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THE FIELD ARTILLERY JOURNAL

VOLUME XXV JANUARY-FEBRUARY, 1935 NUMBER 1

THE RECENT REORGANIZATION OF THE FIELD ARTILLERY

ITS RELATIONSHIP TO MOBILIZATION

BY MAJOR T. J. J. CHRISTIAN, Field Artillery

THE primary objective of the recent reorganization is consonant with the main mission of the Field Artillery: both are laid parallel on the common aiming point of preparation for war.

Although the specific mission of the Field Artillery is clear—to assist the other arms, especially the Infantry and the Cavalry, by means of fire power in combat, it is not so clear how such effective "assistance" can be accomplished in a rapid mobilization without the adequate "means of fire power"—a framework of sufficient field artillery *in being* of active units, organized and trained, in peace time, for speedy war expansion.

If "one million men could spring to arms over night," it has been aptly said "that they wouldn't know which end of the arm to spring to," and, unhappily, neither the issue of a Sam Browne belt, nor a red hat cord can make, by magic, a field artillery officer or man. The speedy expansion of the peace-time active nucleus to a war organization becomes, per se, an arduous task, so that there is certainly no 'royal road' to the creation and training of the all too numerous inactive, "paper" units, upon an emergency.

These new units cannot be "machine-made," but must be "handmade." The latter requires time, and time is the vital factor which, unfortunately, may not be relied upon as an ally.

Unquestionably, the unattainable, yet ideal transformation from a peace to a war footing, would approach the minimum of changes in organization, and the least expansion in personnel strength and equipment.

No change, no dual tables of organization—to go "as is" would be a dream beyond the flight of fancy! An unsuccessful attempt

was made following the World War to hold together nine complete brigades of Regular divisional artillery. In 1920, the field artillery organization was cohesive to the extent of eight light brigades, three regiments not brigaded, one regiment of horsed artillery and one regiment of G. H. Q. mountain artillery. Since that time, a brief retrospect of the constant disruption of the field artillery arm, particularly in the higher echelons, is pertinent in order to view in proper perspective the 1934 reorganization.

Between 1926 and 1930, over one thousand field artillery enlisted men were transferred to the Air Corps, with a corresponding decrease in the numbers of grades and specialists' ratings allotted to the field artillery. Partially active units resulted, with their reduced strength and locations aggravating the mobilization task of the field artillery in the Four Army Organization.

The frame-work for mobilization requirements was cut to the bone, and this unsatisfactory condition by May, 1933, was so acute that a major operation became necessary in order to preserve the skeleton.

The question, at once, arose as to the preference of maintaining the full number of firing batteries and headquarters with the battalions and regiments which were active, endeavoring to keep all existing units active in all their elements, or to spread the total enlisted strength into a larger framework containing at least a cadre of all its essential echelons. The latter possessed distinct advantages for expeditious expansion, for even though some elements, and particularly the higher echelons are at greatly reduced strength, the nucleii of over twenty additional and most essential units have been activated.

The peace-time set-up no longer finds these organizations among the missing, which constitutes a valuable step in the right direction for the mobilization mission of the field artillery. An opportunity was also afforded for a reduction of overhead in service units, the consolidation of the lower units into sections of the higher echelons, within the four-battery regiments stationed in the continental limits of the United States. The saving of such personnel was thereby devoted to creating additional firing batteries.

The reorganization concurrently embraced the opportunity afforded

by the Public Work Administration to implement the Arm with new motor equipment. Over two thousand such vehicles have been delivered, or are in the process of shipping to stations. A total of twenty additional motorized batteries have been included in the reorganization.

Incident to the motorization program, there are forty-one 75-mm gun batteries, truck-drawn, including two batteries G.H.Q. (Mecz) with special equipment at Fort Knox, Kentucky; sixteen 155-mm howitzer batteries, truck-drawn and one battalion heavy artillery, truck-drawn, one battery armed with 155-mm guns and the other with 240-mm howitzers, making a total of 59 motorized batteries, or approximately 60 per cent motorization of the 98 active firing batteries. All field trains have been motorized. Thirty-three batteries remain animal-drawn, including the eight batteries assigned to the 1st and 2nd Cavalry Divisions: the five pack batteries were increased to six, thus, thirty-nine of the ninety-eight firing batteries retain animal transport, or approximately 40 per cent of the total.

The present policy for divisional light artillery consists of 50 per cent motorized and 50 per cent animal-drawn regiments. This organization of mixed transport in the division, one-half horse-drawn and one-half truck-drawn, while not considered as fixing the type for the divisional field artillery brigade, may be regarded as a general yard stick which has measured the extent of motorization up to date.

This formation possesses some advantages in flexibility as regards mobility on various terrain, and retains in the Regular Army an animal-drawn framework, available, upon necessity for expansion.

A summary of the reorganization changes effected is published in tabular form herewith.

Additional organized units include:

Two brigade headquarters, 3 regimental headquarters, 7 battalion headquarters and 8 firing batteries. At present, a brigade headquarters is now provided for all regular infantry divisions, except the 5th, 7th, 8th and 9th. Brigade headquarters are now available in each of the Four Army Areas for use as Army Artillery Headquarters. Regimental headquarters are provided in all

FIELD ARTILLERY ORGANIZATIONS & STATIONS
REORGANIZATION DECEMBER 1, 1934

CORPS AREAS and DEPTS	Organizations & Stations	BRIG. HQRS.	Regtl. Hqrs. Animal Drawn	Regtl. Hqrs. Mtzd.	BANDS	Serv. Btry. Mtzd.	Bn.Hq. Animal Drawn	Bn.Hq. Pack	Bn.Hq. Mtzd.	75-mm Gun Btry. Animal Drawn	75-mm Gun Btry. Mtzd.	75-mm Howitzer Btry. Pack	75-mm Howitzer Btry. Animal Drawn	75-mm Howitzer Btry. Mtzd.	75-mm Howitzer Btry. Horse	Btry. 155-mm How.	Btry. 155-mm Gun G.P.F.	Btry. 240-mm How.	Obsn. (C&F) Bn.	Obsn. (C&F) Btry.	Amm. Train	Batteries
I	7th Field Artillery, FORT ETHAN ALLEN, VT.			1	1	1			2		4											A,B,D, and E
II	5th F.A.(less 2d & 3d Bns.) MADISON BARRACKS, N.Y.			1	1	1			1							2						A and B
	25th F.A.(2nd Bn.) MADISON BARRACKS, N.Y.								1		2											D and E
III	1ST FIELD ARTILLERY BRIGADE, Fort Hoyle, Maryland	1																				
	6th Field Artillery, FORT HOYLE, MARYLAND		1		1	1	2			4												A,B,D, and E
	16th F.A.(1st Bn.) FORT MYER, VIRGINIA						1			3												A,B, and C
IV	12TH FIELD ARTILLERY BRIGADE, Fort Bragg, N.C.	1																				
	4th F.A.(2nd Bn.) FORT BRAGG, NORTH CAROLINA							1				2										D and E
	17th F.A.(less 3d Bn.) FORT BRAGG, NORTH CAROLINA			1	1	1			2							4						A,B,C, and D
	36th F.A.(2nd Bn.) FORT BRAGG, NORTH CAROLINA								1								1	1				C and D
	83rd F.A.(2nd Bn.) FORT BRAGG, NORTH CAROLINA					1				2												D and E
	1st Observn.Bn. (C&F)(less Btry B) FORT BRAGG, N.C.																		1	1		A
	83rd F.A. (1st Bn.) FORT BENNING, GEORGIA					1				2	1a											A,B, and C
V	19th F.A. (1st Bn.) FORT BENJAMIN HARRISON, IND.								1		2											A and B
	68th F.A. (1st Bn.) FORT KNOX, KENTUCKY								1		2a											A and B
VI	6TH FIELD ARTILLERY BRIGADE, Fort Sheridan, Ill.	1																				
	3rd F.A. (2nd Bn.) FORT SHERIDAN, ILLINOIS				1		1			2												D and E
VII	14th F.A. (1st Bn.) FORT RILEY, KANSAS						1			3 a												A,B, and C
	14th F.A. (Battery F) FORT SNELLING, MINNESOTA									1												F
	20th F.A. (3rd Bn.) FORT DES MOINES, IOWA								1							2						E and F
VIII	8TH FIELD ARTILLERY BRIGADE, Fort Sam Houston, Tex.	1																				
	4TH FIELD ARTILLERY BRIGADE, Fort Sill, Oklahoma	1																				
	82d Ammunition Train, FORT SILL, OKLAHOMA																				1	
	1st Field Artillery, FORT SILL, OKLAHOMA			1	1	1			2		4											A,B,D, and E
	12th Field Artillery, FORT SAM HOUSTON, TEXAS		1			1	2			4												B,C,E, and F
	15th Field Artillery, FORT SAM HOUSTON, TEXAS			1		1			2		4											A,B,D, and E
	18th Field Artillery, FORT SILL, OKLAHOMA		1			1	2			4												A,B,D, and E
	74th F.A. (less 2d Bn.) FORT FRANCIS E. WARREN, WYO.		1			1	1			2												B and C
	77th F.A. (1st Bn.) FORT SILL, OKLAHOMA								1							2						A and B
	82nd Field Artillery, (Horse) FORT BLISS, TEXAS		1			1	2			4a												A,B,D, and E
IX	3RD FIELD ARTILLERY BRIGADE, Fort Lewis, Washington	1																				
	9th F.A. (1st Bn.) FORT LEWIS, WASHINGTON								1							2						A and B
	10th Field Artillery, FORT LEWIS, WASHINGTON			1	1	1			2		4											A,B,D, and E
	76th F.A. (3rd Bn.) PRESIDIO OF MONTEREY, CAL.						1			2												D and E
	TOTAL in the United States	6	5	6	7	11	15	1	18	33	23	2				12	1	1	1	1	1	
T.H.	11TH FIELD ARTILLERY BRIGADE, SCHOFIELD BARR., T.H.	1																				
	8th Field Artillery, SCHOFIELD BARRACKS, T.H.			1		1			2		6											A, B, C, D, E, and F
	11th F.A. (less 3d Bn.) SCHOFIELD BARRACKS, T.H.			1	1	1			2							4						A, B, C, and D
	13th Field Artillery, SCHOFIELD BARRACKS, T.H.			1		1			2		6											A,B,C,D,E, and F
	TOTAL in Hawaiian Department	1		3	1	3			6		12					4						
P.I.	23rd F.A. (Battery A) (PS) FORT STOTSENBURG, P.I.											1b										A
	24th Field Artillery, (PS) FORT STOTSENBURG, P.I.			1	1	1			2		6											A,B,C,D,E, and F
C.Z.	2nd F.A. (1st Bn.) FORT CLAYTON, CANAL ZONE							1				3										A, B, and C
	GRAND TOTAL (U.S. & Foreign Possessions) (Peace)	7	5	10	9	15	15	2	26	33	41	6				18	1	1	1	1	1	

OCFA 10/23/34

	F.A. Brigades	Regimental Headquarters	Battalion Headquarters	Batteries	Ammunition Trains	Bands
REORGANIZATION	7	15	44 c	99 c	1	9
PRESENT	5	12	37	91 c	1	9

a. To be armed with 75-mm Howitzer when available.
b. To be armed with 2.95" Howitzers.
c. Includes one (1) S & F.

Corps Areas, except the Vth, VIth and VIIth. In some instances, as in the 5th, 6th, 8th and 9th Divisions, the field artillery nucleus is reduced to but one battalion each, yet, formerly three divisions were without any active artillery elements.

In the matter of grades and specialists' ratings, the reorganization was accomplished with the slight increase of 298 grades and 230 specialists' ratings, which represent an annual money value increase of $126,756.00.

The total number of grades, 15,178, and specialists' ratings, 3,379, authorized upon the reorganization, were spread out evenly as far as they would go among the field artillery organizations.

It is felt that, incident to the modernization of the Army, effecting the motorization and mechanization program, a corresponding increase in skilled technicians, particularly in motor maintenance, is demanded in personnel of higher grades and specialists to keep abreast of the changes in modern equipment.

From a mobilization standpoint, it is believed the effectiveness of accomplishing the field artillery mission is largely proportional to the expansion ratio from the peace organization to mobilization requirements. It would seem that the expansion ratio can only be decreased by either lowering the war requirements, or by increasing the peace-time organizations, or by both, thereby enhancing the mobilization effectiveness.

Therefore, the cycle should swing back to a strength comparable to that of the 1920 station list of field artillery, with at least one field artillery brigade for each of the nine infantry divisions. This would seem to be the vital need—more men, approximately 9,000 more artillerymen for the peace-time organizations. Though not ideal, it is believed that the recent reorganization has, to the utmost limits of present strength, approached a solution of the problem of peace organization as a nucleus for war expansion.

Whatever the peace-time set-up, it is believed that a closer connection and coordination of mobilization training with peace training, is of fundamental importance. Training in peace, which projects the essential methods that will be necessary on mobilization, should surely assist those Siamese twins of Field Artillery, 'Speed and Accuracy' in carrying out the main mission of a "field artillery which never fails its infantry."

FIELD ARTILLERY MOTOR MAINTENANCE

BY MAJOR J. E. LEWIS. Field Artillery

SINCE the existing peace-time procedure in motor maintenance is so involved with economics, and with existing and contemplated legislation this discussion is divided into two parts: A, the war time aspects of the subject, and B, its peace time aspects.

A

MOTOR MAINTENANCE IN CAMPAIGN

This article is based on the hypothesis that Field Artillery Combat Units normally should not undertake the major repair of motor vehicles any more than they would the rehabilitation of serious personnel and animal casualties.

Beyond first aid, their primary interest in human and animal casualties is in their prompt evacuation and replacement. It is submitted that, in general, motor vehicle casualties requiring repairs more serious than can be performed within eight (8) hours should be evacuated to the supply services and promptly replaced by similar serviceable vehicles.

Analysis of prescribed system.—Preventive maintenance (1st and 2nd echelons) is assigned to the using service (Field Artillery).

More serious maintenance functions, (3rd, 4th and 5th echelons) such as replacement, major repair, reconstruction, salvage and reclamation are assigned to the supply services. For complete description see Field Artillery School Notes M-1 or Circular 1-10 Office Quartermaster General. These are to be carried out as follows:

ORDNANCE AUTOMOTIVE REPAIR SYSTEM

The scheme for maintenance of ordnance material in the theatre of operations is to provide a chain of shops or facilities from divisions at the front, back through the communications zone, each shop being equipped to handle heavier work than the one nearer the front. In case of necessity the manufacturing arsenals, in the zone of the interior, supplement the maintenance facilities in the theatre of operations.

FOR THE COMBAT ZONE

For those repair functions which are reserved for the Ordnance Department it has the following echelons provided in combat units for campaign:

WITHIN THE DIVISION

The Infantry division.—In the Infantry division is found an Ordnance Company (medium maintenance) which has an automotive section of two (2) officers and forty-eight (48) enlisted men, mostly mechanics. The equipment consists of a light machine shop truck for duty at the section bivouac, a light truck for roadside repairs, and four (4) spare parts trucks carrying a list of spare parts, mostly lightweight items. The total weight of this equipment is approximately four (4) tons. Parts are furnished without delay or formality. Also every effort is made to salvage equipment.

The Cavalry division.—In the Cavalry division is found an Ordnance Company (light maintenance) with an automotive section of ten (10) enlisted men.

WITHIN THE CORPS

As a part of corps troops there is an Ordnance Company (heavy maintenance) with an automotive section of three (3) officers and eighty (80) enlisted men, for maintenance of ordnance material in corps troops (less artillery brigade), and also for repair of ordnance material for all troops of the corps which for any reason cannot be handled by the organic ordnance companies of divisions and the corps artillery brigade. Attached to the corps artillery brigade is found an Ordnance Company (medium maintenance) similar to that in the infantry division, for maintenance of ordnance materiel of the corps artillery brigade. The Cavalry corps may have one or more light maintenance companies attached if conditions warrant it.

WITHIN THE ARMY

No organic automotive repair units are assigned to an army, but it may have ordnance maintenance companies attached from G. H. Q. reserve as necessary. There are available for this purpose two (2) heavy and two (2) medium maintenance companies

per army. Normally when G. H. Q. artillery is attached to an army it is accompanied by G. H. Q. Ordnance Companies (heavy or medium maintenance). The medium maintenance company that is an organic part of the type army, ordinarily is organized and equipped to operate a small arms repair center only; though, if the situation so demands, it may be organized and equipped similar to a maintenance company in an infantry division. Army maintenance facilities do not constitute an echelon in the ordnance *automotive repair system,* but the *Army Ordnance Depot* is an echelon in the *automotive supply system*. It exchanges serviceable unit assemblies for unserviceable ones or issues serviceable unit assemblies on requisition, and evacuates unserviceable materiel to communication zone shops for repair.

FOR SUPPORT OF THE COMBAT ZONE

In the communication zone are located ordnance shops capable of more extensive automotive repair work than can be accomplished by ordnance maintenance companies with field equipment. These shops are semi-permanent installations completely equipped with machine tools and other facilities. The number and location of these establishments will depend entirely upon the situation, and may include *Advance, Base*, and sometimes *Intermediate* shops. Unserviceable automotive equipment is evacuated from the combat zone to these establishments where it is repaired and turned over to communication zone depots for reissue through the normal channel of supply.

QUARTERMASTER AUTOMOTIVE REPAIR SYSTEM

Organization of Automotive Maintenance.—The organization for automotive maintenance will be echeloned in depth. The echelonment of supplies will extend from spare parts carried on motor vehicles to the centralized stockage in motor transport depots similar to the echelonment of general supplies. The echelonment of maintenance functions will extend from the work of the driver to the major operations of reconstruction shops, similar to the echelonment of surgical operations from first aid dressings back through field to base hospital operations.

