and balloon tires, were towed, while the remainder of the regiment journeyed to camp by the old reliable railroad.

The average distance to be travelled to Camp Jackson, South Carolina, our field training camp site, is approximately 550 miles. The roads were good and we were favored with excellent, though very hot, weather. All driving was done in daylight hours, with the trucks divided in two columns about five minutes apart. Arrangements were made by letter in advance of the movement for police escorts through cities whose size justified such action, for messing the men in restaurants, for billets and for fuel and oil. One officer traveled about three hours in advance of the column to check on these previously made arrangements. At no time was there an interruption of the march caused by failure of these carefully prepared plans.

At this time, we had received no regulations governing the march of truck drawn organizations and were forced to set our own rates of speed, use our own march signals, and in general



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rely upon the ingenuity of our convoy officers and the skill of our drivers. They did not fail us, and the column was marched to camp and returned to home stations with only a slightly bent radiator guard on one of the trucks to prove that our drivers had not been one hundred per cent competent. On the up trip, we found the need of further splitting our column to allow for cross traffic and to facilitate passing through cities and traffic congested areas, hence on the return journey the column was divided into three sections, each of which was about five minutes apart.

By a singular coincidence, the speed which we determined to be right and proper for travel on the march, and the distance we preserved between vehicles in column, was later announced as official by the War Department in the pamphlet Tentative Regulations for Marches and Shelters, Truck Drawn Field Artillery, later replaced by Training Regulations 430-145.

The leading vehicle in each section of the column was occupied by an officer who regulated the speed under direction of the convoy commander. The last vehicle in each section of the column was known as the maintenance vehicle and in it rode medical personnel and a mechanic.

Traveling southward to Florida on the return journey, at rest stops we were quite often accosted by inhabitants of rural sections with the query, "You boys goin' to Cuby?" This was the summer of 1933 and newspapers had been discussing intervention on the part of the United States into Cuba's chaotic affairs.

At the conclusion of field training, a Board of Officers was appointed to make a study of the functioning of the trucks and the modified gun equipment. The report of this Board was studied by the Chief of Field Artillery and the Quartermaster General, both of whom wrote us an expression of their appreciation for the time and effort expended. Minor changes in truck equipment and design recommended by this Board appeared on later models of the vehicles. Whether these were due to our recommendations or to some other agency we are not prepared to say.

In the interests of brevity, we will pass lightly over the similar march made in 1934 to the same camp, with the same degree of success, and with, generally speaking, the same formations, speeds and methods. We were constantly striving to improve our

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march technique and using our previous experience as a guide to further smoothness of operation.

In December, 1934, the regiment received twelve new Dodge trucks and six station wagons to augment those already on hand, and in the spring of 1935 we were advised that it was planned to move the entire regiment to Camp Jackson by motor vehicle. We were also informed that we would be furnished twenty-four additional trucks and one ambulance from the state motor pool, the trucks to be of the same type as those with which we were equipped. Further than this we would be allowed to use twenty privately owned vehicles for the trip.

Immediately staff officers began to wear harried looks and upon the slightest provocation would volunteer grave pronouncements on road space, passenger loads, freight carrying capacities and other kindred subjects, while clutched firmly beneath their muscular arms even the most impersonal eye could detect regulations on logistics, tables of distance, road maps, etc. *Si muy compañeros*, the staff was really on the spot.

Previous experience had shown us the difficulty of marching long truck columns on the much travelled highways of Florida, Georgia and South Carolina. At a meeting of the staff it was recommended by the Senior Instructor, Lieut. Colonel A. L. P. Sands, F. A., that the movement to field training camp be made by battalion, each over a separate route, and that within each battalion the batteries travel in serials under their own captains. This plan did not meet with instant favor with all of the officers present but the Regimental Commander saw its possibilities and decided after some discussion with the field and staff to accept it.

The Commanding Officer indicated that he would place the full responsibility for the march of the two battalions on their commanders. He directed that the march be made in conformity with Training Regulations 430-145 and stated that he and his staff would exercise general control only and would act principally as inspectors. He directed the 1st Battalion to proceed via Jacksonville, Waycross and Augusta, the 2nd Battalion via Jacksonville, Savannah and Allendale, the march schedules to be so timed that the leading elements of both battalions would arrive at Camp Jackson at approximately 1:00 P. M. on the third day after leaving home stations, and that no night marching would be done.

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The Regimental Headquarters Battery and Service Battery (less 1st Battalion Section) were attached to the 2nd Battalion, which was to assemble at Haines City. The 1st Battalion was to assemble at Tampa, its home station. The Medical Department Detachment was divided, each battalion section going with its proper march unit and battery aid men being furnished to all organizations on the march. The 1st Battalion section of the Service Battery was to report to 1st Battalion in Tampa.

Now indeed did battalion staff officers wear pencils to blunt stubs and litter their desks with calculations decipherable only to these brass bound members of the brain trust. The final result of this frenzied display of industry was—for each battalion—a neatly blue printed diagrammatic march graph showing towns en route, distances, time of arrivals and departures, fuel, mess and overnight stops; a mimeographed time table for each battalion and complete march orders covering all phases of the movement to the smallest detail. The Regimental Commander can surely be pardoned for the feeling of pride which stirred him when the excellent work of his two battalion staffs was presented to him for approval.

The National Guard Bureau had allowed travel rations at the rate of \$1.20 per day for a total of four days of the sixteen day period. It appeared that we were expected to make the march to camp in two days and the return trip in a like period of time. As the distance from our most outlying unit to Camp Jackson is approximately 640 miles, it was not considered practicable to make this long march in two days except under most urgent conditions. This belief was based upon two years' experience in marching truck drawn field artillery.

Our past experience had shown us that, in column, our drivers did their best work at an average speed of about twenty-five miles per hour and this in daylight hours. We felt that generally speaking they were competent, but we had precious cargoes of badly crowded human freight which we were anxious to deliver without accident. Our men were not hardened field soldiers, but youngsters from offices, stores and many semi-sedentary occupations; we were loath to subject them to the hardships of fourteen or fifteen hours per day of travel in vehicles, which, however effective, were not designed with an eye to human comfort.

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We could, of course, have cut one day from the time we were to be in camp, but we were unwilling to do this, as our schedule had already been prepared and we needed every day available. It was finally decided to call a drill for the day just previous to the first scheduled day of our field training period and instead of drilling a minimum of one and one-half hours we would spend the whole day marching en route to camp but still within the borders of our own state. The giving of this additional day required great personal sacrifice in many cases, but the morale of this regiment is high and on the morning of Friday, July 19th, at 6:00 A. M. the first units of each battalion rolled quietly into the highway and the march was on, one day ahead of the date set by higher authority. One officer and two enlisted men absent with leave were the only persons not present. The officer was on detached service as Acting Division Surgeon, one enlisted man became ill on the morning of departure and one was granted a furlough for business reasons.

