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Signal Corps Photo

"CALAMITY JANE," SECOND PIECE OF BATTERY E, 11TH F. A., LAST GUN FIRED ON AMERICAN FRONT. OFFICIAL TIME 16:59:59, A. M., NOV. 11, 1918

# THE FIELD ARTILLERY JOURNAL

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NO. 6

## THE ANNUAL REPORT OF THE CHIEF OF FIELD ARTILLERY, 1928

### SECTION I—PERSONNEL

#### 1. REGULAR ARMY

*a. Commissioned Personnel.*—(1) On June 30, 1928, the number of officers by grade in the Field Artillery, including those detailed to it for duty from other arms, was as follows:

	Cols.	Lt. Cols.	Majs.	Capts.	1st Lts.	2nd Lts.	Total
Commissioned in Field Artillery .....	28	57	234	435	438	236	1428
Detailed from Other Arms.....	3	..	...	1	...	...	4
Totals.....	31	57	234	436	438	236	1432

NOTE: Forty-eight second lieutenants, commissioned from the Class of 1928, United States Military Academy, are not included in the above table.

(2) Of the 1,432 officers listed above, thirty-seven were detailed for duty in other branches, leaving a total of 1,395 officers for duty with the Field Artillery.

(3) During the year, the gains and losses in this Arm were as follows:

Two (2) colonels.....lost	Three (3) captains.....gained
Two (2) Lt. colonels ..... gained	Forty-three (43) first lieutenants gained
Two (2) majors .....lost	Twenty-six (26) second lieutenants lost

(4) The present distribution of the commissioned personnel of this Arm is as follows:

	Cols	Lt. Cols.	Majs.	Cpts.	1st Lts.	2nd Lts.	Total
Duty with Branch .....	15	21	62	226	255	201	780
Special Service Schools.....	0	2	32	44	61	21	160
General Staff (W. D.) .....	1	2	8	0	0	0	11
General Staff (Troops).....	4	2	9	0	0	0	15
G. S. (Troops, duty with).....	0	0	1	2	0	0	3
General Staff (Attache) .....	1	0	5	0	0	0	6
War College (Staff) .....	2	1	1	1	0	0	5
War College (Students) .....	0	5	7	0	0	0	12
C. & G. S. S. (Staff) .....	0	1	9	0	0	0	10
C. & G. S. S. (Students) .....	0	0	26	3	0	0	29
Ecole de Guerre (Students).....	0	0	1	0	0	0	1
Inspector Gen's. Dept. ....	0	2	2	0	0	0	4
U. S. Military Academy .....	0	0	6	7	34	0	47
Organized Reserves.....	5	14	17	42	1	0	79
R. O. T. C. ....	0	2	20	43	45	0	110
National Guard .....	1	2	22	52	6	0	83
Miscellaneous Duties:							
Aides .....	0	0	0	2	9	0	11
Recruiting.....	1	0	1	5	5	0	12
Disciplinary Barracks.....	0	0	1	2	2	0	5
Foreign Lang. (Students).....	0	0	0	2	2	0	4
Naval War College (Student) .....	0	0	1	0	0	0	1
Sig. Corps Sch. (Liaison) .....	0	0	0	1	0	0	1
Corps Area Headquarters .....	1	2	0	1	0	0	4
Detailed to Air Corps .....	0	0	2	0	3	12	17
Detailed with C. W. S. ....	0	0	0	0	1	0	1
Detailed to Ordnance.....	0	0	0	1	7	2	10
Detailed to Q. M. C.....	0	1	0	1	2	0	4
Detailed to Signal Corps .....	0	0	1	0	2	0	3
J. A. G. Dept.....	0	0	0	1	1	0	2
Detailed to Finance .....	0	0	0	0	2	0	2
Totals .....	31	57	234	436	438	236	1432

NOTES: Officers who have been detailed as students will not, usually, report at the various schools prior to September 1, 1928. Such officers are carried in the table above as students and not as performing the other duties specified.