In large military organizations, both territorial and mobile, the work of automotive repair and handling of automotive supplies

will be so graded in the echelons of maintenance as to remove all repair facilities, i.e., shop and warehouse operations, unless highly mobile in character, from the field of motor vehicle and train operations. In a theatre of operations in war, the more difficult repairs, heavy machinery and heavy stocks of supplies, which are inconsistent with the principle of mobility, will be located at varying distances from the front lines of motor-vehicle operations. Such distances are theoretically in direct ratio to the degree of immobility represented by shop operations and the mass of automotive supplies involved. The most extensive repair operations, requiring skilled mechanics, always limited in number, the heavy immobile shop equipment and the great mass of automotive supplies will be centralized in motor transport depots under the control of the Quartermaster General.

WITHIN TACTICAL UNITS

To support and extend the repair facilities of Field Artillery operating units, appropriate sized Quartermaster Motor Transport repair units are provided in the major tactical units, each of which establishes a *Motor Transport Replacement Shop*. Its functions are: (1) Replacement of unserviceable unit assemblies; (2) Minor repairs; (3) Supply motor vehicles, unit assemblies, spare parts and equipment; (4) Evacuation of unserviceable vehicles and unit assemblies. This shop should be emplaced within eight (8) miles of the organization that it serves. Its mobility should be maintained by limiting disassembly to that point from which the vehicle can be prepared for towing in eight (8) hours. Normally repairs requiring more than eight (8) hours will cause the vehicle to be evacuated to higher echelons in rear.

This 3d Echelon Maintenance shop is operated by the following units:

1. Within the Division.—A Motor Maintenance Company consisting of three (3) officers and 100 enlisted men.
2. In Corps Special Troops.—A Motor Maintenance Battalion (organization not yet decided upon) for Corps Troops.
3. In Army Service Troops.—The Maintenance Battalion for Army troops.

FOR SUPPORT OF THE COMBAT AREA

In the advance section of the communication zone a 4th echelon establishment known as a *Motor Transport Repair Depot* is allotted to each Corps.

Its functions are: (1) General overhaul of unit assemblies; (2) Advance Motor Transport Supply Depot for vehicles, unit assemblies, spare parts and equipment; (3) Evacuation of unserviceable vehicles beyond the scope of its shop equipment to a Reconstruction Depot.

A vehicle will not be repaired unless it can be put in reliable condition by using the majority of the parts of the vehicle. If the vehicle requires rebuilding or more than 200 working hours for the job, it will be sent to a reconstruction depot, where salvage is advisable when overhaul cost will exceed 35 per cent of the present value of the vehicle.

This depot is operated by a Motor Repair Battalion, an unarmed, non-combatant, non-tactical organization consisting of a headquarters and four (4) Motor Repair Companies, each consisting of 10 officers and 297 enlisted men.

Somewhat further to the rear in the communication zone than the above, *Motor Transport Reconstruction Depots* functioning in 5th Echelon maintenance are allotted at the rate of one to each army in the theatre of operations.

Their functions are: (1) Reconstruction of vehicles and unit assemblies; (2) Base Motor Transport Supply Depot; (3) Salvage and Reclamation of vehicles, assemblies and parts. They are operated by Motor Repair Battalions.

In addition to the above an establishment known as a Motor Transport Reception Depot, is provided. One or more may be allotted each theatre of operations. They are located near the rear boundary of the communication zone or at reconstruction depots. Their function is mainly the issue of motor vehicles.

FIELD ARTILLERY REPAIR SYSTEM. *Organization for Repair.*— Each administrative unit (battery and regiment) has repair facilities consisting of a limited number of mechanics, tools and spare parts. The regiment is the supply unit for its components and its supply officer obtains needed items from the division supply branches.

Battery or similar unit.—The usual allowance of repair personnel for a motorized battery or similar unit is a motor officer (often the assistant executive), assisted by a motor sergeant and two or three mechanics.

They are provided with a light repair truck (½ ton capacity) with a load of hand tools, tire repair outfit, a limited list of hardware (bolts, nuts, washers, etc.) and a small stock of spare parts. See appendix C, F.A.S. Notes, M-5. In some of the new truck-drawn units a station wagon is provided for the motor officer, a pick-up truck (½ ton) for the motor sergeant and a tender or "trouble truck" is provided for supply and towing duty.

Regiment or similar unit.—The regimental Service Battery has a motor sergeant, and for each battalion section a motor mechanic. One standard light repair truck (½ ton) is provided for use of the battery itself and the assistance of the battalions. The supply of spare parts and units and the necessary transportation thereof to and from the supply establishments in rear are the principal functions of this unit in connection with repair.

Thus it may be seen that, in general, no officers especially qualified as motor officers are provided between the battery motor officers and the technically trained officers of the supply services; nor is there a reserve of assemblies or parts or of skilled labor short of the same supply services. Since our present Service Batteries are not organized to make any material contribution to motor maintenance, there will be a great tendency for batteries and similar organizations to make the trip of six (6) to ten (10) miles to the rear and transact their business directly with the technical services. This will mean that, as organized at present, there will be nineteen (19) customers from each Field Artillery Brigade trying to get transportation back and forth to accomplish their errands to the Divisional Ordnance and Quartermaster shops, which in general will be located near railheads. In case of a completely motorized F. A. Brigade this number would be increased to 43. Obviously this would be inefficient, since it would tend toward loss of control of the vehicles involved in these errands and increase circulation difficulties. It must be conceded that, in campaign, battery and battalion commanders will have little time available to devote to the technical service which their

motors demand in order to retain a high degree of mobility. Nor will many of them have the technical knowledge or experience necessary for the required diagnosis or "trouble shooting" on which must be based the correct decisions to repair, evacuate, or abandon disabled motor vehicles.

This indicates the necessity for a limited number of specially trained officers, acting in a staff capacity, to aid commanders in their motor maintenance problems. These officers must have the necessary enlisted assistants, transportation and tools. The new light truck-drawn regiments each have a total of 320 vehicles, 62 of which are in regimental units and 129 in each battalion. The medium regiments are even larger.

The motor maintenance personnel of the divisional supply services are felt to be inadequate. The automotive section of the Ordnance Company (Medium Maintenance, Table 12W) has only two (2) officers and 48 men, while the Q.M. Motor Maintenance Company has three (3) officers and 100 men, only 50 of which are mechanics. Their location in column and during combat is necessarily such as to place them, in many cases, a considerable distance from the Field Artillery units which they are to serve. This last condition is aggravated by the traffic congestion in the rear areas of the division.

It must be remembered that in the case of the Q.M. unit, especially, they must serve the Infantry and the Division Train, a motorized unit much larger even than a completely motorized Field Artillery Brigade. In view of these difficulties it is believed that the supply services cannot render aid to the Field Artillery as promptly as, or in the volume, needed to maintain the degree of mobility which will enable tactical decisions to be carried out promptly and properly.

Limited experience in maneuvers simulating campaign conditions indicates unsatisfactory results in the form of long delays, serious reduction in the number of vehicles in operating condition and damage to vehicles due to operation while deferring indicated repairs.

SUGGESTED F. A. MOTOR MAINTENANCE ORGANIZATION ABOVE THE BATTERY

Keeping in mind the principle enunciated above, the following organization is suggested (not in detail):

For each Battalion, a Battalion Motor Maintenance Section.

Personnel.

One (1) Battalion Motor Officer—Lieutenant with automotive technical training.

One (1) Battalion Motor Sergeant—Sergeant, a good "trouble shooter."

One (1) Battalion Motor Mechanic—Pvt. 1cl. Spec. 4th Class.

Three (3) privates or privates 1cl. (1 as driver for motor officer, 1 as assistant to Battalion Motor Sergeant and 1 as assistant to Battalion Motor Mechanic.

Transportation, Equipment and Tools.

One (1) "trouble truck" or tender, six (6) wheel four (4) wheel drive of the type with which unit is equipped.

Equipment. Unit, for Light Repair Truck (less one (1) 1 motor vehicle mechanic's tool set) (See Cir. No. 4, O.Q.M.C., 7-20-33) and such cross country and pioneer equipment as would permit the towing, righting, or ditching of disabled vehicles, or their extrication if stalled. The addition of a capstan, a wrecking crane and a high pressure air tank is highly desirable.

One light repair truck, less standard load, plus one special hand tool set for personal use of Battalion Motor Officer.

Organization: Normally the Battalion Motor Sergeant. Battalion Motor Mechanic and their assistants are to ride on the "trouble truck" or tender, and drive it.

Normally the Battalion Motor Officer is to ride in the light repair truck.

Operation: This organization gives the Battalion Motor Officer flexibility for diagnosis and staff supervision and provides him with light, speedy cargo transportation to make trips to the Service Battery or to the supply services in rear, and to supervise the minor repair or rescue of all vehicles left outside of a battery column or area. He should be charged with the "wrecker" operations of the battalion and the repair of disabled vehicles too far away for the battery minor repair operations, thus permitting battery personnel to concentrate on *caretaking* (see F. A. S. Notes, M-1, Par. 7a), with a view to improved day to day condition of the vehicles. For much of the period spent in the training area these units could be attached with advantage to the regimental

unit. However, the Motor Officer and the Motor Sergeant might well be employed to supervise the drivers and maintenance training within the battalion, and in making check inspections for the battalion commander.

For each Regiment: A Regimental Motor Maintenance Section.

Personnel.

One (1) Regimental Motor Officer—Lieutenant or Captain.

One (1) Regimental Motor Sergeant—Staff Sergeant.

One (1) Motor Mechanic—per battalion in the regiment—Pvt. 1cl., Spec. 4th Class.

Privates:

One (1) as assistant to each motor mechanic.

One (1) as driver for Regimental Motor Officer.

One (1) as driver for Regimental Motor Sergeant.

One (1) as driver for "trouble truck."

Transportation, Equipment and Tools:

Two (2) light repair trucks—one (1), less standard load, plus one (1) special set hand tools for Regimental Motor Officer and (1), less two (2) tool sets, for Regimental Motor Sergeant. One (1) "trouble truck," or tender, for motor mechanics and assistants.

Load of "trouble truck" or tender: In general the equipment, tools, minor assemblies and parts necessary to operate a small mobile maintenance shop.

Minor assemblies and Parts: About 1,500 pounds of commonly used minor assemblies and parts not carried by batteries or battalions. A list of items suggested will be found in Appendix A and should consist principally of those items whose failure would cause the failure of the vehicle.

Organization: Normally the Motor Officer and his driver would ride in a Light Repair truck, and the Regimental Motor Sergeant and his driver in the other. The Regimental Motor mechanics and their assistants would ride in the trouble truck or tender. This provides a team of a mechanic and a helper per battalion.

Operation:

The Regimental Motor Officer should function in a technical advisory and supervisory capacity concerning all phases of motor maintenance within the regiment. He should be charged with

motor vehicle supply, including all dealing with the supply services, the necessary transportation of parts and minor assemblies to and from the supply service, and the operation of a highly mobile maintenance shop.

Batteries and similar units should be required to transact all business concerning motor maintenance with or through the Regimental Motor Maintenance Section. Due to the rearward location of some disabled or stalled vehicle, authority should be delegated to Battalion Motor Officers to transact the necessary business concerning them, directly with the supply services. The Regimental Motor Officer also should be charged with informing the supply services of the location of all vehicles abandoned except those that Battalion sections can deliver more conveniently to the supply services shops than to the Regimental Maintenance Section.

The Regimental Motor Sergeant has a light repair truck which enables him to do "trouble shooting" and inspection of disabled vehicles or to make trips to the supply services for his chief.

The teams of mechanics and their helpers should in general do replacement and minor repair work at the rear echelon, but may be sent out to work on disabled vehicles too far removed from batteries or beyond their capacity.

For at least part of the time during the training period some of the personnel of the Battalion Section might be attached to the Regimental Section to increase their experience in "trouble shooting" and repair.

DISCUSSION

It is believed that the Battalion unit, which might be a part of the Battalion Headquarters Battery, would serve as a rescue unit for disabled or stalled vehicles, thus preventing their loss due to battery personnel being unable to remain with them long enough.

Its repair functions should be limited to "roadside" repairs, and its cross country and pioneer equipment should assume greater importance than its repair equipment due to emphasis on its "wrecker" functions. On the other hand the Regimental Maintenance unit should establish itself promptly at the Regimental Rear Echelon and conduct very limited replacement of assemblies and

parts in extension of the duties of the 3rd Echelon Q.M. Replacement shop, and the Division Ordnance Company, Medium Maintenance. Its operations should be limited to those minor replacements and repairs which it can execute in less time than would be required to tow the vehicle back to the Divisional administrative establishments and exchange it for a serviceable one, i.e., a maximum of about eight (8) hours.

The tools and spare parts furnished the Regimental Motor Maintenance Section (See Appendix A) are adequate for light emergency jobs only. In practice this enforces a limit on the magnitude of repair and replacement jobs which can be undertaken by the section.

Conditions during the training period or in campaign may be such as to necessitate the detail of trained personnel from the regimental or battalion maintenance section to perform technical inspections in the batteries or, at least, to assist battery personnel in this duty.

The above outlines a scheme of special motor maintenance personnel paralleling the veterinary detachments of the present horse-drawn Field Artillery Regiment which are designed to assist commanders and to relieve them of technical duties in which they cannot be expected equitably to be expert. The above advocated Battalion and Regimental Motor Officers might be termed "Motor Veterinarians."

It must be conceded that it will be impossible to obtain more than a few Field Artillery Officers for a war time army, who are fitted by training and experience for duty as motor officers or "motor veterinarians." A number may be obtained from among automotive superintendents of large fleet operators, foremen of large garages, automotive service managers and such professions and occupations. To these specialists should be assigned the technical phases of our mobility problem, thus more completely freeing other officers for those duties more intimately connected with the delivery of fire.

B

PEACE TIME MOTOR MAINTENANCE

Although the peace time motor maintenance scheme as prescribed by Circular 1-10, O.Q.M.G., dated 7-31-30, and G.O. No.

3, W.D. 1933, appears to distribute maintenance activities in a logical manner, it has not proved completely successful. It is submitted that these unsatisfactory results are due to the following:

First: Failure of the supply service to maintain a proper and adequate stock of replacement units and spare parts throughout the various echelons, especially in the 2nd and 3rd echelons. Unnecessary and wasteful delays have resulted while awaiting deliveries from distant depots.

Second: Shortage of skilled personnel in 3rd echelon shops, resulting in delays at the shops.

Third: Failure of the present distribution of work to utilize properly the skilled maintenance personnel now available in field artillery combat units. Limitations on class of work to be done in second echelon, combined with serious shortage of replacement units and spare parts in 2nd echelon shops, results in overload of 3rd echelon shops with work which could be accomplished efficiently by 2nd echelon personnel.

Fourth: Especially long delays result at stations where it becomes necessary to remove assemblies and ship by freight to higher echelons for replacement. (Six to eight weeks.)

Fifth: Restrictions imposed by the above mentioned regulations and their application in practice have resulted in serious reduction in the practical training and experience of F. A. automotive repair personnel, both commissioned and enlisted.

Sixth: Failure to utilize stockage of parts in the hands of nearby dealers or the use of the manufacturers' unit exchange or unit reconditioning plan.

The following solution is offered for the peace time problem:

Provide the Motor Maintenance Organization mentioned above at least in the 11th F. A. Brigade in Hawaii and the 1st F. A. at the Field Artillery School as an experiment.

Add the following items to the list of tools to be provided a Regimental Motor Maintenance Section (see Appendix A):

1 Cylinder boring bar.
1 Set, Hone—piston pin.
1 Set, Reamers, adapted to vehicles issued.
1 Connecting rod aligner.

1 Valve refacing and reseating kit.
1 Set, Gear and bearing pullers.

This Regimental Motor Maintenance Section should be granted authority to draw from the appropriate supply branch any parts needed for a vehicle under authorized repair. This authority, being granted for garrison service only, would assist materially in determining the limitations upon repair to be granted to this unit during an emergency. While the possession or use of these additional items would not be advisable in war, it would enlarge the scope of the peace time training of our maintenance personnel with a view to meeting more completely the mobilization mission of the unit.

With a view to better 3rd and 4th echelon maintenance in peace time, it is suggested that a Unit Exchange or Reconditioning Plan such as offered by the Ford Motor Company and the Allis-Chalmers Mfg. Company be more commonly applied to the newer equipment. Also time may be saved by obtaining the necessary parts and units from the local dealers or from the stockage under control of the manufacturers' zone offices.

Economy of lost vehicle time may be effected at some stations by the following scheme in the case of those vehicles on which unit replacement is to be practiced and units and parts are stocked by the supply services.

When it becomes apparent that a unit assembly should be replaced in the near future, requisition therefor should be submitted to the appropriate 3rd and 4th echelon shop.

Upon such requisition the 3rd and 4th echelon shop will forward the complete serviceable assembly called for.

Upon receipt of this serviceable assembly the 2d echelon shop will make the installation and, if the unserviceable assembly replaced is worth the transportation expense, it will be shipped to the 3rd and 4th echelon shop from which replacement was received.

APPENDIX "A"

Assemblies and parts suggested for Regimental Motor Maintenance Section:

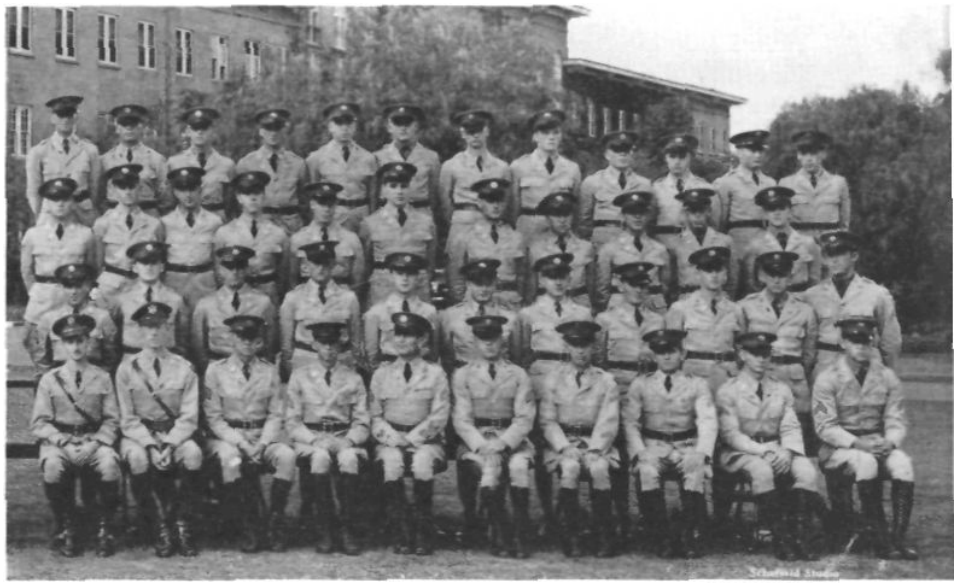
Three (3) batteries. 6 or 12 volt as required.
Three (3) ignition coils.

