

THE FIELD ARTILLERY JOURNAL

MAY-JUNE, 1934

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THE FIELD ARTILLERY JOURNAL

EDITED BY
DEAN HUDNUTT

MAJOR, FIELD ARTILLERY, UNITED STATES ARMY



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MAJOR GENERAL UPTON BIRNIE, JR., FOURTH CHIEF OF FIELD ARTILLERY

THE FIELD ARTILLERY JOURNAL

VOLUME XXIV

MAY-JUNE, 1934

NUMBER 3

MAJOR GENERAL UPTON BIRNIE, JR.

ON March 26, 1934, Major General Upton Birnie, Jr., was appointed Chief of Field Artillery as successor to Major General Harry G. Bishop.

Born in Carlisle, Pennsylvania, in 1877, graduated from the U. S. Military Academy in the class of 1900, he was assigned to the Artillery and joined his regiment in Cuba.

During his years of service he has served in Cuba, twice in the Philippine Islands, on the Mexican Border and in France. He has commanded all artillery units from a platoon to a regiment.

He is a Distinguished Graduate of the Infantry-Cavalry School; a graduate of the Army Staff College; graduate of the Army War College in 1912 and 1921 and on the Initial General Staff Corps Eligible List.

During the World War he served on the General Staff at General Headquarters A. E. F., participating in the Battle of Chemin des Dames (French) 1917, and in the St. Mihiel and Meuse-Argonne offensives.

He holds the following decorations: Officer of the Order of Leopold (Belgium); Officer of the Legion of Honor (France); Officer of the Order of St. Maurice and St. Lazarus of Italy and the Distinguished Service Medal.

General Birnie's entire record is one of outstanding merit. He is an accomplished Field Artilleryman with sound and progressive ideas. The Field Artillery is to be congratulated on having an officer of his caliber named as its Chief.

THE REGULAR COURSE, THE FIELD ARTILLERY SCHOOL

BY MAJOR EDWIN P. PARKER, JR., F. A.
Office of the Chief of Field Artillery

THE courses at the special service schools have been the subject of much study and discussion in the War Department during the past year. One result of this has been the decision to discontinue the Advanced Course and the Company. Troop and Battery Officers' Courses at the special service schools of the Infantry, Field Artillery, Cavalry and Coast Artillery, effective at the end of the present school year, and to substitute therefor, at each of these schools, one course called the Regular Course. It is contemplated that the last named course will be in the nature of a merger of the two courses now being given. However, it is evident that with this new course being allotted only one month's additional time over that allowed each of the two courses which it will replace, all instruction now given in the two courses cannot be included in the revised one year course. Consequently, it will be necessary for some of the basic instruction now included in the Battery Officers' Course to be completed by candidates for the Regular Course prior to detail to pursue that course.

The War Department has established the following requirements for the Regular Course: "The course to be based upon the tactics and technique of the arm to include the brigade. Practical training in mechanics and employment of weapons and command of battle units to be given primary weight in the course."

After considerable study and work, the Field Artillery School submitted an excellent plan for the Regular Course, and this plan has been approved by the Chief of Field Artillery and by the Adjutant General. This plan provides for a division of time approximately as follows:

Mobility	20 per cent
Gunnery	21 per cent
Tactics and Communication	36 per cent
General Field Exercises	13 per cent
Fire Direction	6 per cent
Material	3 per cent
Miscellaneous	1 per cent

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The classification "Mobility" includes instruction in both Animal Transport and Motors. To the subject of Animal Transport is allotted 200 hours. The present Battery Officers' Course has 315 hours and the Advanced Course 164 hours. The principal change in the instruction in this subject will be in the reduction of hours for marches exclusively for draft training, and the elimination of the complete training of a remount by each student which is required in the present Battery Officers' Course.

The study of motors is allotted 134 hours as compared to 195 hours in the Battery Officers' Course and 149 in the Advanced Course. This reduction may seem unwarranted due to the increase in motorization of the Field Artillery. However, the major change in this course is in the reduction from 76 to 24 hours in marches made exclusively for instruction in motor transport. Additional instruction in this will be given on general field exercises and other exercises in which motor transportation will be used.

The subject of gunnery takes up 443 hours in the Battery Officers' Course and 233 hours in the Advanced Course. The new course is allotted 347 hours, 106 hours less than the Battery Officers' Course. This reduction will require the omission of a considerable amount of elementary instruction now given in the gunnery course of the Battery Officers' Course.

Some conduct of fire will be included in general field exercises.

Tactics is allotted 532 hours as compared to 265 hours in the Battery Officers' Course and 724 hours in the Advanced Course. This subject will be supplemented by general field exercises which are, in the main, tactical.

The major change in the subject of communication is the reduction of the time now devoted in the Battery Officers' Course to qualifying students as telegraph (radio) operators. This subject is allotted 67 hours whereas in the Battery Officers' Course 82 hours is provided and in the Advanced Course 34 hours.

A total of 212 hours is set up for general field exercises as compared with 192 hours in each of the present courses. These exercises will be prepared as combined departmental activities under direct supervision of the Assistant Commandant. They will

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demonstrate all of the basic elements of Field Artillery training.

Instruction in fire direction, which heretofore has been under the Tactics Department, is placed under instructors of both the Tactics and Gunnery Departments under the direct supervision of the Assistant Commandant. The technique of fire direction is mainly a gunnery subject and the staff duties incident thereto, a tactical subject. Fire direction is allotted 105 hours.

Materiel is allowed 50 hours, which is 20 hours less than in the Battery Officers' Course and 23 more than in the Advanced Course.

For miscellaneous subjects, such as thesis, horseshow, transportation show and exercises incident to the opening and closing of school, a total of 22 hours are set up as compared to 37 hours heretofore.

The subcourses of the Regular Course, with the hours allotted to each, are listed below, grouped by departments:

<i>Department of Animal Transport:</i>	<i>Hours.</i>
Driving and Draft	60
Equitation	110
Animal Management	30
 <i>Department of Gunnery:</i>	
Conduct of Fire	52
Firing Battery	6
Service Practice	144
General	2
Preparation of Fire	143
 <i>Department of Materiel:</i>	
Materiel	50
Motors	134
 <i>Department of Tactics and Communication:</i>	
Associated Arms	130
Signal Communication	67
F. A. Training	14
General Tactics	47
Artillery Intelligence	21
Logistics	50
Combat Orders	25
Reconnaissance	68

THE FIELD ARTILLERY SCHOOL

Staff Duties	40
Artillery Tactics	120
General Terrain Exercises	16
Organization	1
<i>Combined:</i>	<i>Hours.</i>
Thesis	1
Horse Show	10
Miscellaneous	9
Transportation Show	3
Fire Direction and Reconnaissance.....	105
General Field Exercises	212

The allotments of hours enumerated above for the new Regular Course are based on a ten months' course. In view of the fact that the Regular Course at the Field Artillery School for the year 1934-35 will not commence until October 8, 1934 (in order to provide new quarters on the post for students upon their arrival) some readjustment in allotment of hours to subjects will have to be made during the coming school year.

All candidates for the Regular Course should consider the fact that the Field Artillery School, in its effort to condense two courses into one, will find it necessary to omit considerable elementary subject matter which previously has been taught in the Battery Officers' Course. In practically every subject, the School hopes to commence instruction at a point further in advance than in the Battery Officers' Course in previous years. In order for this plan to be carried out, and at the same time keep students abreast of the instruction, candidates for this course must do a considerable amount of preparation before arrival at Fort Sill. It is believed that the Extension Courses of the Field Artillery School offer the best opportunity for this preparation.

It is realized that the available time before the beginning of the Course for the coming school year is too limited to complete all of the subcourses which it would be advisable to study. However, each candidate should be able to complete quite a few subcourses in approximately four months' time and thus enable him not only to improve his record at the School, but also to assimilate better the instruction given there.

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The following listed subcourses of the Extension Course of the Field Artillery School, arranged numerically, are recommended for completion before attendance at the Regular Course at the Field Artillery School:

20-1, 20-2, 20-3, 20-5, 20-6, 20-7, 20-8, 20-9, 20-11, 30-1, 30-4, 30-5, 30-6, 30-7, 30-8, 30-9, 30-10, 30-11.

It is assumed that all candidates for the Regular Course at the Field Artillery School are acquainted with the subject matter in the following subcourses of the Extension Course of the Field Artillery School:

10-5, 10-6, 10-7, 10-8, 10-9, 10-10.

If not, it would be advisable for them to look over these subcourses also.

An outline of the above listed subcourses may be found in Section IX, Extension Course of the Field Artillery School, Announcement of Army Extension Courses, 1933-34, published by the Adjutant General.

MOBILITY INSTRUCTION IN NEWLY ORGANIZED TRUCK - DRAWN FIELD ARTILLERY UNITS

BY MAJOR J. E. LEWIS, Field Artillery

FOREWORD

ALTHOUGH procedure designed to produce a satisfactory degree of mobility in a newly organized horse-drawn field artillery unit is well established and supported by years of practice, it is believed that the same degree of mobility can be attained, in less time, with truck-drawn units, if a systematic, painstaking and progressive plan of instruction is followed. This article is intended as a guide for use in the mobility training of field artillery units confronted with the necessity for changing their means of transport from horses to trucks.

PREPARATORY STEPS

Since in most cases the commanding officer will have had some advance notice of the reorganization or conversion of his unit from horse-drawn to truck-drawn, it will be possible to take steps to prepare at least a nucleus of personnel to receive the vehicles. The training of this nucleus should follow the procedure suggested hereinafter for the training of all mobility personnel, except in cases where lack of time necessitates a more concentrated schedule.

RECEIPT OF THE VEHICLES

The operating unit should insist that an *Initial Condition Check* be made either by the distributor who delivers the vehicles or the Quartermaster Corps. Failing in this the commanding officer should secure a few copies of such a check list from the manufacturer or his local dealer and, with the services of a few competent mechanics, make the check prior to placing the vehicles in service.

The maker's directions as to "breaking in" the vehicles should be followed if long life and reliable service are to be expected. It may be found expedient, under certain circumstances, to block up the vehicles, put them in gear, and thus "run in" all moving parts. This will reduce the danger of damage by inexperienced drivers in the early days of operation.

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TRAINING OF PERSONNEL (COMMISSIONED AND ENLISTED)

Since efficient mobility is dependent primarily upon correct *operation* and *preventive maintenance* within the operating or using service (in this case the Field Artillery), our next concern should be with instruction in and the correct practice of these two interlocking phases. If the proper standard is attained the necessity for serious repairs will be deferred. However, the time will arrive when repairs are necessary. Use and accidents later on will demand major repairs; hence competent mechanics must be trained.

INITIAL TRAINING PHASE

In the initial training phase, operation and preventive maintenance should be stressed. For officers and key enlisted men the following training schedule, varied to suit the local situation, is suggested:

SUGGESTED COURSE IN OPERATION AND MAINTENANCE FOR TROOP SCHOOL			
Period No.	Hours	Method	Subject and Reference
1	2	*Conf.	The automotive chassis. (Use of film is highly desirable.)
2	2	Conf.	Systems of operation and maintenance of motor vehicles.
3	2	Conf.	First and second echelon maintenance.
4	2	Conf.	The F. A. automotive driver.
5	2	*Conf. & Dem.	Inspection of motor vehicles.
6	2	*Pract.	Technical inspection of vehicle of the same or similar type with which the unit is to be equipped.
7	1	Conf.	Automotive field expedients.
8	1	*Pract.	Lubrication schedules of vehicle of the same or similar type with which the unit is to be equipped.
9	2	Conf.	Conduct of marches. (F. A. Book 123, Pars. 1-41 and 49-63.)
10	1	Conf.	Conduct of marches. (F. A. Book 123, Pars. 64-101.)
11	1	Conf.	Truck - drawn artillery. General principles of marching.
Total	18		

*Desirable to have these periods conducted by an officer who is a graduate of the Advanced Motors Course, F.A.S., or its equivalent.

TRUCK-DRAWN FIELD ARTILLERY UNITS

TRAINING OF DRIVERS AND MAINTENANCE PERSONNEL

Even before receipt of the vehicles, means can be found to begin the training of at least a few drivers and some of the maintenance personnel. All should receive drivers' training and those selected as mechanics, motor sergeants and corporals should receive specialized training in adjustment and repair.

DRIVERS

The driving of a motor vehicle in a combat unit differs so much from that of a commercial or private vehicle that knowledge of the latter might well be considered only a basis of departure and then often a poor one. due to the many false impressions and faulty individual habits which may be found to exist. The ability to drive in convoy on the road, across country and in difficult draft with reliability and safety, at reasonable speeds, is an essential qualification for all field artillery automotive drivers. In order eventually to attain the self-confidence and finesse necessary to this qualification, not only progressive training but driving experience, ever increasing in difficulty, must be provided. The tendency toward excessive speed must be counteracted at all stages.

MAINTENANCE PERSONNEL

For the instruction of maintenance personnel in the construction and functioning of motor vehicles the "Motor Manual" published by the Military Department, Purdue University, Lafayette, Ind., is available. Though very brief, this publication is reasonably modern and low priced. F. A. Book 120, a more complete technical text, profusely illustrated, will be available in the not distant future.

For instruction in maintenance the following publications will be found to be useful:

Manufacturers' handbooks, repair manuals, service manuals, and instruction books.

Automotive Service, by Kuns. (Published by the Bruce Publishing Company, New York, Milwaukee, and Chicago.)

This is an excellent reference book for motor officers and motor sergeants.

Painstaking observance and vigorous enforcement of the details of maintenance recommended in the literature listed above will be rewarded by long, reliable, and safe performance from the vehicles.

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OPERATION

By the term "operation" is meant the use of motor vehicles, individually or in a group, in performing the combat, training and administrative functions of the unit.

Since the Field Artillery is treading new ground in this respect it may be well to proceed conservatively, especially as to speed and the negotiation of obstacles. We can not reasonably hope to attain the upper limits of these factors for some time. By timely and thorough reconnaissance a large percentage of the difficult draft can be avoided.

The available literature, covering operation in addition to that mentioned in the discussion of other phases, is limited to the following:

F. A. Book 123, Marches, Shelter and Field Equipment (Motorized).

Tentative Regulations for Maneuvers, Marches, and Inspection, 75mm Gun M-1897, Batteries, Truck-drawn.

SUMMARY

For resident instruction at The F. A. School in these subjects War Department publications are amplified by the use of F.A.S. Notes M-1, 2, 3, 4, 5, and 6, all devoted to operation and maintenance, and M-26 to M-49 inclusive covering the construction and functioning of motor vehicles.

As an operating organization a field artillery unit should strive for high grade efficiency in operation and preventive maintenance, and insist that, for major repairs and the supply of replacement parts, it be adequately supported by the services.

The characteristics of these vehicles make them susceptible to many abuses. Excessive speeds should be forbidden.

In the training of truck-drawn units great opportunity will be found for the exercise of leadership by junior officers and noncommissioned officers; for, in order to obtain better than ordinary results in operation and maintenance, a sense of pride in performance, efficiency, and appearance of the vehicles must be implanted in the driver and, in a broader sense, in the noncommissioned officers and mechanics.

LE CATEAU, 26 AUGUST, 1914*

BY MAJOR J. J. BETHURUM WILLIAMS, Field Artillery

FOREWORD

The study of military history has been recommended, nay urged, by all the great military leaders of the past. Consequently it is a recognized form of instruction of officer personnel in all countries that have an educational system. From such studies have been prepared the basic instruction manuals, such as Field Service Regulations, in order that the resultant principles to be applied in the future may be readily available to those concerned.

The mere reading of a narrative of events that occurred in some past war is not sufficient. Such reading makes little impression and, even if remembered, the principles that seem to be involved are often misunderstood if all the surrounding circumstances are not well considered. It is more important, from the individual advantage to be gained in preparation for personal leadership of units, small or great, that an officer should know thoroughly some one campaign, or a series of phases of military action, that has occurred in war rather than a long summary knowledge of military history in general. To delve into all the particularities of one bit of action is hard work and makes one think, but therein lies the advantage.

To promote such work, detailed studies are prescribed as part of the course of The Command and General Staff School. That THE FIELD ARTILLERY JOURNAL has seen fit to publish this study is greatly appreciated as an encouragement and an incentive to others to attempt similar studies, whether at school or on their own, in an effort for self-improvement.

Fort Leavenworth, Kansas
May 1, 1934.

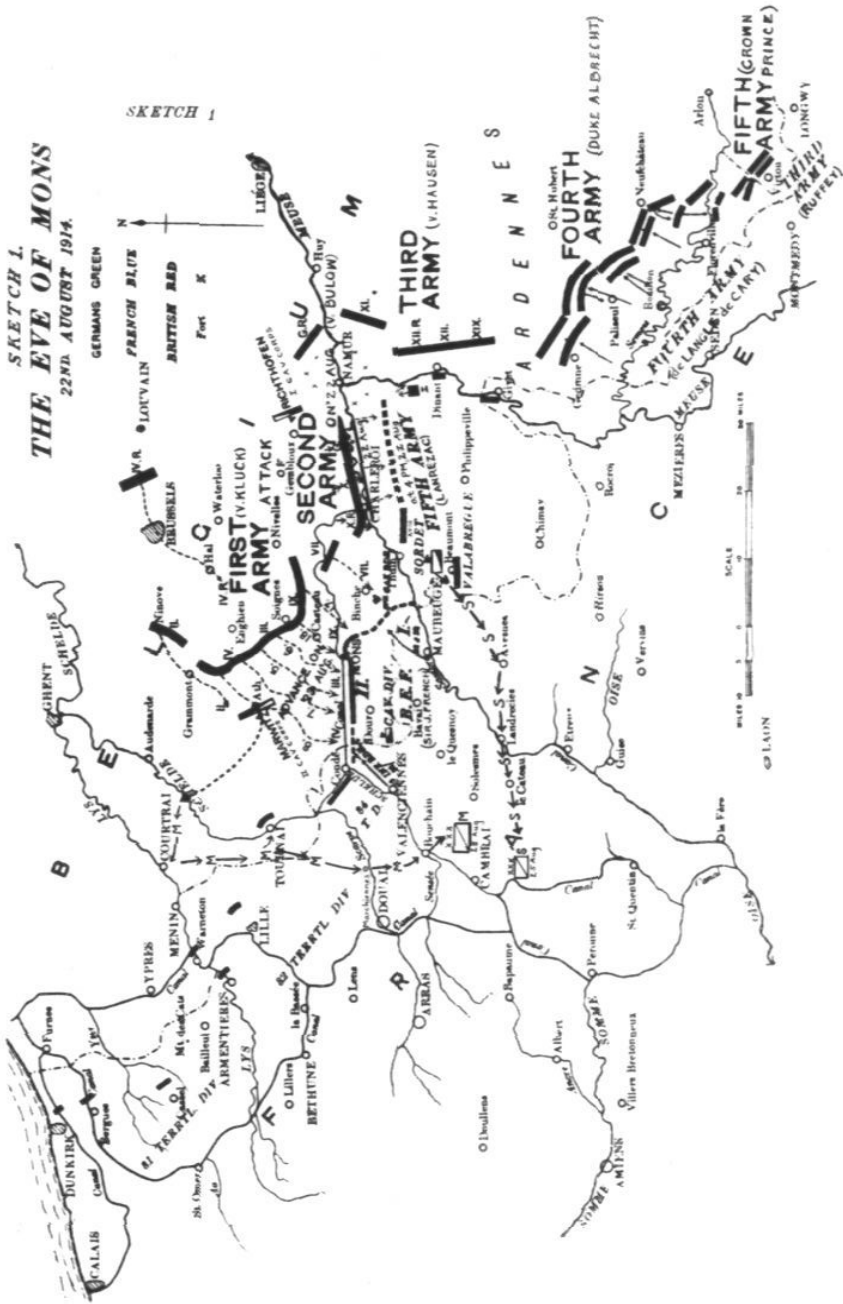
S. HEINTZELMAN,
Major General, U. S. Army.

INTRODUCTION

IT has been sententiously said that the Germans won the World War for four years, then lost it in the last four months. However, it may be said with greater truth that the Germans spent four years trying to win a war they really lost in the first four months. The responsibility for losing the war at its outset rests squarely on the German High Command. Wholly aside from the pre-war modification of the Graf Schlieffen plan resulting in strengthening, unnecessarily, the left at the expense of the right wing; aside from the order of GHQ to the left wing on 22 August directing pursuit, prematurely, in the direction of Epinal; and aside from the later unwarranted shifting of troops to the Eastern Front—the failure to win in the first few months may be ascribed to the failure of German GHQ firstly, to exercise the necessary degree of control over the armies and makeshift groups of armies, and secondly, to provide

*This article was prepared originally at the Command and General Staff School as a solution to the problem in Individual Research. For publication it has been rewritten and revised in the light of latest available information, including the 1933 revision, Volume I, British Official History, just received (March, 1934) in the United States; certain maps, the citations, bibliography, and appendices have been omitted.

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LE CATEAU, 26 AUGUST, 1914

for the proper employment of cavalry masses for a decision in consonance with the Schlieffen strategic conception. As a consequence, opportunity after opportunity to obtain decisive results was lost.