The Regimental Commander and his executive alternated with the battalion columns. A constant check was made by staff officers to see that march schedules were adhered to and march discipline maintained. Corrections were not made during the day but errors were noted and taken up with column commanders in bivouac at night. Batteries traveled in serials within battalion columns at 25 minute intervals. Fuel was provided at certain stops from vendor owned tank wagons and was so skillfully handled that batteries were refueled in ten minutes.

The modern field artilleryman can witness no more inspiring sight in peace time than to see a battery, due to arrive at a given time, pull into the designated location practically on the second. Watch them make their rest halt, note the battery commander consult his watch, hear the whistle calling the men to attention, an arm signal—"start motors"—the battery commander casts a critical look over his column, signals the leading vehicle and enters his car. Slowly at first, the long line becomes animate, gently the 75's nod as they bump over uneven ground, their long noses pointed in derision at the stay at homes. Suddenly they are back on the highway and, as the last bumper disappears down the road, the next battery pulls in for rest. There is something lacking in

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the soldier who fails to thrill at this orderly and systematic procedure.

In this regiment, battery commanders invariably rode in the last vehicle of their column; they would thus be readily available for any emergency which might arise within their command. The battery column was led by the executive who regulated the speed and observed proper precautionary measures for railroad crossings and dangerous points. Other vehicles, of course, simply followed in trace. The last truck in each battery column contained the mechanics and aid men; this truck was generally directly ahead of the battery commander's car. In case of injury to personnel, or the breakdown of a vehicle, proper personnel were immediately available. The last truck in each battalion column was a maintenance truck containing shop tools, heavy jacks, etc. If a breakdown occurred in one of the batteries, the mechanic of that organization attempted to repair it. If repairs had not been made by the time the battalion maintenance truck arrived, the chief mechanic of the battalion who rode this truck would assist them; if the truck could not be repaired on the road he would tow it in.

Battalion commanders or their executives could be found at the extreme rear of their columns. Quite often the major would drive ahead and watch the batteries march past or enter a rest area. Other battalion staff officers worked in road reconnaissance, billeting, supply and such duties as are commonly performed by these officers on the march.

Now a word or two on the subject nearest the soldier's heart. The Commanding Officer, 1st Battalion, elected to mess his men in the field, using field ranges for cooking. The Commanding Officer, 2nd Battalion, decided he wished to mess his men in restaurants en route.

The Regimental Commander allowed both methods to be used as a matter of experiment. While it was necessary to make travel ration money of two days cover three days, no complaint of consequence was made on the food. Only exceptional "trading" ability on the part of the Commanding Officer, 2nd Battalion, made it possible for him to feed his men in restaurants for three days on ration money allowed for two. It is doubtful if any other officer in the regiment could have accomplished this feat. However, it

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is believed that the method used in the 1st Battalion best serves the purpose in this regiment, and unless higher authority rules differently, the Regimental Commander has decided it will be used in the future in spite of our handicaps in the number of vehicles available for carrying supplies and kitchen equipment.

On the first night, the Tampa battalion pitched shelter tents and thereafter made bivouac by spreading tarpaulins between trucks. The 2nd Battalion used armories and public buildings throughout the march with the exception of one night on the return trip, when for training purposes a shelter tent camp was made. The Regimental Commander favors the method used by the 1st Battalion and believes that the young enlisted man of the National Guard enjoys the opportunity of sleeping out of doors in reasonably clement weather. It is an experience and adventure to him and he thrives on it. Of course, as is no doubt true in the regular service, most of the more mature men prefer as many comforts as can be obtained—they have had their fill of roughing it. However, these are very much in the minority in a regiment such as ours and so will have to make the best of future "hardships."

The strength of our firing batteries is four officers and sixty-eight enlisted men. These batteries were allowed a total of seven one and one-half ton trucks, one station wagon, and two privately owned vehicles to carry all personnel, personal equipment and light and heavy baggage, including kitchen equipment. Other organizations of the regiment were vehicled on a similar ratio to their strength. That we were badly crowded is obvious. We hope next year to be allowed at least one extra truck per organization for kitchen equipment.

Average speed per hour was set at 25 miles, which was maintained throughout the entire march. Distance between vehicles was sixty yards. In passing through cities and towns, speed was reduced to 10 miles per hour and distance between vehicles to 5 yards, this latter to prevent other traffic from crowding into the columns. Both battalions marched the first day through intermittent though heavy rainstorms without undue difficulty and were able to maintain their schedules.

None of our trucks came equipped with back rests for the seats. These were made up by the various batteries by bolting a 1" × 8"

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board to the bows on each side with small triangular shaped wooden blocks behind it to give the proper pitch to make it comfortable to lean against. All trucks were equipped with canvas or web straps placed across the rear opening to prevent men from accidentally falling out. These straps were a part of the equipment of our latest trucks but on all others we improvised them from old surcingle webbing on hand.

War conditions were simulated on the march to camp by each battalion. A situation was assumed, orders were issued by proper commanders and the whole movement took on the aspect of a march to a rendezvous point within a theatre of operations.

The following is quoted from the report of the Field Inspection Board of this regiment covering field training, 1935, "The care, maintenance and performance of motor vehicles and road discipline is superior."

The entire round trip from home stations to Camp Jackson, South Carolina, an average distance of 1,100 miles, was made without a single injury to any one of our 684 officers and men or accident to a vehicle in transit. "Pretty good," the reader may grudgingly admit — "Pretty good hell," we modestly rejoin, "Damn near perfect."

# PROPHECY OR FANTASY?

BY LIEUTENANT COLONEL JOHN S. WOOD, Field Artillery

**D**URING the past year the nations of Europe, with its criss-cross of boundaries and its seething hatreds, have been haunted by the specter of sudden invasion by air and mechanized forces breaking across borders and carrying death into the centers of industry and government. In consequence, military thought on the Continent has been greatly occupied with questions of air and tank offensives and the defensive measures required against them. Outstanding as subjects of discussion have been the war doctrine of General Douhet, the tank tactics of the Russians, and the mechanized warfare proposed by the Austrian General von Eimannsberger. An outline of these doctrines may not be amiss at this time.

## THE DOUHET DOCTRINE

The Douhet doctrine of war is no stranger to us, having been used here, as in all countries, to bolster up demands for greater air budgets. It is contained in a series of writings from 1921 to 1930 by an Italian, General Douhet, a brilliant thinker and fearless writer. Douhet's frank speech during the war while chief of staff of a division brought him a year's imprisonment for his criticism of the high command. Amply justified by the disaster of Caporetto, he was reinstated and served for the remainder of his time in the air forces, being promoted to general in 1921. He then left the army and, until his death in 1930, devoted himself to writing in support of aviation.

Douhet's doctrine of war, for which he, himself, made no claim of universality, must be deduced from all his works. In the main, however, it is contained in his book, *Mastery of the Air*, which appeared in 1921, and in revised form in 1927. In brief, the doctrine is to resist on land and sea while seeking a rapid decision by mass offensives in the air. Reasoning from the experiences of the World War, he concludes that a rapid decision can be obtained only by attacking the heart of the enemy—the centers of supply, industry, and government. Offensive operations by land and sea forces will result only in stabilization or long drawn out attrition, hence the importance of such forces should be limited strictly to the requirement that they guarantee the opportunity for offensive action by the air force.