Forty-eight second lieutenants, commissioned from the Class of 1928, United States Military Academy, are not included in the above table.

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(5) The Field Artillery has furnished its quota of regular officers for all classes of duty away from the branch, except in the case of the Organized Reserves. With respect to this latter duty, the policy of the War Department has been to satisfy the branch requirements completely and to reduce, if necessary, the number of officers detailed to the Organized Reserves in order to accomplish this end. This has resulted in a reduction of the number of Field Artillery officers on duty with the Organized Reserves from eighty-eight, as of June 30, 1927, to seventy-nine, as of June 30, 1928. It is felt, however, that the needs of the Organized Reserves, in so far as affects the Field Artillery, are well taken care of and that the officers who have been relieved from that duty and returned to duty with regular Field Artillery organizations have been employed with greater advantage to the Government.

(6) Under present conditions, the amount of service with regular organizations, that field officers of Field Artillery may average, is approximately as follows:

For colonels .....	5 years in 10
For lieutenant colonels .....	3 years in 10
For majors .....	2 years in 10

This statement emphasizes the importance of having battery officers serve the maximum time practicable with regular organizations and thus acquiring thorough basic training in the handling of Field Artillery. Once the Field Artillery officer has passed the grade of captain, his service with the regular troops will, on the average, be only about 33-1/3 per cent of the time.

(7) A favorable condition has continued to exist with respect to the length of time during which officers have remained at their stations. With the exception of officers moving to and from schools, officers have, with few exceptions, remained at their stations at least two years and, on the average, more than three.

*b. Enlisted Personnel.*—(1) The situation, with respect to enlisted personnel for the fiscal year 1928, showed an improvement over 1927. In 1927, the actual strength averaged 90.5 per cent of the authorized recruiting allotment, whereas, in 1928, the average rose to 92.5 per cent.

(2) The Field Artillery needs more enlisted men. Its problem is to make the best possible use of the men actually furnished.

(3) The following table shows the strength of each unit for the year:

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UNIT	July 1927	Aug. 1927	Sept. 1927	Oct. 1927	Nov. 1927	Dec. 1927	Jan. 1928	Feb. 1928	Mar. 1928	Apr. 1928	May 1928	June 1928	% Rectg. Allot.
1st Division, 1st F. A. Brigade, Fort Hoyle, Maryland													
Hqs. and Hqs. Btry. ....	42	42	42	41	44	50	47	48	41	41	42	42	103.5
1st Amm. Train. ....	63	62	62	63	65	66	66	62	63	67	76	65	100.0
6th F. A. ....	916	914	926	925	899	888	845	815	571	830	854	850	99.1
7th F. A. ....	867	891	888	914	967	993	965	948	915	900	872	865	96.1
2nd Division, 2nd F. A. Brigade, Fort Sam Houston, Texas													
Hqs. & Hqs. Btry. ....	35	36	36	39	36	37	37	37	35	36	36	36	98.2
2nd Amm. Train. ....	54	51	49	47	47	58	56	54	55	57	62	58	94.8
12th F. A. ....	769	779	737	726	709	790	791	793	821	800	775	780	82.0
15th F. A. ....	781	773	721	704	698	811	811	808	799	790	786	780	88.7
3rd Division, 3rd F. A. Brigade, Fort Lewis, Washington													
Hqs. and Hqs. Btry. ....	30	32	31	33	32	32	32	32	32	31	31	31	98.7
10th F. A. ....	572	572	559	592	642	698	704	680	697	707	716	710	78.9
76th F. A. ....	621	631	636	619	655	786	805	799	805	807	812	810	86.4
13th F. A. Brigade, Fort Bragg, N. C.													
Hqs. and Hqs. Btry. ....	38	38	38	39	39	38	38	36	39	39	40	40	101.3
1st Obs. Btry. ....	63	61	62	61	58	56	62	61	66	65	65	65	101.7
13th Amm. Train. ....	47	49	47	47	50	48	49	51	49	48	47	48	98.5
5th F. A. ....	702	699	675	660	656	639	667	655	707	710	714	712	93.8
17th F. A. ....	614	611	582	582	585	572	573	569	601	591	571	580	94.2