One such opportunity existed in the huge pocket of the Sambre and the Meuse toward the latter part of August, 1914. At this time neither the French nor the British seem to have had a true appreciation of the great scope and power of the German wheel through Belgium; both were still bent on taking the offensive in carrying out plan XVII, based on the "untenable doctrine of the offensive at all hazards." Instead of attacking prematurely on 22 August with his Second Army and driving back Lanrezac from his precarious situation along the Sambre, General von Bulow should have operated to hold the French Fifth Army in his front while the German First and Third Armies hurried forward to complete the envelopment. If the action of the right wing had been properly coordinated and controlled by German GHQ, a double envelopment of the Allied left, consisting of the French Fifth Army and the entire British Expeditionary Force, should have resulted. The stage was set for the enactment of just such a drama. (Sketch 1).

While not on the scale of that lost along the Sambre and the Meuse a few days before, an especially favorable opportunity was presented to the Germans on 26 August at Le Cateau. The consequences of a decisive victory here might well have been far-reaching. Le Cateau is replete with the exceptional and the commonplace, with the ordinary and the unusual. Let us see what lessons of value there may be in this action.

HISTORICAL FACTS

PLANS AND ORDERS OF BRITISH GHQ

The British Expeditionary Force completed its concentration in France and, advancing north with the mission of undertaking an offensive against the Germans in conjunction with the French Armies on its right, arrived in the area: Mons-Conde-Maubeuge on 22 August, 1914. However, on 23 August, the British were defeated at Mons. As late as 8:40 P.M., 23 August, Field Marshal Sir John French ordered the British II (left) Corps to strengthen the position to which it had been

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forced to withdraw, intending at that time to defend on the ground then occupied. However, later information that the French Fifth Army had ordered a retreat, and that the Germans apparently were in considerable strength on the front and flanks of the British, indicated the necessity for an immediate withdrawal of the British Army from its then forward position, which had become untenable.

Accordingly, at 1:00 A. M., 24 August, at Le Cateau, Field Marshal Sir John French issued orders directing a withdrawal, beginning at daylight, to the general line: west of Maubeuge-Bavai-Jerlain. The I Corps, under Lieutenant General Sir Douglas Haig, was ordered to fall back on Givry and cover the retreat of the II Corps, under General Sir Horace Smith Dorrien, toward Bavai; the Cavalry Division, with the 19th Infantry Brigade attached, under Major General E. H. H. Allenby, was ordered to cover the retirement, paying particular attention to the left flank.

At 4:00 A. M., 24 August, the celebrated retreat from Mons was begun, covered by the Cavalry, reinforced, and rear guards. The British were closely followed up by the German First Army.

By early afternoon on the 24th, in view of information of the retreat of the French Third and Fourth Armies, and the continuation of the retreat of the French Fifth Army on his right. Sir John French decided the British Expeditionary Force could not defend on the rearward line selected initially. Orders were issued directing the retreat be continued early the next morning, 25 August, some miles still further to the rear to a defensive position in the vicinity of Le Cateau, rear guards to clear the road: Maubeuge-Bavai-Eth by 5:30 A. M., 25 August.

Early on 25 August, the retreat was continued, the I Corps passing to the right, the II Corps to the left of the difficult Forest of Mormal. In thus negotiating this accident of the terrain, the two corps became separated by a gap of several miles.

Again, reports received late on 25 August indicated the French were still continuing their retreat; that the Germans were concentrating probably as many as 3 corps on the front of the British while attempting at the same time to turn their left flank with an

LE CATEAU, 26 AUGUST, 1914

additional corps and a cavalry corps. In view of this information, Sir John French now decided the British could not defend on the Le Cateau position as previously ordered, but the retreat must be continued until some serious obstacle such as the river line of the Oise or Somme could be placed between the British and the now relentlessly pursuing Germans. Thus protected, the British would be able to secure some respite, receive replacements, and reorganize in order to take the offensive later when a favorable opportunity should come.

Therefore, at 7:30 P. M., 25 August, at his command post in St. Quentin, Field Marshal Sir John French ordered the retreat continued at 7:00 A. M., 26 August, on St. Quentin and Noyon.

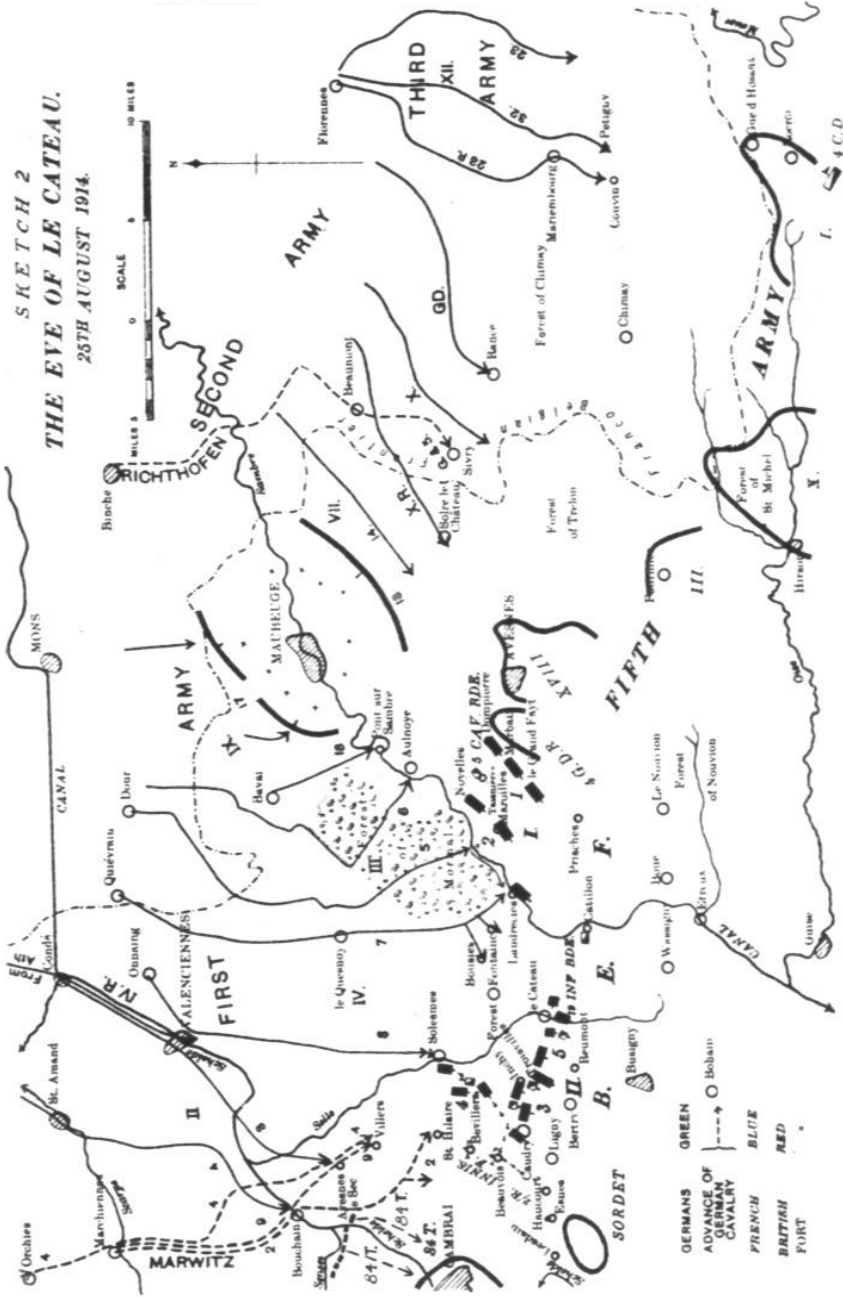
OPERATIONS OF THE I (RIGHT) CORPS IN COMPLIANCE WITH ORDERS OF BRITISH GHQ

The I Corps withdrew from the Mons area on 24 August as ordered. Its further retreat on 25 August was delayed at the crossing of the Sambre at Landrecies, and east thereof at Maroilles, by the convergence of its routes of withdrawal with elements of the French Fifth Army, also withdrawing. As a result of passing to the right of the Forest of Mormal, instead of reaching its position on the right of the II Corps in the vicinity of Le Cateau, by dark of the 25th the I Corps extended 15 or 20 miles to the east. At the nearest point, Landrecies, it was about 8 miles distant, causing a somewhat dangerous gap.

After dark on the 25th, the pursuing German First Army sent forward through the Forest of Mormal infantry in trucks supported by artillery and cavalry. These forces encountered elements of the 2d Division, British I Corps, at the Sambre bridges at Landrecies and north of Maroilles, and night fighting took place, lasting until early in the morning. The situation of the I Corps appeared to be so critical at one time during the night 25-26 August that in response to calls from Sir Douglas Haig, Field Marshal Sir John French asked help from the II Corps and from the French Fifth Army. Elements of two Reserve Divisions of General Valabregue, attached to the French

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SKETCH 2



LE CATEAU, 26 AUGUST, 1914

Fifth Army, came up and assisted General Sir Douglas Haig in effecting the successful extrication of his I Corps.

Upon receipt of Sir John French's order to continue the retreat further to the south on the 26th, the I Corps moved out in the early hours of 26 August, leaving the II Corps on the Le Cateau position.

OPERATIONS OF THE II (LEFT) CORPS, 4TH DIVISION AND CAVALRY DIVISION, REINFORCED, SUBSEQUENT TO THE BATTLE OF MONS AND PRIOR TO THE BATTLE OF LE CATEAU

The British II Corps also retreated as ordered on 24 August, successfully executing an intentional crossover of its 2 divisions enroute, and made preparations for an early resumption of the retreat on 25 August to the Le Cateau position. However, it, too, was delayed as will appear later.

Meanwhile, having just arrived from England, the 4th Division had practically completed the detrainment of the bulk of its combatant troops in the Le Cateau area on 24 August. On account of the exigencies of the situation, the 4th Division, less certain service elements and a portion of its artillery not yet detrained, was ordered to occupy a position in the vicinity of the critical Solesmes bottleneck, some 6 or 7 miles north of Le Cateau, to assist in covering the retreat of the II Corps. At 1:00 A. M., 25 August, the 4th Division was hurriedly marched northward from its detraining stations to carry out its assigned mission. (Sketches 2 and 4).

In a series of rear guard actions, the further retreat of the British II Corps on the 25th was covered by General Allenby's Cavalry Division and the 19th Infantry Brigade. The Germans, however, pursued so closely that by nightfall their advanced elements were in contact with the rear guard of the British 3d Division at Solesmes.

The main body of the British 5th Division, on the right of the II Corps, began arriving on the Le Cateau position at 3:00 P. M., and by about 5:00 P. M. had occupied the right of the line between Le Cateau and Troisville, both inclusive. (See Sketch 3 for dispositions of British II Corps). The rear guard, the 14th Brigade, came in between 5:30 and 6:30 P. M. Elements of this Brigade were sent east of Le Cateau to establish

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contact with the I Corps, as at that time it was still supposed the I Corps would occupy its portion of the defensive position.

The main body of the 3d Division arrived between 6:00 and 7:00 P. M. in a downpour of rain, and occupied its portion of the line on the left of the 5th Division between Inchy and Audencourt, both inclusive.

At dark, the 7th Brigade (rear guard of the 3d Division), the 4th Division, and a portion of the Cavalry Division were still in position covering the Solesmes bottleneck to the north through which troops, transport, and refugees were pouring; the 19th Infantry Brigade and the remainder of the Cavalry Division were marching on Le Cateau and vicinity, where they arrived between 10:00 and 11:00 P. M. The pursuing Germans having gone into bivouac without pressing their advantage at Solesmes, the 7th Brigade, between 11:00 P. M. and midnight, withdrew and occupied Caudry and vicinity on the left of the 3d Division sector.

The 4th Division occupied its covering position on the high ground south of Solesmes until a late hour. Leading elements did not withdraw until well after dark, probably about 9:00 P. M., while the rear guard, the 10th Brigade, did not withdraw until near midnight. In accordance with an amendment to its initial defense order, the 4th Division took up a position on the left of the II Corps between Fontaine au Pire and Esnes: the 11th and 12th Brigades in line, the 10th Brigade in division reserve at Haucourt, and the artillery assembled in readiness at Ligny.

Both British Corps were delayed in their retreat on the 25th by the westward passage of General Sordet's Cavalry Corps. Here and there throughout the sources runs the fascinating thread of the story of this fateful march.

THE MARCH OF SORDET'S CAVALRY CORPS

At 8:30 A. M., 23 August, General Joffre ordered Sordet's Cavalry Corps relieved from its positions on the left of the French Fifth Army and directed it to cover the left of the British Expeditionary Force (Army W).

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"Document No. 49*
Telegram to French GHQ

August 23, 8:10 P. M.

The Army W, after today's engagements, has requested to cross the fortress of Maubeuge to retire on the front: Bavai-Maubeuge. Have made request to (Fifth) Army if I should continue my mission on the left of the Army W.

(SORDET)

Document No. 50

Telegram from GHQ (Received 2:00 A. M.)

August 24. 1:00 A. M.

Reply to telegram of 23, 8:10 P. M.: "Yes."

On the morning of 24 August, Sir John French finds General Sordet at his headquarters at Avesnes, outlines the situation, requests assistance. General Sordet tells of his trying experience while in support of the Belgian Army against that first, desperate thrust of the Germans; tells of the imperative need of his horses for rest; promises to do all he can to help.

In gaining the left flank, the Cavalry Corps must traverse the routes of the British columns retreating south on Le Cateau. The necessary staff arrangements are made. The Corps marches on the 24th, halting at Dompierre.

The trains of the British II Corps are delayed on the 24th by Sordet's Cavalry crossing their line of retreat. This in turn delays the early march of the troops of the II Corps planned for the 25th.

"Document No. 55

Order for August 25th

August 24, 10 P. M.

Tomorrow, August 25, the Cavalry Corps will march to the Army W, in the region of Le Cateau. The three cavalry divisions will form a column, the head on the road Marvilliers-Avesnes at 6 A. M.

Reconnoitering . . ."

Sordet arrives at Bazuel, 2 miles southeast of Le Cateau, at 11:00 A. M., on the 25th. Here he hopes to be able to rest. But the situation will not permit. Field Marshal French urgently requests that the Cavalry Corps gain the left "that very night."

*Documents are extracted from Colonel Boucherie's "Historique du Corps de Cavalerie Sordet," C&GSS translation by Rupert Hughes, Lieutenant Colonel, MI-Reserve.

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"Document No. 59

(Bazuel)

August 25, 12 noon.

The Cavalry Corps continues its march on Cambrai, to operate on the left flank of the Army W.

Routes: 3d Division: Montay-Beaumont-Esnes-Bantouzelle; 5th Division: Le Cateau-Bertry-Esnes; 1st Division: Escaufourt-Walincourt-Lesdain.

The Commander of the Cavalry Corps marches with the center column.

Reconnaissance: 3d Division, a squadron toward Cambrai.

The Army W will be, this evening August 25, on the road: Le Cateau-Cambrai; the Cavalry Division of W will be probably south of Caudry; the 5th Cavalry Division will place itself in touch with these elements."

The British I Corps is delayed in its retreat on the 25th by the rear of Sordet's Cavalry using the road: Maroilles-Landrecies . . . The head of the Cavalry Corps passes through Ligny, in rear of the British II Corps, during the afternoon of the 25th . . . The 13th Brigade, 5th Division, II Corps, retreating down the hot, dusty Roman Road on the 25th, is held up on the outskirts of Le Cateau to permit the passage of 6 regiments and a cyclist battalion of Sordet's Corps under the railroad bridge. Until after midnight 25-26 August, Le Cateau is still congested with transport due to delay occasioned by the passage of the Cavalry Corps across the routes of withdrawal . . . Elements of Sordet's Corps reach Esnes; barricade the western approaches to this village; are come upon about 1:00 A. M., 26 August by the bulk of the 2d Battalion, Royal Inniskilling Fusiliers, 4th Division, sent out to protect the left . . . During a halt of the 1st Battalion, King's Own Regiment, 4th Division, in Haucourt about 4:00 A. M. the 26th, the rear guard of the Cavalry Corps rides through. . .

Thus, finally, after a gruelling march, more than 32 miles of which are covered on the last day, with men and horses rain-soaked and dog-tired, the Cavalry Corps Sordet arrives in the area: Esnes-Lesdain-Walincourt on the critical British left flank. (Sketches 1 and 2.)

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THE DECISION OF GENERAL SMITH-DORRIEN

SITUATION.—At his command post in Bertry at 2:20 A. M., on 26 August, in addition to his knowledge of the general situation, General Sir Horace Smith-Dorrien is in possession of the following information:*

(1) From British GHQ in the afternoon of 25 August: 'Summary of air reconnaissance reports is as follows: Enemy columns of all arms observed advancing south, heads near Bavai and Le Quesnoy with a third column in between; another column entering Valenciennes' (actually the 6th, 5th, 7th and 8th German Divisions).

(2) From GHQ, later in the afternoon of 25 August, the following (autographed) warning order:

"25th/8/14
3.45 P. M.

Dear Sir Horace,

The C.-in-C. has decided to continue the retirement to-morrow, the left (probably the 4th Division) being directed towards Peronne.

He told me to let you have this private note of his intention.

Orders will follow as soon as the details can be worked out.

v. s. yrs.

Henry Wilson."

(Sub Chief of Staff)

(3) From the 3d Division: 'Rear guard (7th Brigade) heavily attacked just before dark by strong enemy infantry supported by artillery, near Solesmes. Attack was not pressed after dark.'

(4) From GHQ, formal written Operation Order No. 8, received at II Corps Headquarters at 9:00 P. M., 25 August, extracts of which are as follows:

"OPERATION ORDER NO. 8

by

Field-Marshal Sir John French, G.C.B., etc.,
Commanding British Expeditionary Force

G.H.Q.

25/8/1914

1. The enemy followed our movement this morning and is also passing troops of all arms to the West and South.
2. It is the intention of the C.-in-C. to continue the retirement to-morrow with a view to covering his advanced base and protect his L. of C.

*As near to the actual situation confronting General Smith-Dorrien as can be gathered from the sources.

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3. For this movement the 19th Brigade will be taken from the Cavalry Division and placed under the orders of the II Army (Corps).
5. The 4th Div. will fall back on the western flank in the general direction of Peronne, the western column moving along the line indicated roughly by the line: Seranvillers-Le Catelet.
The movement to commence at 7 A. M. * * *
7. The I Corps will start at 5:30 A. M. and march to the area of Busigny, and connect with the II Corps at La Sabliere.
The I Corps can use the Le Cateau-Busigny road and roads to the East. * * *
8. The Cav. Div., with the 5th Cav. Bde. attached, will cover the movement on the N. and W. * * *
9. G.H.Q. to St. Quentin at 7 P. M. tonight.

A. J. Murray,
Lieut.-General,
C.G.S."

(5) From GHQ sometime after 10:00 P. M., 25th, the following message: 'The I Corps reports at 10:00 P. M. it is being heavily attacked from the northwest in the vicinity of Landrecies, and requests help. Move to its assistance, with at least the 19th Brigade.'

General Smith-Dorrien has replied as follows: "Much regret my troops are quite unable to move tonight. The 19th Brigade could not reach Landrecies in a useful state."

(6) From General Allenby, delivered in person sometime before 2:00 A. M., in substance the following: 'Colonel Ansell of the 5th Dragoon Guards (1st Cavalry Brigade) came to my command post in Beaumont before midnight and reported that his regiment and the 4th Division had safely withdrawn from the high ground south of Solesmes; he says this high ground is now in possession of the enemy. The Cavalry Division is quite scattered and will have difficulty covering the retreat. All indications are that the enemy is in greater strength than ever, and is very close. He now has strong cavalry, perhaps as much as a corps, threatening the left flank. In my opinion, unless you march by daylight the enemy will be upon you, you will be pinned down, and perhaps surrounded.'

(7) From Major General H. I. W. Hamilton (killed in action 14 October), commanding the 3d Division, whose command post was in Bertry, and who had been sent for at 2:00 A. M.: 'In reply to your question as to whether I can move before daylight,

I do not think my Division can be formed up ready to march before 9:00 A. M.'

(8) From his Chief of Staff, probably, sometime before 2:00 A. M.: 'Some units came in very late. All are not yet in their assigned positions. The troops are tired and considerably scattered. The bulk of the Corps is in hand and has had about 7 hours' rest; the 5th Division has been on the position since about 6:30 P. M., 25th: two-thirds (2 brigades) of the 3d Division since about 7:00 P. M.

Sordet's Cavalry Corps passed across our rear during the afternoon of the 25th, and is now in the vicinity of Walincourt.

II Corps losses during the preceding 3 days have been considerable, about 5,000, or 15%.

Reports indicate the enemy is hurrying forward all available forces.'

(9) At 10:15 P. M., 25 August, II Corps formal Operation Order No. 6, directing a continuation of the retreat on the 26th—trains at 4:00 A. M., troops at 7:00 A. M.—was issued.

(10) The very hot weather of the 25th was broken by a heavy rain storm at 5:00 P. M., and it has been raining during the night. The ground is wet and soft. Roads are good. Many are encumbered with military transport and the carts of refugees. There are sufficient roads for a continuation of the retreat. All streams in the immediate area, except the Selle River, are fordable. Daylight is at 4:00 A. M.

REQUIREMENT.—The decision of General Sir Horace Smith-Dorrien at 2:20 A. M., 26th August, 1914.

General Smith-Dorrien decided: To suspend the continuation of the retreat at once; to defend with divisions abreast on the general line then occupied, with a view to administering a severe check to the pursuing enemy, then continue the retreat.