Three (3) distributors (complete).
Twelve (12) condensers.
Three (3) carburetors (complete).
Three (3) Bendix drive units (if used on vehicle issued).
Four (4) springs, front (complete).
Four (4) springs, rear (complete).
Three (3) radiators (complete).
Three (3) oil pans for engines.
Six (6) fan belts.
Twelve (12) spark plugs.
Three (3) Magnetos, if used.
Three (3) fuel pumps.
Thirty (30) feet gasoline line.
Three (3) water pump assemblies.
Three (3) sets wheel bearings.
Six (6) wheel bearing oil seals.
Four (4) wheel spindles (light passenger vehicle).
Three (3) generators.
Three (3) starting motors.
Three (3) gaskets—cylinder head.
Three (3) gaskets—oil pan.
Three (3) mufflers.
Three (3) drain plugs—oil pan.
Three (3) switch assemblies.
Six (6) mending devices—gas tank.
Three (3) battery cables.
Three (3) radiator caps.
Six (6) wheel nuts.
Three (3) pairs lenses—headlight.
Three (3) axle shafts—if of type easily and quickly installed.
Standard hardware—parts common (nuts, bolts, clevis pins, etc.).
Any other items especially needed on the type vehicle in use.

Equipment and Tools suggested for Regimental Motor Maintenance section:

One (1) chain hoist per battalion heavy enough to hoist either front or rear of any vehicle in the unit or any contained assembly.
One (1) wheel alignment set.
One (1) small gasoline driven electric generator and lighting set.
One (1) electric drill capable of carrying at least ⅝″ bit.
One (1) portable crane.
One (1) portable welding outfit.
One (1) battery charging set.
One (1) heavy duty socket set.
One (1) air compressor, portable, motor driven.
One (1) Unit Equipment for light repair truck less tool sets.
One (1) Motor vehicle mechanic's set for each motor mechanic.

THE 1934 KNOX



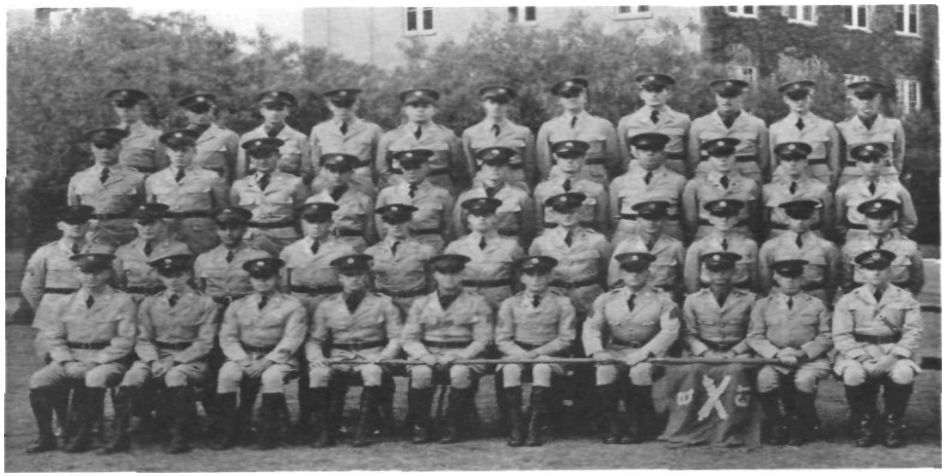
BATTERY "B"

The Chief of Field Artillery, Major General Upton Birnie, Jr., has announced that the Knox Trophy for the year **1934** has been won by Battery B, 13th Field Artillery, stationed at Schofield Barracks, T. H., Captain John W. Faulconer, Jr., commanding.

The Knox Trophy is presented annually by the Society of the Sons of the Revolution in the Commonwealth of Massachusetts to that battery of the Regular Army Field Artillery which has the highest rating in efficiency—this rating to be based on firing efficiency, tactical mobility, proficiency in the use of Field Artillery means of communications and on interior economy.

The batteries selected to represent the commands of which they form a part and to take the competitive test for the Knox Trophy were:

TROPHY BATTERY



13th FIELD ARTILLERY

1st Corps Area—Fort Ethan Allen, Vermont—Battery B., 7th Field Artillery.
2nd Corps Area—Madison Barracks, New York—Battery A, 5th Field Artillery.
3rd Corps Area—Fort Hoyle, Maryland—Battery C, 6th Field Artillery.
Fort Myer, Virginia—Battery C, 16th Field Artillery.
4th Corps Area—Fort Bragg, North Carolina—Battery C, 17th Field Artillery.
Fort Benning, Georgia—Battery C, 83rd Field Artillery.
(Infantry School).
5th Corps Area—Fort Benjamin Harrison, Indiana—Battery B, 3rd Field Artillery.
6th Corps Area—Fort Sheridan, Illinois—Battery D, 3rd Field Artillery.
7th Corps Area—Fort Riley, Kansas—Battery E, 18th Field Artillery.
(The Cavalry School).
Fort Des Moines, Iowa—Battery F, 80th Field Artillery.
8th Corps Area—Fort Sam Houston, Texas—Battery F, 12th Field Artillery.
Fort Sill, Oklahoma—Battery C, 18th Field Artillery.
(The Field Artillery School).
Fort Francis E. Warren, Wyoming—Battery B, 76th Field Artillery.
Fort Bliss, Texas—Battery B, 82nd Field Artillery.
9th Corps Area—Fort Lewis, Washington—Battery A, 9th Field Artillery.
Presidio of Monterey, California—Battery E, 76th Field Artillery.
Hawaiian Department—Schofield Barracks, T. H.—Battery B, 13th Field Artillery.
Panama Canal Department—Fort Davis, C. Z.—Battery B, 2nd Field Artillery.

REMARKS FROM THE WINNING BATTERY COMMANDER

CAPTAIN JOHN W. FAULCONER, JR.

Prior to July, 1934, no member of the Battery had given serious thought to competing for the coveted Knox Trophy. By this time, however, the organization had reached a high state of training and discipline and was in good condition to start the tests.

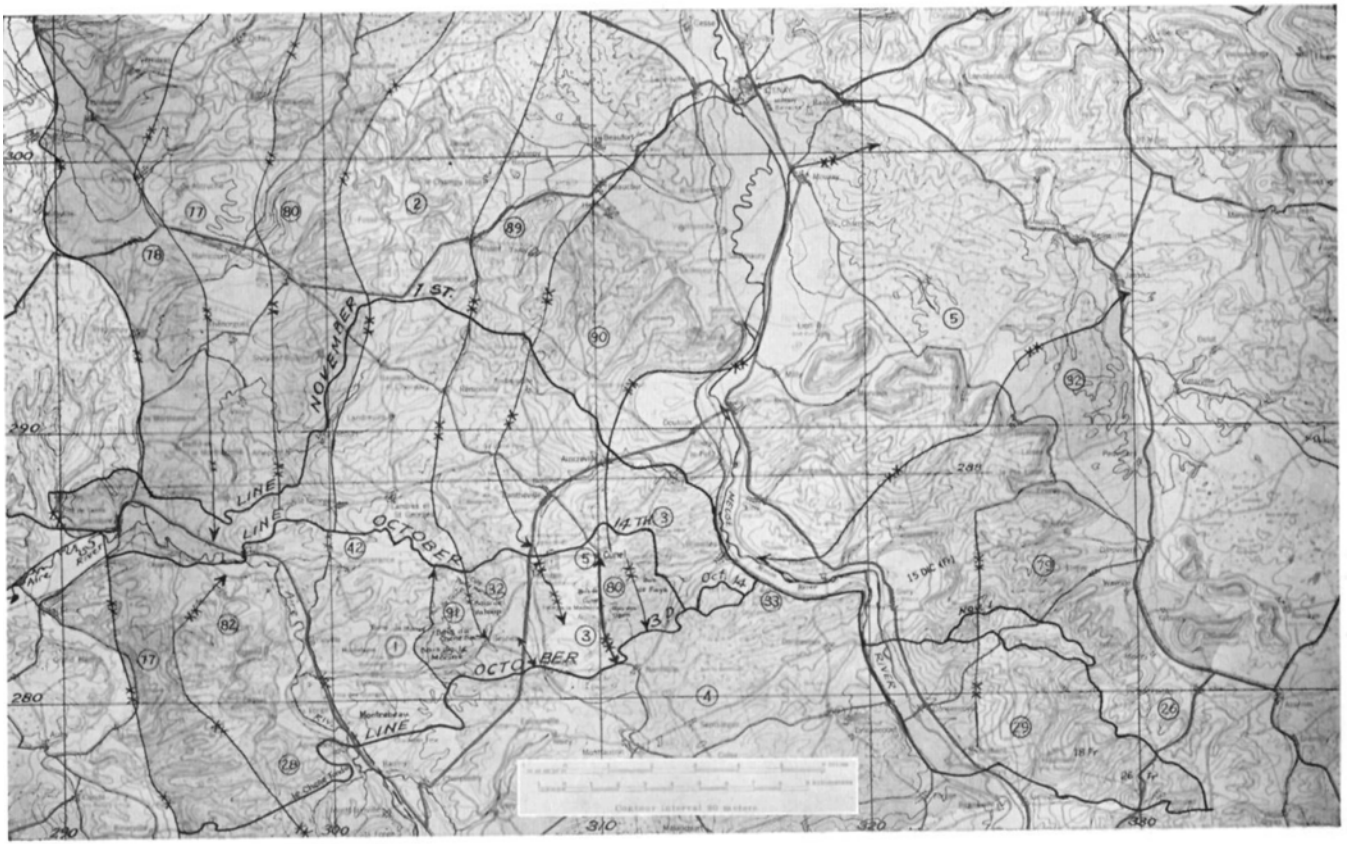
Before obtaining the right to represent the 11th Field Artillery Brigade in the Army test the Battery had first to win in the inter-battalion, regimental and brigade competitions. This it succeeded in doing, although winning in more than one instance by only a narrow margin. These competitive tests, based on prior Knox Trophy test requirements, proved to be of great value. Officers and men became accustomed to working in the presence of field officers, observers and recorders; and due to these rehearsals stage fright and "buck fever" were largely eliminated. Special attention was given to correcting errors made in each set of tests and as a consequence in each succeeding competition our grades were substantially improved.

To Lieutenant William J. Thompson, Reconnaissance Officer and also Acting Executive during several of the tests, too much credit cannot be given. This officer had served in the Battery almost three years and his intelligent training of and work with the

detail had developed that unit to a superior state of training and teamwork. Lieutenant Glenn B. McConnell, who joined just prior to the Brigade test, rendered valuable assistance as Battery Executive and fired excellent problems in both the Brigade and Army firing tests. Credit is also due Lieutenant Roger Goldsmith, who served in the Battery as Executive until July, 1934. But for the excellent work of these officers and the whole-hearted spirit of co-operation of every man in the Battery the Trophy could not have been won.

The Knox Medal, awarded by the same Society for excellence as an enlisted student at the Field Artillery School, was won this year by Corporal Roy L. Albright, Headquarters Battery, 2nd Battalion. 15th Field Artillery, stationed at Fort Sam Houston, Texas. Corporal Albright is a graduate of the Cairo, Illinois, High School and attended the Texas A. and M. for three years. He enlisted in the 15th Field Artillery in 1931 and was appointed Corporal a few months later. He is a graduate of the Second Division Radio School and holds a first-class amateur operator's license. Of Corporal Albright his battery commander says: "He is undoubtedly one of the best qualified radio technicians that I have ever seen in the service. He is every part a soldier and possesses all those qualifications that make him an outstanding Non - Commissioned Officer. We are all very happy to have such signal honor bestowed on a member of the Fifteenth Field Artillery."

CORPORAL ROY L. ALBRIGHT, HEADQUARTERS BATTERY, 2ND BATTALION, 15TH F. A.


NOVEMBER 1 ST. LINE
OCTOBER 14TH LINE
OCTOBER LINE
Oct 14
Contour interval 20 metres

THE BATTLE OF BUZANCY

BY COLONEL CONRAD H. LANZA, Field Artillery

(Continued from the November-December, 1934, Journal)

THE BATTLE

THE ALLIES

5.30 A. M., November 1, 1918, was H hour and D day for the attack of the First Army toward the Buzancy area. The paper strength of the First Army was very nearly 600,000 Americans plus 100,000 French. In this attack no tanks were available.

The front line was Grand-Pré (incl)—Bois des Loges (excl)—St. Georges (excl)—Landres-et-St. George (excl)—Bois de Bantheville (incl)—Aincreville (incl)—Brieulles (excl).

To obtain prompt information as to the progress of the front line, the Army detailed liaison front line parties for about every kilometer of front. The officers in charge were furnished baskets of pigeons and directed to march in the front line along coordinates assigned them. They were to release pigeons immediately after H hour, stating that the infantry had jumped off, if such was in fact the case. Thereafter they were to send hourly pigeon messages, giving coordinates and adding information as to any targets they could see.

The artillery preparation started at 3.30 A. M. The quantity of artillery ammunition fired during the two hours the preparation lasted was approximately:

130,000 rounds of 75mm	roughly 1,000 rounds per minute
87,000 rounds of heavier calibers	roughly 725 rounds per minute

This fire was not evenly distributed but it averaged per kilometer of front, 20 rounds per minute, or one round every minute for each 50 meters front for two hours. This rate of fire was continued until about 8.30 A. M., after which it fell off as the front of the attack gradually narrowed and became further away from batteries. During the last phase of the attack, the front of the V Corps and part of the III Corps was supported by heavy artillery only, the terrain fought over being beyond the range of the light batteries. The I Corps used its artillery mainly to fire concentrations on selected targets believed to cover enemy units;

the V and III Corps employed their artillery to fire concentrations over extensive areas any part of which might contain enemy units.

Until 7.00 A. M. it was dark, daylight not arriving until after that hour. The attack which started at 5.30 A. M. had, therefore, 1½ hours before daylight. The day was foggy, rainy and misty. The OPs were completely unable to follow the action at any time and of course saw no targets. The liaison officers carrying the pigeons saw no targets either but some of them did report their positions in the front line and this information enabled the command posts to partially visualize the progress the infantry was making.

At 5.30 A. M. the infantry jumped off. With the exception of the right regiment of its right division (the 80th Division), the I Corps was quickly stopped by severe artillery, trench mortar and machine gun fire. When day broke, the Corps shifted its artillery fire to some new locations believed to be the probable location of the enemy. A heavy machine gun barrage was placed upon the south edge of the Bois des Loges and spurs to the west of it. At the same time the road from Briquenay to le Morthomme was placed under zone fire by the 78th Division artillery. About 8.00 A. M. the 309th and 310th Infantry each with two battalions in line attacked the Bois des Loges, but were stopped by an artillery barrage and machine gun fire before they reached the wood. They dug in, to wait for the 77th Division on their right to take Champigneulle, and thus outflank the enemy in their front.

The 77th Division heavily shelled Champigneulle, until it appeared impossible for any one to still be there. But when the infantry advanced it was unable to reach this village, as they received artillery and machine gun fire from several directions at once. In the fog they were unable to locate where this fire originated. Noting the failure of the 77th Division to take Champigneulle, the 78th Division again savagely shelled the south edge of the Bois des Loges, after which the infantry again advanced about 10.00 A. M., only to break down before they could reach their objective. Heavy fire continued thereafter throughout the day without serious efforts to advance the infantry lines

which were on open ground north of the Aire River. After 12.00 Noon the terrain became visible to the OPs. The advance which had been difficult when the visibility was poor was now much more so when the visibility was good. The American OPs were on the high ground south of the Aire and had excellent observation during the afternoon. Consequently a large number of problems were fired against terrain features assumed to shelter enemy organizations, such as edges of woods and villages, ridge lines, etc. No real targets were seen. At 6.00 P. M. the 310th Infantry in a final effort succeeded in entering the Bois des Loges but was unable to progress into it. The 309th Infantry was not able to advance even as far as the wood.

The 80th Division attacked on its left the Ravin des Pierres. This ravine had been particularly well shelled during the artillery preparation. Nevertheless the infantry in their initial attack failed to reach the ravine, their attack being stopped within twelve minutes. The infantry soon recognized that the enemy held a line in front of the ravine, not in it. This information was sent to the rear, but the OPs were not able to identify the opposing forces in the fog. After suffering severe losses for over four hours, the infantry at about 9.40 A. M. advanced, drove in the enemy and occupied the ravine. It was now discovered that the enemy had a second infantry line parallel to and beyond the ravine. After some delay this line (as well as woods beyond) were brought under our artillery fire. However, the infantry was unable to make a material gain.

The 319th Infantry, the right regiment of the 80th Division, made slow progress from the start. It was aided by the advance of the 2nd Division on its right. This regiment reached the first rest and reorganization line at about 9.30 A. M., instead of at about 7.40 A. M. At 9.40 A. M. it started from this line from southeast of Imécourt, being about 2,000 meters in rear of the main barrage. At about 10.10 A. M. it came under direct fire of enemy light artillery located on a ridge estimated to be about 2,000 meters away. The infantry stopped. Almost immediately, the hostile artillery was caught by the main barrage of heavy artillery and put out of action. The infantry again moved forward and in the early afternoon reached its objective southeast

of Buzancy. Its left was completely in the air as the troops which should have been on the left were back in the Ravin des Pierres. About 5.00 P. M. an attempt was made to advance into Buzancy but this broke down under hostile machine gun and artillery fire. During the advance this regiment, together with the left of the 2nd Division, captured several hostile batteries east of Imécourt which had not fired a shot. The prisoners taken stated that our artillery preparation had prevented them from serving their guns at any time and that they had been unable to leave their shelters before our infantry arrived.