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He proposes a single ministry controlling the three forces in peace time and a supreme commander of the three for war. Coupled with this ministry is one for defense against air operations. This latter is concerned only with defense of the interior by anti-aircraft weapons and by passive measures. No air forces are withdrawn from the air army for such work, not only because all aircraft must be utilized in the main effort but also because they are ineffective in defense. Douhet does not discount the effectiveness of anti-aircraft artillery but he has no great confidence that sufficient amounts of it will be available for all the points that must be protected. Passive defense (scattering, concealment, bomb-proofing, and gas-proofing of objectives; protection of the population against gas) must be developed to a maximum degree.

In Douhet's theory, the air army will act offensively in mass; first, to destroy the enemy air force by bombardment of its ground installations and, second, by the bombardment of other ground objectives determined according to their importance to the enemy. No attempt is made to seek out and combat enemy planes in the air, but such combat is not avoided if the enemy attacks. The air army acts by force and not by surprise. It consists of a mass of battle planes, heavily armed (1 or 2 guns of 37mm or larger caliber, 16 to 20 machine guns) and a small number of one man reconnaissance planes with great speed and no armor or guns.

All the resources of the country will be utilized to construct and maintain the greatest possible air force. No separate auxiliary air components will be provided for the land or sea forces, and these forces themselves will be reduced to the absolute minimum sufficient to give a reasonable guarantee of air action.

Naturally, so radical a doctrine has been subject to widespread criticism, both in Italy and abroad. Much of this has been summarized in Colonel Vauthier's sympathetic work, *The War Doctrine of General Douhet*, recently published in Paris. In general, the critics deny that a decision can be obtained in the air alone; that land and sea operations lead only to stalemate; that the decision may not be determined by land forces; that the surface forces, reduced to a minimum and deprived of organic air units, can defend themselves successfully against modern mass attacks; and that all other types of planes, together with the auxiliary air

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forces, should be abolished in order to provide maximum offensive power in battle planes for the air army. In other words, all the eggs are in one basket; and, if the guess is wrong, nothing remains to prevent destruction. It must be remembered, however, that Douhet does not demand attention to the air force until reasonable guarantee of its action has been assured by a proper allotment of strength to the other forces. He merely insists that, for Italy, the possibilities of a decision by air exceed all others, hence that the air force should be dominant and that the other forces should defend while it attacks.

In any case, his work can not be lightly dismissed. Marshal Petain has this to say of it in his preface to Colonel Vauthier's book: "The study of Douhet furnishes an inexhaustible source of reflection. His bold doctrine may have a decisive influence on the events of tomorrow. Profoundly classic in his premises and in his method of reasoning, he reaches disturbing conclusions. Have a care in treating him as only a Utopian and a dreamer."

## RUSSIAN TANK TACTICS

The countries along Russia's western border, together with Germany, have a particular interest in following the progress of the Soviet military machine which is undoubtedly formidable in size. From them during the past year have come many articles regarding the development of the Russian tank forces and the "deep tactics" based on their use.

Unquestionably, Russia has a large number of modern tanks. The Russian military journal, *Krassnaja Svjesda*, gives the number as 3,000 in 1935. On May Day, 1935, about 2,500 tanks appeared in the parade at Moscow. At the present time, the number is probably somewhere between 4,000 and 5,000. General Jacobié\* of the Rumanian Army, states that the goal set by the revised Five Year Plan is 15,000 armored vehicles for the engagement of a group of 10 mechanized divisions. More recent documents report that 10 infantry divisions have been completely motorized, together with most of the corps and all of the army artillery.

Soviet combat vehicles are classed according to employment as follows:

Reconnaissance (armored cars, Ford, Model 1931-32; light

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\*Romania Militaria, July-November, 1934.

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tanks and amphibian tankettes, 3 to 6 tons, Vickers and Carden-Lloyd types, turreted, with one or two machine guns).

Infantry support and protection (light tanks; and medium tanks, Renault-Rossky, 10 to 12 tons, with one 37mm and one machine gun).

Distant action (fast medium tanks, Christie and Vickers Mark IV types, turreted, with one 37 or 47mm and two machine guns).

Assault (heavy tanks, French 2C type, 16 to 20 tons, with one cannon and five machine guns).

General Jacobié states that the Russian tactical employment of tanks resembles that of the Americans. In any case it appears to contemplate tank employment in mass, not less than three battalions (150 tanks and 40 tankettes) per division front in the assault.

After an artillery preparation, the tanks advance in three waves. The first wave of medium tanks, supported by artillery and aviation, moves at once to attack the defensive battalion reserve lines. It is followed ten or fifteen minutes later by the fast distant action medium tank group which, supported by aviation, passes through and attacks the artillery and division reserves. The infantry follows about five minutes later, accompanied by the close support group of tanks. Medium tanks form the bulk of the three waves but light types accompany them for reconnaissance and flanking action.

The artillery support action appears to be, first, a preparation consisting mainly of counter-battery against artillery and anti-tank guns throughout the defensive position; second, a continuation of counter-battery, together with action on the defensive battalion reserve lines ahead of the first wave of tanks; third, action against observation posts and anti-tank gun emplacements beyond zones of tank effort, neutralization of zones not attacked by tanks, and observed fire on anti-tank guns. The difficulties of liaison and coordination in a plan of this sort are, to say the least, considerable.

The Soviet regulations stress the use of combat vehicles with cavalry and motorized units for flanking and distant action, also their use in withdrawals and their particular value in exploitation. On the defensive, their action is limited to counter-attacks and protection of the artillery.

In spite of the considerable amount of bombast, incantation,

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and invocation of proletarian ardor contained in the writings and speeches of Voroshiloff, Tukachevsky, and other Russian army leaders, it must be admitted that the Soviet military progress has been great. It has not been impeded by the existence of ancient and entrenched forms of military organization or military thought and has been free to proceed along unconventional lines. An army of 1,300,000 men can not be overlooked, no matter how unorthodox or fantastic some of its underlying conceptions may appear.

### THE VON EIMANNSBERGER TANK DOCTRINE

General von Eimannsberger's book, *Tank Warfare*, published in Munich last year, has been the source of much discussion throughout Europe and particularly in France. The author, like General Douhet, has reasoned carefully and logically from certain definite premises to clear cut and striking conclusions.

His basis of thought, however, is fundamentally opposite to that of General Douhet. Von Eimannsberger considers that an inevitable duel of aviation forces at the beginning of a war will lead to a stalemate in the air, as well as on the ground, and that only after about six months or so of intensive industrial effort will there be new forces procured in sufficient quantity to gain a decision.

In his study of the nature of these forces and their manner of use, the author divides his work into three parts. The first deals with the lessons of the World War and with developments since the war; the second, with the methods of defense against present day mechanized forces; and the third, with the offensive employment of such forces.