SITUATION.—At 3:45 A. M. General Smith-Dorrien is in possession of the following information:

(1) At 2:30 A. M. he received a report in substance as follows: 'The enemy has occupied Cambrai.'

(2) At 3:45 A. M. Field Marshal French informed him: "The enemy appears to be working round south of Landrecies. G. O. C., 4th Brigade (I Corps) doubts if he can move south. My orders of last night (order of 7:30 P. M. to continue the retreat) hold good as far as you and Snow (Commanding General, 4th Division) are concerned. You are now allotted the additional road: Le Cateau-Busigny, previously assigned to the I Corps (which will move south instead of southwest)."

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REQUIREMENT.—The decision of General Smith-Dorrien.

General Smith-Dorrien adhered to his decision of 2:20 A. M. to defend, and about 4:00 A. M. went in person to the Commanding General of the 5th Division to discuss the situation. In the meantime staff officers had been sent out to inform all concerned.*

Both General Allenby and Major General T. D. O. Snow, commanding the 4th Division, agreed to stand and fight under General Smith-Dorrien's command.

The British troops that fought at Le Cateau, therefore, may be considered as the II Corps, now consisting of the 3d, 4th, 5th Divisions, and 19th Brigade, with a Cavalry Division attached.

DISPOSITIONS OF THE BRITISH BY DAYLIGHT, 26 AUGUST

The II Corps, as now constituted, occupied the general line: south of Le Cateau-Troisvilles-Audencourt-Beaumont-Caudry-Fontaine au Pire-Esnes, as follows: the 5th, 3d and 4th Divisions in line in order from right to left, each holding about 5,000-6,000 yards of front; the 19th Infantry Brigade (four battalions) at Reumont, in rear of the right flank, in corps reserve; the bulk of the Cavalry Division on the right, with one brigade toward the left flank. (Sketch 3.)

The I Corps was in march to the south as ordered.

DISPOSITIONS OF FRENCH TROOPS ON THE LEFT OF THE BRITISH II CORPS

In addition to Sordet's Cavalry Corps nearby, some 11 miles to the northwest of the British left, General D'Amade's 84th Territorial Division was located along the Sensée Canal and astride the Schelde, north of Cambrai.

DISPOSITIONS OF THE GERMAN FIRST ARMY, NIGHT 25-26 AUGUST

In its pursuit, the German First Army halted for the night 25-26 August on the general northwest-southeast line: Bouchain-Solesmes-Bousies-southern and east edges of the Forest of Mormal-and along the Sambre, with troops disposed from right to left (German) approximately as follows (Sketch 2):

*Actually the French were in possession of Cambrai, and it seems reports of the situation near Landrecies were somewhat exaggerated, as is so often the case with night fighting.

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The II Corps, on the extreme right, in two divisional columns, with leading elements at Douchy and Monchaux, near Bouchain and Avesnes-le-Sec.

The IV Reserve Corps in one column, echeloned to the right rear, with its head at Valenciennes.

The Cavalry Corps billeted around Avesnes-lez-Aubert, St. Hilaire and Villers, four to eight miles east and northeast of Cambrai.

The IV Corps, in two divisional columns: advanced elements of the 8th (right) Division in Solesmes (6 miles from Le Cateau); the 7th (left) Division billeted at Bousies (5 miles from Le Cateau), and villages in the vicinity, with advanced elements in contact with the British I Corps at Landrecies.

The III Corps, in two divisional columns, along the two good roads leading southeast through the Forest of Mormal: the head of its 5th (right) Division at Landrecies, with some advanced elements in contact with the British I Corps at the Sambre bridge north of Maroilles; advanced elements of the 6th (left) Division occupying the bridges of the Sambre at Aulnoye.

The IX Corps: the 17th Division investing Maubeuge on the west side; leading elements of the 18th Division at Pont-sur-Sambre.

PLANS AND ORDERS OF THE GERMAN FIRST ARMY FOR OPERATIONS ON 26 AUGUST

The plan of operations for the German First Army on the 26th provided for a continuation of the pursuit, on a broad front, in forced marches to the southwest, with the intention of blocking the retreat of the British between Cambrai and St. Quentin. The Army Order for the 26th, issued at Haussy (3 miles north of Solesmes) at 10:50 P. M. (11:50 P. M. German time)* on the 25th, prescribed zones, routes, and march objectives as follows (Sketch 4):

"The First Army, from parts of which severe marches are demanded, will continue the pursuit of the beaten enemy.

The II Corps (commencing on the west) will march via Cambrai on Bapaume, west of the road: Valenciennes-Vendegies-Villers en Cauchies-Cattenieres, till it is abreast of Graincourt (5 miles southwest of Cambrai).

*German time was 1 hour earlier than British. In order to avoid the seeming discrepancy, hours have been changed to agree with British time.

SKETCH 3

LE CATEAU

WEDNESDAY, 26TH. AUGUST 1914.



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The IV Reserve Corps, starting early, will march via Vendegies-Villers en Cauchies to Cattenieres.

The IV Corps will march from Solesmes and Landrecies, by two routes: via Caudry, and via Montay-Caullery-Walincourt, to Vendhuile; the road: Landrecies-Le Cateau is allotted to the III Corps.

The III Corps will march by the Landrecies-Le Cateau road to Marez.

The IX Corps will cover the flank march of the Army against the west and southwest fronts of Maubeuge, and will send any troops not required, to follow the III Corps, via Berlaimont-Marolles to Landrecies.

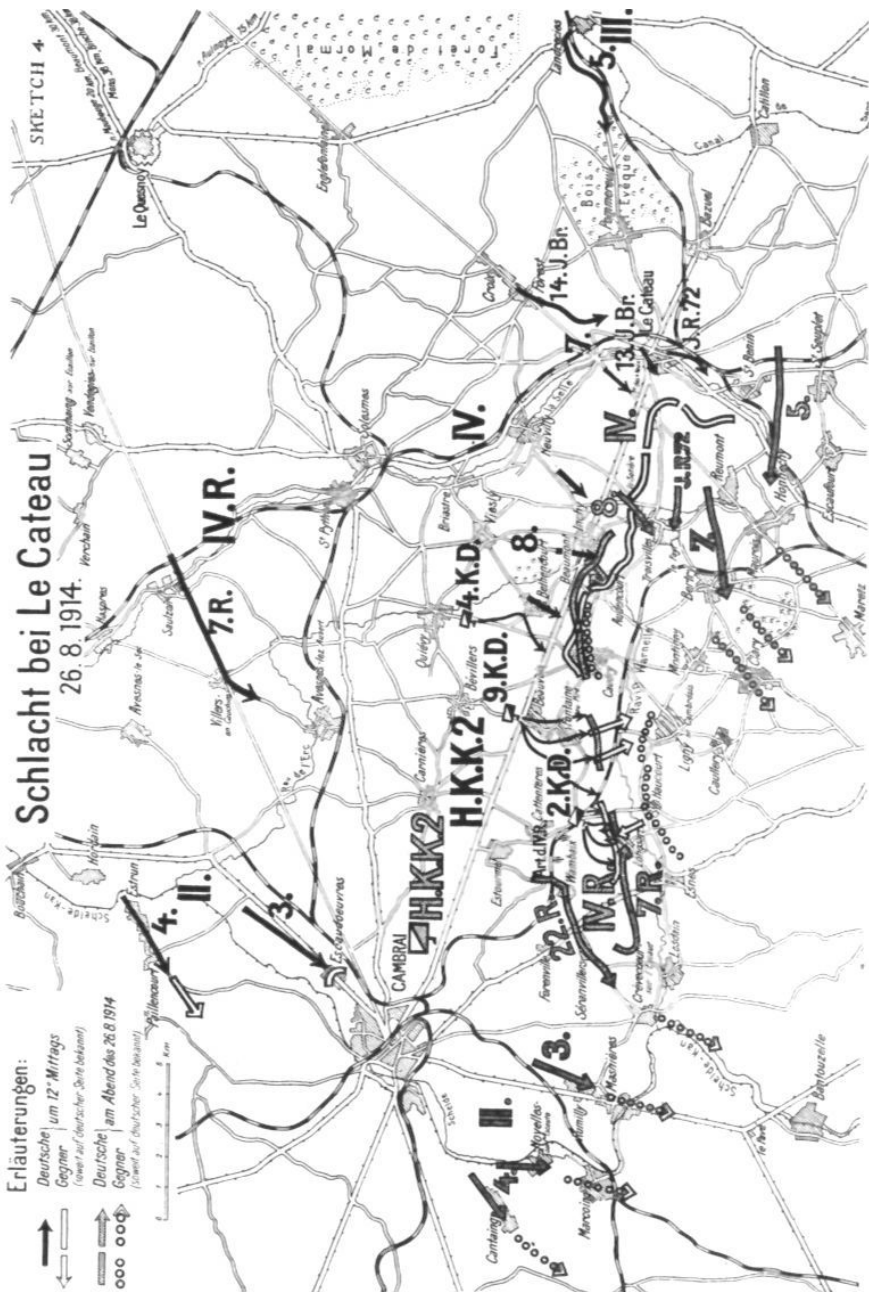
Representatives of the corps will receive orders about noon (11:00) at Solesmes, where Army Headquarters will move from Haussy on the morning of the 26th."

DESCRIPTION AND ANALYSIS OF THE TERRAIN

"The town of Le Cateau lies deep in the narrow valley of the river Selle, surrounded on all sides by open cultivated country and occasional moor, with never a fence, except in the immediate vicinity of the villages, and hardly a tree, except along the chaussées. The river, though small, is unfordable. The heights on the east, crescent shaped, slightly overlook those on the west, the highest ground of which is roughly a (horizontal) T in plan: the head (the Reumont Ridge), running north to south, from Viesly to Reumont, and the stalk (the Le Cateau position or Caudry ridge) east to west from Le Cateau to Crevecoeur. The reverse or south side of the Caudry ridge drops sharply to the Warnelle stream, with higher undulating country behind it, dotted with villages and woods, admirably suited to cover a retirement, once the long slope from the stream up to the edge of the higher ground marked by Montigny and Ligny had been passed. The front or north side is broken by a succession of long spurs running northwards; the western end drops to the Schelde Canal.

Except for this Canal with its accompanying stream, and for the Selle river with its tributary, the country was free for the movement of troops of all arms, and, from its open character, generally suited to defensive action, though there were numerous small valleys up which enterprising and well-trained infantry could approach unseen. Beetroots and clover covered part of the ground, but the other crops had mostly been cut and partly harvested. Here and there were lines of cattle, picketed Flemish fashion, in the forage patches."*

*British Official History, Vol. I. pp. 152, 153.



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Observation: The east-west ridge south of Clary, 160 meters in height, is the dominant observation in the area, but is well to the rear. North of the Warnelle ravine there is good observation from positions in the vicinity of Audencourt and the Quarry near Fontaine au Pire. In general, observation appears to be limited.

Field of Fire: The field of fire apparently was fair to good. However, in the sector of the British 5th Division, there was much dead space and the field of fire was limited, especially on the right flank. In the sector occupied by the 3d (center) Division, the field of fire was generally good, being excellent in the vicinity of Audencourt; in front of Caudry it was good, but this town formed an appreciable salient in the British line. The 4th (left) Division occupied initially a reverse slope position north of the Warnelle ravine. The field of fire was excellent in the vicinity of the Quarry southwest of Fontaine au Pire, and good in the vicinity of Longsart; but further to the west it was limited. After the 4th Division was driven to a position south of the Warnelle stream, the field of fire was good in front of Ligny.

Cover and Concealment: The position was open. Some patches of woods appeared south of the Warnelle ravine. There were many villages on the position capable of defense and affording considerable cover.

Natural Obstacles: The small, unfordable Selle river provided some protection on the right flank; on the left, the Schelde Canal would provide little or no protection against an enemy envelopment.

Routes of Communication: The Le Cateau position possessed an excellent road and rail net.

Weakness of the Position: With the I Corps in march to the south on 26 August, it is obvious that the greatest weakness of the Le Cateau position lay in the fact that both flanks were in the air, and invited envelopment.

DEPLOYED DEFENSE

Some units of the 5th Division did not receive the counter order to stand and fight much before the Germans attacked; some units never received them at all but conformed to the movements of those that did. Consequently the 5th Division had done little to improve its position, in the expectation of a continuation

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of the retreat in accordance with the II Corps order issued at 10:15 P. M., 25 August.

The 3d (center) Division, having its command post in Bertry near II Corps Headquarters, was informed early of the decision to defend. It was able to effect some ground organization, improving in the limited time available some poorly sited trenches that had been begun by French civilian labor.

Ground organization in the 4th (left) Division sector was ordered to be begun at daylight, the 26th.

Due to the lack of time for completely organized fires and deliberate ground organization, including fire emplacements and obstacles, obviously the form of defense at Le Cateau was a deployed defense.

ATTACK OF THE GERMAN II CAVALRY CORPS

(Sketches 4 and 3)

At 3:30 A. M., 26 August (4:30 A. M. German time), Lieutenant General von der Marwitz' II Cavalry Corps marched out of its billets, three divisions abreast, on its pursuit mission to the south. Between 5:00 and 6:00 A. M., the Cavalry Corps encountered outposts of the 4th (left) and 3d (center) British Divisions on the line: Wambaix-Cattenieres-Beauvois-Bethencourt. On the front of the British 4th Division, portions of the outpost were surprised by the suddenness of the dismounted attack of the 2d Cavalry Division, supported by its 4th and 7th Jager Battalions. Some of the troops on outpost were caught in close order and severely punished by the German machine gun fire before they could deploy. In front of the position at the "Quarry" southwest of Fontaine au Pire, due to the good field of fire and excellent work of the artillery, the advance of the 2d Cavalry Division was stopped. However, the Germans having worked around the flank of the advanced line near Wambaix, the left brigade of the British 4th Division was forced to withdraw, probably about 8:45 A. M., to the line: Ligny-Haucourt-Esnes, south of the Warnelle ravine. The withdrawal was successfully carried out under cover of a local counterattack.

About 6:00 A. M., further to the east, dismounted elements of the 9th Cavalry Division, supported by its 3d, 9th and 10th Jager

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Battalions, drove British outposts from Beauvois and attacked the 11th (right) Brigade of the 4th Division hastily entrenched south of Fontaine au Pire. But the British position south of Fontaine au Pire was held until about 3:00 P. M., when the 11th Brigade, 4th Division, was also forced to withdraw to Ligny, south of the Warnelle ravine. Later in the afternoon the Jager battalions launched two unsuccessful attacks against Ligny.

Still further to the east, early in the morning, at the same time the right of the 4th Division was being attacked, other elements of the German 9th Cavalry Division, in conjunction with the 4th Cavalry Division on their left, attacked dismounted on the front: Caudry-Bethencourt, held by the British 3d Division. The 4th Cavalry Division failed to drive the British outposts from Bethencourt. Largely due to the good field of fire to the north and east of Caudry, and to the excellent field of fire in the vicinity of Audencourt, the British held Caudry against all attacks of the German cavalry.

Upon the arrival of the infantry of the IV Reserve and IV Corps in the zone of action of the Cavalry Corps, the cavalry was withdrawn, the horsemen probably around 2:00 P. M., and the Jager battalions after dark, to assembly points at Naves and Cauroir, villages about two miles northeast and east of Cambrai. Here the II Cavalry Corps spent the remainder of the afternoon and night without taking further part in the battle.

ATTACK OF THE GERMAN IV CORPS

It will be recalled that elements of the 8th and 7th Divisions billeted in Solesmes and in Bousies, about 5 miles from the British II Corps, on the night 25-26 August. The 8th Division marched early on 26 August through Solesmes, the bulk of the division in the direction of Viesly, and the 72nd Regiment of Infantry, well to the (German) left flank, in the direction of Le Cateau. Upon receipt of information that the British were defending on the Cambrai-Le Cateau road, the 8th Division deployed and attacked, drove British outposts from Bethencourt about 10:00 A. M., and from Beaumont about 11:00 A. M. In the meantime, the 72d Infantry had reached Le Cateau, and about 6:30 A. M. opened fire on British troops caught in column as they were ready to move out of the town. Upon gaining the

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southern outskirts, this regiment engaged in a fight with the British in position on the heights overlooking Le Cateau.

The principal attack of the IV Corps prior to noon, however, was made by the 7th Division, which marched down the Roman Road and, about 8:00 A. M., deploying on both sides of the road near Forest, attacked the British 5th (right) Division, bringing relief to the isolated 72d Infantry. It is interesting to note that when elements of the 7th Division first approached from the northeast, they were fired on by the 72d Infantry, in the belief they were enemy troops. The fire was returned.

As a result of piecemeal attacks during the morning by both divisions, "the quick eye of General Sixt von Armin very soon recognized he was involved with more than mere rear guards covering a retirement." At 11:15 A. M. he issued orders for a coordinated attack by the IV Corps, prescribing in part the following (Sketch 4):

Boundary between divisions: the line: Neuville-Troisvilles.

The 8th Division (less 72d Infantry) will advance west of that line.

The 7th Division (less 1 brigade), and the 72d Infantry, will advance in the zone: right boundary: boundary between divisions; left boundary: the line: Le Cateau-Reumont.

One brigade of the 7th Division, advancing via the Le Cateau railroad station, will envelop the enemy right flank.

After a long artillery preparation, participated in by both the Corps and Divisional artillery, during which the right flank of the British was taken severely in enfilade, the 8th Division attacked the positions at Caudry and Audencourt, and about 2:00 P. M. captured Caudry, the apex of the British line. It held on to Caudry in spite of a counterattack by the British 7th (left) Brigade, which succeeded in retaking part of the village, only to evacuate it later. Elements of the 8th Division established themselves along the southern edges of Beaumont and Inchy sometime after noon, but were unable to advance further. Repeated attacks on Audencourt failed.

Meanwhile, the German 7th Division, attacking on both sides of Le Cateau, supported by both its own and part of the 5th Divisional artillery, taking advantage of favorable routes of approach,

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was overrunning resistance on its front. Working up the valley of the Selle River, its 14th Brigade (27th and 165th Infantry Regiments) was gradually enveloping the British right, as prescribed in the Corps order. Finally, about 2:30 P. M., the 7th Division assaulted and overwhelmed the advanced elements remaining on the British right flank.

ACTION OF THE III CORPS

The Reichsarchiv records: "The intervention of the III Army Corps, likewise, made itself felt now, from the east. Leading elements of the 5th Infantry Division gradually approached from Pommereuil abreast of the 7th Infantry Division; the remainder of the 5th Infantry Division turned off south towards Bazuel. However, before this far-flung enveloping movement could become effective the English resistance collapsed. * * * The 5th Infantry Division reached Honnechy with its leading elements; the 6th Infantry Division marched to Forest."

German regimental histories, more recently available, are not in complete agreement with the official history, as will be brought out later.

The sources agree that the III Corps was delayed, did not get up in time to envelop the British right, and failed to pursue.

ACTION OF THE IV RESERVE CORPS

To return to the German right, the IV Reserve Corps marched early on the 26th from Valenciennes, apparently in one column, and was ordered by First Army Headquarters at 9:00 A. M. to "cut off the English retreating west in full flight." The Corps Commander, General of Artillery von Gronau, thereupon ordered his divisional artillery forward at increased gaits. Escorted by cavalry, it went into action in the vicinity of Cattenieres, bringing effective support to the II Cavalry Corps (Sketch 4).

As in the case of the III Corps, the available sources are not in agreement concerning the details of the operations of this Corps. The advance guard of the leading division, the 7th Reserve, apparently arrived in the vicinity of Cattenieres about 2:00 P. M., whereupon the horsemen of the II Cavalry Corps were withdrawn, the Jager battalions remaining in contact with the British.

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According to the Reichsarchiv:

"later in the action, First Army Headquarters ordered the IV Reserve Corps to swing as far as possible in the direction of Crevecoeur and then to advance with a view to enveloping the British position near Caudry. When, however, the infantry of the corps approached the battlefield, the English had already been thrown into their position south of the Warnelle ravine by the attack of the II Cavalry Corps. Without knowing this, at 2:30 P. M., the Corps Commander ordered an attack in the general direction of Haucourt. The leading division, the 7th Reserve, ordered part of its infantry to attack in the direction of Haucourt, other elements to envelop the British left wing via Wambaix. But before these movements could be executed, the division was forced to change front to meet the attack of strong French Cavalry advancing from Crevecoeur. When the French horsemen retired, the German Infantry followed them as far as Crevecoeur and Esnes. * * * Instead of advancing southeast from Crevecoeur with a view to making a decisive thrust into the left flank of the English, the Division Commander attempted to maneuver his Division so as to attack in the direction ordered initially, with the result that much time was lost and the movement was interfered with in part by the arrival of the 22d Reserve Division. The 7th Reserve Division did not reach the heights northwest of Haucourt until after dark, and made no further attack after nightfall. The 22d Reserve Division, leading elements of which reached Crevecoeur, did not get up in time to take part in the action." (Sketch 4.)

The "History of the Sordet Cavalry Corps" tends to confirm this account of the action of the IV Reserve Corps. It states:

"the information received between 12:00 noon and 1:00 o'clock made it clear that the English left wing was being attacked on the front: Haucourt-Caudry-Le Cateau by important German forces debouching from Cambrai and threatening to outflank it. The situation at 1:30 P. M. is critical, and the commander of the Cavalry Corps resolves to intervene:

The Cavalry Corps is about to march north of the Escaut to attack the German forces: 1st Division, by Marcoing; 3d Division, by Masnieres; 5th Division, by Crevecoeur.