The 2nd Division jumped off on time and thereafter followed the barrage very closely on schedule throughout the engagement. Landres-et-St. George was found to be completely reduced by the artillery preparation and made no resistance, about 1,000 prisoners surrendering at this point. The division received considerable enemy artillery fire from heavy calibers but not enough to delay the forward movement. The enemy was largely demoralized by our heavy artillery barrage and 1,300 more prisoners were taken, together with 75 guns, being all the light artillery of the opposing enemy division. The Bois de Hazois was occupied on time with only slight opposition. This was found to have been shelled so thoroughly with HE and gas that the enemy was in no condition to fight.

The 89th Division also kept on schedule during the entire attack. They made a point of following the barrage closely without regard to other missions. They found the German machine gunners cowered in fox holes under the effects of our heavy barrage. Some of them were killed by this fire but for the main part they were killed or captured by the infantry before they could get their machine guns out of the holes and into action. The enemy artillery also reacted strongly in this sector during the early part of the engagement but this fire fell more and more to the rear, inflicting damage principally on reserve infantry and batteries. As the advance progressed, enemy batteries were captured which had been put out of action by the main barrage. The enemy artillery reaction consequently became steadily weaker until it disappeared. Shortly after 10.00 A. M. two companies lost the barrage west of the Bois d'Andevanne, due to enemy

artillery fire. This caused these companies a twenty minutes' delay, but they recovered their barrage on the next rest and reorganization line. This was the only delay in the division.

The V Corps had one battalion of 75mm guns as accompanying guns. This battalion followed a short distance in rear of the infantry lines from 5.30 A. M. until 1.00 P. M. It never fired a shot, as due to fog, mist and smoke it never saw any targets; for the same reason it had only slight casualties. While this battalion was useless during the attack, it became very useful immediately afterwards. Taking position with OPs on the high ground beyond the Bois de la Folie and the Bois de Barricourt, the battalion fired many problems with apparent good effect against numerous small enemy targets. For several hours it was the only artillery we had right on the new front. This was one of the rather rare occasions where the OPs were able to adjust fire on real targets. Towards evening light batteries came up everywhere, as well as a reasonable number of 155mm howitzer and GPF batteries.

The 90th Division made progress from the first. It was able to closely follow the barrage and kept on schedule. Enemy artillery reacted in this sector severely but fell largely on rear areas where it did considerable damage to CPs, OPs, batteries and other elements which the enemy had probably located before the battle. Not until about 10.30 A. M. was there any deviation from the established plan. At this time the infantry in front of Andevanne was held up for about twenty minutes by artillery and machine gun fire. The troops to the right and left moved forward on time and the enemy abandoned Andevanne. The infantry occupying this town and regaining their barrage at the next prescribed rest and reorganization line. When the division reached the Bois de Barricourt it found two abandoned enemy batteries. Prisoners taken stated that the artillery fire had caused the personnel to flee, as they were unable to stand the terrific shelling from our heavy guns. This division was the only one to encounter a regular barbed wire entanglement. This caused no delay, as it had been sufficiently cut by the main barrage of 155mm guns and 8-inch howitzers as it rolled across.

The 5th Division had no special difficulties. It followed the barrage closely and reached its objective on schedule time.

By 1.00 P. M. the V Corps and the III Corps with a fraction of the I Corps were on the objective as indicated in the army plan and the battle was virtually over. The I Corps, with the exception noted, had secured only a slight advance. Although the troops had been told that the objectives announced in orders were minimum objectives, except in the Bois de la Folie, no troops attempted to proceed beyond. In this Bois troops advanced to the north edge which was used as OPs for the artillery. Our casualties this day were 4,464 killed and wounded.

The line reached was Grand-Pré (incl)—Bois des Loges (excl) Champigneulle (excl)—Ravin des Pierres (incl)—St. Georges (incl)—Imécourt (incl)—Sivry-les-Buzancy (incl)—Bois de la Folie (incl)—Bois de Baricourt (incl)—Andevanne (incl)—Aincreville (incl)—Brieulles (excl).

THE GERMANS

The force on the east bank of the Meuse, against which our battalion of 75mm guns had attempted gas neutralization, was the 1st Austrian-Hungarian Division. Their reports do not indicate that they noted this shelling until October 19, on which day 21 men were gassed. No casualties occurred on the 20th, but on the 21st, 8 officers and 124 men were lost. On the next day, 2 officers and 58 men were gassed; and on the 23rd, 9 officers and 165 men. The batteries of the Division were now in part withdrawn to positions beyond the area being shelled. Due to lesser personnel, losses decreased, but amounted to

On October 24, 1 officer and 84 men gassed.
On October 25, 4 officers and 85 men gassed.
On October 26, 27 men gassed.

It was impracticable to further continue to serve the artillery in this area and the remaining batteries were withdrawn.

On October 25, the Air Service furnished photographs of the American positions between the Meuse and the Argonne. These photographs showed positions of 43 new advanced battery positions. On the next day some more battery positions were discovered and great activity was observed. The Third and Fifth

Armies issued warnings that within the next few days enemy attacks were to be expected in the area west and probably east of the Meuse. The American battery positions noted were not at the time fired on, as it was believed that if this were done, the batteries would change positions and might not again be located. Instead, firing data was prepared and targets allocated for use whenever the American attack took place. Most of the German artillery firing on November 1 was directed against these and other targets in rear of the front which had been found through examination of air photographs.

The harassing fire, fired by the American artillery prior to the battle, caused considerable losses. On October 27, Briquenay and le Morthomme were destroyed by fires started by Allied artillery. On the same day, Landreville and Imécourt were gassed during the morning while during the afternoon, the area north of Landres-et-St. George received severe artillery fire. During the night the enemy artillery fire was so heavy that it was reported as a barrage. On the morning of the 28th, methodical artillery fire of a serious nature was reported by the 41st Division as on all villages back from the front line as far as Buzancy, inclusive. In the afternoon the XXI Corps and the east edge of the Argonne Forest were reported as gassed. On the 29th, the Bois de Hazois was particularly heavily shelled during the morning.

On October 29, the American artillery caused such heavy losses in the 107th Division that the Fifth Army appointed a Board of Officers to investigate and fix the responsibility for this. It was ascertained that a battery, temporarily halted, had suddenly come under a terrific artillery concentration. A battalion of the 392nd infantry, billeted in woods adjacent to where the battery had halted, came under the same fire and lost heavily from bursts on trees. In all, this division lost 9 officers and 200 men on this day from gas shells; while the losses from the HE shells of large calibre were so great that at the end of the period the three infantry regiments together had only 722 men left present for duty.

On October 30, the 76th Reserve Division lost heavily, while in the ensuing night, the 169th Infantry, 52nd Division, lost

150 men from hostile artillery fire. On October 31, the 76th Reserve Division, occupying the east edge of the Argonne, reported that the persistent gas shelling by the enemy artillery had caused "unheard of losses" and that several batteries could no longer be served.

During this period the artillery of the 15th Bavarian Division lost so heavily from enemy harassing fire, that all batteries were manned with reduced numbers. Some batteries had only 30 to 35 men present for duty and could not properly handle their guns with such a small number of men. The Division made a general change of battery positions to avoid their being shelled, which they attributed to some uncanny knowledge by the enemy of their locations.

On October 30, new bridges across the Aire near Grand-Pré were observed by the Air Service; while air photographs taken showed 38 more new battery positions near Romagne-sous-Montfaucon and Cunel. A prisoner taken about 8.50 P. M., near Landres-et-St. Georges gave information as to a coming attack.

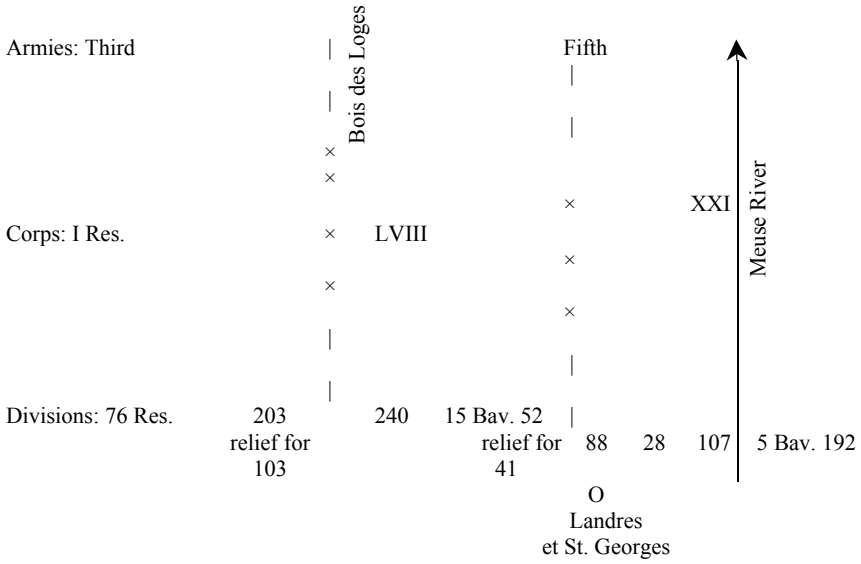
Beginning on the 28th, enemy interdiction fire destroyed lines of communication and blocked the ravines leading up from the low ground east and northeast of the Cotes de Meuse. West of the Meuse this became very serious, as it prevented the orderly supply of ammunition and stores to the forward areas. By November 1, some batteries and machine gun companies were completely out of ammunition, while the lack of rations affected the morale of the organizations in line. East of the Meuse, the enemy interdiction fire had only a minor effect, for while it here also blocked the established lines of communication and supply, an energetic corps commander abandoned these lines without delay and opened detours up the ridges between the ravines which were under steady shell fire. This worked—the ridge lines of communication and supply were at no time fired on.

On October 31, trails were noted by air photographs in increasing numbers within the enemy lines and close to their front. Tank tracks were seen, but only in rear areas. From a consideration of the location of the enemy battery positions, it seemed probable that the main weight of the coming attack would be toward hill 278 (2 kilometers southeast of Buzancy) and the Bois

d'Andevanne. This was considered as natural, as there were no terrain obstacles in this sector, such as the l'Andon brook afforded to the east.

A German report for the period ending October 31, states the Germans could always distinguish American artillery fire by certain characteristics. For instance: harassing fire was delivered with much more system and regularity than by the British and French, being put down at uniform intervals of time, as every fifteen minutes, or every half hour; that it was more concentrated than the fire of the others in the sense that it was delivered against critical points, such as road crossings, headquarters, etc., while the other Allies fired more promiscuously; the American artillery made it a point to locate and to fire on the higher headquarters, thereby making life a burden for the staff.

On November 1 the German order of battle was:



All divisions were below strength and morale was poor. There were no troops in reserve available for counter-attacks. The plan adopted was to defend the position held. The front line avoided features of the terrain indicated on maps. The infantry was deployed in one or more thin lines, which in general were in open country offering some field of fire for infantry weapons. Each line consisted of about 50 men per kilometer arranged in an irregular manner both as to interval and depth, each man being

in an individual fox hole or converted shell hole. Practically every man had a machine gun or automatic rifle.

At 3.30 A. M. November 1, a terrific shelling, obviously an artillery preparation, started to fall over extensive areas along the front and in rear thereof. All roads, villages and woods, to a distance of 7 to 10 kilometers back from the front appeared to be covered. With few exceptions telephone lines went out. This was a great handicap to the defense, as it prevented the transmission of orders and of information. The situation was worse, as due to the shelling received on preceding days, the telephone lines had been so often cut and seriously damaged, that there was a want of necessary material. The personnel had become so disheartened by the constant interruption of lines that many batteries had not attempted to reestablish communications. Knowing little of the progress of the battle, unable to see any targets, subject to a most severe shelling by large caliber pieces, the personnel in large numbers, having nothing to fire at, abandoned the gun positions and sought shelter wherever they could. Many batteries never fired a round. Those that did fire, fired generally on those enemy targets which had been discovered before the battle and for which firing data had been prepared in advance.

At 5.30 A. M. the front line infantry noted the commencement of the Allied rolling barrage and sent up green rockets, calling for the defensive barrage. Due to fog, these signals were not everywhere observed. Some OPs did see the signals but had lost their telephone connection and could not transmit the information. Thereafter, due at first to darkness, then to fog and mist and the general lack of communications, practically no information reached the artillery as to the location of the enemy infantry or other targets.

The 192nd Division, in line just east of the Meuse, with instructions to use its artillery to enfilade any Allied attack across the river was unable to accomplish this mission. It reported that "almost all its artillery was completely put out of action within the first hour" and was not available after 4.30 A. M. for assisting in repulsing the hostile infantry's attacks.

The 103rd Division, north of Grand-Pré, was in process of being relieved by the 203rd Division. No serious infantry attack

developed in this sector but both divisions suffered casualties from artillery fire. The 203rd Division was moving into position at 3.30 A. M. when it was caught by the artillery preparation. At 5.00 A. M. one battalion of the 409th Infantry was scattered by a sudden burst of enemy fire of heavy calibers, all the automatic rifles being lost due to a direct hit by a large shell in the combat train. The same regiment had its colonel and adjutant wounded by shell fire when hours late, it finally arrived about 11.00 A. M. at its new CP.

The 240th Division defended the Bois des Loges, principally by machine guns posted on high ground near the center of the wood. As the Bois is located on a hill having a concave slope, it was practicable to fire from the middle of the wood on the south edge and on the open ground beyond. The enemy savagely shelled the edges of the wood with HE and gas, but the main line escaped this fire. About 6.00 A. M. an infantry attack in what appeared to be massed columns developed; this was broken, before it could reach the wood, by rifle and machine gun fire. At 9.00 A. M. another attack came. With the help of batteries still in action, this attack was stopped with severe enemy losses. An officer from the American 78th Division was captured and was found to have in his possession a map showing the plan of battle of the First American Army with the objectives marked thereon. The information on this map was immediately transmitted to higher headquarters and was known to the Third Army by noon. The enemy once more submitted the south edge of the Bois des Loges to an intense shelling. About 11.45 A. M., by which hour the visibility had become fair, a rolling barrage containing considerable smoke, preceded another infantry attack. Under machine gun and artillery fire, this attack also broke down with heavy losses to the enemy.

The 15th Bavarian Division came under severe fire from about 5.00 A. M. Much of the fire fell on Champigneulle and in the Ravin des Pierres, neither of which places were occupied. The Ravin was defended by infantry lines in front and in rear of the ravine. They were close enough to it to receive a considerable amount of fire and they suffered severe casualties. After repulsing attacks, the front line was forced in at about 10.00 A. M.,

but the second line held. About 11.00 A. M. the enemy entered Champigneulle. This town was defended by squad posts arranged in a rough semi-circle around it; this loss was not important.

The 41st Division holding Landres-et-St. George was completely overwhelmed by the artillery preparation and made no serious resistance. The artillery support disappeared early and the infantry fled to shelters, or to the rear, to escape the dense concentration of heavy caliber shell. No effective opposition was offered. The 52nd Division, which was in process of relieving the 41st Division, was equally involved in the disaster, both infantry and artillery abandoning their weapons and positions. Some batteries of this division had all their men under cover from the commencement of the artillery preparation at 3.30 A. M. and they had no time to regain their guns after the tail of the barrage passed over before the enemy infantry arrived.

Until about 8.30 A. M. the 41st and 52nd Divisions managed to retain some semblance of line while withdrawing, but about that hour the line began to disintegrate. About 9.00 A. M., in spite of the efforts of their officers, men in thick crowds passed through the positions of the division artillery going toward Bayonville et Chénnery and yelling "the Americans are coming." Artillery officers tried to rally these men on a crest northeast of Imécourt and in front of the battery positions. As fast as men were posted in one place, they broke in another. In order to stiffen the infantry, battery commanders in one battalion of 77mm guns, were ordered to advance one gun to the crest for direct fire. The guns got there, but even this did not help. The infantry crumbled away more and more, although at the time only light artillery shells were falling and no targets could be seen anywhere. Finally only two automatic rifles were left to represent the division infantry and these soon disappeared, leaving the artillery alone to hold the front. The gunners offered to fire at their own infantry, but were prevented by their officers from so doing. About 9.45 A. M., the fog having partly lifted, enemy infantry in line was observed coming over a crest about 1 kilometer east of Imécourt and to the south thereof. The guns on the crest opened fire and the batteries were at once brought in; together they apparently stopped the enemy advance. Just when this had happened,

an intense barrage of all calibers came out of the creek bottom in front and took twenty minutes in passing over the positions. This rendered further resistance impossible, as the gunners in turn ran away and the entire front was abandoned without further resistance.

It had been arranged that the command from the 41st to the 52nd Division would pass at 12.00 Noon, both division commanders being at the Chateau Belval. At the time the command passed, the new commander found that the light artillery of both divisions, over twenty batteries, was completely lost and the infantry so dispersed that no organized body could be found over a front of ten kilometers. The division staffs were sent out to rally any men they could locate. By 4.00 P. M. they succeeded in assembling some small detachments along the line Buzancy—Nouart, both inclusive. They were able to do this as the heavy shelling had ceased about 1.00 P. M., after which no infantry attacks had been reported. But at about 5.00 P. M. an attack developed against the southeast edge of Buzancy, made by what appeared to be about two companies of American infantry. This attack was not supported by artillery fire, and although not over thirty men were available to oppose it, the attack was stopped. Luckily, no other hostile movements developed, as the line could not have been held against any real advance. The only men left to defend the front opposite the division CP were the orderlies and officers on duty there. Otherwise there was a 10 kilometer gap open to the enemy. The staffs continued to function, without any reserves and notwithstanding that they were so close to the enemy that infantry fire fell on them.