#### 1. Lessons.

After a detailed study of the Allied tank offensives of 1917 and 1918 (Cambrai, Soissons, Amiens) and a comparison of their results with those obtained in the great German artillery-infantry offensives of the same period (Chemin des Dames, Champagne), General von Eimannsberger reaches the following conclusions:

a. Surprise is extremely difficult to obtain in attacks relying on artillery support, mainly because of the mass of batteries and ammunition required. Such attacks can not be pushed ahead with sufficient continuity and rapidity because of the necessity for artillery displacement. The enemy has time to bring up his reserves, and no victory is possible except one of attrition.

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b. Surprise can be obtained in tank attacks, together with rapid and complete rupture of the defensive position. To achieve success tanks must be used in mass on a large front, in cooperation with infantry, protected by artillery, and in collaboration with aviation.

c. Tank successes can be exploited only by fast mechanized forces. Cavalry has proved itself entirely inadequate for such action.

d. Defensive positions such as those of the war, organized to resist attacks based on artillery action, are too shallow for resistance against tank attacks.

e. Tank losses are relatively small, especially in successful engagements, (about 10 per cent). Direct fire from cannon is the tank's greatest enemy.

f. Local infantry counter-attacks against tanks are ineffective.

### 2. Defense.

The increase of mechanized forces does not mean that artillery will disappear. Defensive positions, therefore, must be organized to resist attacks based on artillery action as well as tank attacks.

Undoubtedly, the direct fire of artillery is the greatest menace to tanks, but the defensive artillery has other missions to perform and can not be scattered in every direction throughout a position. The infantry must be given an effective anti-tank weapon of its own. General von Eimannsberger does not consider machine guns (even 50 caliber) sufficiently powerful to stop a tank quickly. For this he demands a gun (37mm or, preferably, 47mm) firing an explosive shell and able to perforate 30mm of armor at 500 meters and an angle of 60 degrees. The rate of fire should be about 40 rounds a minute and the weight 750 to 850 pounds.

Assuming that each anti-tank gun will probably account for about 3 tanks in action and that 50 to 100 tanks will be engaged on an average defensive battalion front of 2 kilometers, then each infantry battalion so situated should be given from 16 to 32 of these guns. To achieve such an allotment, a cannon company of 6 guns, (3 sections) is suggested for each infantry battalion. These guns, together with others from the divisional anti-tank battalion of 3 companies and from the anti-tank regiments (3 battalions) of the general reserve, will provide the protection required. The cannon company takes the place of the battalion machine

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gun company whose weapons, if retained, are placed in the rifle companies. Each regiment will have a company of anti-aircraft machine guns (50 caliber). All cannon companies should be mechanized and should comprise a mine section carrying about 400 mines (10 lbs.). Eimannsberger's defense is based on the old German division sector organization of 3 regiments abreast. Each regiment has one battalion occupying the main line of resistance on a 2km front, one battalion on the regimental reserve line, and one in division reserve.

Four principles govern the adaptation of this organization to anti-tank defense: first, the uselessness of local counter-attacks against tanks; second, the need for each unit to hold until powerful counter strokes can be launched by reserve divisions; third, the necessity for greater depth of defense; and fourth, the necessity for protection of anti-tank guns by infantry.

Each battalion organizes a center of resistance, with its 6 guns protected by infantry and mines and covering about 300 yards of front per gun. The advance battalion provides the outposts and the usual main line of resistance defense against infantry attacks.

The battalion in second line, 3,000 yards in rear, provides the principal anti-tank resistance. It is reinforced for this purpose by a company from the division anti-tank battalion, by forward artillery, and by anti-tank units from the general reserve.

The third line battalion, 3,000 yards farther back, constitutes a final resistance in rear of the zone of defensive artillery positions. If provided with cross country transport it may be moved to reinforce the second line or to cover the flanks.

A second position of this nature is organized by second line divisions, 10 to 15 kilometers in rear of the first. Motorized divisions, 2 per group of armies, stationed fifty kilometers or so from the front, are held ready to intervene within ten hours on the second position. Mechanized shock divisions of 500 combat vehicles, distributed within the army group and the general reserve, are placed so as to be available for counter strokes within eight to twelve hours.

### 3. Attack.

For the rupture of a stabilized front organized as outlined above General von Eimannsberger proposes an initial assault on a front of 30 kilometers by infantry and reinforcing tank brigades

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(150 medium, 200 light tanks), with subsequent operations by tank divisions (300 medium, 200 light tanks in 2 brigades; 1 brigade of motorized infantry; artillery; aviation, etc.), followed by motorized divisions particularly powerful in anti-tank guns (162 per division) to cover the flanks and hold the gains.

The operation comprises three phases:

- (1) Rupture of the first position to a depth of 6 to 8 kilometers.
- (2) Rupture of the second position 10 kilometers or so in rear of the first.
- (3) Exploitation by a new tank army.

### *First Phase.*

Acting by surprise and speed, the attack should enable the exploiting tank army to be in action by the end of the first day. If not, no decisive success can be expected. The hour of departure is set at broad daylight and late enough to avoid early mists which are fatal to speed.

In General von Eimannsberger's concrete example, the sector troops (5 divisions on the 30 km front) are not changed. The necessary movements of artillery and ammunition (700 pieces with two days of fire on a 45km front) can be made during the last night prior to the attack. The reinforcing mass of tanks will be held at least 10 kilometers in rear and moved up to about 4 kilometers from the front only during the last hours of darkness before the jump-off.

One brigade of tanks (350) is considered necessary to overcome the 70 anti-tank and 36 field guns which may be encountered on each division front (6km). The two interior divisions making the main blow are each given 600 tanks, making a total of 2,250 tanks (12 light battalions, 21 medium battalions) for all 5 divisions.

The tanks, supported by artillery and aviation, attack in four waves which cross the line of departure five minutes apart, as follows:

- a. The first wave attacks the forward organizations of the enemy position.
- b. The second wave attacks the strong organizations of the regimental reserve line.
- c. The third wave attacks the artillery and division reserve positions.

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d. The fourth wave immediately precedes and accompanies the infantry.

Operating in groups containing both light and heavy types, the tanks, radio equipped, utilize their speed to move from cover to cover, using flank action and smoke against the anti-tank weapons encountered and moving rapidly through each breach to attack the flanks and rear of remaining strong points.

Assuming an average speed of 15 kilometers per hour, and H-hour at 9:35 A. M., the third wave of tanks should reach the rear areas of the first position (6,000 yards) at 10:30 A. M. and the infantry will arrive there about noon. At this time the tanks will assemble, leaving certain groups in observation.

In this attack, the main artillery role is counter-battery action against the anti-tank guns and artillery of the first defensive position. In addition, it assures the neutralization of localities not amenable to tank action (villages, woods).

### *Second Phase.*

The second phase must follow rapidly in order to overcome the second defensive position before it can be fully manned. Hence there is not time for an artillery displacement and the assaulting tanks must rely on aviation support alone.

A new force of 1,650 tanks (7 light and 19 medium battalions) is considered necessary for this phase. It will pass through the first position and arrive in front of the second about 11:30 A. M., followed at an interval of about half an hour by 5 motorized divisions. These will detruck about noon and proceed to the support of the tanks, occupying the second position and covering the flanks of the pocket.