Combat reconnaissance on Cambrai (1st Division), Seranvillers (3d Division), Beauvois (5th Division).

After crossing the Escaut (Schelde), the given directions are: 3d Division, Seranvillers; 1st Division, Florenville; 5th Division, Seranvillers (by the south).

The Escaut is crossed without incident, but beyond it the scouts report enemy troops on the march against the English left wing. While the artillery of the 1st and 3d Cavalry Divisions opens fire on a long column debouching from Cambrai, the 5th Division attacks in the direction of Seranvillers.

From the observation-post of the commander of the Cavalry Corps established north of Masnieres, one can see our shells (*obus*) falling in the midst of the enemy lines. The cyclist group of the 5th Division, supported by dismounted soldiers of the light brigade and by the machine-gun sections of the division, advances with vigor, led by the chief, Captain Ribailleur. He reaches the outskirts of Seranvillers, but runs into very superior forces, which oblige him to fall back. Captain Ribailleur is killed during the fight.

The object sought was, however, realized. The enemy columns, surprised by the attack of the French cavalry, had to pause for a change of front, and the left wing of the English army found time to disengage itself, thus escaping the encirclement that menaced it."

ACTION OF THE II CORPS

On the extreme (German) right, the II Corps, advancing south with its 4th and 3d Divisions abreast, encountered and drove back d'Amade's 84th Territorial Division. In a delaying action, this Territorial Division fell back to Cambrai and here again held up the II Corps. After the II Corps forced its way through Cambrai, it was taken under fire from the south by Sordet's horse artillery and further delayed.

SUMMARY OF OPERATIONS OF GERMAN FIRST ARMY ON 26 AUGUST

The probable action of the German First Army may be summarized as follows:

The IV Corps made the principal attack, assisted by the II Cavalry Corps on its right. Initially, it attacked piecemeal; later, in a coordinated attack, it partially enveloped the British right flank.

The III Corps, ordered to march on Marez, was delayed, especially by the fire of horse artillery and medium field artillery in position on the British right and rear, and got up too late to envelop.

The IV Reserve Corps, ordered to envelop the British left, was attacked by Sordet's Cavalry Corps and delayed in its attempted envelopment.

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On the German right, the II Corps was accounted for by d'Amade's 84th Territorial Division, assisted also by Sordet.

Of the IX Corps, the 18th Division reached Landrecies late in the afternoon; the 17th Division remained before Maubeuge.

The II Cavalry Corps withdrew in the afternoon, and went into bivouac without taking further part in the action.

There was no real attempt on the part of any of the Corps to pursue.

PURSUIT DELAYED

At 8:13 P. M. (9:13 P. M., German time), 26 August, General von Kluck issued orders for a continuation of the pursuit on the 27th, prescribing zones and objectives as follows:

"The II Corps (von Linsingen) will advance at 2 A. M. (1:00 A. M. British time) from Hermies on Manancourt and from Marcoing on Guyencourt, north of Villers Faucon, in order to continue the attack on the enemy, presumably retreating, wherever found.

The IV Reserve Corps (von Gronau) will advance in the gap between the II and the IV Corps.

The IV Corps (Sixt von Armin) is allotted the zone: right boundary the line: Caudry-Ligny-Walincourt-Vendhuile; left boundary, the line: Reumont-Serain-Bellicourt.

The III Corps (von Lochow) will move to the south of the IV Corps beyond Marez (which it had been unable to reach the day before).

Approximately the line: Esnes-Caudry-Reumont will be passed at 5 A. M. (4:00 A. M., British time).

The leading division of the IX Corps (von Quast), marching by Landrecies, will arrive with the heavy corps artillery at Le Cateau at 10 A. M. (9:00 A. M., British time), where it will be at the disposal of the Army Commander; its other division will be left opposite the west front of Maubeuge.

Marwitz's Cavalry Corps will advance in front of the II Corps and hinder the enemy's retreat."

However, according to the Reichsarchiv, the II Cavalry Corps did not march until 3:00 A. M. (4:00 A. M. German time). The II Corps did not march until 5:00 A. M. (6:00 A. M., German time), due to delay in receiving the Army Order.

The German First Army, therefore, pursued in a generally southwest direction, but delayed pursuit until the morning of 27 August; the British II Corps withdrew in the afternoon of 26

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August and continued its retreat during the night 26-27 August on St. Quentin, a little west of south.

OPERATIONS OF THE BRITISH II CORPS

Comparatively early in the action the situation of the British batteries and infantry of the 5th Division became critical under the punishing German artillery fire.

Some time after 9:00 A. M., the Argyll and Southern Highlanders and Middlesex Battalions of the 19th Brigade in corps reserve at Reumont were released by the Corps Commander to the 5th Division to enable that division to meet the enveloping maneuver of the German IV Corps, then first becoming apparent. Also, at 10:00 A. M., in view of reports of the situation on his left near Ligny, General Smith-Dorrien ordered the two remaining battalions of his corps reserve to Montigny, about 3 miles to the west, there to await developments.

About 10:00 A. M., the 7th (left) Division of the German IV Corps which, it will be recalled had deployed astride the Roman Road, attacked the British right, in dense formation, on a front of about 2 miles from the valley of the Selle to Rambourlieux Farm just northwest of Le Cateau. The British inflicted severe losses on this target.

"But losses did not stop the German infantry of 1914. . ." (British Official History, Vol. I, p. 160).

They came steadily on in increasing numbers, despite all efforts of the British.

Between noon and 1:00 P. M., the 5th Division made desperate attempts to withdraw the guns remaining in action on the right flank. While the writer appreciates the lack of value of mere narrative as compared with lessons to be derived from historical studies, a portion of the account given in the British Official History, Edmonds, p. 172, and confirmed by Becke in his "Royal Artillery at Le Cateau," pp. 50, 51, 58, 59, is so moving and so illustrative of the quality of the old British Regular Army that it is here quoted:

"Shortly after 1 P. M., Sir Charles Fergusson, from his lookout in Reumont village, could see that the right of his (5th) Division was shaken and might shortly give way, and he reported in that sense to Corps Headquarters. A little later he added

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that a German division (no doubt the 165th Infantry, 7th Division) was working round his right from Bazuel. Finally, at 1:20 P. M., he suggested that unless material assistance could be sent to him he had better begin retiring. It seems to have been about this time that, during a lull in the German fire, the teams of the 11th Battery came up to the guns, and got five of them away, that of the sixth being shot down.* The teams of the 80th and 37th Batteries also came forward, and brought away five of the guns and four of the howitzers. Somewhat later, the teams of the 122nd Battery galloped up through the line of the West Kent, in brigade reserve, who stood up and cheered them loudly as they dashed between their trenches and onward down the slope towards their guns. As they came within view of the enemy, they were struck by a hurricane of shrapnel and of bullets from the machine guns in the Cambrai road: but still they went on. The officer in charge of the teams was killed, one team shot down in a heap before the position was reached, but two guns of the 122nd Battery were carried out without mishap. A third was limbered up, but the horses went down instantly. It was an extraordinary sight; a short wild scene of galloping and falling horses, and then four guns standing derelict, a few limbers lying about, one on the skyline with its pole vertical, and dead men and dead horses everywhere. It was then decided to abandon the remainder, the breech-blocks being first removed and the sights smashed. Altogether, twenty-four field guns and one howitzer were lost in this part of the field; but considering that the batteries were practically in the firing line, it is astonishing that any were rescued."

General Smith-Dorrien now realized he would be compelled to attempt a daylight withdrawal, if his corps was to escape complete envelopment. About 1:40 P. M., orders were issued for the withdrawal to be made in accordance with plans previously prepared, the withdrawal to be by division commencing from the right. At the same time, the two remaining battalions of the Corps Reserve were moved from Montigny east to Bertry and there released to the 5th Division. Elements of the 5th Division that had been sent east of Le Cateau during the night 25-26 to connect with the I Corps, made their way through the Germans on the morning of the 26th, and arrived on the right rear of the 5th Division about noon, where they remained in Division reserve.

*The British Royal Field Artillery (18 pdr guns and 4.5 inch howitzers) and Horse Artillery employed the 6 piece battery; the Garrison Artillery (60 pdr), the 4-gun battery. The Germans also employed the 6-gun light battery in 1914.

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At 1:15 P. M. these troops were ordered to a covering position at Honnechy. About 2:00 P. M. the two battalions of the Corps Reserve were moved from Bertry to a covering position in the vicinity of Maurois. Also, a section of the 108th Heavy* Battery was ordered into position at Honnechy, just east of the Roman Road.

These troops, and the guns of the Royal Horse Artillery in position near Escaufourt, covered the withdrawal of the bulk of the 5th Division which began about 3:00 P. M.; held up the further enveloping maneuver still being attempted by elements of the IV Corps; and effectively delayed the wider enveloping movement of the 5th Division, German III Corps, which by this time was becoming somewhat more imminent.

The 3d Division, conforming to the movement of the 5th, withdrew about 5:00 P. M. Its withdrawal was covered by the 9th Brigade in position between Bertry and Montigny. By 6:00 P. M., the 3d Division, except for front line covering detachments about a thousand strong, had withdrawn with little interference save from artillery fire, and was again in retreat.

On the left, the 4th Division, it will be recalled, although its flank was open to envelopment, had held its own after the bulk of the division was driven south of the Warnelle ravine some time after 8:45 A. M. by the II German Cavalry Corps. At 5:00 P. M., the division commander issued orders for the withdrawal, detailing the 10th Brigade as rear guard. Having received an earlier warning order of the intention to withdraw, the division artillery commander had made arrangements for the artillery to be withdrawn to successive covering positions. Shortly after 5:00 P. M., a portion of the 12th Brigade began its withdrawal. About this time the Germans were beginning to renew their enveloping movement around the left flank, but Sordet's Horse Artillery again came into action. The 11th Brigade and the bulk of the 12th remained in position until about 6:00 P. M., when they withdrew. With units badly intermingled, it appears that the bulk of the 4th Division had succeeded in withdrawing and was again in retreat by about 7:00 P. M. The Germans

*60 pounder, therefore medium battery according to present day classification.

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kept the retreating columns under artillery fire as long as they were within sight and range.

Many of the more advanced front line units failed to receive the order to withdraw and fought resolutely on up into the night. Some detachments were finally overwhelmed and captured or destroyed. The Germans passed by others in the dark. One detachment of the Dublin Fusiliers, numbering about 200 after isolated groups of soldiers from all three divisions of the II Corps had drifted in its direction and attached themselves to it, running into the Germans everywhere in its attempt to withdraw, struck out to the northwest and cut its way through the German lines. The remnant—78 officers and men—eventually arrived at the Channel port of Boulogne.

(To be concluded)

EXPERIENCES OF A TRUCK-DRAWN NATIONAL GUARD FIELD ARTILLERY REGIMENT

BY LIEUTENANT COLONEL H. J. WEILER, 131st F. A., Texas N. G.

THE 131st Field Artillery, 36th Division, Texas National Guard, received its allotment of Chevrolet trucks and station wagons shortly before the 1933 field training period was scheduled to open.

The regiment is located at the following stations in Northwest Texas:

- Regimental Headquarters—Lubbock
- Headquarters Battery—Wichita Falls
- Service Battery—Lubbock
- Medical Detachment—Amarillo
- 1st Battalion Headquarters—Wichita Falls
- 1st Battalion Headquarters
 - Battery and Combat Train—Decatur
- Battery A—Plainview
- Battery B—Amarillo
- Battery C—Lubbock
- 2nd Battalion Headquarters—Corpus Christi
- 2nd Battalion Headquarters
 - Battery and Combat Train—Abilene
- Battery D—Wichita Falls
- Battery E—Abilene
- Battery F—Jacksboro

It began its overland movement to Camp Hulen, Palacios, Texas, on August 3, 1933. On that day the units stationed at Lubbock, Plainview, Amarillo, Wichita Falls, Decatur and Jacksboro moved to Abilene, where the organizations stationed at that point joined them. After bivouacing that night, August 3-4, in the Fair Park at Abilene, the regiment moved out and cleared the camp site at 6:00 A. M. August 4.

The regiment marched that day a distance of 285 miles to San Antonio, arriving at 7:00 P. M. and bivouacing night August 4-5 on Pershing Field, Fort Sam Houston.

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The next day, August 5, the column cleared camp at 7:00 A. M. and marched to Camp Hulen, where they arrived at 2:00 P. M., distance 176 miles. When on the march a military police detachment in a station wagon preceded the column, making arrangements for moving through towns and cities without interruption, marking the route and guarding intersections and railway crossings. This detachment made arrangements for servicing the vehicles with gasoline and oil, which was accomplished where more than one station was available wherever practicable.

The Texas Highway Department furnished an escort of motorcycle traffic officers who handled traffic matters, thus relieving the regiment of these details and expediting the march. Difficulties were encountered in hilly country in keeping the column closed up due to the towing trucks losing distance. This was remedied by putting all such trucks in the front of the column.

Four messes were arranged for the march. The kitchen

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trucks, after serving the noon meal, were detached and sent ahead in order to have the evening meal ready on arrival of the column at the day's destination. Field ranges were used and proved satisfactory. They were removed from the trucks and set up on the ground for cooking purposes.

It was found necessary to have a distance of 100 yards between vehicles. A speed of 30 miles per hour was maintained on the road. Local speed limits required a modification of this when passing cities and towns. Medical personnel were at the rear of the column in case of accidents and a motorcycle messenger was used to transmit information from one part of the column to another.

The distances involved in this march were very great, some units moving 770 miles, while the shortest distance traveled by any unit was 461 miles.

Detours on main highways forced a great deal of travel over country roads which were narrow, crooked and dusty. No mishaps worthy of mention occurred, however.

The march from Abilene to San Antonio, 285 miles in one day, was an indication of what truck-drawn artillery may be expected to do on the march when called upon.

The regiment reached Camp Hulen at Palacios on August 5 and joined the remainder of the 36th Division during the annual field training period. It was the rainiest summer training period the Division had experienced since 1926. In spite of this, however, the training of the artillery was not interfered with by the wet weather. Any one familiar with the black mud of the Texas coastal plain will wonder how any motor vehicle propelled itself when not on paved roads. The field artillery regiments, however, were able, by using the traction devices provided for one truck to occupy their selected positions and fire all scheduled problems. This necessitated putting the guns in position in pastures and fields. No truck equipped with the traction devices was ever stuck, although they were run through deep ditches and mud holes in an effort to stick them. The large tires on the guns prevent the making of deep ruts and a battery completely equipped with the traction devices should experience no difficulty in going anywhere in mud that horse-drawn artillery can negotiate.

BREITENFELD—THE BATTLE THAT CHANGED THE WORLD

BY FLETCHER PRATT

THE path of the military innovator is hard. His profession is fundamentally conservative—and rightly so, for there are no patent laws in war. To experiment with a new device or tactical concept on a small scale is to turn over the result of your researches to the enemy. To experiment on a large scale is to stake national existence on the extremely unlikely chance that the thousand and one accidents surrounding the new idea will all be happy accidents. That the idea is ultimately successful is poor consolation to the general who has lost his own and his country's honor because he failed to foresee some defect in the invention to which he trusted the fate of his army. For every Cambrai where the tanks go storming through, there are a dozen Passchendaeles where they drown in mud.

And yet Monsieur Bloch was right; warfare tends to stagnate around the defensive in a bloody, exhausting and profitless deadlock. It must have innovation if it is to be carried on at all; tactical, like Erich von Ludendorff's escape from the hebetude of trench fighting through the infiltration attack, or mechanical, like the tanks that broke the Hindenburg line. Today we are so close to the fighting in Flanders and Champagne that preceded them, that we seldom realize they were only one more of the eternal efforts to break defensive paralysis, and that other leaders have been faced with the problem of the winter of 1916. Indeed, one of the most curious passages in the history of war is due to such an episode—that strange century in which all intelligence seemed to have departed from military science, the hundred years between the battle of Pavia in 1525, and that of Breitenfeld in 1631.

It was certainly not because the century was one either of peace or of intellectual poverty. It was the age of Queen Elizabeth, Cortez and Ivan the Terrible; the Turks were hammering at the gates of Vienna and Henri IV was mounting a breach, crying to himself, "Ah, you tremble, miserable carcass! Well, you would tremble still more if you knew where

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I am going to take you!" Yet this era of the titans, this age of expansion, courage and struggle, produced not one single major battle—probably the only period of similar length in human history of which this can be said. There were terrific sieges—Haarlem, Malta, Algiers; tremendous sea-fights—the Armada, Lepanto. But of clashes between armies, the epoch gives us nothing better than the armed staff-ride of Fontaine Francaise, and the formless hurly-burly of Stadion.

The reason is, of course, that somebody must attack or you will never have a battle, and the memory of Pavia lay like a mortmain across the will of every attacker. The Spanish army ruled Europe, and the Marquis of Pescara's tactic, frozen into the graceless immobility of a system, ruled the Spanish army. The "invincible tertiaries" who composed it went to war in a solid block of pikemen, ten deep, fifty across the front. Around its flanks skirmished musketeers; more were deployed in depth ahead of it. To break up this tight formation was impossible; it moved ponderously across the battlefield, inviting attack but never delivering it, a sort of living juggernaut, a denial that mobility or enterprise had any place in war. Cavalry had failed so signally even to get through the musketeer screen at Pavia that it had abandoned the effort. The horseman had replaced his lance with a pistol, and a dashing charge in the sixteenth century consisted in riding up to the opposing line at a trot, discharging pistols, and then filing to the rear to reload. Artillery had no business on the battlefield at all; it took twenty horses to drag a "field-gun" into position, and once there, it fired so slowly that the gunners were simply assassinated by whatever musketeers or pistol-armed cavalry chose to approach them.

Yet every deadlock breaks some day and in some way, and this one broke with a crash that shook the world in one of the greatest battles in history. That is, the battle was the sign-manual of the break, the outward evidence of an inner change that had taken place some time before in a little nation perched up against the Arctic Circle—Sweden; and in the mind of a king in whom the mad energy of the Vasa was united with a curious taste for mechanical invention—Gustavus II Adolphus.

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His whole education had been on military lines, and he possessed an exceptional amount of talent. At the age of sixteen he was already leading an army; at the age of twenty, he had perfectly definite ideas of how it could be made a better army. Being a ruling monarch he did not have to pass them through a board, and being a Vasa, he put them into effect without regard for tradition.

The first of these ideas were tactical and were the product of the fact that Sweden lacked the population to furnish huge arrays of pikemen. Rather than go into every battle outflanked on both wings, Gustavus ranked his pikes only three deep. This meant that they could not stand against a formation ten deep in a push; therefore the deeper formations had to be kept at a distance, and to accomplish this the proportion of muskets to pikes, which was one to four elsewhere, he increased to three to two.

But it was the mechanical side of the question that most deeply interested the Swedish king. Those solid blocks of pikemen had always been invincible and might continue to be to the end of time, but he was eaten with curiosity to see what would happen if somebody turned cannon against them. Before he could find out he had to have cannon that could march with the infantry, fire fast enough to knock out cavalry, and get away if too closely pressed. They did not exist, so he invented them. His first step was the famous "leather-guns," consisting of a copper tube over which a series of iron rings was sweated, the whole being wound with rope set in cement and covered over with leather. They were the invention of an artillerist named Wurmbandt, and basically they were not a bad idea—remember that the wire-wound gun was still the rule in some services in 1910. But they heated excessively and before many were in service Gustavus himself made a pair of discoveries that revolutionized the whole artillery question—namely, that guns only a sixth as long as the 24-foot monsters then in use were quite adequate for field service, and that one could mount these new light cannon on wheels whose diameter was measured in feet instead of inches. Neither invention, it will be observed, was much use without the other,

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but when combined they made a gun that would go anywhere an infantryman went.