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UNIT	July 1927	Aug. 1927	Sept. 1927	Oct. 1927	Nov. 1927	Dec. 1927	Jan. 1928	Feb. 1928	Mar. 1928	Apr. 1928	May 1928	June 1928	% Rectg. Allot.
Separate Organizations													
1st F. A. ....	877	879	792	870	948	974	955	938	967	955	947	945	91.7
3rd F. A. ....	739	720	743	786	828	947	931	908	908	895	888	885	102.2
4th F. A. Bn. ....	461	450	430	290	305	389	379	368	366	356	344	340	72.7
16th F. A. ....	808	821	816	797	814	847	816	796	791	800	814	808	94.6
18th F. A. ....	720	695	700	716	777	806	831	813	829	789	769	760	91.7
82nd F. A. Bn. ....	377	395	402	425	432	429	435	440	438	433	428	425	96.2
83rd F. A. Bn. ....	370	370	397	390	393	394	400	386	386	386	386	386	97.0
Office Chief of Field Artillery.....	24	24	24	24	23	24	24	24	24	24	24	24	99.9
3rd Amm. Train.....	55	56	55	55	62	65	63	63	62	57	57	58	91.1
F. A. S. Detch. (White).....	145	144	148	145	149	153	152	149	150	148	146	144	97.8
F. A. S. Detch. (Colored).....	174	169	167	163	167	168	168	165	161	157	154	151	104.9
Overseas:													
2nd F. A. Bn., Panama.....	445	471	465	469	461	454	438	434	427	450	489	485	102.3
11th F. A. Brig., H. T. ....	2518	2388	2528	2539	2685	2698	2679	2645	2670	2671	2678	2675	95.2
24th F. A., Philippine Islands.....	891	892	891	893	890	890	890	882	881	894	903	900	88.8
Monthly Per Cent of Rectg. Allot.....	90.5	89.8	89.4	89.5	92.4	96.0	95.4	93.9	93.2	93.0	93.0	93.5	

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### 2. NATIONAL GUARD

*a.* The allotment of Field Artillery to the National Guard is as follows:

- 18 Light Field Artillery Brigades (Infantry Division)
- 16 Regiments, 155 mm. Howitzer (Corps)
- 2 Regiments, 155 mm. Gun (Corps)
- 2 Regiments, 75 mm. Gun, portée (G. H. Q.)
- 3 Regiments, 75 mm. Gun, Tractor-Drawn (G. H. Q.)
- 1 Battalion, 75 mm. Gun, Tractor-Drawn (G. H. Q.)
- 4 Battalions, 75 mm. Gun, Horse (Cavalry Division)

No attempt will be made herein to render a detailed statement of the Field Artillery of the National Guard, as these matters are covered completely in the report of the Chief of the Militia Bureau.

*b.* Field Artillery Officers, detailed as instructors with the National Guard, have been chosen with considerable care. It has not been possible, of course, to select only those officers with the highest ratings, but the officers detailed are at least an "average" cross-section of Field Artillery commissioned personnel, and in their selection, especial attention has been paid to securing officers of tact, who may be depended upon to work smoothly with the organization to which they have been assigned.

### 3. OFFICERS' RESERVE CORPS

*a.* The status of the Field Artillery Section of the Officers' Reserve Corps is as follows:

GAINS	
Regular Acceptances.....	618
R. O. T. C. Acceptances.....	864
Transferred .....	16
Total gains.....	1498
LOSSES	
Died .....	12
Transferred .....	45
Discharged .....	502
Declined Reappointment.....	176
Resigned .....	91
Total losses.....	826
Surplus of gains over losses.....	672

The total number of Field Artillery Reserve Officers, as of June 30, 1927, was 10,892, of whom 1,328 also held commissions in the National Guard. The total number of Field Artillery Reserve Officers, as of June 30, 1928, is 11,564, of whom 1,620 also hold commissions in the National Guard.