Aviation support will be provided by one division of combat planes (520) and 1¼ divisions of bombers (475).

### *Third Phase.*

The exploitation is undertaken by a mechanized army of 10 tank divisions, 10 motorized divisions, and 1 aviation division (mixed combat and bombardment). This force has been moved forward to cross the old front lines at 11:00 A. M. and the second position at 2:00 P. M. Its formations and operations will depend on the dispositions and movements of the available enemy reserves (estimated at 7 tank divisions and 9 motorized divisions



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for this problem). The controlling factor in its operations will be speed to prevent any organized stand by the enemy.

During this first day, the assailant will have advanced 60 to 70 kilometers into enemy territory. His tank losses, partly reparable, will have been between 30 and 50 per cent of the 8,900 tanks engaged, and his aviation losses, 25 per cent; but the infantry losses will be only about 5 per cent instead of the 35 to 40 per cent of casualties suffered in the artillery-infantry assaults of the World War.

The battle, however, is not yet won. All enemy reserves may not be destroyed. For subsequent action, General von Eimannsberger visualizes the employment of a group of mechanized armies (10,000 tanks and numerous motorized divisions) to deliver the coup de grâce.

### COMMENTS

The chief merit of General von Eimannsberger's study lies in the fact that he attacks the problem from the standpoint of reality, basing his estimates on types of weapons that are actually in existence and on an industrial output that is possible. The large number of tanks visualized may be surprising, but it must be remembered that over 3,000 tanks were constructed by the French in 1918 and that the British and Americans together contemplated the construction of 25,000 for use in 1919.

General von Eimannsberger, like the Russians, believes that the speed and maneuverability of the tank will enable it to accomplish its distant missions without infantry support. This appears doubtful when we consider the effectiveness of direct artillery fire against tanks and the difficulties of crossing an organized terrain at high speed. The mass of tanks in the successive waves may well jam up, furnishing a wealth of splendid targets to active and properly disposed artillery. The rapid transportation of motorized divisions across the battlefield appears equally doubtful. There can be little doubt, however, that the next war will be mechanized. Hence, this work merits close attention as a practical study of the probable rôle of mechanized forces in battle. Among the ideas set forth, the necessity for a change in our conceptions of the defense and the possibilities of exploitation offered by tanks are to be noted with particular care.

## THE POST TRADER'S STORE

THE modernization of the Field Artillery School commanded by Major General H. W. Butner has resulted in the removal of the Post Trader's Store, one of the outstanding building links between the present time and the old Indian days when Fort Sill was truly a frontier outpost.

Back in 1869, John S. Evans obtained the trading concession and hauled in by ox teams from Kansas the lumber for construction of the building. At that time the 10th Cavalry and the 6th Infantry garrisoned the post and were building the stone structures still standing and forming what is known as the Old Post. Then the store was the center of the life of the post as Evans built a club room for the officers and another for the enlisted men.

About seven years later, however, Evans lost the concession. This was secured in 1876 by Captain Rice, an officer retired for wounds received in action, who conducted the business with various partners until in 1889 he formed the firm of Rice and William H. Quinette. With influential connections, this partnership grew until it was dominant in the commercial life of this section of Oklahoma. Along in the 90's when most other Post Traders were done away with the Fort Sill Post Trader was given a perpetual license, being one of the two thus favored throughout the country.

When a fire practically destroyed the store in 1897 Quinette at once restored the building. The Trader's Store continued to be the center of affairs at the Post. For some six months when Congress failed to make an appropriation for pay, the store paid the troops and cashed the officers' pay vouchers. Quinette was also the postmaster and in 1901 just prior to the opening of the territory which is now Lawton, about 30,000 persons were camped in the vicinity of Fort Sill and the store was the only postoffice and practically the only trading point.

Until 1916 the Post Trader's Store continued in its unique position among the other military posts of the country, but in that year, Quinette sold the building to the Government and relinquished his perpetual license.

Authorities of the School of Fire, which was then located at Fort Sill, used the building as Administration Headquarters, and of late years it has housed the Post Library.

# THE TRICENTENARY OF CONNECTICUT ARTILLERY

BY 1ST LIEUTENANT JAMES R. CASE, 192d Field Artillery

**A**LTHOUGH the 192d Field Artillery (155mm How.) and the 242d Coast Artillery (Harbor Defense) of the Connecticut National Guard trace their direct descent from militia units first recognizable as such in the reorganization of 1739, research undertaken in connection with the tricentenary of the state reveals the existence and use of artillery almost from the settlement of the confederated towns of Hartford, Wethers-field and Windsor in 1635. The "Palisado" at Windsor which enclosed the original houses probably mounted the "two drakes" which the General Court of Massachusetts "ordered . . . shall be . . . lent to the plantacons att Connecticut, to fortifie themselves withal . . . also 200 shott, with other implements belonging to the peeces. . ."

Under the Saybrook patent, a fort was constructed in 1635 at the mouth of the Connecticut river by Lieut. Lyon Gardiner, who styled himself "Engineer and Master of works of Fortifications in the legers of the Prince of Orange in the Low Countries." This fort, first constructed of wood, was destroyed by fire in 1637 and rebuilt with earth-works, the remains of which may still be seen. When the Saybrook patent was taken over by the Connecticut river plantations in 1644 the "appurtenances . . . mentioned" included

"Two demiculvering cast pieces, with all the shott thereunto appertaining, except fifty which are reserved. . .

Two long Saker cast pieces, with all the shott thereunto belonging; one Murderer, with two chambers, and two hammered pieces;

Such irons as there are for a draw bridge; one sow of lead, and irons for the carriages of ordnance.

. . . the howsing reserved for the gunner. . ."

Connecticut early took defensive measures "as their circumstances were such, that it was judged necessary for every man to be a soldier" and in 1636 every able-bodied man was required to "watch, ward and train" also to keep on hand suitable weapons,

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two pounds of powder and twenty bullets which must be exhibited to the constable on demand, against a fine of twenty shillings. In the spring of 1637 the colony went to war against the Pequots, their "army" of ninety men (half the number in the colony) being raised under Captain John Mason and who were to take with them a "gunn if they can." Records of the expedition fail to make mention of the use of this "gunn" so maybe they "could not." Anticipating more trouble with the Indians and having had some disputes with the Dutch the General Court in 1641 ordered "Capt. Mason . . . to take course for the procuring of some peeces of Ordnance from Piscataq' (Kittery, Maine) or elsewhere . . . also to take order for erecting some fortifications . . . where meet for service. . ." The next spring Robert Saltingstall, of Windsor, "doth promise to lend the Country two peeces of Ordnance Sakers or Minions, and if he require them before the Country can spare them, he is to pay the frayt." These "peeces" were probably fitted with a yoke and pinion or a swivel so they could be mounted on the wall or palisade of a trading house. The guns sought in Maine were apparently of a heavier bore however as "the Capten" was later "ordered to prepare caridges for the peeces that cam from Piscataq'. . ."