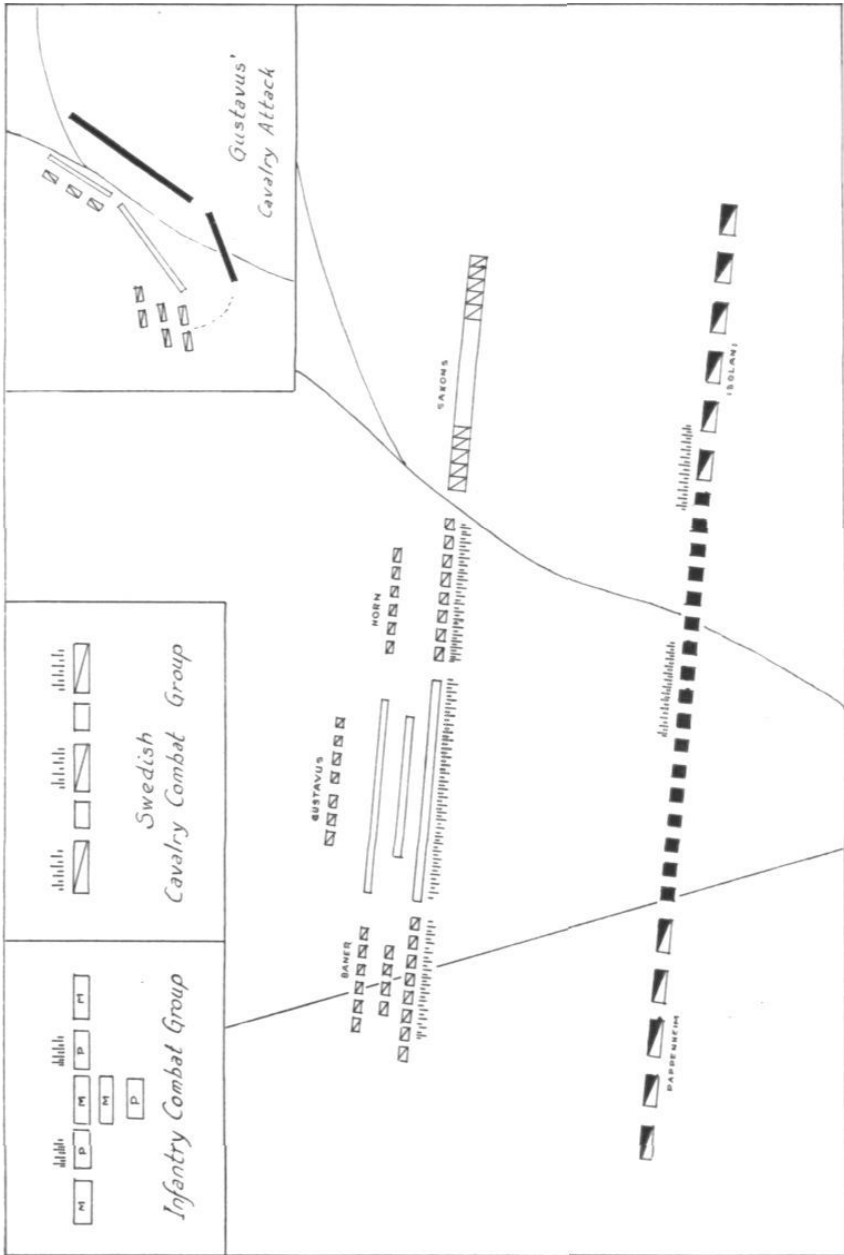
Having made the discovery, Gustavus had all the guns in Sweden re-cast on the new model, reorganized his artillery service with a 27-year old lad named Torstensson at the head of it, declared war on the Holy Roman Empire and ferried his army across the Baltic to Stralsund.

It was not a mere invasion of glory. The Emperor had a pretender to the Swedish throne in his pocket. He had been suppressing the Protestants of Germany for the last twelve years, amid scenes of exceptional barbarity, and made no secret of the fact that Sweden, the last Protestant power on the Continent, would be next on the list. War was inevitable; Gustavus merely struck first with the idea of fighting abroad rather than at home.

The Emperor, however, was unworried by this attack—"So, we have a new little enemy, have we?" he giggled, when he heard of it. Wallenstein, that mysterious and eccentric genius, was better informed. "He will be the worst enemy the Empire ever had," he wrote ominously. But nobody paid any attention to Wallenstein; he was in disgrace, locked up in his Bohemian castle with his astrologers and his mistresses, and Johann Tzcesclas Tilly was the commander of the Imperial armies. "Father" Tilly they called him, 72 years old, one of the cruellest men and craftiest leaders of his age, an essentially un-fatherly character who ordered the massacre and rape of all the people in captured Magdeburg and then went in to breakfast. But he had seen two-score campaigns and with the Spanish tertiaries at his back, should be more than a match for this "little snow-king."

A twelvemonth later Ave Marias were being sung in every cathedral from Ratisbon to Palermo for the Empire's deliverance from the demon of the north, Wallenstein was chuckling in his retreat and Father Tilly was sweating blood in the vain effort to parry the strokes that fell on him with the unpredictable force of thunderbolts. He had been pressed inexorably from city after city and province after province. One of the ablest commanders of the age—but he was of the age and not beyond it; like his contemporaries he thought of war in no larger terms than the

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battle and the siege-lines. He could not know that the new art of strategy, the art of the movement of armies, in which battles and sieges are incidentals whose results are of small importance, had come into being. Dazzled and troubled, comprehending vaguely that some new element had entered the familiar business to which he had given his life, the veteran flung his regiments across Gustavus' path north of Leipzig and offered battle.

It was the plain of Breitenfeld, an open, almost featureless expanse with nothing to spoil the beautiful alignment of the Imperial infantry. Tilly, that old, tried man of war, had chosen his position well, where sun and wind-blown sand were at his back and in the faces of the enemy. He had just under forty thousand men, drawn up in a single long line. On the left was Pappenheim, the brilliant partizan leader, with his German cavalry, 5,000 strong; on the right Isolani and Fürstenburg, with the Italian and Austrian horse, in about equal strength. In the center the invincible tertiaries, arranged in seventeen deep phalanxes, more than a thousand men apiece this day, with the musketeers around them. They were all professionals, mercenaries who carried their fortunes on their backs, and the whole line glittered with gold and jewels. There were only 26 guns; half of them right-center, the other half with Isolani's cavalry on the right. The Imperialists bound white kerchiefs in their hats in a kind of rude attempt at uniform, and cheered to the echo as their old general rode down the line. They were supremely confident; nobody had ever beaten a Spanish square, the Swedes were caught at last, forced to attack in a position where their strategy would not serve them.

The king's line was sombre by comparison, and much shorter from flank to flank. On its right was Banér—"Banér in a bag" the Swedes call him for some obscure reason, it does not appear that he was ever in one—with four regiments of horse in his first line; two more, the Stalhanske Cavalry, the best corps in the army, in a reserve to the first line. A second line contained three more cavalry regiments. The Swedish left, under Horn, was similarly formed in two lines of cavalry, but with no reserve. In the center was the infantry in two lines, the first having a mobile reserve; and behind the center the army reserve of two

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heavy cavalry brigades, with Gustavus in person. The artillery was all along the line, the heaviest concentration being left, where Torstensson commanded in person; and there were well over a hundred guns, 19,100 infantry and 7,700 cavalry all told.

But it is the minor organization of the Swedish army that really commands attention, for it was in a number of "combat groups" each intended to be self-sustaining under all conditions. In the infantry center these groups consisted of three companies of musketeers and two of pikes, alternately, with one more of musketeers and one of pikes behind the center. In front of each pike company was a battery of artillery. On the flanks each squadron of cavalry was ranked separately, six deep, behind a battery; between each pair of squadrons was a knot of 200 musketeers. The whole effect was not unlike that of the Roman quincunx, and it was adopted for the same reason—mobility and attack, for Gustavus meant nothing less than to stake the fate of his crown and his religion on an advance against the unbreakable squares of pikes. Finally, on the Swedish left were 19,000 Saxons. Nobody has recorded their formation, but it was extremely unimportant, as they did no fighting.

The armies were in position; it was high noon, and Tilly waited for the Swedes to come on. Torstensson's guns opened all along the line, firing at a tremendous rate, three or four times as fast even as the Imperial muskets. The Imperialists were dumbfounded, Tilly appalled at this incredible storm of cannonballs. Isolani was out of range; Pappenheim's cavalry drew the heaviest fire and was hard hit. At last he could stand it no longer, and without orders, sent his squadrons down in an attack on Banér. "He has lost the world!" cried old Tilly, throwing up his hands, but the movement had begun, and to prevent Gustavus reinforcing the menaced wing, he sent Isolani and Fürstenburg in on the other flank.

Pappenheim, already overlapping Banér, swung out to take him in the flank and roll up his line, but the Swede deployed his second line in a crotchet and received the Imperial horse with rolling volleys of musketry as they came down. Then, as the musketeers emptied their pieces, they filed smartly right and left behind the batteries and Banér's own cavalry dashed out in little,

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compact squadrons to meet attack with attack. Pappenheim was flung rudely back; he reformed and came on again, and again was thrown back with empty saddles all down his line. Still he would not give up, rallied and returned again and again, seven times; and at the seventh Banér let loose the Stalhanskes against his shaken front. It went to pieces, and for the first time in his life Pappenheim was borne from a battlefield in a stream of flying men.

On the other wing Isolani and Furstenburg merely rode up to the Saxon line; it collapsed, and every man ran away without firing a shot to carry home the tale of a frightful defeat. Isolani turned in to take Horn in flank and rear; Tilly saw the break and sent forward his infantry in a right oblique to break through the Swedish line in front while the cavalry took it in reverse. The discipline of his men was wonderful; they performed the difficult maneuver under fire without one of them losing position.

But it was not a defeat yet; Horn was made of tougher metal than the Saxons. When they broke he wheeled to the rear, at right angles to his former position. The musketeers and artillery were drawn from both his lines and rushed sharply forward to hold the line of the road, where a ditch and low hedge gave them a little cover; the cavalry pulled out and disposed in a single line a couple of hundred yards behind them. The movement was carried out with a precision wonderful to behold. The whole line was in position and Gustavus rushing more infantry from the center reserve before Isolani struck it.

It was fortunate that the Swedes were so well drilled, Horn's measures so promptly taken, for Isolani's onset was both fierce and determined. His men rode along the hedge, slashing at those behind it and blazing away—"they picked off every officer in Lumsden's regiment with their pistols"—and at one or two points even broke through. But it was no go; Horn's horsemen charged in to make good the breaks; Torstensson's rapid fire racked the Imperial cavalry to the core, the muskets finished them, and unable to bear up under the bullets, they were driven from the field.

Yet this was only the prelude. Tilly's huge squares had not come into play; now they came down like battleships surrounded

by a foam of musketry fire, to deliver their slow, irresistible blow. When they struck something must give.

When they struck. For their movement was slow, and long before they could reach the road, Gustavus had divined the intention and prepared his counterstroke. He swung his whole center of infantry round in a vast half-wheel to the left, prolonging Horn's wing at the road, sent Banér with three regiments of horse in on the flank of the Imperial infantry, and pausing only long enough to gather up his reserve, led the Stalhanske cavalry in after them in a whirlwind charge at the gallop—for the first time in a hundred years.

The pikemen halted, formed square. Banér recoiled, but he had hurt them, and Torstensson's guns had hurt them more. There were gaps in the forest of spears, not quite so many defenders as the Stalhanskes rode right over the supporting musketeers, right through the pikes and into the heart of the Spanish formations. They broke—Tilly's whole left wing dissolved, the Imperial gunners were cut down at their pieces, and Gustavus swept on to threaten the rest of the infantry line from the rear. Tilly could not ignore the menace of riders who had broken the invincible Spaniards. His movement halted in its tracks, his men lowered pikes and prepared to receive the charge.

It never came. Gustavus now had all the artillery on the field and all the cavalry. Tilly's army was in a position of utter hopelessness. The pikemen could not retreat with the Swedish cavalry hanging over them like a thundercloud; they could not advance against Torstensson's agile guns with that same cavalry behind them; they would not surrender. They could only stand still while the Swedish artillery shot them down from the front, the captured Imperial guns from the flank. If Gustavus ever wished to see how the tertiaries would stand up under cannonballs, he now had more than his wish; six thousand of them lay on the field and the only question remaining was how long they could last. With a courage that had something of fanaticism in it, they did last till night, and only began to filter off when the gloom covered their retreat. But even dark was no help on that open plain; Gustavus went after them mercilessly and the cavalry

THE BATTLE THAT CHANGED THE WORLD

got most of them before morning. The Imperial army was wiped out. . .

"Lost the world!" Tilly had cried with clairvoyant accuracy; for the world was lost to everything he and his system represented. When Gustavus galloped into the smoke of Breitenfeld that afternoon, there rode with him a new, more complicated and difficult form of existence, less attached to absolutes, certain only of one thing—that "there are no general rules, only individual cases." For if anything had been certain, it was that well-disciplined spearmen in formation could withstand any cavalry; if there was any rule of war as inflexible as the laws of the Medes and Persians it was that a line of guns could not withstand cavalry at all. But Gustavus had broken pikemen with horse and horsemen with guns, and in doing it he had set war free from the iron bonds of the Spanish system that had held it imprisoned for a century. He had restored the attack to its place and made the passive defence forever impossible. For if it was the king's own thundering charge that had been the obvious turning point of the battle, the real victory had been won long before, when Torstensson's guns so riddled the Imperial cavalry that they must charge or be scattered. Henceforth, no defence could be complete without an adequate force of rapidly-moving, rapidly-firing artillery, which even on the defensive takes a form of offensive action. In short the tactics of the thrusting blade had been abolished; they were replaced by the tactics of the bullet, in which everything had still to be learned.

Perhaps it is to this fact that we owe the lack of any of those artistically-pleasing grand tactical conceptions one finds in the battles of the previous age. Breitenfeld was a dramatic and arresting spectacle, but as a tactical study, it left much to be desired; a straight parallel-order fight, the queen's gambit declined of war. The whole interest, tactically, is in the novelty of Gustavus' regimental formation. Even the king's thrilling cavalry charge, wonderful though it was as a demonstration of surprise and timing, was no more than a bit of opportunism. Or again, perhaps the tactical insignificance of the battle was due to Gustavus' very certainty of the results his artillery would

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bring. If the Imperialists attacked him, he was ready for them; if they stood on the defensive, he would strike them down from a distance with the guns he had invented.

For he was a century ahead of his adversary; he had discovered the modern world and completed the work of Columbus. Breitenfeld, one of the most truly decisive battles of history, marks the real end of the Middle Ages—of the characteristically medieval effort to simplify human thought and human conduct by compressing them within a few rules that should automatically meet all contingencies. Gustavus was truly the worst enemy the Holy Roman Empire ever had; he struck it down on that field, for though it continued to live on in name, it was only as a kind of legal fiction of the chancelleries, a waxwork from which the vitality had departed. And by that blow the Swedish king made certain that England, Holland, and the northern states should remain independent bodies, free to develop and contribute to civilization something peculiarly valuable because peculiarly their own. Tilly had lost the world, not merely in a material sense, and there is a peculiar philosophical satisfaction in the knowledge that the cause in which Gustavus had deployed so much of independence of received formula was that of the individual's freedom to think for himself.

LATERAL CONDUCT OF FIRE

BY CAPTAIN C. C. PARK, Field Artillery

FOR Lateral Conduct of Fire, TR 430-85 prescribes four essentially different methods to keep bursts on the line, as follows:

	<i>Deflection Shift</i>	<i>Range Change</i>
1. Small T precision	Elev. change $\times s/c$.	Multiple of the fork.
2. Small T bracket	Multiple of s .	Multiple of c (100 yards).
3. Large T precision	Arbitrary shifts of 16, 30, 60, or 120 mils.	Deflection shift $\times c/s$.
4. Large T bracket	Arbitrary shifts of 25, 50, or 100 mils.	Deflection shift divided by s .

Under "Lateral General" all four methods are discussed without indication as to when each is applicable. The text is clear only to officers who have learned what is in succeeding paragraphs. Instead of being progressively introduced, the subject is presented initially as an indigestible mass, with later paragraphs to aid the digestion. Learning when and how to apply the four methods requires arduous study and practice; facility in their use is, without continuous practice, soon lost; and continuous practice is impracticable for officers of the civilian components, and for many of the regular service. Clarification of presentation and simplification of method(s) are desirable.

The method now used for small T bracket is simple and readily understood. This method is equally adaptable for large T bracket; its use for large T precision presents no difficulty; and it may be used for small T precision, if range bounds are made in multiples of c (100 yards).

The primary purpose of a lateral precision adjustment is to determine:

1. A deflection sufficiently close to the target to permit sensing by rule; and

2. An elevation to place the bursts on or near the OT line and include the target within the zone of dispersion for range.

The fork need not be used before fire for effect (the first group of which is really fire for improvement). If, during lateral adjustment, range bounds are made in multiples of c , there is no need for the factors s/c and c/s . In both precision and bracket

adjustments, whatever the size of the angle T, bursts may be kept on the line by one method. This method is simply the use of the relation of s to c .

With a view to brevity and coherence, the suggested method is presented in the general form of a text, with type problems.

* * * * *

1. *GENERAL. a. Terms.*—Conduct of fire is termed *lateral* when the target offset (T) is larger than 100 mils.

The *deviation* is the horizontal angle measured at the OP between a burst and the target (Fig. 1).

When the deviation is zero, the burst is called a *line*.

If a burst is on the observer side of the GT line, the *deflection is short*; if beyond the GT line, the *deflection is over* (Fig. 1).

A range change of 100 yards is termed c (Fig. 2).

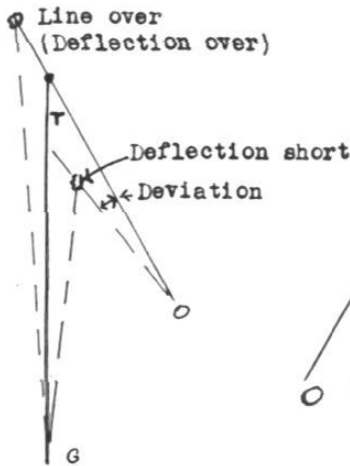


Fig. 1.

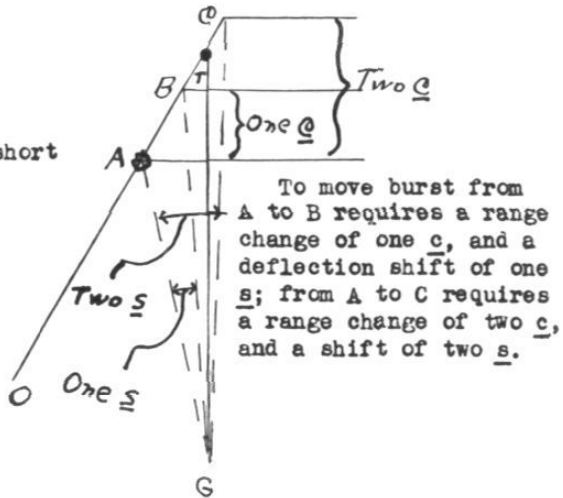


Fig. 2.

b. Adjustment.—To obtain a sensing it is generally necessary to have a burst on or near the OT line. After the burst has been brought to the OT line and a sensing is obtained, both deflection and range are changed when seeking a bracket. To *keep* the burst on or near the line, changes of deflection and range must correspond to each other. For each c change of range, the deflection

LATERAL CONDUCT OF FIRE

change is one s , and vice versa (Fig. 2). The value of s depends upon T and R , and may be determined from firing tables. For hastily prepared data, when T is not larger than 600 mils, s may be determined with satisfactory accuracy from the formula $s=(1/10T)/R$.

2. SMALL T .

a. GENERAL.—When T is between 100 and 300 mils, the procedure is essentially the same as in axial conduct of fire. Range bounds are made in multiples of c , with corresponding deflection shifts in equal multiples of s . During adjustment with one gun, bursts are sensed as follows: *line, over (or short); 7 left, doubtful (or short or over); target.*

(1) *To bring bursts to the line.*—If the first burst is not on the line and can not be sensed for range, the deflection is shifted in the proper direction by an amount equal to the deviation $\times r/R$. If the next round is *not near* the line, a new value of r/R may be determined by dividing the deflection shift made by the deviation change observed.

(2) *To keep bursts on the line.*—When a range sensing is obtained, an appropriate range change is made. If the range sensing was made on a burst not on line, the appropriate deflection shift is: the shift to place the burst theoretically on the line (deviation $\times r/R$), plus the shift for the range change. If the next burst is not on the line and can not be sensed for range, it is brought to the line by a deflection change. When a range bracket is obtained it is split, as in axial conduct of fire, and the deflection is shifted to keep the bursts on the line.

b. PRECISION. (1) *Adjustment.*—A range bracket, determined as in *a* above, is split until a trial range is obtained (Par 81 *b* TR 430-85). When splitting a range bracket, the correct deflection shift to put the next burst on the line may be determined as follows:

- (a) multiply the sum of the deviations of the bursts determining the range bracket by r/R ;
- (b) add the deflection changes made between the two rounds;
- (c) take half the sum and change the sign. (See Note at end of this article.)

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(2) *Fire for effect.*—Fire for effect is begun at the trial range and at the deflection to put the bursts on the line. Bursts are sensed for deflection (*over, short, correct or doubtful*) and for range. To facilitate deflection corrections, half groups of three rounds are fired until the deflection is *correct*.

- (a) *Deflection correct.*—The deflection is *correct* when a target hit is obtained, when a deflection bracket of 2 mils is split, or when a deflection over and a deflection short are obtained at the same deflection setting.
- (b) *Sensing range by rule.*—When the deflection is correct, deviations on the side of the target away from the gun indicate range over, and those on the side of the target toward the gun indicate range short. When fire for effect is begun the deflection error does not exceed $\frac{1}{2} s$, and range may be sensed by rule as if the deflection were correct. Bursts should be sensed by rule *only when they can not be sensed positively*.
- (c) When a deflection sensing is obtained, the deflection is changed to obtain a positive deflection bracket, or to split the established deflection bracket until the deflection is correct. The shift to obtain a deflection bracket should be not less than 2 mils and not more than $\frac{1}{2} s$. The adjusted elevation is determined as in axial precision.