In the 88th Division, a hostile artillery shoot fell on the 426th Infantry about 11.00 P. M. October 31, the night before the battle. Several companies lost half of their strength of 80 men. The morale of the remainder of the men was so lowered that when the artillery preparation began to fall upon them at 3.30 A. M. the men were nearly useless. Due to these causes and the succeeding fire, the infantry offered but little opposition. The infantry line lay in an open ravine and many of the machine guns were put out of action by the heavy artillery barrage. The men of the division artillery had nearly all fled and there was

little artillery support. The American artillery preparation was so severe that the cannoneers were unable to man the guns. What was left of the infantry was in no condition to make an effective resistance.

After losing all the front line positions, the division commander endeavored to use his reserve infantry battalions in the Bois de Barricourt to defend that position. There was a good field of fire to the front but due to fog and mist, objects could only be seen a few hundred yards away. Two light batteries were in direct fire positions in the south edge of the wood. This came under severe fire from heavy artillery about 10.30 A. M., which fire continued for about forty minutes. This caused the infantry to break, as they suffered seriously, and could see no targets at which to fire. By strenuous effort the men were rallied and led back, when about 11.30 A. M., a triple barrage of very heavy artillery broke the resistance and the men streamed back and were not again rallied until they had covered several kilometers to the rear. The two light batteries lost most of their personnel and their sights, quadrants and equipment. One gun was overturned, one caisson exploded; but the remainder of the materiel was not badly damaged. It could have been used after cleaning off the sand and dirt thrown over it. The pieces were, however, taken by the enemy. One battery in the center of the wood attempted to withdraw. It brought up the teams only to lose every horse, caught in the heavy barrage.

The battle was virtually over by 1.00 P. M. Having ascertained the Allied plan from the captured man and having considered the large gains won from them by the French Fourth Army together with the serious losses suffered by the Fifth Army, which turned their left flank, the Third Army at 2.45 P. M. ordered their front withdrawn, after nightfall, to the line, Autruche—north of Harricourt—Bar—Buzancy. At 3.50 P. M. the Fifth Army issued a similar order, directing a withdrawal to the same line extended east. The withdrawal commenced in front of our I Corps about 8.00 P. M., was unobserved and was made in an orderly manner during the night. The Fifth Army had lost so heavily that they had little to withdraw. Their difficulty was to establish any kind of a line until reenforcements

arrived. What men they had, almost without artillery, silently withdrew during the night. Neither Army was interfered with by enemy action, except as to a limited amount of fire on main roads. At such places detours were arranged.

This battle was one of the greatest defeats Germany had ever had.

COMMENTS

Both Infantry and Artillery Training Regulations, before and during the World War, stressed the point that the main mission of the artillery was to support the infantry by firing on such targets as were at any moment most dangerous to the success of the infantry. Regulations were obscure as to how the artillery was to decide what were the targets most dangerous to the infantry and who was responsible for deciding this, also how the targets were to be located. Many felt that "the infantry" would indicate from time to time, targets which they desired the artillery to fire at, especially so before an attack. They believed that the artillery would have as its main task, the complying with such requests. During the early part of this war, field orders habitually prescribed that the artillery would promptly fire at targets indicated by "the infantry," without stating who in the infantry was charged with this duty. Neither was it clear how the infantry was to communicate the desired information to the artillery. It seemed to be expected that the artillery liaison officers would somehow find out from the infantry, to which they were attached, what were the most dangerous targets, would accurately locate these and would transmit this information to their respective artillery units. Regulations provided for the artillery liaison officer, firing his battery, from the infantry front line, by telephone, on targets which it was presumed he would see best from his position.

Where battles were prepared in advance, from stabilized positions, and where the terrain in front of the lines had from long observation and contact, become intimately known, as well as the enemy organization, it was possible to determine in advance what the targets were that the artillery should fire at, and sometimes possible for the artillery liaison officer to fire problems from the front line trenches.

Time and experience later indicated that this system would not work in open warfare, where the troops were not familiar with either the terrain in their front or with the manner in which the enemy occupied it. There were no elaborate works to indicate where the defense line might be. Its location could, in general, only be guessed at. In any case it was so easy to change a line consisting only of fox holes that it frequently moved. If too badly shelled, the infantry moved and it was never known in advance just where the enemy infantry was located. Generally the enemy had no line. He occupied an area in depth to a distance of possibly several kilometers, which contained elements arranged in an irregular and changing manner.

It was almost impossible to locate hostile artillery. It was usually posted in defiladed positions. The light batteries sometimes changed their positions daily if any firing had occurred; heavy batteries changed positions as soon as there was any indication of a possibility of their location having been noted by the enemy.

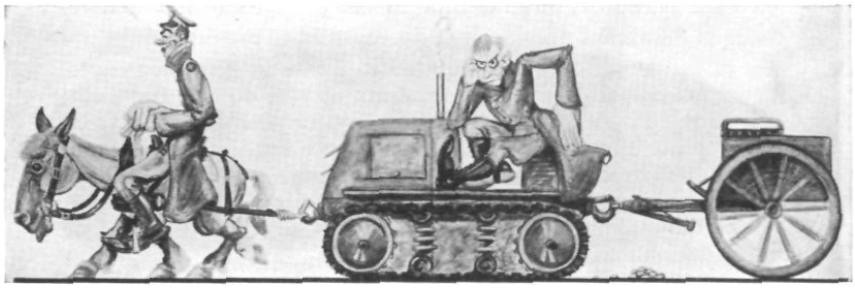
Under these circumstances, the artillery found it difficult to ascertain where the targets were. It was unusual for the OPs to see any target; still more unusual for the liaison officers to discover them and transmit the information in time for effective use. The infantry saw apparently least of all, and almost never indicated any targets to the artillery. The front line might be aware that they were being held up, but they could not locate from where the fire was coming, nor determine the coordinates of hostile machine guns, trench mortars or guns. Nor could they get information back as to where they themselves were without extraordinary delay. It was not the duty of any particular infantry officer to keep the artillery posted and usually each officer expected some one else to attend to this, with the result that no one attended to it. In any case, with machine guns posted at the rate of one to every 20 meters front, it would have been useless to indicate a few as targets, leaving the others free to fire. All machine guns, or nearly all, on a front at least 1,200 to 1,500 meters in every direction from the infantry need to be silenced to enable an advance to be made.

In the battle of Buzancy, the artillery on its own initiative, changed the tactics previously in force, so as to provide:

a. artillery S-2s were required to locate targets themselves, instead of depending on the infantry to do this for them;
b. the artillery preparation, except on the I Corps front (where the attack did not have much success), covered all areas from where hostile machine guns might fire, and all areas capable of concealing hostile batteries;
c. the rolling barrage was changed to employ pieces of 155mm caliber, or larger.

The amount of ammunition required for such a system of fire was large. As already pointed out, it amounted to 1,750 rounds of all calibers per minute for a front of seven divisions. This works out at about 7½ tons of 75mm ammunition and 36 tons of heavier ammunition per minute; equivalent to 1 ton of light and over 5 tons of heavy ammunition per division per minute. These are large figures; they look impressive, but they won the battle. All the evidence from German reports are to the effect that it was the heavy artillery fire which broke their infantry and rendered their artillery inoperative. It was also with a less loss of life on our part than ever before in a battle of this size. It was the expending of ammunition to save lives of doughboys; the expenditure of materiel or money instead of blood. It succeeded.

SEE SPECIAL GROUP RATE FOR NEW MEMBERS, PAGE 68



SEZ THE STABLE SERGEANT
TO
THE MOTOR SERGEANT:

"O horse, you've kept 'em rolling along; when motors stall, you still go strong; no horn to honk, nor valves to grind; nor sleet, nor snow, nor mud to mind; no tires to pump, no grease nor gas; when hay is short, you forage grass; when radiators freeze, alas! you need no chains in icy blast; no speed cops chugging in your rear, yelling summons in your ear. Your inner tubes are all O. K., and thank the Lord they stay that way; your spark plugs never miss and fuss; your crank case never makes us cuss. Your frame is good for many a mile; your body never changes style. Your wants are few and easily met; you've something on the motor yet."

UNILATERAL CONDUCT OF FIRE

BY CAPTAIN BONIFACE CAMPBELL, Field Artillery

FOREWORD.—Unilateral conduct of fire has been a controversial subject in our service since the World War. Several methods, fundamentally similar, but varying considerably in mathematical precision and complexity, have been adopted as standard and later discarded. During the past year the Field Artillery School was the scene of a comparative test between a method developed by the Field Artillery Board and a method developed at the School. The writer was in a position to observe much of this test, and to have access to the final reports thereof; he is familiar with the methods prescribed in T. R. 430-85 and in the Field Artillery Field Manual. The following is proposed as a sound method embodying the best points of those mentioned above; as being sufficiently detailed and precise to permit its use in extension courses without a resident instructor; as being applicable to all calibers; and as having sufficient simplicity and flexibility to make it a practicable field method.

GENERAL.—There are two subdivisions of unilateral conduct of fire, depending on the size of the target offset (T). When the target offset is small (300 mils or less), range is the controlling element of the adjustment; for larger target offsets, deflection is the controlling element. Changes in the element that is not controlling are made, (1) to keep bursts on or near the observer-target line when changes in the controlling element are made; and (2) to move or calculate bursts to the observer-target line. The principle is identical to that prescribed in T.R. 430-85.

PROCEDURE WHEN TARGET OFFSET IS SMALL.—The adjustment is conducted similarly to an axial adjustment, except that small deflection shifts are made to keep bursts on or near the observer-target line as range changes are made. The shift for each unit range change, termed *s*. is determined as follows:

a. From the *s* (ø) table in Firing Tables.

b. By the formula *s* = (1/10 T)/R, where T is the target offset in mils, and R is the gun-target range in thousands.

c. By formula *s* = (unit range change in yards × tangent T)/R.

a and *b* above determine *s* for a range change of 100 yards. When the fork is not 100 yards, *s* as determined above is modified by multiplying it by the ratio: (Fork in yards)/100 or by: [Fork in mils (F)]/[Elevation change for 100 yards range change (c)].

The ratio of observer-target range to gun-target range is determined for use in bringing bursts to the observer-target line as in axial; this ratio is expressed as r/R.

The target is bracketed for range as in axial conduct of fire, a deflection shift of one *s* being made for each unit range change. A round not sensible for range because of its deviation from the observer-target line is moved to the line by a deflection shift, shifting the amount *observed deviation in mils* × *r/R*. A round sensible for range, but not on the observer-target line, is not moved to the line, but the deflection shift necessary to place it there is determined and incorporated in the next deflection change to keep the bursts on the line.

The adjustment is continued as above until the desired range bracket is obtained. Fire for effect is conducted as in axial, the initial deflection being that to place bursts on the observer-target line at the center of the range bracket.

In precision fire when a one fork range bracket has been split and the appropriate deflection shift made, bursts may be sensed by rule (bursts on the side of the observer-target line away from the piece indicating range over and vice versa) *in the absence of positive sensings*. Thereafter, deflection changes are made only as positive deflection sensings are obtained, the deflection being shifted 2 mils or ½ *s*, whichever is greater, until a positive deflection bracket is obtained. Fire is in half groups of three rounds until the deflection is correct. The deflection is considered correct when a two mil deflection bracket is split, when a target hit is obtained, or when deflection rights and lefts are obtained at the same deflection setting.

In bracket fire, a hundred yard sheaf is usually employed, unless the target offset is less than 200 mils and the adjusting point is narrow, in which case the sheaf may be partially converged. Deflection shifts unless small are usually in multiples of 5 mils.

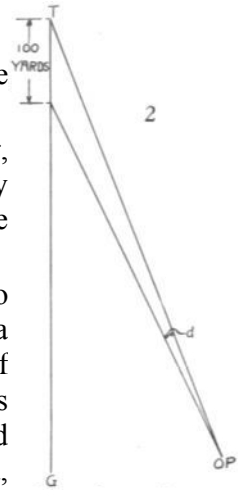
If the original *s* proves greatly in error, a new value *may* be calculated by determining the shift from line shot to line shot, and dividing by the number of forks range change.

It will be noted that the procedure when the target offset is small is substantially that prescribed in T.R. 430-85 for a bracket

adjustment; in precision fire, s/c and the complicated rule of thumb for calculating bursts to the line are eliminated.

PROCEDURE WHEN TARGET OFFSET IS LARGE.—

When the target offset exceeds 300 mils, deflection is the controlling element of the adjustment. The target is bracketed for *deflection* between actual or computed line shots, the deflection bracket thus determined being successively reduced until the adjustment is completed. The size of the deflection bracket is a multiple of *s* equal to the number of forks range bracket that would be sought in an axial adjustment of the same type. The deflection bound to establish the bracket is a multiple of *s* equal to the number of forks range bound that would be employed in axial with similar initial data; thus, a one *s* bound is made for very accurate data, a two *s* bound for plotted or uncorrected map data, and a four *s* or greater bound for estimated data. This procedure eliminates the use of c/s and of the complicated tables of deflection shifts prescribed in T.R. 430-85. The necessary relations are:



s, determined as for a small target offset.

d, the deviation in mils caused by a range change of 100 yards as viewed at the OP.

d may be determined from Firing Tables or, when the target offset is less than 600 mils, by the formula $d = (1/10\ T)/r$ where *r* is the observer-target range in thousands.

d is used to compute the range correction to move bursts to the observer-target line, a deviation of one *d* indicating a range change of 100 yards. When laying by the gunner's quadrant, elevation corrections are determined by multiplying the deviation by the factor c/d, where *c* is the elevation change corresponding to a 100 yard range change. It is determined from Firing Tables.

The target is bracketed for deflection, a change of one fork in range being made for each *s* deflection bound. A shot not sensible for deflection because of its deviation from the observer-target line is moved to the line, changing the range 100 yards for

each *d* deviation (or by changing the quadrant elevation in the amount *observed deviation* × *c/d*.) If the computed value of c/d or *d* proves greatly in error, a new value *may* be determined from the relation of the range change ordered to the change in deviation between rounds. A burst sensible for deflection, but not on the observer-target line is not moved to the line, but the range correction necessary to move it there is determined, and the burst is assumed to have been a line shot at the corrected range.

A deflection sensing having been obtained, the deflection is shifted the proper number of *s*'s, and the range changed the corresponding number of forks from the actual or computed setting at which the initial sensible round was a line shot. A deflection bracket, having been obtained, is split; the new range is the center of the range bracket, actual or computed, corresponding to the deflection bracket. The adjustment is continued as above until the desired deflection bracket has been obtained; in precision fire this is one *s*, in bracket fire, usually two. Fire for effect is commenced at the center of the deflection bracket, and at the range to place bursts on the observing line. When *s* is very large, it may be advisable to reduce the deflection bracket further before commencing fire for effect.

In precision fire, bursts may be sensed for range by rule when a one *s* bracket has been split. Fire is in half groups of three rounds until the deflection is correct; if the rounds of the initial half group are all in the same sense, the elevation is changed one half fork in the proper sense and the group completed. After splitting a one *s* deflection bracket, the deflection is changed only when positive deflection sensings are obtained; the existing deflection bracket is split until the deflection is correct.

In a bracket adjustment, an open sheaf is usually used during adjustment; against a target of little width the sheaf may be narrowed as the target is definitely located with respect to the sheaf. Range settings are usually employed; *s* and *d* are usually taken as a multiple of five; range changes to move bursts to the line are usually in hundreds of yards of range setting. When firing time shrapnel, it must be remembered that a change of five points on the corrector scale will displace the burst approximately one *d* (100 yards), unless compensating changes are made. The

battery is brought in when splitting a four *s* deflection bracket, when making a two *s* deflection bound, or at any time when the additional information to be gained by four pieces is considered advisable.

CONCLUSION.—As proficiency, confidence and judgment are developed, wide latitude in the exact application of the principles governing unilateral conduct of fire is permissible. Blind insistence on minute details of procedure at the expense of effect on the target should not be tolerated.

ILLUSTRATIVE PROBLEMS

NOTE: The following information is common to each of the problems given:
MATERIEL: French 75mm guns, Model 1897, firing Shell Mark I, Fuze Short.
SET-UP: OP is on the left of the gun-target line.
OT (r) is 3,200 yards, GT (R) is 3,600 yards.
Fork (F) is 3 mils, C is 5 mils.
Initial data are estimated.

1. PRECISION, TARGET OFFSET LESS THAN 300 MILS.

Target offset (T) is 240 mils. r/R is .9.
s for 100 yards is 24/3.6, or 7 mils.
s for one fork is 7 × 3/5, or 4 mils.

Commands	*Elev.*	*Deviation*	*Range*	*Def.*	*Remarks*
No. 1, 1 rd	110	40 left	?		40 × .9 = R 36 to get on line
Right 35 (36)	110	4 left	Over		4 × .9 = R 4 to get on line 4 × 4 = L 16 to stay on line
Left 12	98	Line	Short	Short	
Right 8	104	3 right	Short		L 3 to get on line R 4 to stay on
(Right 1)	107	Line	Over	Over	One fork bracket obtained. Start fire for effect; bursts may be sensed by rule.
Left 2, 3 rds	105 (106)	3 right	Short	?	On rule
		Line	Over	Over	
		2 right	Short	?	On rule
Left 2	105	Line	Short	Short	
		4 left	Over	?	On rule
		2 left	Over	?	On rule
Right 1, 6 rds	105	Cease Firing.			Two mil deflection bracket has been split: deflection is considered correct.

2. PERCUSSION BRACKET, TARGET OFFSET LESS THAN 300 MILS.

Target offset (T) is 240 mils. r/R is .9. *s* is 24/3.6 or 7 mils.
Target requires a 200 yard bracket with an open sheaf; the initial command for distribution provided an open sheaf.