*b.* The following table shows the distribution of Field Artillery Reserve Officers:



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Assignment Jurisdiction	Cols.	Lt. Cols.	Majs.	Capts.	1st Lts.	2nd Lts.	Total
Corps Area Commander .....	71	119	392	1101	1815	6078	9576
Chief of Field Artillery .....	8	13	46	131	98	61	357
The Adjutant General .....	2	2	5	1	0	1	11
Totals .....	81	134	443	1233	1913	6140	9944

NOTE: Reserve Officers holding commissions in the National Guard are not included in this table. This table shows that about .8 of 1 per cent are in the grade of colonel; 1.3 per cent in the grade of lieutenant-colonel; 4.5 per cent in the grade of major; or a total of 6.8 per cent in field grades. This is regarded as satisfactory.

### SECTION II—TRAINING

#### 4. REGULAR ARMY

*a.* The survey of training of Regular Army units has been less extensive than during previous years, due to changes in the Office of the Chief of Field Artillery and reduction in visits of observation. Thoroughness in the organization and carrying out of training is influenced by the familiarity of senior officers with the basic technique of the arm. It is increasingly apparent that yearly advantage must be taken of the Refresher Course offered at the Field Artillery School to increase the technical knowledge of senior officers new to the arm, or who have been long absent from it on other duties. There should be a fuller appreciation on the part of the Corps Area Commanders that the officers made available to attend the Refresher Course will be able to increase the efficiency of Field Artillery training in units to which they are assigned.

*b.* In general, little change can be seen from conditions reported last year. Troops suffer the same handicaps involved in reduced strengths, special duty, detached service, and fatigue. Officers have worked as earnestly to overcome these handicaps. Frequent changes in officers and large turn-over in enlisted personnel result in periods of adjustment and progress—a pulsation which must be expected as normal under present circumstances of service.

*c.* Marching is one element of training which should receive greater attention. Many commands are having satisfactory yearly marches; many others are not. Nothing more can be asked of those commands which already are giving this subject their attention, but the other commands, in which marching is neglected, must increase efforts to include it in their programs and schedules. To be of most value, marches should be continuous over a period during which the command covers upwards of two hundred miles.

*d.* Occasionally, although important training, such as Field Artillery firing, is taking place at the home station or nearby, some

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officers on special duties do not participate in such training. This can be due only to a lack of interest on the part of the individual officer or a lack of appreciation of the value of and necessity for such training on the part of the responsible commander.

*e.* There has been less than the desirable amount of training in Field Artillery firing with airplane observation. It is highly desirable that all Field Artillery commands conduct some service practice each year in which adjustments are accomplished by air observation. In the Air Corps-Field Artillery Team, the Field Artillery unit must be competent to maintain efficiently its part of the radio communication involved, and should initiate the proposal that the means for the combined training be provided. For division Field Artillery units, speed in adjustment by means of airplane observation must be stressed.

*f.* A new examination for Field Artillery gunners has been promulgated in T. R. 430-175. This regulation is based upon a desire to reward enlisted men who have specially prepared and trained themselves, but the desire had at its foundation the need of more "highly-trained" men, not of more men paid a compensation. Examining boards should bear in mind this purpose in maintaining a high, just, and impartial standard.

*g. The Knox Trophy and Medal.*

(1) *Knox Trophy.*—(a) The Knox Trophy, which is donated annually by the Society of the Sons of the Revolution of the Commonwealth of Massachusetts for award to that battery of Field Artillery which has the highest rating as judged on "Firing Efficiency, Mobility, Communications, and Interior Economy" was won for the year 1927 by Battery "B," 82nd Field Artillery, Fort Bliss, Texas, Captain John M. Reynolds, commanding.