(3) Type problem: Target. machine gun emplacement to be destroyed. 75mm gun, shell Mk I. fuze short. OP on the right. Plotted data (range-finder ranges). T=240, R=4.6, r=2.8, r/R=.6, s=24/4.6=5, c=6. INITIAL DATA: No. 1 ADJUST, COMPASS 1840, SHELL MK I, FUZE SHORT, No. 1 ONE ROUND



Commands	Elev.	Sensings			Remarks
		Dev.	Rn.	Def.	
Quadrant	160	20 L	?		$20 \times .6 = 12.$
R 12	160	5 R	+		For a range bound of $2 c$ the shift is: $L (5 \times .6) + R 2 s = R 7.$
R 7	148	4 L	-		$(4 L + 5 R) \times .6 + R 7 \times \frac{1}{2} = 4 R.$
L 4	154	Line	+	+	$(0 + 4 L) \times .6 + L 4 \times \frac{1}{2} = 3 L.$
R 3	151	2 L	-		Fork = 4. Shift for fire for effect is: $(2 L + 0) \times .6 + R 3 \times \frac{1}{2} = 1 R, \text{ or } L 1.$
L 1, 3 rds	152	{ 3 R Line 1 L + + +	{ + + +	{ ? + +	Third round sensed on terrain. Change elevation by $\frac{1}{2}$ fork, and fire 2 rounds.
R 2, 2 rds	150	{ Line 3 R	{ - +	{ - ?	4 overs and 2 shorts. Adjusted elevation is: $151 - (2/12 \times 4) = 150.3.$
L 1, 6 rds	150.3				The deflection is now correct.

LATERAL CONDUCT OF FIRE

c. BRACKET. (1) *Adjustment.*—Initial commands should provide for a sheaf of the width desired for adjustment. To bring bursts to the line and keep them on the line, the same methods are used as in small T precision, with the following modifications:

- (a) The battery is brought in as in axial bracket, or when the information given by four bursts is needed. When the battery is brought in, exact determination of deflection shifts is unnecessary.
- (b) When the battery is fired deviations are not sensed, but the deflection of each salvo or volley, as a whole, is sensed.

(2) *Fire for effect.*—Fire for effect is begun when the range adjustment is complete. The open sheaf is normally used. The sheaf may be converged to fit the target on information obtained from positive deflection sensings.

(3) Type problems:

- (a) Target, machine guns in the vicinity of a bush. 75mm gun, shell Mk I, fuze long. OP on the left. Estimated data. $T=200$, $R=4$, $r=3$, $r/R=3/4$, $s=20/4=5$.

INITIAL DATA: BDR 250. SITE ZERO, SHELL MK I, FUZE LONG, No. 2 ONE ROUND



Commands	Range	Sensings			Remarks
		Dev.	Rn.	Def.	
	4000	20 L	?		$20 \times \frac{3}{4} = 15$.
R 15	4000	Line	-		For a bound of 4 <i>c</i> the shift is 4 <i>s</i> .
R 20	4400	7 L	+		$R(7 \times \frac{3}{4}) + L 2 s = L 5$.
L 5, BR	4200		?		No. 3 was line over. For effect, the opening from a 60 yard sheaf is: $([33 - 20]/4)=3$.
			+		
			?	+	
L 5, on No. 2 open 3, B 1 rd	4100				Fire for effect begun at midpoint to verify or modify the deflection.

- (b) Target, infantry howitzers near a designated terrain feature. 75mm gun, shell Mk I, fuze long. OP on the right. Range-finder ranges. $T=300$, $R=5.4$, $r=5$, $r/R=.9$, $s=30/5.4=6$, $c=8$. INITIAL DATA: BDR 220, SHELL MK I, FUZE LONG, No. 2 ONE ROUND



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Commands	Sensings				Remarks
	Elev.	Dev.	Rn.	Def.	
Quadrant	230	8 L	-		Bring in battery. The shift is: $R (8 \times .9) + L 2 s = L 5$.
L 5, BL	246		?		For effect, the opening from a 60 yard sheaf is: $13/6 = 2$.
			?		
			+		
R 5, on No. 3 open 2, B 1 rd	238		?	+	To be followed by "230", "246", "242" and "234". When the deflection is approximately correct, the command "Zone 8 mils, 246-230" is appropriate.

3. LARGE T.

a. GENERAL.—When the target offset is larger than 300 mils, adjustment of range is easy if the deflection is approximately correct; hence, the primary object of adjustment is to determine a deflection which is close to the target. To obtain deflection sensings, bursts should be brought to or near the OT line by range changes. During adjustment with one gun, bursts are sensed as follows: *8 right, deflection doubtful (or short or over); line, over (or short), deflection over (or short); target.* Range need not be sensed, unless obvious, until fire for effect is begun.

(1) *To bring bursts to the line for a deflection sensing.*—The angle at the OP between two bursts at the same deflection, but differing in range by 100 yards, is termed d . The value of d depends upon T and r (Fig. 3), and may be determined from firing tables. For hastily prepared data, when T is less than 600 mils, d may be determined with satisfactory accuracy from the formula: $d = (1/10 T)/r$. A burst off the line may be brought to the line by a change in elevation equal to the observed deviation $\times c/d$. If the next burst is *not near* the line a new value of c/d may be determined by dividing the range change by the observed displacement of the burst.

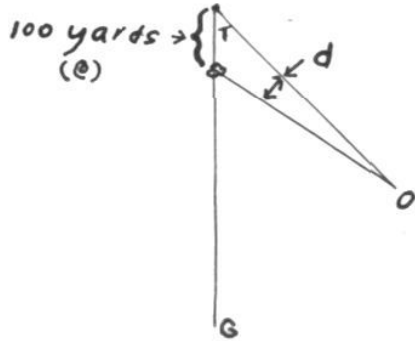


FIG. 3

(2) *To keep bursts on the line when seeking a deflection bracket.*—When a deflection sensing has been obtained, a shift

LATERAL CONDUCT OF FIRE

of an appropriate multiple of s and a range change of a corresponding multiple of c are made to bracket the target and keep the bursts on the line. If the deflection was sensed on a burst off the line, the appropriate range change is the change to place the burst theoretically on the line ($\text{deviation} \times c/d$), plus the change for the deflection shift. The size of the initial deflection shift depends upon the estimated accuracy of initial data and the apparent distance of the burst from the target. The following values are given only as a guide:

<i>Method of determining data</i>	<i>Initial shift</i>
Map data	1 s
Plotted data (range-deflection fans with range-finder ranges), or small shifts	2 s
Estimated data	4 s

Note: The shift should be multiple of s which does not exceed 100 mils, unless the deflection error is known to be large.

(3) If the next burst is not a line, and can not be sensed for deflection, the following burst should be moved to the line by a range change. If the second deflection sensing is the same as the first, the range change from line shot to line shot may be used for the second deflection shift.

(4) *Splitting the deflection bracket.*—The deflection bracket, when obtained, is split, and the range is changed so as to keep the bursts on the line. The indicated range is *midway between the ranges of actual or theoretical line shots at the limits of the deflection bracket.*

b. PRECISION.—A deflection bracket, determined as in *a* above, is split until the deflection is correct (Par. 2 *b* (2) (a)).

(1) *Fire for effect.*—Fire for effect is begun when the deflection error is less than 8 mils, and not more than $\frac{1}{2} s$, at the elevation to place the bursts on the line. Bursts are sensed for range and deflection. Range may be sensed by rule (Par. 2 *b* (2) (b)). Half groups of three rounds are fired until the deflection is correct. The adjusted elevation is determined as in axial precision.

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(2) Type problem: Registration upon a base point. French 75mm gun, shell Mk I, fuze long. OP on the right. Plotted data. $T=450$, $r=3.6$, $R=4$, $c=5$, $d=45/3.6=12$, $s=45/4=11$, $c/d=5/12=.4$.

INITIAL DATA: BATTERY ADJUST, COMPASS 4950, SHELL MK I, FUZE LONG, No. 1 ADJUST, No. 1 ONE ROUND.



Commands	Elev.	Dev.	Sensings		Remarks
			Rn.	Def.	
Quadrant	130	30 L		?	$30 \times .4 = 12$.
	142	10 R		+	c/d is $12/40 = .3$. Line over at $142 - (10 \times .3) = 139$. For shift of $2 s$, decrease elevation $2 c$.
	(139	Line	+	+	
R 22	129	3 L		-	Line short at $129 + (3 \times .3) = 130$.
	(130	Line	-	-)	Next elev.: $130 + \frac{(139 - 130)}{2} = 134$.
L 11	134	Line	-	-	Ready for fire for effect. Next elevation: $134 + \frac{(139 - 134)}{2} = 136$.
L 6, 3 rds	136	2 L	-	?	Split the deflection bracket and change elevation by $\frac{1}{2}$ fork.
		3 L	-	?	
		Line	-	-	
L 2	138	2 R	+	?	4 shorts and 2 overs. Mean elev. for group is 137. Adjusted elev.: $137 + (2/12 \times 4) = 137.7$.
		Line	+	+	
		3 L	-	?	
R 1, 6 rds	137.7				The appropriate command if a more accurate range adjustment is required.

c. BRACKET. (1) *Adjustment*.—Initial commands should provide for a sheaf of the width desired for adjustment. To bring bursts to the line and keep them on the line, the same methods are used as in large T, precision, with the following modifications:

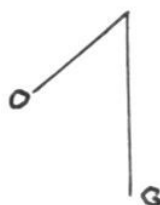
- (a) *With 75mm guns*, range usually may be set by the range drum, in which case c is unity and c/d becomes $1/d$. The range change to get on the line (deviation divided by d) is usually determined to the nearest hundred yards. If the first change does not bring the burst *near* the line, a new value of d may be determined by dividing the observed displacement by the range change in hundreds of yards.
- (b) The battery is brought in when making a $2 s$ or smaller deflection shift, or sooner if necessary to secure sensings. When the battery is fired, sensings are made as for the battery in small T bracket (Par. 2 c (1) (b)).

LATERAL CONDUCT OF FIRE

(2) *Fire for effect.*—Fire for effect is begun when the deflection error is less than 1 s, except when s is very large (T larger than 600 mils), in which case the deflection error should not exceed about ½ the width of the open sheaf. The range to put the bursts on the line is taken as the center of the appropriate range bracket. The sheaf for effect is the same as in small T bracket (Par. 2 c (2)).

(3) Type problems (a) Target, Machine guns in vicinity of a rock. French 75mm gun, shell Mk. I, fuze long. OP on the left. Data from range-deflection fans. T=900, r=2, R=3.5. From firing tables: d=39 (use 40) and s=35.

INITIAL DATA: BDL 200, SITE PLUS 5, SHELL MK I, FUZE LONG, No. 2 ONE ROUND.



Commands	Range	Sensings		Remarks
		Dev.	Rn. Def.	
	3500	100 L	?	100/d = 3 hundred yards.
	3200	30 R	—	Line short at 3200 + 30/d = 3300. For shift of 2 s, bring in battery.
R 70, BR	3500		?	
			?	
			+	
			?	
L 35	3400		?	When def. bracket of 35 mils is split, the def. error will not exceed about 50 yards (17 mils × 3 = 51 yards). The opening from a 60 yard sheaf is 13/3 = 4.
			—	
			?	
			?	
R 17, on No. 3 open 4, B 1 rd	3450		?	Next range given without waiting for a sensing. If the volley at 3450 is not sensed before 3350 reported "on the way," then "L 8" will precede "3500."
	3350			
L 8	3550			

(b) Target, advancing infantry in the vicinity of a terrain feature. 155mm howitzer, shell Mk I, zone V, fuze long. OP on the right. Plotted data. T=400, r=4, R=5.5, d=40/4=10, s=40/5.5=7, c=7, c/d=.7.



INITIAL DATA: BDL 140, SITE 305, SHELL MK I, ZONE V, FUZE LONG, No. 3 ONE ROUND.

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Commands	Elev.	Sensings		Remarks	
		Dev.	Rn.		Def
Quadrant	294	30 R	?	$30 \times .7 = 21$ (use 20).	
L 14, BL	274	12 L	-	$c/d = 20/42 = \frac{1}{2}$. Line short at $274 + (12 \times \frac{1}{2}) = 280$.	
	(280	Line	-	No. 2 was line over. For effect, the opening from a 60-yard sheaf is $\frac{(70-20)}{6} = 8$	
	294		?		
			+	?	mils. Begin fire for effect at mid-point to verify deflection.
R 7, on No. 3 open 8,					
B 1 rd	287		?	-	Next range given without waiting for sensing. Command for zone fire is appropriate when both deflection and range are satisfactorily adjusted.
	280				
L 4 (or 5), zone		7 mils			
	280-294				

* * * * *

NOTE: THE DEFLECTION SHIFT FOR SPLITTING A RANGE BRACKET, SMALL T. PRECISION (PAR. 2b).

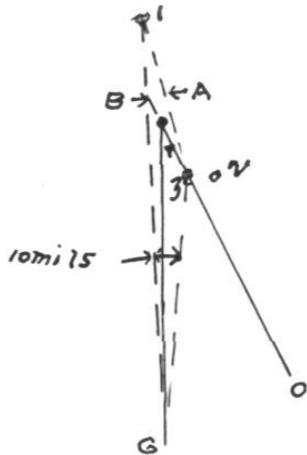


Fig. 4.

When it is necessary to make more than one shift between the two bursts determining the range bracket, or when the bursts are not near the OT line, the relation of s to c may be in error. To correct for errors when splitting the range bracket, the deflection for the next round should be *midway between the deflections of theoretical line shots at the limits of the range bracket*. The deflection change should be $\frac{1}{2}$ the total shift between the two rounds, plus a correction for the mean of the two deviations.

Example (See Fig. 4): Estimated data. $r/R=.9, s=7, c=5$.

Commands and sensings are as follows:

Commands	Sensings			Remarks
	Elev.	Dev.	Rn.	
	130	10 R	+	L $(10 \times .9) +$ R $4 s = R 17$
R 17	110	8 R	?	L $8 \times .9 = L 7$
L 7	110	2 L	-	
(L 9)	120			

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Between bursts 1 and 3 the total deflection shift was $R\ 17 + L\ 7 = R\ 10$. A shift of $L\ 5$ would place the burst at A; but A is off the OT line by the mean of the deviations of bursts 1 and 3, or $\frac{10R + 2L}{2} = 4R$.

To correct for this mean deviation, and bring the burst to B, a further shift of $L\ 4 \times .9$ or $L\ 4$ is necessary, making the total shift $L\ 5 + L\ 4$, or $L\ 9$. In practice, it is easier to use the method given in Par. 2 *b*, which is as follows:

- (a) $(2L + 10R) \times .9 = 7R$;
- (b) $7R + R\ 17 + L\ 7 = 17R$;
- (c) $17R \times \frac{1}{2} = 9R$; the shift is $L\ 9$.

SIXTEENTH FIELD ARTILLERY GUNNERY COURSE

THE many demands on the time of officers of all units make proper instruction in gunnery a difficult problem. The 1st Battalion, 16th Field Artillery, Lt. Col. C. P. George, Commanding, is certainly no exception, as the demands on it by reason of its station at Fort Myer, Virginia, are many and exacting. The following schedule, which was used during the period March 1 to April 30, 1934, is published in the belief that it may be helpful to other organizations. The periods as indicated in the first column were of one hour each and it was usually possible to have four periods each week. The course was in charge of Captain H. W. Blakeley, a former instructor in gunnery at Fort Sill, assisted by Captains H. T. Brotherton and W. R. Frost and 1st Lt. J. L. Chamberlain, Jr. The conferences were conducted by one of these officers, but for all practical work the student officers were divided into groups of not more than six selected on the basis of their knowledge of gunnery. The text used was Field Artillery Field Manual, Vol. II. Reference texts were T. R. 430-85, Gunnery for Field Artillery; Book 160, Elementary Gunnery, and Book 162, The Firing Battery.

TROOP SCHOOL IN GUNNERY

<i>Part I</i>		
<i>Period</i>	<i>Subject</i>	<i>Text (F.A.F.M. II)</i>
1.	General outline of course. Conference on duties of executive, chiefs of section, etc. (Technique of laying not included in this conference.)	Pars. 11-40. Pars. 47-52.
2.	Fire commands. Sequence.	Pars. 53-83.
3.	Preparation of fire, rapid.	Pars. 93-100 & 111.
4.	Practical work in figuring deflections.	Pars. 93-100 & 111.
5.	Compass laying, shifts, direct methods.	Pars. 101-103.
6.	Practical work in figuring compass and shifts.	Pars. 101-103.

SIXTEENTH FIELD ARTILLERY GUNNERY COURSE

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|-----|--|----------------|--|
| 7. | Deflection difference. | Par. 104. | |
| 8. | Practical work in deflection difference. | Par. 104. | |
| 9. | Site, projectile, charge, fuze, etc. | Pars. 105-110. | |
| 10. | Practical work, preparation of data, rapid. | | |
| 11. | Examination, Preparation of data, rapid. | | |
| 12. | Conduct of fire, general.
Precision axial. | Pars. 120-126. | |
| 13. | Problems, precision axial.
(Officers in groups.) | | |
| 14. | Percussion bracket. | Par. 127. | |
| 15. | Problems, percussion bracket.
(Officers in groups.) | | |
| 16. | Time Bracket. | Par. 128. | |
| 17. | } Problems, all types, axial.
(Officers in groups.) | | |
| 18. | | | |
| 19. | | | |
| 20. | | | |
| 21. | Conduct of fire, axial.
Examination. | | |
| 22. | Conduct of fire, lateral. General. | Par. 129. | |
| 23. | Precision, lateral. Small T. | Par. 130. | |
| 24. | Problems, precision, lateral.
Small T. | | |
| 25. | Precision, lateral. Large T. | Par. 130. | |
| 26. | Bracket lateral. | Par. 131. | |
| 27. | } Problems, lateral (Officers in
Groups.) | | |
| 28. | | | |
| 29. | | | |
| 30. | Conduct of fire, lateral.
Examination. | | |
| 31. | } Duties of Executive, Technique
of laying. | } Pars. 41-46. | |
| 32. | | | |
| 33. | | | |

NOTE: Instruction in conduct of fire using the F. A. Trainer will be held at times to be announced.

"GABRIEL OVER THE WHITE HOUSE"

"It was precisely this gay insouciance, this forgetfulness that the world existed for any but a single class in it, and this carelessness of the comfort of others, that made the catastrophe (the French Revolution) possible."—LOWELL.

IT MAY be that the above true words do not apply to the people of the United States. For as everyone knows we have no "class" distinction in this great Republic of ours. At least so I've been told. The fact remains that the great majority of our fellowmen, who have been blessed with health and an abundance of the material things of life, go selfishly and gaily on their way, heedless and indifferent to the ills and misfortunes of that great "class" or "mass" of humanity which constitutes the greater portion of the population of this country. But at last our government has begun to realize that something must be done for the great mass of unemployed, and with this realization has come action.

Perhaps a great many have come to the conclusion that the world is growing steadily worse and that people are not deserving of help. But is this a fact? What, other than adverse opinions, can the public form, with all the notoriety that is given to crime? The countless articles in the daily newspapers depicting robberies, murders, lynchings, kidnappings, embezzlements, with the crowning one of stealing trust funds created for the benefit of our unemployed by grafting politicians, are the finest kinds of propaganda for fostering the belief that the world is fast smothering itself to death in its own muck.

And isn't human nature peculiar? How many persons would subscribe to or buy a daily paper if they were not sure of finding choice bits of scandal besmirching the character of some prominent citizen? Such articles could much better be left unpublished.

Having just completed a seven months' detail with the Civilian Conservation Corps, my outlook on life has changed for the better. I have seen boys who were undernourished and despondent gradually gain back their health and self-esteem. I have seen these same boys go to church and kneel to express a grateful thanksgiving for the new opportunities afforded them. Most of them had finished high school. They were without funds to continue

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their studies; work was not to be had. Due to economic conditions, their families were no longer able to provide for them. So right at the greatest crisis in their lives their rich Uncle Sammy stepped in and provided a breathing space for them. It was not a dole. Had it been the whole plan would have ended in failure. Nor were the men under-paid. Based on the cost of transporting them from the concentration camps in the East to forests and parks in the West, furnishing clothing, food, equipment, medical attention and the necessary overhead. I estimate that it cost the government over one hundred dollars per man per month—quite a great deal more than the thirty to forty-five dollars a month they were receiving in cash. And I believe the men realized this fact.

That the members themselves derived great benefit from the Civilian Conservation Corps is beyond doubt, not only from a pecuniary standpoint, but also on the social side. Here are young men who would be, at least a great portion of them, back home hanging around street corners and pool rooms, thus placing a real burden on their struggling families and communities. The President enters the picture, places them in healthful camps, pays them a salary, which not only provides enough spending money, but makes possible an added income to the families back home. Towns and villages located near work camps were helped through the funds expended for the purchase of supplies. Here we have the pecuniary benefit afforded by the C. C. C. project.

Next we come to the social good accomplished. The people of today, more so than at any other time, must learn to live peacefully together. The home, the Church and the school have, up until now, been our sole institutions for teaching men and women how to live in harmony. Now, along comes the Reforestation Project with its hundreds of camps, within which must live thousands of men. They must of necessity learn to live together harmoniously. That they have learned to do just that is easily seen by any one who has visited or lived in a C. C. C. Camp. At first the social self-teaching progressed slowly. But as time went by great strides were made and are still being made. Each camp was a society in itself. Each individual was taught that he was living within a small circle containing only himself and his God.

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OUR CAMP WHEN NEARLY COMPLETED

This was his world and none might enter without his bidding. But bounding this individual circle were others, each one increasing in diameter in proportion to the extent the individual mingled with his fellow men. As he stepped out into the next larger circle the individual was taught he would come into contact with others, who also had their inviolate rights. Thus was formed the group. Groups were taught to respect the sanctity of other groups, and so on. Will not then the boys who learned, in camp, to respect the rights of others be better fitted to live with their fellow citizens in the outside world?