		Deviations			
Commands	*Range*	*Noted*	*Range*	*Def.*	*Remarks*
No. 2, 1 rd	3600	30 left	?		30 × .9 = R 27 to get on line; use 25 or 30
Right 25 (30)	3600	10 left	Over		R 9 to get on line, L 28 to stay on L 5
Left 20	3200	5 right	Short		plus R 14
Right 10, BR	3400	15 right	?	Over	Deflection is sensed for salvo as a whole. Make minor change to refine deflection.
		Line	Over		
		5 left	Over		
		10 left	?		
Left 5 (10), Battery one round, 3200. Cease Firing.					
(Fire through zone of 3200-3400)					

3. PRECISION, TARGET OFFSET GREATER THAN 300 MILS.
Target offset (T) is 550 mils.
s for 100 yards is 55/3.6, or 15 mils (Firing Tables give 17).
s for one fork is 15 × 3/5, or 9 mils.
d is 55/3.2 or 17 mils. c/d equals 5/17 or .3.

Commands	*Elev.*	*Deviation*	*Range*	*Deflection*	*Remarks*
No. 1, 1 rd	110	40 left		?	Decrease elevation 40 × .3, or 12 mils
	98	6 right		Short	Line short at 100. Shift 4 *s*, and
Right 35 (36)	112	Line		Over	change elevation 4 forks *from 100*
Left 18	106	5 left		Over	Split deflection and range brackets
					Line over at 104
Left 9	102	Line		Short	One *s* deflection bracket has been obtained. Start fire for effect at its center; range may be sensed by rule.
Right 5, 3 rds	103	Line	Over	Over	Split deflection bracket; complete
		3 left	Over	?	group of 6 rounds for effect ½ fork
		8 left	Over	?	short of 103.
Left 3 (2)	101	Line	Short	Short	Deflection is correct.
		Line	Over	Over	
		3 right	Short	?	
6 rounds	101.5	Cease Firing.			

4. PERCUSSION BRACKET, TARGET OFFSET GREATER THAN 300 MILS.
Target Offset (T) is 550 mils. *s* is 55/3.6 or 15 mils.
Initial sheaf is open. *d* is 55/3.2 or 17 mils (use 15).

		Deviations			
Commands	*Range*	*Noted*	*Range*	*Def.*	*Remarks*
No. 2, 1 rd	3600	40 left		?	40/15 = 300 yards range change to bring burst to line.
	3300	10 right		Short	Line short at 3400. Shift deflection 4 *s*, and change range 400 yards from 3400.
Right 60	3800	20 left		?	20/15 = 100 yards.
	3700	Line	Over	Over	Bring in battery, split 4 *s* bracket.
Left 30,					
Battery right,	3500		?	Short	Target is bracketed for deflection. Start fire for effect at center of deflection bracket, and at range to put bursts on line.
			?		
			Short		
			Short		
Right 15					
Battery 1 rd	3600	Cease Firing.			Fire through zone 3500-3700.

ARTILLERY STRENGTHS IN THE FRENCH OFFENSIVES OF 1918

BY GENERAL FOURNIER, Revue d'Artillerie; May, June and July, 1934

A Digest by Major J. S. Wood, Field Artillery

REQUIREMENTS, 1917.—The limited objective attacks made by the French and British during 1917 required very large quantities of artillery and artillery ammunition. At Messines. Ypres and Verdun the light and heavy artillery totalled about one gun per 7 meters of front, not counting trench artillery. At La Malmaison, in October, the attack on a 10 kilometer front utilized 624 light guns, 986 heavier pieces, 270 trench mortars and 5 battalions of tanks. The six day preparation for this affair consumed 68,500 tons of artillery ammunition, 12,400 tons additional being expended on the day of the attack.

Based on the experiences of the year, the Combat Instructions for Large Units, dated October 31, 1917, evaluated the forces necessary for the various phases of offensive action. Maximum, average and minimum allotments were defined as corresponding to the following situations, respectively; enemy on the alert, position completely organized; enemy more or less surprised, not reinforced, or position incomplete; enemy in withdrawal. The corresponding strong, average, and reduced allotments of artillery were as follows:

STRONG	AVERAGE	REDUCED
	LIGHT GUNS (75mm)	
One piece per 14 meters of front: i.e., 18 batteries per km.	One piece per 18 meters: 14 batteries per km.	One piece per 25 meters: 10 batteries per km.
Ammunition: 8 days of fire (1/4 in special shell)	6 days of fire (1/3 in special shell)	4 days of fire (1/4 in special shell)
	HOWITZERS (155mm. 220mm)	
One piece per 25 m; 10 batteries per km. 6 days of fire (1/6 in special shell)	One piece per 35 m; 7 batteries per km. 5 days of fire (1/5 in special shell)	One piece per 50 m; 5 batteries per km. 5 days of fire (1/5 in special shell)
	COUNTERBATTERY ARTILLERY (105mm and 155mm Guns)	
One piece per 30 m; 8 batteries per km. 6 days of fire (1/3 in special shell)	One piece per 40m; 6 batteries per km. 5 days of fire (2/5 in special shell)	One piece per 50 m; 5 batteries per km. 4 days of fire (1/2 in special shell)

FRENCH STRENGTH, 1918.—In July, 1918, the French army was composed of 105 infantry divisions and 6 cavalry divisions. The infantry divisions comprised three regiments of infantry (9 battalions), three battalions of 75mm guns and one battalion of 155mm howitzers. There were 30 corps artilleries, each of one battalion of 105mm guns and one battalion of 155mm guns. The general reserve comprised approximately 30 regiments of 75mm porté, 9 battalions of mountain guns and 3,000 pieces of heavier calibers. The ammunition situation was as follows:

Type	Daily Expenditure May, July, 1918	In G. H. Q. Reserve	To Be Provided (By Feb., '19)
75	47 lots	1217 lots (6000 rounds per lot)	100% increase
105	14,500 rounds	17,000 rounds	1,500,000 rounds
155	56,200 rounds	2,300,000 rounds	50% increase
75 smoke	——	500,000 rounds	Large increase
Mustard Gas	——	Limited	Large increase

At this time there was no idea of large scale attacks by the French prior to the spring of 1919. However, the German disorganization and losses, together with the Allies superiority in effectives resulting from the American reinforcements, enabled Marshal Foch to assume the offensive with all his armies. In this situation, it was difficult to maintain the proportion of guns and ammunition utilized in the methodical limited objective attacks of 1917.

The 1918 directives of Foch and Pétain stressed the necessity for simpler and more rapid methods; the elimination of complicated plans; the return to simple, concise orders and the assignment of increased frontages to divisions. As a result we find that the artillery allotments indicated in 1917 were not often realized in the final attacks of the war.

COUNTER-ATTACK OF JUNE 11.—Attacking on May 27, the Germans crossed the Aisne and the Vesle and pushed on to the Marne. Halted there, they shifted their effort to the west of the Oise by an attack on June 9 north of the forests of Compiegne and Villers—Cotterets against the French Second Army which, though hard pressed, succeeded in holding along its second battle position on June 10. To remedy this situation, five divisions were placed at the disposal of the commander of the Reserve Army Group, General Fayolle, for a counter-attack. The foot troops, moving

by truck, were to be ready to enter into action by about 10:00 A. M. on the 10th; while the artillery was ordered to be in position by dawn on the 11th, after a march of 50 to 60 kilometers.

The attack order of General Fayolle, dated 10 June, 4:00 P. M. grouped these divisions under the command of General Mangin for action on the front of the 35th Corps which was also placed under his command. Two regiments of 75mm (porté), four battalions of tanks and one brigade of British guns on self-contained mounts were assigned as reinforcements. The attack was to be made as early as possible on the 11th.

General Mangin's orders were issued verbally on the 10th at 7:00 P. M. The counter-attack on an eight kilometer front, with four divisions in line and one in reserve, was set for 11:00 A. M. on June 11. It was to be supported on the flanks by a limited advance of the divisions already in line.

General artillery support was to be furnished by the Corps artillery of the 35th Corps (7 batteries 155mm G, 3 batteries 105mm G.). The reinforcing artillery and the tanks (including units from the reserve divisions and the divisions in line) comprised 12 battalions of 75mm guns, 4 of heavier calibers and 12 battalions of tanks.

The total artillery strength on the front of the attack (9 kilometers) was as follows:

a. Light guns (75)—93 batteries, slightly more than 10 batteries per kilometer.
b. Heavy howitzers—25 batteries of 155 and 2 batteries of 220, 3 batteries per kilometer.
c. Heavy guns—7 batteries of 155 and 3 batteries of 105, one battery per kilometer.

The number of guns per kilometer is considerably below the reduced allotment contemplated by the 1917 combat regulations, except for light guns. The counter-attack, however, rapidly organized and delivered and strongly reinforced by tanks, gained in a short time from 1,000 to 4,000 meters along its front. It was then halted for lack of further reinforcements.

OFFENSIVE OF JULY 18.—Instructions were issued by General Pétain on July 12 for an offensive by the Xth and VIth

Armies between the Aisne and the Marne for the purpose of reducing the Chateau-Thierry salient. The main thrust was to be made by the Xth Army under General Mangin in the direction of Oulchy-le Chateau, covered by an advance of the VIth Army under General Degoutte in the direction of Brény-Armentières. Further to the right, along the Marne and to the east of Rheims, the IXth and IVth Armies were to remain on the defensive ready for the German attack expected on July 14 or 15.

The preparations of General Mangin and General Degoutte were continued in spite of the German advance south of the Marne on the 15th. On the 18th at 4:35 A. M. the counter-offensive was begun.

The Xth Army, with the 18th Corps holding north of the Aisne, attacked on a 24-kilometer front with the 1st, 20th, 30th and 11th Corps, in order from left to right. Ten divisions were in first line and six in reserve. The 1st and 2nd Divisions (U. S.) and the Moroccan Division were in the first line of the 20th Corps. No artillery preparations was made, the advance being covered by about 200 tanks which were assigned to the five divisions in the center. A regiment of light tanks was kept in army reserve. Supporting artillery along the front of attack was as follows:

210 batteries of 75 58 batteries of 155H	Division Artillery
6 batteries of 155G 6 batteries of 220H 8 batteries of 280H	Corps Artillery
30 batteries of 105G 6 batteries of 120G 10 batteries of 145G 41 batteries of 155G	Corps counterbattery artillery
49 batteries of trench mortars 8 pieces of railway artillery	

The resulting artillery densities are again below the reduced allotment of the 1917 Regulations—9 batteries per kilometer instead

of 10 for light guns and about 3.5 batteries per kilometer instead of 5, both for howitzers and for counterbattery guns.

The VIth Army, comprising the 2nd and 7th Corps and the 1st Corps (U. S.), attacked on a front of 26 kilometers, with six divisions in line and two in reserve. It had 171 tanks, 112 light batteries and 121 heavy batteries; giving an artillery density of 4 light batteries per kilometer and 4.5 batteries per kilometer for all heavier calibers combined—less than half the reduced allotment of the regulations.

All guns of the two armies opened fire at 4:35 A. M. All planes of the corps, armies and the air division went into action. The infantry of sixteen divisions moved forward with the tanks. The enemy, completely surprised, lost practically all his first line units and advanced batteries.

About 8:00 A. M. General Mangin released his light tanks to the 20th and 30th Corps for the exploitation. The 2nd Cavalry Corps was ordered forward to pass through the first line divisions and move against the enemy communications in the direction of Fèreen-Tardenois, some 40 kilometers to the eastward. The cavalry, however, held up by traffic of all sorts in the forest of Villers-Cotterets, was unable to enter into action effectively. A few units reached the front lines and fought on foot with the infantry.

The objectives set were reached on the 20th after an advance of 8 to 12 kilometers and the attack ended.

OFFENSIVE OF AUGUST 8.—Since April, 1918, a combined offensive by the French and British in the region of Montdidier had been contemplated in order to free Amiens and the railroads centering there. The German attacks on the Aisne and the Oise had temporarily halted the preparations, but they were resumed immediately after the successful counter-attack of the Xth Army. The 1st Army, with four Corps in line and one in reserve, together with the 2nd Cavalry Corps, was placed under the orders of Sir Douglas Haig for this operation.

General Debeney, the army commander, issued his orders on July 29. The four corps in line were to attack successively from north to south along the Avre. The 31st Corps, attacking in liaison with the Canadians on its left, was to make the main effort, covered

on its right by an advance of the 9th Corps at H + 4 hours and later by the 10th Corps which in turn was to cross the Avre and pinch out the 9th after the latter had advanced 3 kilometers to form a bridgehead. The 35th Corps was to attack later south of Montdidier after the main effort on the north had progressed sufficiently. The artillery was to be pushed forward as far as possible on the nights between August 5th and 8th.

The heavy artillery of the 9th and 10th Corps was to be emplaced so as to assist the 31st Corps in its main effort. A rapid and powerful artillery preparation was prescribed. The artillery allotment in batteries per kilometer is shown below:

Corps	75s	Howitzers	Heavy Guns
31st	10–	7–	5+
9th	7.5	4	6.5
10th	5+	3	2.5
35th	6	2–	2–

The allotment for the 31st Corps is stronger than the average for the Xth Army on July 18, while for the other corps it is considerably weaker—a result, of course, of the difference in rhythm of the two attacks. The four corps of the Xth Army had to advance simultaneously along the whole front; while the 1st Army attack was a progressive operation which covered two days in its initial development, enabling General Debeney to shift his artillery accordingly. As soon as the advance of the 31st Corps permitted, six of its howitzer battalions were withdrawn for use of the 10th and 35th Corps. On the following day, all artillery of the 9th Corps was utilized to assist the 10th Corps advance.

The attack, held up initially around Montdidier, was pushed vigorously on August 9 and 10. On the latter date it had gained 12 kilometers toward Roye, the next objective.

OFFENSIVE OF THE IVTH ARMY, SEPTEMBER 26.—On August 30, Marshal Foch outlined a series of converging offensives by the British, French and American armies. Combined with the continued action of the British in the direction of Cambrai and that of the French center along the Aisne was a new

operation on the right by the French IVth Army and the Americans in the direction of Mezieres-Sedan.

The means allotted to the IVth Army for this attack were 22 divisions, 90 battalions of 75, 90 battalions of heavier artillery, 120 long range guns, and 13 tank battalions. In view of the strength of the German defenses in Champagne, General Gouraud, the IVth Army Commander, demanded a considerable increase in artillery, particularly in 75s of which he desired 54 additional battalions. General Petain refused the request, stating that the state of the German morale and equipment justified the use of considerably reduced allotments along the front, and authorizing the use of a rapid succession of attacks combined with the American advance on the right and that of the Vth Army on the left.

The IVth Army operation comprised three phases:

1. Penetration of the German defenses between the Aisne and the Suippes in conjunction with the American advance to Grand Pré.
2. Exploitation on the left toward the northwest, together with an effort by the VIth Army.
3. Extension of both attacks toward Rethel and Attigny, 20 kilometers north.

General Gouraud's orders of September 18 prescribed a main blow directly north by four corps for the 1st phase, covered by a limited advance of the corps on each flank of the main attack. A seventh corps held the extreme left of the front but made no advance. One cavalry and two infantry divisions were kept in army reserve. Exploitation was then to begin by the two corps on each flank of the original advance, followed by an attack of the two center corps. An advance of some 12 kilometers was planned for the first day of attack.

Twenty-one battalions of 75 and about 20 battalions of heavier artillery were allotted to each of the four corps making the main effort. The covering corps had an equal amount of heavy artillery but only 12 to 15 battalions of 75. In all, 1,332 pieces of 75 and 1,226 of heavier calibers (60 per cent howitzers) were put in action on a 25 kilometer front; an average of one light gun per 18 meters and one heavy piece per 20 meters of front. This allotment

against very strong positions corresponds only to the so-called "average" allotment of the 1917 table.

The attack began at 5:25 A. M. September 26, after a dense six-hour artillery preparation. The progress was slow, only 3 or 4 kilometers by nightfall. Five days of violent battle were required to reach the objectives set for the first day. On October 3, after reorganization and reinforcement, a final attack carried the heights north of Somme-Py.

OFFENSIVES OF THE 1st ARMY, OCTOBER 1—NOVEMBER 4.—After its advance toward Roye on August 11, the 1st Army under General Debeney, pushed forward slowly to the Hindenburg line west of St. Quentin, which it reached on September 12. The remainder of the month was spent in preparation for an attack in conjunction with the British IVth Army to capture St. Quentin and advance on Guise. The action which began October 1 was the first of a series of four attacks that ended with the capture of Guise on November 5. These attacks were made with from four to five corps in line with artillery strengths as shown below:

Date	Army Front Kilometers	Battalions of Artillery 75s	Howitzers	Heavy Guns
October 1—St. Quentin	35	45	18	15
October 8—St. Quentin	45	48	17	18
October 17—Mont-D'Origny	47	63	20	23
November 4—Guise	35	69	25	21

These assignments are much below the contemplated allotments of 1917 for attacks against similar positions. They are even less than the reduced allotments of the 1917 table, which is hardly surprising considering the extent and the continuous nature of the Allied offensives in the final phase.

AMMUNITION SITUATION, 1918.—Ammunition expenditures during the German advance were such as to cause much anxiety at French General Headquarters. In 75s alone, the average had been more than 240,000 rounds a day, while production had reached only 170,000 rounds a day. The reserves had been depleted by 10,000,000 rounds.

On June 8, General Petain asked for an increase in production to 240,000 rounds of 75 daily, at the same time prescribing a reduction

in the daily allowances for his armies. The expenditures, nevertheless, increased to 546,000 rounds daily for the period July 15-20: causing a warning from Marshal Foch that this rate would expend all reserves in a few weeks' time. In spite of all orders and warnings, however, the reserves of 75 had decreased nearly 75 per cent by November 11 and those of 155 about 30 per cent.

Prior to September 28, the French armies had been maintained on a basis of five days of fire. Thereafter, the total amount in depots and with troops was reduced to three days of fire.

On July 31, there were about twelve days of fire available to the French for each of their 4,872 pieces of 75 and 2,920 pieces of 155 and 145. These amounts were large, but they proved barely sufficient for the vast offensives undertaken at that time.