(b) In 1926, thirteen batteries were considered in making the award, while in 1927 the number was fourteen. The average mark in 1926 was 341 out of a possible 400; in 1927 it was 342, or almost exactly the same. The highest marks are made in "Mobility" and "Interior Economy," while the largest cuts continue to be made in the important and perhaps more easily and more uniformly rated subjects of "Firing Efficiency" and "Communications."

(c) Throughout the Field Artillery, commendable interest is manifested in this competition. That it has a beneficial and stimulating effect on important features of training is certain. Though the competition is now quite satisfactorily standardized, continued effort will be made to improve its details to the end that the rating will indicate, with an increasing degree of accuracy, the relative efficiency of the organizations selected to participate.

(2) *Knox Medal.*—The Knox Medal, donated annually by the

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same society as the Knox Trophy, and as an award for excellence as an enlisted student at the Field Artillery School, was won in 1927 by Corporal John P. Olezcwski, Headquarters Battery and Combat Train, First Battalion, 10th Field Artillery, Fort Lewis, Washington.

*h. Morale.*—The year just closed has seen material progress at Field Artillery stations in the execution of the War Department building program. Housing conditions are not yet perfect and will not be for a long time. However, the progress made during the past year has been so great and the improvement in living conditions so obvious that the morale of Field Artillery troops cannot have failed to be materially improved.

### 5. NATIONAL GUARD

During the year, no inspections of National Guard units were made by this office. It is assumed that full report of their condition and efficiency will be made by the Chief of the Militia Bureau.

### 6. OFFICERS' RESERVE CORPS

During the past year, officers of the Branch Assignment Group, who were available, were sent to territorial organizations for training. While this is deemed less desirable than to have a special camp for these officers, it has been found impossible to assemble at a fixed time a sufficient number of officers to make a special camp worth while. Funds during the year have been almost exactly sufficient to meet the requests of Branch Assignment officers for training.

### 7. THE FIELD ARTILLERY SCHOOL

*a. OFFICERS COURSES.*—(1) Eight separate courses for officers were held during the School Year 1927-1928, as follows:

Battery Officers' Course .....	Regular Officers
Advanced Course .....	Regular Officers
National Guard and Reserve Battery Officers' Course.....	Two—Fall and Spring
National Guard and Reserve Field Officers' Course.....	Two—Fall and Spring
Refresher Course .....	Regular Officers
Special Refresher Course .....	General Officers
Advanced Course in Horsemanship .....	Regular Officers

(2) *The Battery Officers' Course.*—(a) This course began September 15, 1927, and ended June 15, 1928. It was taken by a class of seventy-five officers. Sixty-nine officers satisfactorily completed the course and were awarded diplomas.

(b) This course is well standardized. The only change made this year or contemplated for next year is the further substitution of practical for theoretical instruction.

(3) *The Advanced Course.*—This course began September 15,

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1927, and ended June 15, 1928. It was taken by twenty-six regular army officers, one Marine Corps officer, and one foreign officer. Twenty-four officers satisfactorily completed the course and were awarded diplomas.

(4) *The National Guard and Reserve Battery Officers' Courses.*

(a) *Fall Course.*—This course began September 15, 1927, and ended December 15, 1927. Forty-one officers began this course; twenty-five satisfactorily completed it and were awarded certificates.

(b) *Spring Course.*—This course began January 30, 1928, and ended April 28, 1928. Twenty-six officers began this course, of whom twenty-one satisfactorily completed it and were awarded certificates.

(c) This course has become well standardized and is believed to be as satisfactory as it can be made in the very limited time available. The number of officers who failed satisfactorily to complete this course indicates the necessity for supervision by the agencies charged with the selection of student officers to make certain that officers designated to take the course are properly prepared therefor.

(5) *The National Guard and Reserve Field Officers' Course.*—(a) This course began January 10, 1928, and ended February 15, 1928. Ten officers began this course, of whom nine satisfactorily completed it and were awarded certificates of proficiency. The officer who failed satisfactorily to complete the course was relieved shortly after the beginning of the course on account of sickness in his family.