In addition to the pecuniary and social gains afforded the youth by the Reforestation Camps, there were also such physical gains as body and mind development and the forming of regular living habits.

From the standpoint of good citizenship, let us see if the government benefits from the plan. When I say "Government" I do not mean solely the National Government, which is sponsoring the project, but also local governments. Most of the men in the Conservation Corps come from dependent families. In many

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cases these families were on the local welfare rolls. By the National Government providing a means of subsistence for them, local governments were relieved of some of the welfare burden. By keeping the boys off of city streets the National Government has aided local governments in one more respect. Idleness breeds mischief. Mischief breeds crime. So these boys, instead of being a potential menace to local society, have, because of clean camps and proper environment, become better citizens.

From a pecuniary viewpoint has the National Government gained? The answer is yes. As far as the company I commanded is concerned, and I believe it affords a fair cross section on which to judge the balance of the Corps, I know that each member strived to earn the cost of his pay and maintenance. From June 22 to October 15, 1933, my company did the following:

- Completed nine miles of new roads.

- Maintained sixteen miles of old roads.

- Built six new bridges.

- Graded forty-five miles of trails and removed the down timber adjacent thereto.

- Completed eight new camp grounds, installing the necessary stoves, tables, benches and out houses.

- Built over ten miles of fences.

- Cut, peeled and treated over six thousand fence posts and telegraph poles.

- Installed six miles of new telephone lines.

And in addition to the above they saved millions of feet of virgin timber by promptly extinguishing numerous forest fires before they could get beyond control. Quite a sizeable job for two hundred and sixteen young men to accomplish in a little over three months.

Now let's see what the Regular Army did to help along the President's splendid program and at the same time see what, if anything, the C. C. C. did to the Army.

Offhand I believe that the Army benefited in three ways. First: It greatly depleted the flimsy stock of clothing that has been in storage since the war. Second: The members of the C. C. C. have, through close contact, come to know the Army better, and through this knowledge has come a thorough understanding of

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the underlying principles for which our Army is maintained. Third: It has taught (or should have done so) a lot of officers that men can be made to respond to command through a sympathetic firmness and a kindly consideration of their problems, without the threat or imposition of disciplinary measures. Of the three hundred and sixty men that were in my camp only two were insolent and insubordinate. And each of these men, after I had sent him home, wrote me a letter. As to whether or not they had learned their lesson, I will leave for you to judge after reading an excerpt from one letter quoted herewith:

"And now I'm sorry I left. . . . You were right and I was wrong. . . . It was my fault. . . . I was just getting sick of things, that's all. . . . Don't worry about me saying anything against the company or any other forestation camp. If I knew I could get back there I'd be glad to stay for the remainder of the time."

One remembers that when the Civilian Conservation Corps was brought into being about a year ago there was a lot of talk about reducing the officer personnel of the Army. Suddenly this talk ceased. And a great many officers attributed it to the fact that we were needed to handle this great civil experiment. With this opinion I cannot agree. Regardless of the fact that the post at which I serve was almost entirely depleted of its officer personnel in order to provide leaders for the various companies organized at this place, I cannot admit that the only excuse for maintaining the Regular Army is to handle just such emergencies. Nor am I ready to admit that the Army was the only organization that could successfully take care of the Civilian Conservation Corps. But I do challenge any other organization, federal, local or otherwise, to even come close to the splendid record made by the Army in carrying out the President's wishes and the intent of Congress, in the handling of the C.C.C. Also had it not been for the splendid efficiency and the loyal cooperation rendered by another great government organization, the Forestry Department, the Army could not have successfully put over the plan. Permit me to pause here for just a moment to tell you that the men of this company thought so much of the Forestry Superintendent

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they had in the West that they named their winter camp in the South after him. A splendid tribute to a deserving man.

Let us go back a year and record a few of the obstacles that were overcome in taking care of the C. C. C. Of course I can only state the happenings at one post, but I imagine the same conditions prevailed at every other post that was called upon to house and train members of the Civilian Corps. In March, 1933, this post was asked how many men it could take care of in the event that the President called his Civil Army into being. Evidently the answer to this communication was not satisfactory, for it was not long until a Corps Area representative was on the ground making a physical survey of all buildings on the post. Plans were made to remove property from battery day rooms, transfer property from supply rooms to dark, cold and dingy attics, so that provision could be made for housing around six hundred civilians. One must remember that the post I am speaking of does not emerge from the clutches of winter until around the middle of May, so that the use of tents in March and April is out of the question. And was the civilian to occupy these makeshift squad rooms? No. Your Uncle Samuel's buck private was to move from his regular squad room into the proposed inadequate ones in order that the civilian would not be subjected to a few inconveniences. Now if I appear to be just a little bitter at this stage of this chronicle please bear with me. For it is desired to state facts and feelings just as they occurred. And of course rumors were flying thick and fast. Members of the Civilian Conservation Corps were going to receive as much as one hundred dollars per month. The pay of the soldier was going to be greatly reduced. Is it any wonder then that most of us looked with fear and disfavor upon such a condition? Oh. I'll confess that I saw visions of mutinous troops and trouble ahead. But like the old saying, "Today is the tomorrow you worried about yesterday and everything is still all right," nothing dire happened. The six hundred "civies" dwindled to two hundred and twelve. It was remarkable the amount of space that could be found without vacating a single day room or supply room. Each organization was given a small allotment of men to take care of and when the first group arrived on April 12th, they found

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ONE OF THE TWENTY-SEVEN LAKES ABOVE OUR CAMP

warm and cheerful quarters ready for their occupancy. And as always the good old American Soldier was equal to this emergency. Although he himself was a little crowded there was no grumbling. He welcomed the civilian right from the start. A few selected non-commissioned officers were placed in charge of the new arrivals. But the thing that I marveled at was the way the soldier responded. Private John Smith, unasked, did everything possible to make things comfortable for the "civie." He showed him how to make his bed, how to put away his belongings, how to keep his equipment, what to do with burned matches and cigarette butts, so that when the inspecting officer came around no one would be "skinned." (I think he also showed him how to play poker.) And did the "civie" respond to this kind of treatment? I'll say he did!

No time was lost in putting them to work. An intensive training program was devised and put into effect, it being the Commanding Officer's idea that the place to weed out the undesirables was at the training center and not the work camps. The mornings were devoted to setting-up exercises, close order drill and

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health building games. The afternoons were spent in getting them fit for field duty. They were quickly made acquainted with our two greatest army accessories, the pick and the shovel. The few that enrolled in the Corps with the idea that it was to be a vacation comprising eating and resting, with great emphasis on the resting, were quickly found out and sent home. The men realized from the start that if they were sincere in their efforts to abide by the rules and regulations governing them, they were met with that kindness and sympathetic consideration underlying the purpose of their organization.

And each post that was fortunate enough to have a C. C. C. outfit derived great benefit therefrom. Fatigue details of soldiers were either abolished or reduced to an unfelt minimum. More soldiers appeared at drill formations. A program of intensive landscaping was made possible. Everybody was happy. And thus was dispelled the first and greatest fear involving the handling of this vast horde of unemployed young men.

And then came the second phase—the transition from conditioning centers to work camps. By the end of May over twelve hundred men were housed in tents and training was going on in earnest. The original group of two hundred men was organized into cadres of twenty-one men each. These cadres, supplemented by four Regular Army men, comprised the advance detachments that were to go west and make ready the camps in the National Forests and Parks for the reception of the balance of the companies. After numerous delays, waiting for tools and equipment, we finally, on June 2nd, left home for the great adventure. The demand on the officer personnel was so great that only one second lieutenant was left in our battalion. In three days this officer had taken over four organizations. Time was so short that he had to sign "blind" for all property, it being a physical impossibility to check the hundreds of thousands of dollars' worth of equipment. But thanks to a wonderful group of supply sergeants, no one had to pay for any lost property. I look back now and smile at this harassed and overworked officer as he stood beside our train feverishly writing down the last minute instructions that were being yelled at him by the departing officers. Fund books, vouchers, property lists, etc., protruded from every

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pocket, thus putting a rather humorous aspect to what would otherwise have been a pathetic picture.

So, with the band playing, women crying, dogs barking and everything a perfect bedlam, our train was on its way. And of course the first topic of conversation by the officers was: "What are the poor troops going to do without us?" But we need not have worried. The paucity of officers did not last long and from all I have been able to learn the animals were properly groomed; drill and instruction went efficiently on under competent noncommissioned officers. So, for me, the second and last fear was dissipated.

Our advance cadre arrived at its destination on the morning of June 6th. The place to which we were being sent had a name suggestive of a beautiful summer camp high in the mountains, surrounded by huge trees, babbling brooks; and I for one conjured up visions of lazy days spent in watching picturesque cowboys breaking and riding wild horses for the amusement of summer guests. Imagine my rude awakening when I found that this beautifully named place was formerly a coal mining town. But the dismal impression did not last long. Our camp was situated ten miles up the canyon from town on a most beautiful site. We were encamped beside a beautiful mountain stream. A road, which in 1935 will be opened as a new entrance to the Yellowstone National Park, ran through the camp.

The business men of the town turned out more than the necessary number of trucks to get our equipment quickly hauled to camp. And by afternoon, with the help of the Forestry Department, camp was made and we began a most enjoyable five months of work and play. On this first day a friendship between the townspeople and members of our company was formed that endured throughout our entire stay. The town was able to provide just the kind of clean amusement that the boys needed. Dances were given every Wednesday and Saturday night. There were more than enough girls of the right sort, and it wasn't long until every boy in camp had a girl in town.

We had our camp baseball team and also our own ball diamond. The diamond was built by the men in their off hours. We had many a hotly contested game with teams from neighboring towns,

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both on our own diamond and also on theirs. In the fall we developed a fine basketball team which was successful in most of its games. As the town was also a great fight town, we turned out our share of good boxers, two of them being undefeated.

The men cheerfully purchased from their own pockets a few necessities to make camp life more desirable. They purchased a huge hotel range to replace the army field range. This range not only served our main camp, but because of it we were able to supply the three spike camps with pies, cakes, doughnuts, cinnamon rolls and all the other tasty things that only mothers and good cooks know that men and boys enjoy.

The troubles we had were few and far between. Of course the first three weeks were the hardest, but even at that we all got a great kick out of building the camp. Our first instructions were that our camp was to be a tent one. Imagine our surprise therefor when three carloads of lumber suddenly arrived at the depot. Following the lumber came instructions from District Headquarters to erect a wooden mess hall and kitchen, shower house and latrine. Blue prints covering the shower house and latrine were furnished, but none was furnished for the mess hall. A wire to Headquarters brought the information that no blue prints for the mess hall were available, but that it was to be built as shown in standard form No. so and so found on page two hundred and ninety-eight of the Quartermaster Manual. Of course this was a big help, since we did not have a copy of this manual. But Corps finally came to the rescue and decided they better send out to the companies copies of these blue prints instead of keeping them on file. So work on the mess hall was commenced. After laying one third of the floor joists we ran out of two by sixes. In reply to a wire asking when the balance of the lumber was to be expected, we found out that we had all the lumber necessary, and didn't we know that the floor joists were not to be laid nine inches apart, as called for in the original plan, but that they were to be eighteen inches from center to center, as shown on Changes No. 3 to the original plan. No, we didn't know about Changes No. 3, in fact we didn't even know about Changes No. 1 and No. 2.

As instructions had been received to push the construction as

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**THE NEW NATIONAL HIGHWAY INTO THE YELLOWSTONE AT A POINT 6,000
FEET ABOVE OUR CAMP**

rapidly as possible, authority was requested to purchase fifty dollars' worth of carpenter tools. This request brought a reply in which information was desired as to why we hadn't brought the necessary tools with us. We replied that we brought all the tools authorized, but that these tools consisted of one hammer and one saw and sixteen men couldn't very well make much progress under these conditions. Needless to say, we got our tools. So the buildings were all completed and we were ready and waiting for the plumbing supplies when they finally arrived. Imagine my surprise on going over the plumbing blue prints to discover that for the fourteen shower heads only two valves were called for, one for the hot water and one for the cold. This meant that if one man wanted to bathe he turned on fourteen showers. And one can imagine the quick annihilation that would have come to some individual had he been so bold as to turn on the cold water while other bathers were indulging in the glorious soothing feel of hot water on tired muscles and bodies. So the men were again asked to dig into their own pockets in order that we could purchase

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the necessary material for the installation of individual showers. The above is recorded not in just criticism of our supply branches, but to bring out the splendid spirit and resourcefulness of the men. If what they wanted was not supplied by the Government, they didn't beef about it. They went out and got it.

I cannot close this article without paying tribute to our District Headquarters, with its overworked but highly efficient staff. Every reasonable request was promptly complied with. Every unreasonable request, and there were such, was given due and sincere consideration and more often than not such request was approved. Never once did I receive a communication, from either Corps or District, to "explain by indorsement hereon" why such and such a report was not forwarded on time. A letter inviting the "Company Commander's" attention to the fact that such paper was due was all that was received. The Quartermaster Corps never failed once in sending supplies. Timely information was furnished every camp in the District, so that plans for the purchase of the perishable components of the ration could be drawn up far enough in advance to insure an orderly and proper supply. I do not know what ratings the office personnel at District Headquarters received on their efficiency reports, but had it been left to the Company Commanders, they all would have received "superior."

And now, last but not least, let us give proper credit to the seven men who, more than anyone else, were responsible for the complete success of our camp. I refer to the Camp Superintendent and his six foremen. Had I not decided to make this more or less an impersonal article, I would give you their names and histories. Through their professional knowledge, their long experience in the forests and mountains of the West, their ability to carry out their well laid plans, their ability to instantly size up each individual and place him on the job to which he was best suited, made our camp one of the best in the entire United States. And it was with real sorrow that we had to sever our pleasant relations with them when, on the 19th day of October, we left the West for our winter camp in the South.

So, if your faith in human beings has begun to slip, make

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yourself acquainted with the good that is being done by the Civilian Conservation Corps and learn, as I have learned, that there are thousands and thousands of young men struggling to make of themselves something worth while. Get close to them so that you may realize that for every two criminals there are at least a thousand stalwart upright citizens who will not permit these United States to be ruled and pulled into oblivion by a certain small group classed as "criminals."

And as I look back in retrospect over this seven months' detail with the "civies," weighing the good and the bad, I have reached the conclusion that in the organizing of this vast project which has done so much good for so many people that "Gabriel was indeed over the White House."

FIELD ARTILLERY NOTES

Marines Extend Royal Welcome to Old Comrades of the 2nd Division

Pursuant to arrangements completed by the office of the Chief of Field Artillery, Battery "B," 17th Field Artillery, stopped at the Marine Barracks, Quantico, Virginia, on the night of January 11, 1934, while enroute from Fort Bragg, North Carolina, to Aberdeen Proving Ground, Maryland. The Battery arrived at Quantico at 5.15 P. M. after having been on the road for more than eleven hours and having traveled 321 miles on a cold and gloomy day. As the head of the column reached the main parade ground, the band struck up the Field Artillery March. When the column had halted, a reception committee greeted the Battery and explained the arrangements that had been made to entertain the officers and men. After battery park had been formed, a Marine guard was posted to safe-guard the materiel. In one of the superb Marine Barracks mess halls, places were laid for the enlisted men of the Battery. After dinner they were entertained free of charge at the Moving Picture Theatre as the guests of the Marine Corps. Later the men were surprised to find beds with clean linen and blankets prepared for them in one of the barracks.

The officers with the Battery likewise were royally entertained. Major Bank and Captain Reeves were invited to be the house guests of Brigadier General and Mrs. C. H. Lyman, U.S.M.C., and Lieutenants Kruger and Furuholmen were invited to be the house guests of Major and Mrs. Fassett, U.S.M.C. During the course of the evening, Major and Mrs. Fassett entertained all the Field Artillery officers and a large number of Marine officers and their wives at dinner.

Although it was necessary for the Battery to leave before daylight the next morning, Brigadier General Lyman and many officers of his command were present to wish the artillerymen a pleasant journey and a quick return.

Ancient Order

The editor of *Saber and Spur*, a monthly magazine published by the 106th Cavalry, Illinois National Guard, apparently has been delving into musty records, for in a recent issue of that publication the following appears:

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Fort Riley, Kansas,
October 25, 1842.

General Orders

Number 2.

1. Members of this command will, when shooting at buffaloes on the parade ground, be careful not to fire in the direction of the C. O's. quarters.

2. The troop officer having the best trained remount for this year will be awarded one barrel of Rye Whiskey.

3. Student officers will discontinue the practice of roping and riding buffaloes.

4. Attention of all officers is called to par. 107, A. R., in which it provides under uniform regulations that all officers will wear beards.

5. Short buffalo coats ordered will be ready for issue November 29.

(From U. S. Army *Recruiting News*, dated December 1, 1928.)

Artillery in a River Crossing

A great many years ago, according to my Uncle George, who is full of such stories, the members of the Advanced Course in Horsemanship at the Field Artillery School were having a little difficulty crossing a stream.

Three lieutenants, acting as drivers, had a 75mm gun well bogged down in the soft bottom.

The Lead Driver had his right leg applied well behind the girth, and was doing something very technical with the right indirect reign of opposition.

The Wheel Driver had achieved the direct flexion for the first time since he had read about it, and he had decided to attempt the lateral flexions also, while the time was right.

The Swing Driver, glancing fore and aft, and noting these interesting experiments, saw there was nothing left for him to do except something original, so he busied himself with vibrations and divisions of support, and was gratified to note proper action of the poll and submaxillary, instead of movement at the fourth cervical vertebra, which he had feared.

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Meanwhile the Wop corporal, whose piece this was, danced up and down on the bank in a frenzy of anxiety over his bright metal and bearing surfaces, submerged beneath the flood.

"Officers, listen!" he implored. "The gun, she's-a can't go straight while the horses, she's-a go crook"! Listen, officers! All together now! Come on, officers. LET'S-A GO!"

What a great slogan!

"Keep 'Em Rolling"

Under the title of "Keep 'Em Rolling," the Field Artillery moving picture made under the working title of "Rodney" has recently been released by R. K. O. Studios. Inc. As stated in the September-October, 1933, number of THE FIELD ARTILLERY JOURNAL, the picture was made for the most part at Fort Myer, Virginia. The officers and men of the 1st Battalion, 16th Field Artillery, put in, as one old soldier expressed it, "the hardest two months since the fall of 1918" in making the section race, review and war scenes in the picture. Among the officers of the 16th who are readily identified in the picture are Lt. Col. C. P. George, Maj. G. D. Shea (who acted as the battery commander in the World War scenes), Capt. H. T. Brotherton and Capt. W. R. Frost. About forty working days were spent at Fort Myer and Hollywood in actual picture taking and as the completed picture runs less than eighty minutes on the screen, it is evident (and very surprising to the layman) that two minutes of the final picture as seen in the theatre is the average result of a hard day's work. Another point of interest is that three horses were used at Fort Myer to represent Rodney, one to represent him as a remount, one during his World War service and one as an old horse. These three horses had, of course, to be of similar conformation and all capable of doing what was required of them in front of cameras, light reflectors and sound equipment. After this problem was solved, it developed that each of the three had to be doubled at Hollywood for the scenes that were to be taken there. Capt. H. W. Blakeley, 16th F. A., who acted as technical advisor during the making of the picture both at Fort Myer and in Hollywood, found upon his arrival in Los Angeles that two of the three horses selected by matching with "still" photographs of the

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three Fort Myer horses were unsatisfactory. Further search through hundreds of horses was necessary to secure those which resembled the Fort Myer horses sufficiently to permit their use.

The part of Benny Walsh, the old soldier whose long association with Rodney has developed into a tie which cannot be broken by fate or the exigencies of military service, is splendidly portrayed by Walter Huston. In every respect, he has succeeded in being the old regular, and the officers of the 16th Field Artillery without exception speak enthusiastically of the hard work and intelligent interest which he put into the creation of the character of Walsh. His present outstanding success in "Dodsworth" on the New York stage is a matter of satisfaction to all of the officers who were associated with him at Fort Myer.

The "love interest" in the picture is of minor importance, but is well carried by Frances Dee and Robert Shayne. Frank Conroy, as Walsh's battery commander in the pre-war scenes and later as his regimental commander, also lives up to his stage reputation as a sterling actor by a representation, which is soldierly and impressive, of the highest type of regular officer.

TARGET PISTOL SHOOTING

BY BOB KNISELEY

"PRACTICE with small caliber pistols will lead by a direct route to successful shooting with larger sized guns."

Lieutenant Ivan D. Yeaton, F. A., University of Oklahoma pistol coach and instructor in the R. O. T. C. unit, says.

"Any man who is proficient in the use of the .22 caliber pistol will be efficient in the use of the .45 caliber service gun," the lieutenant points out, in explaining the value of training the pistol shooter with the smaller caliber gun. "The .45 method," he says, "often blocks the beginner from becoming a good shot under service conditions."

The man learns how to hold his gun, how to sight and squeeze—then he goes on the range. When he gets a loaded .45 in his hand, he automatically flinches in expectancy of the noise. When the piece is fired, the shock and noise are so great that it makes even a hardened veteran "jittery," and subtracts from his efficiency. A big percentage of the men do not get over this shock from year to year, and the shooting in successive years is tempered with the effect of the first shooting, according to the lieutenant.

As a secondary consideration in the matter, the lieutenant says, the difference in the cost of the ammunition should not be compared with the results obtained. Ammunition for the .22 caliber gun costs about one-half cent per round, while a shot with a .45 costs about six and one-half cents.