CONCLUSIONS.—A study transmitted by General Pétain to Marshal Foch on August 29, 1918, regarding the possibilities of an offensive in 1919, gives certain conclusions that were amply substantiated by the experience of later battles. It stated that *the amount of artillery available is the main factor in determining the extent of front of an offensive*, and that there should be an average of 53 light guns and 56 heavier pieces per kilometer of front for success in the attack.

It is not believed that these conclusions would be greatly modified if such a study were undertaken at present. New developments since the war have been mainly in automatic weapons and in tanks. The areas occupied by modern automatic weapons must still be neutralized by artillery zone fire and the gain in artillery implied in the support of infantry by modern tanks will be more than balanced by the necessity for artillery support of the tanks themselves.

As to ammunition, it can only be said that one must have too much in order to have enough. The requirements must be calculated with a factor of safety which increases with the degree of importance of the headquarters concerned.

SEE SPECIAL GROUP RATE FOR NEW MEMBERS, PAGE 68

A DEVELOPMENT PROGRAM FOR ARTILLERY DESIGN

BY CAPTAIN C. C. BLANCHARD, Field Artillery

A RECENT article by Capt. Goebert, chief of the Design Section at Aberdeen Proving Ground, discusses the demands which have been made on artillery designers since the World War. The gist of his article is as follows:

(1) The field artillery has demanded increased ranges, wide traverse, high road speed, and other features as well as prescribing the acceptable weight limits. These demands must be modified before suitable balanced weapons can be built, since the designers have exhausted every resource to keep within the weight limits and still obtain stability and wear life in gun carriages.

(2) The increase in range has required higher muzzle velocities, resulting in shortened lives of the gun tubes. The necessity of these long ranges is questioned because of the difficulties of observation using long lines of communication or the loss of effect if observation is not used.

(3) Suitable weapons can be built with maximum ranges as follows:

75mm howitzer	9,000 yards
75mm gun	12,000 yards
105mm howitzer	12,000 yards
105mm gun	15,000 yards
155mm howitzer	15,000 yards
155mm gun	20,000 yards
8″ howitzer	20,000 yards

(4) The division artillery might comprise the 75mm howitzer and the 75mm gun.

To a casual observer not hampered by any profound knowledge of the subject, it appears that excessive demands have been made not only for range but for many kinds of unnecessary features. The Westervelt Board, immediately after the war, recommended specifications for all types of artillery. The specifications for the division light artillery, for example, were as follows:

Caliber: About 3 inch.
Traverse: Ideal, 360 degrees.
Elevation on carriage: 80 degrees.
Range: 15,000 yards.
Weight: Load for 6-horse team.

Later, various other schemes have called for self-propelled mounts, guns mounted on trucks, weapons capable of use against tanks and airplanes in addition to their primary missions, accompanying weapons for cavalry, and so on. It appears that the demands for special weapons have been given exaggerated consideration, resulting in the 75mm howitzer carriage on the one hand and the all-purpose gun on the other. Neither is a "work-horse" suitable for use by the division for its principal mission—the delivery of masses of supporting fire. Thinking of the various artillery designs that have been produced since the war calls to mind recent remarks heard on the radio concerning Mr. Brisbane, "He's designing an airplane to fly a hundred miles underground a thousand years from now."

The statement of Captain Goebert in regard to the maximum ranges that can reasonably be expected of the various calibers must be accepted. Within these limits, we offer the following program for consideration.

The division artillery would comprise two regiments of 105mm howitzers for close support and one of 105mm guns for general support. The characteristics of these weapons would include the following:

Caliber: 105mm.
Carriage: Box trail, 100 mils traverse (6400 by shifting the trail), 60 degrees elevation.
Range: Howitzer, 12,000 yards; gun, 16,000 yards; number of charges, 3.
Weight: Whatever is necessary.

COMMENTS

Organization.—The use of howitzers for direct support and guns for general support is a reversal of our present organization. When the gun was originally chosen for the light weapon, shrapnel was considered the primary projectile and defilade was a minor

consideration. Neither of these statements are at present true. Anyone who has served with a 75mm gun regiment knows the difficulties of selecting positions which are defiladed and still give sufficiently low minimum ranges. A howitzer will greatly simplify this problem. The general support units are not so restricted as to position areas and usually fire at longer ranges. Hence, the gun was specified, although in effect, it is no more than a long range howitzer.

Caliber.—Various proposals for the armament of the division artillery have included calibers of 75mm, 90mm, 105mm, and 155mm. From a gunnery standpoint, the 75mm piece can do few things that cannot be done better by the 105mm, using the same weight of ammunition. For neutralization, the heavier shell is much more effective, both in producing casualties and in moral effect. The 90mm could satisfactorily replace the 75mm gun, but not the 155mm howitzer. The 155mm is too heavy for the division, both the ammunition and the weapon. It can be replaced by the 105mm which should be equally effective for all missions encountered in a moving situation; in a stabilized situation, the medium and heavy artillery of Corps and Army will be available.

Carriage.—The advantage of the wide carriage-traverse has been exaggerated. A gun crew usually shifts trail in preference to hand traversing for any change of direction greater than a few mils. The split-trail carriage permits fairly quick traversing through an arc of 60 degrees. When a greater change of direction is required—as by the appearance of tanks to a flank—the split trail becomes a serious hindrance. A box trail is entirely satisfactory. If it is open, permitting the piece to recoil through the trail, there is no necessity of digging a trail hole which increases the difficulty of traversing. If the need for quick traversing through wide arcs is considered desirable, the rear component of the shock of recoil could be taken at a pivot underneath the center of the axle, thus preventing the trail from digging in. Such a method is used on the newest British light piece and on some of the German pieces.

The necessity of digging a trail hole has always been a great disadvantage of the 75mm gun M1897. The split-trail carriage gives all the elevation desired but, compared to the box trail, it is more complicated, unstable near the limits of traverse, and heavier.

Range.—The demands for longer ranges were a result of the World War and were no doubt excessive. The value of 75mm fires at any range approaching 15,000 yards is questionable. A glance at a firing table will show how the weather effects become excessive. There is a range for each caliber beyond which the projectile may be considered at the mercy of the elements. Any demands for increased ranges beyond a certain point should include an increase in caliber.

The question of communication to the observation posts is not as difficult now as during the war. The communication equipment has been increased and sufficient radio equipment added to the battalion to maintain two forward observation posts. Our observation as now organized permits a single observer to handle the fires of an entire battalion. Better results can be obtained by pushing the observers forward rather than by frequently changing battery positions. Hence, we believe that moderately long ranges are desirable. Those given by Capt. Goebert for the 105mm weapons should answer any reasonable demand.

The use of a large number of charges complicates the work of the battery commander in determining corrections. Weather corrections must be computed for each target instead of for a few points in the target area. The K or VE determined with one charge cannot be applied to another, at least not with any predictable accuracy. The simplicity gained by using a few charges certainly outweighs any theoretical advantage of varying the angle of fall by a few degrees. Three charges for each type of ammunition are suggested with maximum ranges as shown below:

Charge	*Howitzer*	*Gun*
1	6,000	8,000
2	9,000	12,000
3	12,000	16,000

Weight.—The specifications given above should permit of pieces of reasonable weight being constructed. After being constructed, the pieces can be weighed and suitable prime-movers selected. On later models, weight can be reduced as experience and improvements in alloys and construction methods permit.

Ammunition supply.—Under the organization suggested, the projectiles for the division are of the same type. Perhaps identical powder charges could be used by the gun and howitzer, the variation in range being obtained by the difference in length of tube. The organic field artillery of corps would comprise only 155mm weapons built according to the specifications of Capt. Goebert. Ammunition supply would be simplified under such a scheme.

CONCLUSION

The specifications given are subject to argument. It is believed, however, that priority should be given to the construction of pieces which are designed according to moderate specifications, will surely stand up under service conditions, and are simple enough to be produced in quantity at least by the second year of a war. Original design can be kept to a minimum. Various countries have already built and proven designs of the several components of pieces—carriages, breech blocks, recoil mechanisms, etc. After plans of simple serviceable pieces have been developed and proven, then is time enough for experimentation with new conceptions.

UNITED STATES FIELD ARTILLERY ASSOCIATION

In accordance with the call of the Executive Council, the twenty-fourth annual meeting of the U. S. Field Artillery Association was held at the Army and Navy Club in Washington, D. C., at 4:30 P. M. on December 12, 1934, with Brigadier Charles D. Herron, senior member of the Executive Council, present, in the chair, acting for Major General Upton Birnie, Jr., President of the Association, who was absent on an inspection trip.

The President had previously appointed a committee consisting of Majors T. J. J. Christian, F. A. and B. H. Perry, F. A., to audit the financial statements of the Treasurer. Major T. J. J. Christian then read the report of the committee, which stated that the auditing had been performed and the financial statements had been found to be correct. A motion was then made, seconded and adopted, approving the report of the auditing committee.

The chair stated that there were three vacancies in the Executive Council to be filled. The vacancies were caused by the expiration of the terms of office of Major General Upton Birnie, Jr., Lieutenant Colonel Ralph C. Bishop, Reserve Corps, both of whom were filling temporary appointments since the last annual meeting, and Lieutenant Colonel T. D. Osborne, F. A., who was completing a two-year term.

The following officers were elected to fill the vacancies, the Secretary being directed to cast the unanimous ballot for them: Major General Upton Birnie, Jr., U. S. Army; Lieutenant Colonel Ralph C. Bishop, Reserve Corps, and Major T. J. J. Christian, Field Artillery, U. S. Army.

Brigadier General Henry W. Butner, U. S. Army, was elected Vice President of the Association vice Brigadier General William M. Cruikshank, retired.

The Secretary was directed to consult with the Treasurer of the Army Mutual Aid Society in order to secure the advice of the Society relative to the handling of those securities of the U. S. Field Artillery Association which are no longer paying interest.

The Secretary was directed to utilize the expected profits during the ensuing year by increasing the payment to authors and the publication of more pictures in the JOURNAL.

In order to interest the newly appointed Field Artillery officers in the Field Artillery Association it was directed that the following be continued during the coming year:

a. To each 1935 graduate of the United States Military Academy assigned to the Field Artillery, the JOURNAL shall be sent for one year as a gift from the Association.
b. To each 1935 graduate of a Field Artillery R.O.T.C. unit, commissioned in the Field Artillery section of the Officers' Reserve Corps, one copy of the JOURNAL shall be sent as a gift from the Association.
c. It was directed that a special group rate be made for *new* members secured by any regimental or separate battalion commander of any Field Artillery unit of the Regular Army, National Guard or Reserve Corps. The membership dues for each new member of such a group of *five* or more shall be $2.00 for the first year.

It was directed that the Secretary write a letter to Colonel Leroy Herron, Reserve Corps, who for many years has been a member of the Executive Council, expressing the regret of the Association that he was not able to be present at the meeting, our gratification that his recent accident was not as serious as first reported, and to wish him a very speedy recovery.

ANNUAL REPORT OF THE SECRETARY-TREASURER
For the year ending November 30, 1934

Assets—November 30, 1933:		
Balance, checking account	$ 3,739.23	
Savings account	3,247.64	
Securities on hand	23,000.00	$29,986.87
Assets—November 30, 1934:		
Balance, checking account	$ 4,707.48	
Savings account	3,341.58	
Securities on hand	23,000.00	$31,049.06
		$1,062.19

A detailed statement of the receipts and expenditures during the last fiscal year is as follows:

RECEIPTS

Membership dues and subscriptions	$ 6,686.59	
Interest on securities	500.69	
Interest on savings account	93.94	
Books, magazines and binders	1,107.50	
Miscellaneous	1,006.70	
	$9,395.42	
Cash on hand November 30, 1933	6,986.87	$16,382.29

EXPENDITURES

Printing and mailing Field Artillery Journal	$ 2,928.71	
Office supplies	110.98	
Postage, express and telegrams	216.30	
Rent and telephone	432.03	
Services	1,600.50	
Authors, engravers, photographers	939.61	
Books, magazines, binders	839.72	
Insurance	12.00	
Trophy	20.00	
Donations	7.00	
Miscellaneous: copyright, refund, collection charges	1,226.38	
	$8,333.23	
Cash on hand November 30, 1934	8,049.06	$16,382.29

Total receipts for year ending November 30, 1934	9,395.42
Total expenditures for year ending November 30, 1934	8,333.23
Or a gain of	1,062.19

Outstanding obligations and amounts receivable are approximately the same as on November 30, 1933. The only outstanding obligation of any importance is the printer's bill for the November-December, 1934 number of the Journal, which has not been received. The same obligation was also outstanding on November 30, 1933. Considerable amounts are receivable consisting of dues to the Association.

The past year has seen an increase in membership of 112. A large proportion of this was due to the campaign inaugurated in January, 1934, for new members. In compliance with the directive of the Executive Council made on January 8, 1934, the Association is giving one copy of the Journal for one year to each graduate of the United States Military Academy assigned to the Field Artillery. In compliance with the same directive there was presented to the graduates of Field Artillery R.O.T.C. units throughout the United States 1,170 copies of the Journal.

Concerning the $23,000.00 in securities held by the Association, the same securities that paid dividends during the fiscal year ending November 30, 1933, also paid during the fiscal year ending November 30, 1934. If we consider at par value the $9,500.00 worth of securities which are paying dividends; and the present market value of the $13,500.00 worth of securities not paying dividends as $1,220.00, then the present value of all securities owned by the Field Artillery Association is $10,720.00. The depression has taken from us in paper loss $12,280.00 or approximately 53.4 per cent. Only time and improved business conditions can restore these $13,500 worth of securities to a value wherein they can be disposed of to any advantage to the Association.

Due to the fact that our membership was increased by 112 members during the past year, that no further default of securities has occurred and our profit during the current year amounts to $1,062.19, it would appear that the worst had passed.

The importance to the Association of increasing its membership among Field Artillerymen of the Regular Army, National Guard and Organized Reserves is obvious. Field Artillery officers on duty with the National Guard, Reserve and R.O.T.C. units are in position to be of immense assistance to the Association in increasing its membership. The more members we get the better we are accomplishing our mission of disseminating professional knowledge. The help of our present members in interesting prospective members is most important. A few personal words will do more than many letters from the Secretary.

DEAN HUDNUTT,
Major, Field Artillery, U. S. Army
Secretary-Treasurer

NOTES ON FOREIGN ARMIES

Motorization, Mechanization, and Air Forces in the Japanese Army—Militar Wochenblatt, April, 1934 (from Russian sources).

Owing to their lack of horses, the Japanese have particular need to develop the use of motors. Economic considerations, however, have rendered this development very slow and difficult. A few Japanese firms have begun the production of airplanes, also of tanks and armored cars; but at present reliance must be placed mainly on the importation and adaptation of foreign machines.

In each infantry division there is to be an automobile regiment of four or five companies and a motorized battery, with a detachment of cavalry added. One company is to be on light vehicles of the Carden-Lloyd VI type, one on motorcycles with machine guns, one in armored cars, and one or two infantry companies in light trucks. Motorized liaison and chemical sections are to be included. A certain number of small tanks are included, also some motorized 37mm guns for anti-aircraft and anti-tank work. Motorization of engineer troops and of supply trains is proceeding slowly. Divisional artillery remains horse drawn.

Each cavalry brigade is assigned an armored car battalion of two troops, each comprising 10 machine gun cars and 10 motorcycles with machine guns. In addition, each battalion has 8 or 10 motorcycles with 13mm machine guns, and a section of special anti-aircraft machine guns. The artillery is to be motorized in a few cavalry brigades. Supply trains and services are to be completely motorized in some brigades, and partially so in the others.

Of the non-divisional artillery, the heavy artillery, comprising 15cm guns, 24cm and 28cm mortars, has been completely motorized. Two regiments of 10cm howitzers, a fourth of the medium artillery, are motorized. The other six regiments, 150mm howitzers, are still horse drawn. The light artillery, one regiment plus a separate battalion and certain separate batteries, is entirely motorized.

Light tanks are to be used for the supply of ammunition in combat. Specially constructed tanks of large capacity are also being produced for ammunition transport.

There are only two tank regiments of 40 tanks each, including both light and medium types. Each infantry division has six or eight tanks for instruction. Among the various types of tanks in service are found the light Renault, Model 1917 and Model 1927, the Medium A with four machine guns, and the heavy 33 ton Mark V with two light cannon. The Chinese campaign demonstrated the need for more tanks; and recent purchases have been made of French 68 ton. Christy amphibian, and Vickers types.

The Japanese possess ten armored trains. It is reported that these were used with much success in Manchuria.

The air forces consist of eleven regiments, with three others in process of formation. These comprise one pursuit regiment, one bombardment regiment, and nine mixed regiments of observation, pursuit, and bombardment planes. All regiments at present have two battalions, about 100 officers and 1,300 enlisted men, and 60 to 80 planes. The pursuit planes are of Japanese construction, 184 in number, armed with 2 Vickers machine guns and having a speed of about 200 miles an hour. There are 180 observation planes, also of Japanese construction, speed about 150 miles an hour, armed with 4 machine guns. The bombardment planes are mainly of the Junkers type and comprise 88 light bombers, 180 medium bombers, and 38 heavy bombers. The bombers are armed with 5 to 7 machine guns and have a speed of about 130 miles an hour.

Strategical reconnaissances in the Chinese campaign were often made at night by heavy bombers at distances of 250 to 300 kilometers. Tactical reconnaissance was carried out by 2 or 3 reconnaissance planes or by pursuit planes equipped with photographic apparatus. Considerable use was made of day bombing and attack aviation throughout the advance.

The Evolution of Italy's Military Forces from 1929 to 1934, by Commandant Morel—Revue Militaire Francaise, July, 1934.