(b) This course is essentially a refresher course and is believed to be a valuable one. A great deal was accomplished in the short time available.

(6) *The Refresher Course.*—(a) This course began January 16, 1928, and ended March 31, 1928. It was taken by one officer of the regular army, who satisfactorily completed the course and was awarded a certificate.

(b) This course is primarily intended for field officers of Field Artillery of the Regular Army. This is the third year the course has been given at the Field Artillery School. It is believed to be a very valuable course and to have far-reaching results in the coordination of training throughout the various components of the army. It is believed to be worthy of encouragement by all commanders. Only one officer was made available to take the course this year. It is hoped that in the future this valuable course can be given to more officers.

(7) *The Special Refresher Course for General Officers.*—This

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course began on March 3, 1928, and ended on March 31, 1928. It was taken by one general officer, who satisfactorily completed the course and was given a certificate.

(8) *The Advanced Course in Horsemanship for Regular Officers.*—(a) This course began September 15, 1927, and ended January 15, 1928. It was taken by five officers of the regular army, all of whom satisfactorily completed it and were awarded diplomas.

(b) This is the first year that this course has been given. The course was satisfactory and, it is believed, will prove a very useful one in the training of Field Artillery organizations throughout the army. Graduates of this course are well qualified to act as Instructors in draft and equitation.

### b. ENLISTED SPECIALISTS COURSES.

(1) Seven (7) classes of enlisted men completed courses during the School year 1927-1928, as follows: Horseshoers (Regular Army and National Guard) (Two Classes), Motor Mechanics (Regular Army and National Guard), Saddlers (Regular Army and National Guard) (Two Classes), Battery Mechanics (Regular Army and National Guard), Communications (Regular Army and National Guard).

#### (2) *Horseshoers Course.*

(a) *Fall Class.* This course began September 15, 1927, and ended January 28, 1928. It was taken by nineteen (19) regular army students of whom seventeen (17) satisfactorily completed the course and were graduated.

(b) *Spring Class.* This course began February 6, 1928, and ended June 15, 1928. It was taken by seven (7) Regular Army students; all of whom satisfactorily completed the course and were graduated.

(3) *Motor Mechanics.* This course began September 15, 1927, and ended January 28, 1928. It was taken by three (3) Regular Army students; all of whom satisfactorily completed the course and were graduated.

(4) *Saddlers.* (a) *Fall Class.* This course began September 15, 1927, and ended January 28, 1928. It was taken by nine (9) Regular Army students; seven (7) of whom satisfactorily completed the course and were graduated.

(b) *Spring Class.* This course began February 6, 1928, and ended June 15, 1928. It was taken by four (4) Regular Army students; all of whom satisfactorily completed the course and were graduated.

(5) *Battery Mechanics.* This course began February 6, 1928, and ended June 15, 1928. It was taken by five (5) Regular Army

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students; all of whom satisfactorily completed the course and were graduated.

(6) *Communications*. This course began February 6, 1928, and ended June 15, 1928. It was taken by thirty-two (32) Regular Army students and twenty-three (23) National Guard students; of whom twenty-eight (28) Regular Army and twenty (20) National Guard students satisfactorily completed the course and were graduated.

c. CORRESPONDENCE COURSES. The situation with regard to these valuable courses, remains unchanged since the last Annual Report of the Chief of Field Artillery.

### 8. COURSES FOR REGULAR FIELD ARTILLERY OFFICERS AT CIVILIAN EDUCATIONAL INSTITUTIONS AND AT OTHER SPECIAL SERVICE SCHOOLS

a. During the past year, field artillery officers have attended courses at such schools as follows:

Automotive Engineering, Mass. Inst. of Tech.....	2 officers
Communications Engineering, Yale University .....	2 officers
Ballistics, Univ. of Chicago .....	1 officer
Sound Ranging, Univ. of Penn .....	2 officers
Practical Motor Mechanics, Sweeney Automotive School	4 officers
Cavalry School .....	2 officers
Signal Corps School.....	2 officers
Air Corps Tactical School.....	1 officer
Chemical Warfare School.....	2 officers
Ecole de Guere, Paris, France.....	1 officer

b. The courses at these schools are of great value in furnishing the Field Artillery with a small group of highly specialized officers capable of being employed as instructors.