That the handling of "greate gunns" was considered an art and science to which every man was not initiated is evidenced by a most interesting vote of the General Court in 1642 when "It is ordered, that there shall be an Artillery Yard, where the Company shall have liberty to exercise their Arms once a month, and chuse their Officers according to the course of Artillery men, and there shall be 300 acres of ground allowed thereunto for their incouridgement therein, in some convenient place, where it may be found for the benefit and use of the Company successively. . ." Many of the early immigrants had seen service on the continent and apparently were familiar with artillery organization and the prestige this arm possessed. The company was in existence for some time as in 1659 "John Allyn and Jacob Mygatt, in behalfe of the Artillery, pursuing a former graunt of this Corte of 300 acres of land, for incouragement to the artillery successively . . . do desire . . . 30 miles island. . ." No more appears in the records about this apparent early effort to form a

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corps d'elite inspired perhaps by the organization of the Ancient and Honorable Artillery Company at Boston in 1636. Significantly it was in 1658 that the first troop of horse was authorized in Connecticut.

The Colony's artillery was often the object of legislation by the General Court. In 1652 they "doe order that six of the greate guns at Seabrooke shall be . . . layd up & fitted compleatly uppon able carriages . . . for defense of said place. . ." Fearing raids from the Dutch fleet New London in 1660 obtained the loan of "two great Guns, from Seabrooke, with shot such as . . . may be convenient to let goe." In 1671 "Captn Tallcott" was impowered "to take care to preserve the great Artillery that belongs to the Colony at Saybrooke" and the next year an inspection and inventory was again ordered. In 1675 "Capt. Bull desires that for the use of the ordnance . . . there may be about forty fathoms of his match sent down."

Connecticut at that time had made settlements on Long Island and in rendering a report to the General Court concerning the attack by a Dutch vessel on Southold in 1674 John Winthrop stated the town was defended with "our ordnance, many of our shot hitting the ship, as wee could perceive, but know not of any hurt done him!" The general moral effect of the use of "ordnance" seems to have been accepted however as in 1680 "the Corte recommends it to the severall plantations to procure some great artillery, one or two in each plantation, at the towne's cost and for the towne's use."

Connecticut having a royal charter for self government did not welcome with open arms Fletcher, who tried to assume command of the militia, or Andros, who tried to establish himself as governor. In fact, resistance was anticipated *in extremis* and the fort at Saybrooke was ordered "to be kept teneble and a suitable person settled in the Forte house." A committee was appointed to "provide shott for the canons or great gunns . . . in the best way they can" and the same committee "Major John Tallcott and Capt Robt Chapman, haveing presented to the Courte an account of an agreement they have made with John Parker to be the gunner of the Forte . . . and master of the great artillery, and of the commission which they gave him, with the instructions . . . the Courte declared they approved of the same,

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and doe order sayd John Parker carefullly to attend the place and office he is appoynted to, according to his commission afore-sayd. . ." The instructions included orders to call on the local militia captain for men to work the pieces when necessary, and as can be imagined, this scheme did not always work too well.

From about 1700 defense measures were of little concern to the rapidly growing and prosperous colony for seventy-five years although during that period Connecticut did send her quota of men to Havana against the Spanish, to Louisbourg for the reduction of "the Gibraltar of America" and often to the Northwest against the French and Indians. In 1739 the militia was first organized with tactical regiments, having previously been grouped by counties, but little mention occurs anywhere concerning artillery. That there was, in fact, some neglect may be inferred from the circumstance that in firing a salute to celebrate the fall of Louisbourg a militia captain was killed at New London by a bursting cannon. When the Revolution commenced Connecticut appears to have had nothing but infantry in its military organization.

An independent artillery company was raised in Hartford under Capt. John Bigelow and served in the Northern department apparently being accepted as Continental troops. In Col. John Lamb's 2nd Continental Artillery Regiment there were four companies of 170 men recruited in the state. This regiment, "noted for its efficiency," probably never functioned as such, being distributed by batteries among the infantry divisions. Its second in command was Lt. Col. Eleazer Oswald, who began a long and distinguished military career by serving at Bunker Hill and in the Expedition against Quebec. Connecticut also had a few men in the 3rd Continental Artillery and some in Col. Flower's regiment of "Artillery Artificers." Among the ratings were "gunners," "bombardiers" and "matrosses."

The state militia had some artillery for local defense, there being a company of matrosses at New Haven under Capt. Phineas Bradley, others at Norwalk and Saybrook and some organization under Capt. William Lathrop, of Groton, at the New London harbor defenses. They saw service during the enemy raids on Danbury, Norwalk, Fairfield, New Haven and New London, but apparently were rather ineffective against the

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British troops. At New London the assault units landed out of range of the batteries and simply marched up behind the forts to capture them.

Connecticut made a notable contribution, however, in the form of many iron cannon, cannon balls and bomb shells cast at Salisbury and considered of the finest quality. "Old Ironsides" was first armed with a complement of Salisbury iron guns. While the field pieces of brass or bronze were easily handled, the heavier and usually larger iron cannon were more difficult to manage and transport and in 1777 a wagon train master recorded the "pieces of artillery are drawn—six, by eight yoke of oxen each, one by seven, and one by six." The usual motive power for the transport wagons were the "five cattle teams," a lead horse and two yoke of oxen.

The artillery appears to have acquired some prestige during the war as when the state militia was reorganized or consolidated in 1783 the "artillery or matross companies" were allowed to choose the "colour of their cloathing." But evidently this resulted in too much variety, for in 1793 the Adjutant General of the state recommended a certain pattern—yet one gaudy enough, if all the blue, red, buff and yellow facings, linings, "livery lace," buttons, epaulettes and shoulder "notts" were donned! The companies of artillery were attached to the several regiments and consisted of 30 matrosses and officers but the inspection forms provided that "if the Artillery had no field pieces they must be considered in every respect as Infantry." While the bulk of the militia were infantry the crack organizations in each regiment seem to have been the "companies" of cavalry or artillery attached to each brigade. The law apparently permitted the organization of such only when there was a surplus of enlistments in the several infantry companies.

There were difficulties over allowances and care of property in those days also. Each brigade was generously allowed two cannon and they were to be taken good care of as this order of 1800 witnesseth: "Sir: Two Brass field pieces having been delivd you, & for which you are responsible, you are hereby directed to make annual returns to the QM Genl of the real state of those pieces under your direction—detailing to him the actual condition of the pieces, their carriages, harness, apparatus, &

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every implement attached to them, as received by you: together with the place where lodged, & the particular mode adopted for their safe keeping & preservation, also a report of any accident, damage or decay, which may have happened at any time, & the cause which may have produced them—by which means the QM Genl will be enabled to know their actual condition, the repair which may be needed & what further measures may be necessary to be adopted respecting them. You will consider this a standing order, to be by you complied with, so long as the pieces are under your command, & the annual returns are to be made to the QM Genl. . . ."