During the past five years the development of the Italian forces has been considerably influenced by three factors: the stability of the Fascist regime, the disarmament discussions, and the economic crisis. Owing to the first factor, the direction of military affairs has rested in the hands of one man, with a consequent gain in

continuity of purpose and a minimum of waste in money and energy. The influence of the second factor is indirect. Italy seeks a disarmament agreement which will annul the military superiorities that, in her opinion, are not justified by the present political situation in Europe. In other words, she desires France to abandon heavy armament, costly materiel, and the use of colonial forces. Her perfect interior discipline and the militarization of the whole nation allow her to concede reductions in her purely military forces—reductions which, in any case, are likely to become a necessity in view of her financial difficulties. The military budgets have been decreased each year since 1930 and face another reduction this year. The negative action of the two latter factors has prevented any substantial modification of the army, permitting only certain adjustments and improvements.

The concentration of forces in North Italy has continued. One additional division on the French front and one on the Jugoslav front give a total of nine reinforced divisions along the northern border. This concentration with its obvious offensive advantages has given rise to uneasiness in neighboring states; but it is believed that defensive rather than offensive considerations govern the Italian dispositions. The northern plain of the Po, within 100 kilometers of the frontier, contains the demographic and economic center of the nation; and it has been a field of maneuver for invaders during fifteen hundred years of past history. Moreover, the logical desire of the present regime would be to block its frontiers against interference while it proceeds with the internal consolidation so necessary to its continuance.

In so far as organization and materiel are concerned, the infantry and light troops have benefited most from recent changes. Special effort has been made to increase infantry fire power by providing a new type of automatic rifle, the Breda 29, and giving three such weapons to each section, an increase of one per section. A large increase in tromblons for rifle grenade fire was contemplated, but only forty per company have been prescribed so far. The Italians prefer individual weapons to group weapons such as the machine gun, and further increase in fire power will most likely be sought in the development of an automatic shoulder weapon. Each infantry regiment is to have its battery of 65mm guns replaced by howitzers

of larger caliber. The question of adding certain anti-aircraft and anti-tank weapons to the basic infantry equipment is being studied. The development of strong infantry units with organic supporting weapons seems to be the goal.

The bersaglieri have been given an increased number of motorcycle units and incorporated in two divisions, each of three cavalry regiments and one bersaglieri regiment. These are the nucleus of war strength mobile divisions which are to include light tanks of the Carden-Lloyd type, armored machine gun cars, and motorized transport. At present, motorization of the Italian artillery has been limited to the heavy regiments.

The policy of priority of consideration for the infantry and for developing light mobile units is a logical result of Italy's military, economic and political situation. The possible adversaries who possess superior industrial equipment are separated from Italy by mountain barriers that lessen the menace of heavy tanks and heavy guns; while the nations on the more favorable frontiers are relatively weak industrially. Although the mountain tactics (which favor the use of light foot troops) and the industrial situation (which does not allow the manufacture nor upkeep of heavy forces) are important factors in this policy, it is dictated above all by moral and political considerations. The infantry is the most suitable arm in which to inculcate the warrior spirit that is part of the Fascist doctrine. It is the immediate and most convenient point of contact between the army and the State Militia which has the task of imbuing the entire military organization with the spirit of Fascism.

The role of the State Militia, a voluntary Fascist organization, has been increased considerably. It is now charged with the pre-military instruction of the youth of the nation and with the air defenses. Moreover, two battalions of Black Shirts have been incorporated in each infantry division. The indications are that the functions of the militia will increase with the development of pre-military training. A reduction in the period of compulsory service is contemplated, and the post-military organizations of the militia will carry on reserve training. In other words, a development toward the Anglo-Saxon system appears to be in progress, particularly in the infantry, which lends itself better than the more technical

arms to absorption by the militia. Aside from the economic advantages of this development, it is a means of imbuing the army with the spirit of Fascism. The plan naturally has met with certain uneasiness and resistance in the professional establishment; but this will be of little consequence as long as the head of the Fascist government controls in person the direction of both forces.

This total militarization of the people from infancy to old age—this profusion of uniforms, of parades, of official emphasis on the military virtues—arises less, apparently, from a desire for war preparedness than from the endeavor to give a spirit of cohesion and co-operation to the entire nation. It is part of the religion of force and heroism that the Fascists believe necessary for national regeneration, which explains, perhaps, the apparent contradictions between the expressions of policy for foreign consumption and those intended for the Italians themselves. On the one hand, a desire for peace is expressed—a sincere desire, apparently, since peace is an essential for the internal consolidation of the regime. On the other, an affirmation and exaltation of the warrior spirit is the motive element of this consolidation.

The Initial Possibilities of the British Army for a Continental War—Revue d'Artillerie, May, 1934.

The Regular Army of 200,000 men, composed of volunteers enlisted for twelve years, has as its mission the defense of India and the Colonies. About half this force is stationed in England. It is organized in five infantry divisions (each of 18,000 men), four brigades of cavalry, and a general reserve of all arms, and can be brought rapidly to war strength for early action. Motorization of regular units has proceeded steadily for the past six years and a number of mechanized units have been created. An expeditionary force would, in all probability, be composed at present of the regular divisions, mostly motorized, together with certain special mechanized armored units in the general reserve.

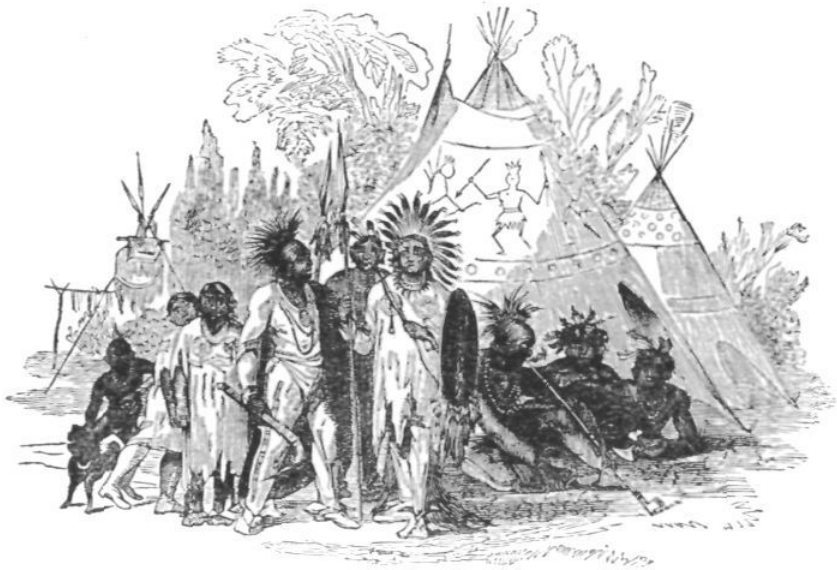
The Regular Army Reserve of 150,000 men (30,000 less than in 1914) is composed of men who have been transferred from the Regular Army to the Reserve for completion of their twelve years' service. The period of actual regular service is six years in the cavalry, seven in the infantry, and three to six in the artillery. This

excellent personnel would constitute a reinforcement of seven or eight divisions in time of war.

The Territorial Army is a militia force of fourteen divisions organized exactly as the regular divisions. There are a hundred thousand fewer territorials than in 1914, but their training is much more thorough. They could hardly be utilized outside of England before three or four months after a declaration of war.

The various Dominions have small professional forces for the training of their militias which are organized in divisions along the pattern of the Territorial Army. These troops could probably be present in appreciable force in six or seven months.

It is evident that while England's forces in case of war would be about the same as in 1914, her initial numerical strength would be somewhat less.



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SEE SPECIAL GROUP RATE FOR NEW MEMBERS, PAGE 68

FROM A PRIVATE TO HIS GENERAL

THE Civil War perhaps more than any war of recent times was one of individuals. It was waged and decided in the minds of individuals as much as in the clash of arms. In the judgment of values the individuals' reactions furnish finer material for true estimates of causes and reputations than documentary evidence from government archives.

There is a tendency today to exaggerate the imperfections of leaders for the sake of a popular effect. Two documents, however, that have recently come into the possession of the editor of THE FIELD ARTILLERY JOURNAL are interesting commentaries on the character of one of the leaders of the Union forces in the Civil War.

John B. Day served in the Chicago Battery Light Artillery at Fort Donelson, on through the various campaigns in Tennessee, at the battle of Lookout Mountain, and was discharged when Sherman's Army reached Atlanta. The Battery was largely, during its career, under the direct observation of General Sherman.

The following letters were in the possession of Mr. Day. After his death his sister gave them to Colonel Thatcher T. P. Luquer, Aux. Res., who, because of their interest to artillery officers, sent them to this JOURNAL.

The letters follow:

Near Kenesaw Mt. June 25th/64.

Maj. Gen. W. T. Sherman
General

As a private of Battery A, 1st Ills. Lt. Art., I respectfully request that you will accept this bridle and collar as a slight token of the high regard and esteem which all soldiers entertain towards you as our commander. We as a Battery have long served under you as Div. Corps, Department Commander and now as chief in command and at all times have felt confident that under your leadership our final success would be achieved. Please accept the bridle and collar. General (made by me in Camp at Larkinsville, Ala.) simply as a slight tribute of the regard and confidence reposed in you.

I have the honor to be, General
Very respectfully your obedient servant
GEORGE GATES,
Harness Maker Batt. A. 1st Ills. Lt. Art.
1st Brigade 2d Div. 15th A. C.

Maj. Gen. W. T. Sherman.
Comdg. Mil. Div. of the Miss.

Hd. Qrs. Mil. Div. of the Mississippi
In the Field near Kenesaw, Ga., June 26th/64

Geo. Gates
Co. A, Chicago Lt. Art.

Dear Sir

On reaching camp last evening I found your letter of June 25th with a handsome bridle with bit and bridoon and a beautifully stitched breast strap and martingale made by your hand in the leisure hours of camp. I assure you such a mark of your affection and respect is more acceptable to me than money, rich jewelled sword or fancy steed that are wont to be the tokens of military regard—to feel that the soldier at his post marks my constant labor to his safety and success satisfies me there are those witnesses close by who appreciate the truth of events far better than those in the background who judge of Battles by the sound of popular clamor rather than by witnessing the actual direction given to armies, and the dread missiles of war. For yourself and associates be assured that I have watched and noted your career with unalloyed satisfaction, at Arkansas Post especially, at all the movements on Jackson and into Mississippi, at Vicksburg when you had not only your own guns but for six weeks lay close under its walls with the 30 pounder Parrotts which did more execution than any guns at that memorable siege. I have always borne testimony to the peculiar intelligence, good conduct and gentlemanly deportment of the young men who compose your Battery and when war does close if I survive it I will make it my study to give full honor and credit to the soldiers in the ranks who though in humble capacity have been the working hands by which the Nation's honor and manhood have been vindicated.

As Battery A was one of the first to fire a hostile shot in the war in the great Valley of the Mississippi, I hope it will be one of the last and that its thunder tones will in due time proclaim the peace resulting from a war we could not avoid but which called all true men from the fancied security of a former long and deceitful peace.

With thanks to you personally.

I am your Friend

W. T. SHERMAN,

Maj. Gen.

PROBLEM IN FORWARD OBSERVATION

The battalion commander sent a liaison observer forward to the assault battalion of the infantry, saying to him as he left. "Here is a mosaic with an overlay showing the prepared concentrations of our battalion. I want you to keep me informed of the progress of the attack and at the same time give the infantry fire on targets of opportunity using air observation methods. Communication will be by radio. The battalion base point is marked on the mosaic."

The liaison observer arrived at the command post of the infantry battalion. He proceeded to check communication and identify the base point. The infantry commander then requested fire on a machine gun whose location he indicated on the mosaic. The liaison observer went to a position from which he could see the target and the following radio communication ensued:

Message: *Base point* 300* *right*, 600* *over, machine gun, can observe*.
Reply: *Adjust battery. Wait a few minutes* (short lapse of time.) *Battery ready*.
Message: *Fire*.
Reply: *Battery has fired*.
Message: 100 *right*, 200 *over*.
Reply: *Battery has fired*.
Message: 50 *right, over, fire for effect*.
Reply: *Fire for effect, battery has fired*.

The observer continued to observe and report effect making sensings as necessary to produce the maximum effect. When the desired result was obtained he sent.

Result accomplished.

Later on as the attack progressed the liaison observer could no longer see the base point. He studied his mosaic in conjunction with the overlay and found that scheduled concentration No. 47 placed fire on a bridge that he could identify. At this time the infantry commander requested fire on a strong point which was holding up our advance. The liaison observer sent the following message by radio:

Concentration No. 47, 100 *right*, 400 *short. Trench, can observe*.

This procedure again enabled the battery to fire a salvo in the vicinity of the target and by means of air observation methods the observer succeeded in placing effective fire on the strong point.

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*The numbers indicate yards. The complete message means "the base point is 300 yards right of and 600 yards beyond a machine gun upon which I can observe fire."

FIELD ARTILLERY NOTES

Selection of Classes
Command and General Staff School and Army War College

A greater number of official and personal letters which solicit or recommend detail to the Command and General Staff School and the Army War College are received by the Office of the Chief of Field Artillery than with reference to *all* other Personnel subjects combined.

At the present time there are in the Field Artillery 723 officers eligible for the course at Leavenworth and 149 for the War College. Eligibles for the Command and General Staff School comprise those officers who are not on the General Staff Corps Eligible List, who are above the grade of second lieutenant, and who are less than 48 years of age. Eligibles for the War College comprise those officers above the grade of first lieutenant, who are less than 52 years of age, whose names are borne on the General Staff Corps Eligible List. The Field Artillery allotment is normally 18 for the former class and 10 for the latter. In such circumstances, it appears that under present conditions many well qualified officers will never get these courses.

It seems probable that, conditions being as they are, an impression prevails throughout the arm that those officers who have an influential "friend at court" are likely to be the fortunate ones when it comes to selections for these eagerly-sought details.

The Chief of Field Artillery is desirous of removing this impression. Under his guidance and instructions the selections are being made in the following manner:

1. *All eligibles are considered*. No letter to the office of the Chief of Field Artillery is necessary to assure this.

2. Based upon a thorough study of records, initial eliminations are made until there remain for each class from 90 to 110 of those whose records are most outstanding.

3. The essential details of the records of these 90 to 110 officers are then transferred to blank forms which are identified *by a number only*.

4. These records, unidentified by name, are then placed in appropriate categories which are imposed by War Department directive,

such, for instance, as for the Leavenworth class, majors, upper age captains, lower age captains, and lieutenants.

5. Each officer in the office of the Chief of Field Artillery, acting alone and according to his own evaluation, arranges the records of each category in their relative order of merit.

6. All officers having submitted their resulting lists, these are consolidated so as to make a final list. The highest on this list are recommended by the Chief of Field Artillery when he has assured himself that it includes the men with the most outstanding records from the viewpoint of all those elements which make for the highest military attainments and efficiency.

Further action is taken on these recommendations by those other agencies of the War Department which are charged with co-ordinating functions to assure compliance with War Department policies. If changes are made, they result because records are read and judged by these final agencies differently than they were read and judged in the office of the Chief of Field Artillery.

While it may be advanced that the military records of officers on file in the War Department may not infallibly establish absolute efficiency, they do, when taken over a period of years, best reflect relatively the qualifications of the most outstanding officers professionally. No other impersonal and objective basis of determining this exists.

As an illustration of the fairness of the method above described, it can be stated that the recommended list for the Command and General Staff School this year includes one officer who was unknown to every officer in the office of the Chief of Field Artillery, and others who were known to but one or two.

Paradise for Soldier Athletes

The extensive athletic program now being carried out in the Hawaiian Division offers a veritable paradise for soldier athletes. Competitions are held in baseball, football, basketball, track and boxing. The Division has a magnificent athletic plant—a big gymnasium, wonderful football and baseball fields and a boxing bowl capable of seating 10,000 people. Trophies are presented to the winning teams. The grand trophy, however, is presented by the American Legion to that unit which excels for all around athletic proficiency during any athletic year.

BOOK REVIEWS

RIDING AND SCHOOLING HORSES. By LT. COL. HARRY D. CHAMBERLIN.—Riding and Schooling Horses is one of the best contributions that has been made to equine literature in recent years. It can be read and reread by the expert horseman with sincere appreciation and real benefit, and for the beginner it will serve as a text to be constantly referred to until the principles and sound instruction therein have been thoroughly mastered. Published by The Derrydale Press. Price, $10.00.

POLO PONIES. By MAJOR GROVE CULLUM.—Major Cullum, by virtue of his long experience in selecting, breeding and training horses for the United States Army (he is an ex-chief of the Remount Service) is ideally fitted to discuss ponies, a phase of the game of polo about which there is all too little useful information available. Published by Charles Scribner's Sons. Price, $5.00.

ULYSSES S. GRANT: THE GREAT SOLDIER OF AMERICA. By COL. ROBERT R. MCCORMICK.—This important biographical study gives a unique interpretation and a revealing analysis of the generalship of Ulysses S. Grant. It is not a life, nor does it attempt a detailed narrative of the Civil War. Its use of the battlefield is to reveal the genius of the man who became commander-in-chief of the Federal armies in time to save them and the Union, and who, in this carefully documented revaluation, is viewed as America's greatest soldier.

By pertinent fact and unimpeachable evidence, Colonel McCormick demonstrates that Grant never lost an objective; that with a magic touch he rescued lost campaigns; that when he left his command, his fellow generals were helpless and the war stopped; but that when he returned, the enemy was swept aside. Published by D. Appleton-Century Company. Price, $5.00.

MILITARY BOOKS

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

	Price (*Domestic postage included*)
FIELD ARTILLERY: The King of Battles—*Maj. Gen. H. G. Bishop*	$2.00
INFANTRY IN BATTLE	3.00
ITALY'S PART IN WINNING THE WORLD WAR—*Colonel G. L. McEntee*	2.00
THE PERSONAL MEMORIES OF JOFFRE (2 vols.)	6.00
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THE GUNNERS' MANUAL—*Capt. Arthur M. Sheets, F. A.*	1.50
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Canada, $3.25 per annum.
Countries in the postal union, $3.50 per annum.

Checks drawn on banks in the Philippine Islands, Hawaii and Canada should include 25 cents for collection charges—from the Canal Zone 35 cents.