* * *

As an authority on pistol shooting and practice, Yeaton is classed as an expert. He has many medals for pistol shooting in both service competition and outside contests. He has coached teams which have records surpassed by no other university or college team in the United States. His ideas on the training methods for pistol shooting should, for that reason, be highly valuable to persons interested in the pistol game.

Before going further into the matter of pistol shooting and the essentials in training, classifying of guns, and matters of cooperation on the part of commanding officers, let us first look into the history of pistols and their uses.

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Authorities differ on the date of the earliest pistol, and on the inventor of it, but all agree that it was first used in the early part of the 16th century in Italy. Most authors say the first small arms were made by Carminello Vitelli, in Pistoia, Italy, and the name of the town gave the weapon its name. Others hold that the name was taken from a coin, the "pistole," which was the same diameter as the bore of the first weapon. Still others claim the name came from the word "pistallo," which means "to pommel."

A few say that the pistol was originated in Perugia, Italy, and was of the match-lock type, requiring a flame to fire the piece. Its first adoption into the services was in 1550, when it began to be used in the Italian cavalry. The pistol seemed to be suited to mounted service, and since its first use in the earlier cavalry units, has continued as a portion of the equipment of that branch of the service until today.

Since 1550, the value of the pistol, as well as its dependability, has increased. The shortening of the rifle, for maneuverability, evidently was the cause of the invention of the pistol, since the first rifle was invented almost twenty years earlier, and was of the type which was evidenced in the first pistol. Consequently, with each new development of the rifle, the pistol has been improved.

Shortly after its adoption into the Italian army, the pistol followed the line of rifle improvements and was adapted to the wheel-lock type. However, instead of using the thumb-turned wheel, as in the case of the rifle, the short gun was equipped with a coiled spring, released by a trigger, which in uncoiling turned a wheel against a piece of flint. The process was very similar to that used in the present day cigarette lighter.

This type of weapon remained in use about two centuries. Then the percussion cap was invented for rifles. The pistol was quickly adapted to the use of the new form of ammunition, and the greatest step forward, since their invention, was noted in the small arms. This occurred in 1807.

Just before this time, late in the 18th century, swords gave way to the pistol as dueling weapons. Practice in the art of pistol shooting became prevalent. Up to this time, men who went into

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battle armed with pistols, fired their one shot and then threw the unloaded piece at the enemy or used it as a club. But when men began to fight duels with pistols, people became more interested in the weapon as an offensive and defensive machine. Gunsmiths became more numerous and began to turn out more efficient and accurate guns from their shops.

But after a time, public disapproval brought about the discontinuance of pistol dueling. This affected the birth of target shooting as a sport. Some men, especially in France, went so far as to indulge in mock duels, using wax bullets, solely for the sake of practice. All this finally developed into what we know today as "Free Pistol" shooting, which is considered the highest form of shooting known.

Pistol shooting in this country reached its first peak during the Indian wars and the expansion of the frontiers in what we called the "Wild West." The revolver or pistol today is the chief arm of all our enforcement officers and our most important weapon of defense in the service. It has even been suggested by many that the pistol replace the bayonet in the army. It is more effective, they argue, and is safer because it may be used over greater distances and with greater accuracy.

* * *

In Lieutenant Yeaton's own words, we may see what he considers paramount among the things which affect the training of the pistol shooter, and the changes he suggests in methods of instruction in firing. He first talks about the attitude of the commanding officer and its effect on the shooter.

* * *

The longer I stay in the service, the more I'm convinced that the success or failure of a team or organization to perfect itself in pistol shooting is due, not so much to the coach or organization commander, as it is to the attitude of the commanding officer concerned. In other words, the commanding officer who looks lightly upon pistol practice will find that his attitude is carried right on down to the individual shooter, in most cases.

And I do not believe in normal peace times enough time is

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allotted to practice. By this I don't mean the expenditure of more ammunition than is now used, but simply a few more minutes added to the practice time each day, which would produce far better results.

In 1929 I was given the University of Oklahoma pistol team, which up to that time had not distinguished itself in any way especially, and under the leadership and guidance of Maj. Edwin P. Parker, Jr., the team, for the first time, won the Chief of Field Artillery's R. O. T. C. trophy. Major Parker arranged my schedule so as to allow me all the time necessary, built us new ranges and bought new equipment. He also initiated the custom of awarding sweaters and keys to the members of teams, and allowed us to make trips to nearby matches.

The attitude of the commanding officer was again shown in 1930-'31, when we again won the .45 cup. The next year, 1931-'32, the university had a new P. M. S. & T.—Maj. Harry J. Malony, an authority on machine guns and a small arms expert. Again, his attitude of understanding and helpfulness allowed us to win the .45 cup for the third consecutive year.

Major Malony purchased additional equipment for the team, reconstructed the ranges, and by personal supervision inspired the team to still greater heights. In 1932-'33 the team reached its peak. It held more Southwestern, Individual State and National championships than any other college team in the United States, to the best of my knowledge.

In four years, the team has won 20 cups, 118 medals and 39 championships (Gold Medals), 39 silver medals for second places in championship matches, and 26 bronze medals for third honors in championship shoots.

To Major John F. Boles, F. A., the team owes its thanks for helpful suggestions that led to increased efficiency, and to Major Wm. D. Frazer, whose book, "American Pistol Shooting," has been a guide for four years and my principal reference for a great deal of this article.

* * *

Here the lieutenant goes into the subject of classification of pistol shooting and a discussion of choice of weapons for each class.

TARGET PISTOL SHOOTING



CUT NO. 1

THE .38 DETECTIVE SPECIAL REVOLVER

A business like defensive gun and grip that adapts itself to quick draw, snap shooting, and double action from any position.

Major Frazer has classified pistol shooting in three ways, each method having three classifications.

- | | | |
|----------------------------------|------------------------------|---|
| A. Military Practice | 1. Target Shooting | (a) Self and Home Defense |
| B. Police and Defensive Shooting | 2. Revolver Shooting | (b) Law Enforcement and Military Purposes |
| C. Recreational Target Shooting | 3. Automatic Pistol Shooting | (c) Target Shooting as a Recreation |

(The third classification is the choice of Lieut. Yeaton, and each step of that group will be discussed here.)

SELF AND HOME DEFENSE

For home and personal defense, the ideal weapon, I believe, is a pistol or revolver weighing about 22 ounces, with a barrel not over 2½ inches long and shooting a bullet not smaller than a .38 caliber. A weapon of this type is light to carry, and because of its short barrel is easily concealed and easily brought into play. A caliber less than .38 does not contain enough shocking power to be classed as a good defensive weapon. This type of gun, of which the Detective Special (see cut No. 1) is a representative, I believe to be

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the ideal gun for home use. There is sufficient accuracy, up to 25 yards, for this sort of gun, when properly handled, to answer the purpose for which it was designed.

* * *

LAW ENFORCEMENT OR MILITARY PURPOSES

For law enforcement and military purposes, working under the old military slogan, "The best defense is a good offense," I believe a pistol or revolver weighing between 38 and 42 ounces, with a barrel not less than 5 or 6 inches in length and shooting a bullet of a caliber at least .44 or .45, makes the best weapon. In this class of gun, we have the government model automatic (see exhibit "a" in cut No. 6), the single action army revolver, and the new service revolver—all of them excellent weapons. But the government model automatic is the best, I believe, because of its grip, which will be discussed later.

* * *

TARGET SHOOTING AS A RECREATION

The field of target shooting is a large one, and excepting for the "National Free Pistol," I believe a pistol weighing between 38 and 42 ounces, with a barrel not over 7½ inches and the caliber not over .38, is the best gun (see cuts No. 2, 3, 5 and 6). In "Free Pistol" shooting, the type of fire is single shot with no time limit, and no restrictions except that sights must be "open." This is, of course, the most accurate of pistol shooting, and a specialty in itself.

Target shooting may be classed as to Slow-, Time- and Rapid-fire, or as to large-, and small-caliber shooting. The slow-fire, or deliberate shots, using a small caliber, long barrelled, single shot pistol, constitutes a department of the pistol game which closely approaches the "Free pistol" shooting. Most state matches favor this type of shooting; however, the Camp Perry matches, sponsored by the government, and such state matches as pattern after them, favor the all-round, or slow-, time-, rapid-fire experts.

A person starting out in the pistol game would be wise to attempt to perfect himself, first in the slow-fire, small caliber field, after which he could branch out to the faster types of fire and the larger

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CUT NO. 2

THE .38 CALIBER OFFICER'S MODEL

An open hand grip for the .38 caliber revolver shooter that allows smooth cocking for rapid-fire and squeeze for slow-fire.

calibers with safety. It is my contention that the slow-fire expert is the most dangerous of all competitors, and for four years, working on that theory, I have trained my teams to the point where I believe they were confirmed in the art of holding and squeezing before allowing them to decrease the time of squeeze.

At the first indication that a man was jerking the trigger on account of the rapidity of fire, he was sent back to slow fire until such time as the fault disappeared. During the last two years, the University of Oklahoma team has seldom been beaten in a slow-fire match, and is considered one of the most dangerous slow-fire teams in the southwest, due to this method of training.

The one danger in this type of schooling is the development of what is known as "Freezing," where the individual, through his caution, becomes unable to exert enough pressure on the trigger to fire the shot. This can be overcome in two ways: (1) Locking the piece and causing the shooter to exert all pressure possible on the trigger, then releasing the safety and allowing the shot to be fired. (2) Requiring the shooter to fire his 10 shots in 10 minutes.

Another minor fault that may develop in this type of practice is the failure of the shooter to bring the arm down when something goes wrong, or after he has held for a long period of time without

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firing. Some men get the idea that once the arm is extended, it must be kept there until the shot is fired. The coach can correct this by ordering the man to take his arm down and start over, when he feels the man has been holding too long. Our team spends the first three months of each year on this deliberate type of shooting.



CUT NO. 3

THE .22 CALIBER "ACE," ON .45 FRAME

An ideal gun to start service shooters out: showing the open hand grip taught all beginners for slow-fire.

Target shooting as a recreation is rapidly becoming more popular. Compared to tennis or golf, it is no more expensive, and requires the highest degree of skill. The results obtained are ordinarily in direct proportion to the time spent in practice. It is a sport that may be indulged in as late, if not later in life than any other sport. Pistol shooting in the R. O. T. C. units is taken up as a sport, and not with the viewpoint of making undergraduates bloodthirsty or inculcating in them any desire to kill.

After the slow-fire period of training is completed, the team goes into rigid training, which consists of a training diet; giving up the use of all liquids except water and milk; and one hour of physical exercise each day. The exercises are designed to do four things: Perfect the balance; increase the lung capacity and prolong the time which a man may hold his breath; decrease the mobility of the spine and joints and strengthen the muscles used in shooting.

TARGET PISTOL SHOOTING



CUT NO. 4

Lieutenant Yeaton demonstrates the positions so successfully used by the University of Oklahoma team for the last four years. (Note the freedom of the posture, with the free arm hanging at the side.)

On shooting position, I have nothing new to offer except about what should be done with the free arm. Some authorities say the hand should be placed in the belt, some say put it in the pocket, on the hip, etc. But I believe that allowing it to hang relaxed at the side, as in cut No. 4, to be better.

A few authorities advocate the raising of the shoulder of the

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arm extended, but I coach my teams to hold the shoulders level, as well as the hips, and to stand squarely on both feet, with the body facing 45 degree away from the target, as is demonstrated in cut No. 4. In other words, we do not bring one muscle into play unnecessarily.

In determining whether a man should be a right- or left-handed shot, the fact that he is naturally right- or left-handed is disregarded. In examining a man for the pistol team, I first determine, by optical test, which eye is the stronger. The man is trained to fire with the arm on the same side as his stronger, or master eye.

Some resistance to this is met at first, because the individual concerned feels that one arm is stronger than the other. This resistance soon disappears when the man finds, by a little experimenting, that neither arm is trained for the use to which he is about to put it, and he is easily convinced that it is just as easy to train one arm as it is the other.

In this second period of training, the rapid-fire practice is taken up. Besides the physical exercises mentioned, a man is required to stand a certain length of time each day with his arm extended, holding a pistol of the type he is to use. The timing of this practice begins with a three-minute period for the first week, and is increased one-half minute each week. The rapid-fire practice is, of necessity, held with the .45 automatic pistol, because of the visibility of the hammer, and the possibility of attaching a string to it.

I am convinced that training any team that uses the automatic pistol to fire time-fire is useless. Our scores last year showed that a man perfected in the art of rapid fire, when allowed a few seconds more for time fire, upsets himself and his score in attempting to use the few additional seconds allowed him, and I intend to train my team this year to fire slow and rapid only. All the time fire scores will be fired in rapid-fire timing.

As soon as the team is in shape, the entire membership fires once through the course daily and the five shooting members are chosen from their daily averages and not from a few remarkable performances. The good, consistent shot can be depended upon to uphold a team, while the occasional "flash" will let it down. Preliminary tryouts consisting of one or two scores have proved to be a failure. The above type of practice, using the .22 caliber automatic, or

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CUT NO. 5

*THE .22 CALIBER "WOODSMAN" WITH STEDIMORE BALANCER
The open hand slow and rapid-fire grip for automatic target shooting, showing
also "Stedimore" balancer attached to the barrel.*

"Woodsman" (see cut No. 5), for trigger squeezing, is hard on firing pins, but the minor cost in replacing these parts is not to be compared to the results obtained as against the other pistols and methods.

On the weight of the Woodsman, I am convinced that it is a little too light for a good target gun. Our scores have been greatly improved by the use of a three ounce weight slung from the barrel of the gun. A very satisfactory balancer is found in the "Stedimore," which weighs about three ounces. It may be seen attached to the Woodsman in cut No. 5. The weight is distributed under the entire barrel.

* * *

In the opinion of Lieut. Yeaton, the grip of a pistol is an important feature. He discusses it at length in the following chapter.

* * *

The grip of a pistol is something to which the amateur does not give much thought, but experts have been experimenting with it for years. I am convinced that the grip on the government model automatic pistol is the closest approach to a perfect grip that has yet been designed for commercial issue. The revolver grip, because

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of the fact that the gun was designed for holster use and quick draw, is small and protruding. But this same grip in a target revolver can be greatly improved by enlarging the butt and filling in the space in rear of the trigger guard (see cut No. 2). The perfect grip, to my mind, is the one that is large enough to allow the middle, ring and little fingers to be in approximately the same position as the trigger finger at the end of the squeeze (cut No. 5). Most automatics are so constructed that part of the weight rests on the middle finger, using the base of the trigger guard, which is a desirable feature (cut No. 3).

The fact that the .45 caliber automatic successfully competes with the better revolvers of the heavier caliber is because the prescribed grip places this gun in the hand in the most advantageous position to squeeze. The shape of all other guns, and particularly the revolver, is such that the average person holding the gun out for the first time will adopt a "thumb-down" position, which is not conducive to good shooting.

Experience has proved the most perfect squeeze is developed with a "thumb-high" position. In other words, the thumb must be carried at least on a level with the trigger finger, or preferably a little higher. On all automatics the thumb should be placed as high on the wooden stock as the safety will allow, taking care that it is not placed against the slide. On the revolver the thumb should be placed on the frame as close to the hammer as possible without interfering with its downward motion. (These facts are illustrated in cut No. 2).

To sum this all up—the more open the hand, the more nearly perfect the squeeze.

In exhibits "d" and "h" in cut 6, the Pachmayr adapter for revolvers is shown in a large and small size, respectively. This adapter is a decided step in the right direction, but I do not believe it is carried far enough. As I have said before, the middle finger should be used to help carry the weight of the gun, and in so doing should be below the trigger finger and not above or level with it. As to the ring and middle fingers, these are of advantage to the shooter only as a means of keeping the gun steady in the hand, but any tendency to squeeze the grip at the same time the trigger is being squeezed should be overcome by forcing the shooter to shoot

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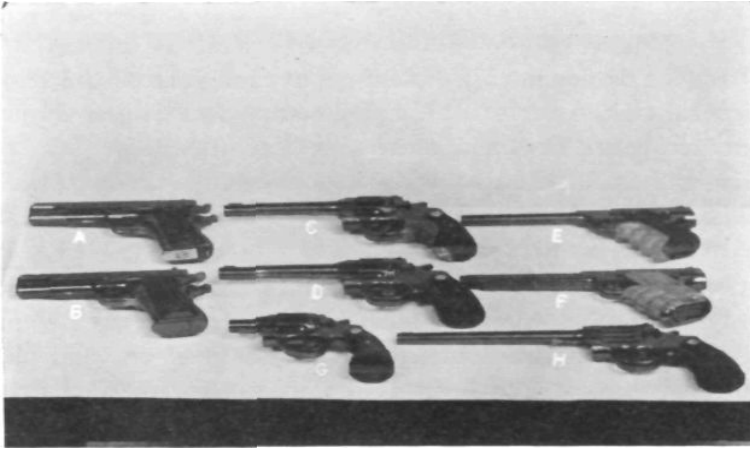
slow-fire only, without the use of those fingers, holding them extended as in cut No. 3.

To boil this down, this system gives each part of the hand its individual task to perform; i. e., the thumb and trigger finger are concerned with the development of a perfect squeeze, straight to the rear; the middle finger with supporting the gun only; the ring and little fingers with keeping the gun straight in the hand, primarily during the time- and rapid-fire.

As I have said before, the government model .45 automatic most closely approaches the fulfillment of these requirements, and all other revolvers and automatics should be filled out and padded until this grip is approached. If it were not for the fact that the noise and shock of recoil of the .45 caliber issue gun is extreme, it would make an ideal gun for its purpose, but I believe that more men in the services have been ruined forever as pistol shots by the fact that their first shots were fired from this weapon. The "Ace" (cut No. 3), which closely resembles the .45 caliber automatic in size and shape, firing a .22 caliber bullet, is an ideal gun for the starter. I believe that if each battery, troop, squadron or other unit armed with the pistol, could afford one or more of these small caliber weapons, shooting issue .22 caliber ammunition, until such time as the men of the organization are confirmed in the art of holding and squeezing, that the percentage of qualified pistol shots in the army would be greatly increased. I am also convinced that firing of an allowance of a few rounds of .45 in practice before shooting the course does more harm than good. The Junior class of the R. O. T. C., after nine hours of trigger squeezing, was fired for record without any preliminary firing. Sixty-four per cent of the class qualified as marksman or better, and although this percentage is low, I believe it is due to the fact that only nine hours were allotted to practice and not to the fact that they were not allowed to fire practice shots.

Over 90 per cent of the class fired their first scores of slow-fire, averaging better than 60 per cent. In the years that I have trained this pistol team, no member of the varsity squad has failed to qualify as expert the first time he fired the .45 caliber pistol, and such scores as 95 to 97 per cent are common. These men were trained with a .22 caliber, confirmed in the art of holding and

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CUT NO. 6

A GROUP OF GOOD PISTOLS AND REVOLVERS

- A. *The .45 caliber government model automatic with long trigger in place of the short one, and part of the hammer cut away to prevent pinching the hand.*
- B. *The .22 caliber government model automatic on the .45 frame. This gun is known as the "Ace."*
- C. *The .38 caliber Officer's model with enlarged grip.*
- D. *The .22 caliber Officer's model on the .38 frame, showing the large size Pachmayr adapter.*
- E. *The .22 caliber "Woodsman." showing enlargement of grip.*
- F. *Another Woodsman, showing enlarged grip and the "Stedimore Balancer," an ideal combination.*
- G. *The .38 caliber Detective Special, for defense only.*
- H. *The .22 caliber Camp Perry model, single shot, showing the small size Pachmayr adapter.*

squeezing, and were slow-fire experts before they were allowed to fire any other gun or any other type of fire than slow. The result is that, within a few days, they can adapt themselves to any type of gun, pistol or revolver, provided that the grip is so fixed that it does not violate the above principles.

* * *

In a few words, let us show you some of the work that has been done by individuals on the University of Oklahoma pistol team. From the list of members for the four-year period on which this article is based, the name of Jack Louthan, engineering graduate of 1932, is followed by a list of honors that might be envied by the world of pistol shooters. Louthan is the holder of more individual state and southwestern championships than any shooter in the

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southwest. From 1929 to 1931 he was captain of the team. During his years, which amount to three, he was twice State Grand Aggregate champion, twice Southwestern Aggregate champion, once National F. A., R. O. T. C. champion, and once pistol champion of the Oklahoma National Guard.

Tom and Bob Mayrath, twins, also graduates of the college of engineering in 1933, both acted as captains of the team during their last years here at the university. Their home is in Dodge City, Kansas. They look so much alike that it is even hard to distinguish the record of one from the other's. They were pistol champion and runner-up, respectively, in the state of Kansas, and holders of several Oklahoma and Southwestern championships.

Ivan Miller, another engineering graduate, who finished in 1933, was once Oklahoma Grand Aggregate champion and runner-up in the Southwestern contest for Grand Aggregate. He won several state and southwestern championships during his three years on the team.

Clifton Whitehead, captain of the team this year is the holder of several places in the state and Southwestern matches. Mark Cox, member of the team this year was winner of the Balfour trophy, and is the 50-yard Southwestern champion for this season's meet. Homer Blake, who graduates from the university in 1935, holds several state and Southwestern honors and is considered, always, a dangerous competitor and most reliable team member.

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

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