When the War of 1812 broke out a call for troops from the national government led to a serious disagreement as the then governor refused to place the state troops under the command of regular army officers. Several regiments of regulars were recruited in Connecticut, however, and served during the war, but not within the boundaries of the state where the militia had its work cut out for it. The British raided the coast and the infantry were helpless. Commodore Decatur's frigates were driven into New London harbor and blockaded there for a considerable length of time. This produced wide spread alarm and a large body of militia assembled. There seem to have been some Federal troops in Forts Trumbull and Griswold, but the British made no attempt upon the city. But at Stonington, a few miles east and then quite a commercial shipping center, the British fleet hauled in close and prepared to destroy the place. Two eighteens and a four-pounder were in position at the battery on a point near the harbor entrance and were used effectively in preventing a landing in force although the ships with their heavier guns lay out of reach and bombarded the town. Essex, a few miles up the Connecticut river, was also raided by the British and twenty-two vessels of various descriptions burned. The militia rallied and with their "brass field pieces" harried the boats of the attacking party and finally drove them off.

In 1815 a reorganization of the militia was again effected. In a total of 38,300 men enrolled there were 1,782 artillery in two regiments of light and two of heavy (horse) artillery. The former contained twelve companies of forty-four men each, the latter four companies of sixty-four men. Although composing



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a brigade on paper and headed by a general officer for the next twenty years, they were assigned to and carried on the returns of the six infantry brigades. Cannon were a rarity or antique and if there were guns they were probably drawn by men with drag ropes. The light artillery lacked horses and the horse artillery lacked cannon, but there was some compensation as it was decreed that the "Artillerist will wear yellow mounted swords, of twenty-eight inches blade suspended from the shoulder by a white leathern belt, not less than two inches wide!" Thus they were equipped to appear at advantage in public as the Hartford companies did in 1817 for a Presidential review by Monroe and in 1824 as an escort to Lafayette. Or perhaps they borrowed for the latter appearance some of the six-pounders received from the War Department in 1822 at the State Arsenal.

The artillery had fallen into a bad way by 1838, however, as the Adjutant General reports "the carriages of the Field Artillery, belonging to the State in the use of the Militia, with implements and equipments . . . are in some instances in bad repair and unfit for service . . . I . . . call your attention to the great changes which have been made in the form and construction of the field pieces, gun carriages and caissons . . . furnished the army of the United States . . . and I consider it of the first importance that the Artillery companies of this State . . . should be supplied with field trains of like character. . . It will be recollected that the three regiments of Horse Artillery located along our seaboard have never been furnished with ordnance." In 1843 it was recommended that the artillery be disbanded and although returns list two companies attached to each regiment, after 1847 no field officers of artillery are listed. About 1853 the last of the artillery was disbanded. In 1846 the Mexican War had broken out and several infantry regiments were recruited in Connecticut. This year also the militia returns are at the peak, there being a total of 53,191 infantry, 1,704 riflemen, 1,575 light artillery, 508 horse artillery and 692 cavalry.

At the outbreak of the war between the States, Connecticut raised three infantry regiments of three months men at once but, as it became apparent that the struggle would be a protracted one, enlistments were taken for longer periods and the organization

## THE TERCENTENARY OF CONNECTICUT ARTILLERY

of artillery and cavalry units was authorized. There were three light batteries from this state usually attached to Connecticut brigades of infantry and they acquitted themselves creditably throughout their service. The 4th Connecticut Volunteer Infantry was organized as the first three years' regiment, but was converted into the 1st Connecticut Heavy Artillery and under Col. Robert O. Tyler and his successors established an enviable record. It was expanded to a strength of about 1,800 men and served first in the Peninsular Campaign of 1862, where their armament was made up of 71 pieces of different type heavy siege guns. It continued as heavy or siege artillery throughout the war and concluded its glorious career at the Siege of Petersburg. On the grounds of the State Capitol at Hartford there has been mounted one of the 13-inch mortars used by this regiment and christened the "Petersburg Express." The Adjutant General of the United States reported that the 1st Connecticut Heavies were "ranked by military judges as the best volunteer regiment of heavy artillery in the field, and considered equal in all respects to any regiment of the same arm in the regular service." At the time of its muster-out the Chief of Artillery said "the 1st Connecticut Artillery, in intelligence and the acquirements and services of its special arm, stands unrivaled in the armies of the United States." The 19th Connecticut Volunteer Infantry was also converted into artillery and served as the 2d Heavies, but as the occasion required were used as infantry freely. This regiment was at Cold Harbor, Cedar Creek and Petersburg and in other engagements.

In 1865 the Connecticut National Guard first came into being as such and in 1871 two sections of artillery were authorized, which in 1881 was increased to one battery of three platoons, horse drawn. The single field artillery battery which the state had was called into Federal service for the Mexican Border trouble and during the World War served in France as Battery E, 102d Field Artillery. In 1902 Coast Artillery Corps units were authorized and a dozen companies were organized, mostly in the towns along the shore. During the World War some of these served in the Coast Defenses of Long Island Sound, while the rest composed a large part of the 56th Coast Artillery, which served with the III Corps in France. In the general reorganization

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of 1922 the 192d Field Artillery (155 mm) and the 242d Coast Artillery (Harbor Defense) were constituted and today are proudly carrying on, and as their regimental mottoes state, applying "Skill and Force" in the conduct of their "Devoir" with three hundred years of artillery history and tradition behind them.

### BOOK REVIEW

WITH NAPOLEON IN RUSSIA—From the Memoirs of GENERAL DE CAULAINCOURT.—General de Caulaincourt, member of the Emperor's Staff, Master of the Horse and Ambassador to Russia prior to the disastrous campaign of 1812, made daily notes of his experiences during this fatal period. The rapid advance into Russia without supplies—the exhaustion of men and animals before midsummer—the slaughter at Borodino—the entry into Moscow which became a furnace rather than refuge—the retreat through snow, ice and in face of all the dangers of the northland when starvation stalking in the ranks and only superb morale saved the paltry thousand survivors to ever reach Paris in formation—the loss of a division at the critical crossing of the Beresina when in the night its experienced commander took the wrong road—the flight of the Emperor to Paris—all these are portrayed in the vivid notes of the officer who accompanied Napoleon throughout the journey.

These notes were about to be published when the World War broke out. De Caulaincourt's chateau was captured by the Germans and in 1917 it was mined. Not until 1933 were the notes found in a battered iron chest among the debris. Here we have a living record of "the little Corporal" at the beginning of the sunset of his power.

Published by William Morrow and Company. Price \$4.00 (less 10 per cent if ordered through the Field Artillery Association).

## FIELD ARTILLERY NOTES



MASTER SERGEANT JOHN B. LARKINS AND SON

### **Father and Son, Field Artillerymen**

The Field Artillery School Detachment (White) has had, for several years, the unique distinction of having a father and son serving in the organization at the same time.

The father, Master Sergeant John B. Larkins, is well known by many Field Artillery Officers, having been in charge of the Range Detail at the school for the past five or six years. He will be remembered by many officers who passed through the school in the "Twenties" as the Mess Sergeant of the White Detachment who supplied such good "chow" on the various problems in the field.

His son, John B. Larkins, Jr., enlisted in the White Detachment four years ago and having already graduated from the communication course. Enlisted Specialists School, gives promise of keeping the handling of the range detail within the family for some years to come.

Col. C. S. Blakely, Asst. Commandant of the School, in addressing the White Detachment a few weeks ago, stated, "I know of no finer tribute to an organization than that a father should cause the enlistment of his son in his own organization."

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THE "BAKER TWINS" BEING DECORATED BY BRIG. GEN. T. E. MERRILL

### **Twin Army Captains Awarded Medals Together**

Twin brothers-in-arms, Captains Herbert and Herschel Baker, of the Eighth Field Artillery, continued their well-nigh unbelievably parallel lives when Brig. Gen. T. E. Merrill, their brigade commander, pinned the medal of the Purple Heart upon their chests. The decorations for meritorious service and bravery were presented at a retreat parade of the regiment held on its parade ground at Schofield.

Born November 21, 1896, sons of a medical officer stationed in Illinois, Herbert and Herschel were commissioned second lieutenants of Field Artillery on the same day, June 18, 1918. Their army serial numbers differ by only one digit. On February 3, 1917, they first joined the colors as privates in the same troop of the Second Cavalry. Together they were made privates first class in Headquarters Troops, Fourth Division, and were transferred to the 147th Field Artillery.

After receiving their temporary commissions they were assigned to the 151st Field Artillery, with which unit they went overseas. During the latter phase of the Meuse-Argonne offensive each was wounded in action, Herschel on October 26, 1918, and Herbert on the day following. It was for their part in this engagement and the wounds received that these brother officers

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were yesterday awarded the Purple Heart by order of the Secretary of War.

After the war their paths still paralleled. Their wartime commissions expired simultaneously on Sept. 4, 1920, and the same day they were commissioned second lieutenants of Field Artillery in the regular army. Since that date they have seldom been separated, serving at the same posts, usually living in adjoining quarters, being promoted to the grades of first lieutenant and captain on the same dates.

The "Baker Boys," as they are known throughout the service, both came to Hawaii in the spring of 1932 and were naturally assigned to the same regiment at Schofield, in which they have commanded the regimental headquarters battery and the headquarters battery of the Second Battalion.—*From the Honolulu Advertiser.*

### **Attendance at School Climaxes Sergeant's Interesting Career**

Earl W. Bacon, sergeant instructor of the 128th Field Artillery, Missouri National Guard, with Headquarters in Columbia, has departed to attend the Command and General Staff School of the United States Army at Fort Leavenworth, Kansas, March 14 to June 29.

Sergeant Bacon is probably the only bona fide enlisted man in the United States to attend the Command and General Staff School. He is a lieutenant colonel, Field Artillery Reserve, and will attend the school in that rank. He is attending the school during the period between enlistments. His last term of service as staff sergeant, detached enlisted men's list, National Guard, culminating twenty-three years in the army, expired February 19, 1936. He has received permission to reenlist when he returns from the school.

During the World War he served as a first lieutenant in France, acting as executive officer of Battery D, Fifth Field Artillery, a part of the famous First Division, and the oldest military organization in the United States Army. Alexander Hamilton was its first commander. Bacon served in two major battles, Catigny and Montdidier-Noyon, receiving one of his two citations in the latter battle. He wears the Silver Star with an oak leaf cluster for gallantry in action March 25, 1918, and June 9, 1918.

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The order commending him for action in the Montdidier-Noyon Defensive reads: "As executive and orienting officer during the Montdidier-Noyon Defensive, he displayed great courage and devotion to duty during a heavy bombardment of gas and high explosive shells lasting from 11:40 P. M. June 8, 1918, to 7:00 A. M. June 9, 1918. Throughout this period he directed the fire of the battery and superintended the evacuation of wounded and supply of ammunition. The example set by his coolness and disregard for danger was an inspiration to the men in holding a position that was almost untenable. Although suffering from mustard gas burns, he remained on duty until the action was over."

Sergeant Bacon, who was born February 4, 1894, in Howell County, Missouri, began his service in Jefferson Barracks, Missouri, and left that recruiting station in 1912 to join the Second Field Artillery, a "pack-mule" or mountain artillery regiment, in the Philippine Islands. He returned to the "states" in November, 1915, becoming a first sergeant and served with the Fourth Field Artillery, also a "pack-mule" outfit, on the Mexican border. He spent eleven months in the Mexican interior, "chasing Villa."

In April, 1917, the month the United States entered the World War, Bacon was one of the 180 non-commissioned officers selected from the border artillery to attend an officers' school at Fort Bliss, El Paso, Texas. Of the 180, only 50 were commissioned, and he ranked ninth to become Second Lieutenant Bacon on July 10, 1917. Before he went overseas in September, 1917, he was promoted to first lieutenant, and, after eleven months' service in France, to captain, returning to America as an instructor for the national army. At the close of the war he served nine months at Hoboken as debarkation officer.

At the "termination of the emergency" he returned to his pre-war grade of first sergeant and rejoined the Fifth Field Artillery, at Camp Taylor, Louisville, Ky. He came on duty as sergeant instructor, 128th Field Artillery, Missouri National Guard, in 1923. He was stationed at Boonville, Mexico, St. Louis, and Sedalia before coming to his present station in Columbia in September, 1933.

Sergeant Bacon has completed the courses offered by the

## FIELD ARTILLERY NOTES

First Corps Artillery School at Gondrecourt, France, the Battery Officers' course in the Field Artillery School at Fort Sill, Oklahoma, the small arms firing course at the national matches, Camp Perry, Ohio, and the Field Officers' course, Field Artillery School, Fort Sill, Oklahoma. He was commissioned lieutenant colonel, Field Artillery Reserve, in 1935, and holds a certificate of capacity for the grade of colonel, to which post he will be commissioned upon completion of twenty-five years' service in the Officers' Reserve Corps. The high point of his career, from the "thrill" point of view, Sergeant Bacon says, was in 1920, at Camp Taylor, when the First Division was being reviewed by General Pershing. General Summerall, then commanding the First Division, called First Sergeant Bacon from the ranks and introduced him to General Pershing as one of the outstanding members of the First Division.—*From the Columbia Missourian.*

### **National Guard and Reserve Class**

Fifty-two National Guard and Field Artillery Reserve Officers reported March 2nd for the opening of their special course at the Field Artillery School. Twenty states from the Atlantic to the Pacific sent selected officers of their Guards and sixteen states are represented by Reserve Officers. The course, which ends May 30th, will major Gunnery—a total of 233 hours being allotted to that subject. 130 hours will be taken by the Material Department, while Tactics and Communication will occupy 88 hours. The balance of the instruction will be devoted to Fire Direction and Field Exercises.



## MILITARY BOOKS

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

	<i>Price</i> (Domestic postage included)
FIELD ARTILLERY: The King of Battles— <i>Maj. Gen. H. G. Bishop</i> .....	\$2.00
THE AMERICAN ARMY IN FRANCE— <i>Maj. Gen. James G. Harbord</i> .....	5.00
WITH NAPOLEON IN RUSSIA— <i>Gen. de Couloincourt</i> .....	4.00
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THE GUNNERS' MANUAL— <i>Capt. Arthur M. Sheets, F. A.</i> .....	1.50
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