### 9. RESERVE OFFICERS' TRAINING CORPS

a. The output of Reserve Officers from the Field Artillery R. O. T. C. units still remains below the War Department procurement objective of 1,069 annually.

b. For this reason, it is regretted that it was found necessary during the year to approve the withdrawal of the unit from the University of Wisconsin as of June 30, 1928, thereby reducing the total number of Field Artillery units to nineteen.

c. In spite of this reduction, however, it is believed that the growth of the units remaining has been such, and promises to be such, as to justify the expectation that they can reach the procurement objective indicated.

d. (1) The following table shows the growth of enrolment and output of Field Artillery R. O. T. C. units from their organization in 1910 to include the college year 1926-1927:

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<i>College Year</i>	<i>Basic</i>	<i>Enrolment Advance</i>	<i>Total</i>	<i>Output Commissioned*</i>
1919-1920 .....	5151	209	5360	3
1920-1921 .....	5395	588	5983	105
1921-1922 .....	6205	946	7151	319
1922-1923 .....	6506	1132	7638	432
1923-1924 .....	6695	1348	8043	420
1924-1925 .....	8747	1615	10362	591
1925-1826 .....	9681	1761	11642	656
1926-1927 .....	10303	1929	12232	816
Total .....				3342

(2) This table indicates a consistent growth that is deemed highly satisfactory. Based on a statistical study of all enrolment data since the units were organized in 1919, the War Department production objective of 1,069 Field Artillery Reserve Officers annually would require the figures of the table to become:

Basic .....	11,737
Advance .....	2,675
Total .....	14,412

### SECTION III—MATERIAL AND EQUIPMENT

10. As in previous Annual Reports of the Chief of Field Artillery, it is desired to emphasize the fact that the Chief of Field Artillery contemplates no expensive and extensive rearmament of the Field Artillery. However, continuous experimentation and development is essential if we are to progress and to keep abreast of other nations. No more important work confronts the Chief of Field Artillery than the continuous development of new and modern types of Field Artillery material.

#### 11. ORDNANCE DEVELOPMENTS

*a. Cannon and Carriages.*—(1) *Light Gun.* The gun referred to in the last Annual Report of the Chief of Field Artillery as the 75-mm. gun, Model 1923, and now known as the 75-mm. gun, M-1, of which four have been manufactured, is under test at the Field Artillery School, organized as a battery. Unexpected difficulty with the recuperators during the test necessitated the return of these guns to Rock Island Arsenal for correction of the developed faults. The faults have now been corrected, and the guns will shortly be returned to the Field Artillery School for the purpose of continuing the extended service test. Ballistically, the performances of this weapon have been highly satisfactory. This weapon will continue to be the standard light gun for future manufacture.

(2) *Pack Howitzer.* The 75-mm. pack howitzer, M-1, referred to in the last Annual Report of the Chief of Field Artillery as Model 1923-E, continues in extended service test by the Pack Artillery Board, now located at Fort Robinson, Nebraska. One of the

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\* Includes certificates.

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four units manufactured has been returned to Aberdeen Proving Ground to be used for special ballistic and powder test. This weapon has been adopted as standard as to type, as a result of the test march under the supervision of the Pack Artillery Board which ended in June, 1927, the result of which was not known when the last Annual Report of the Chief of Field Artillery was prepared.

The development of this weapon is regarded as a remarkable feat, both in design and manufacture. Its splendid ballistic qualities and light weight show great possibilities for its use as a pack weapon and for expeditionary uses. It is understood that twelve units of this matériel are under order for the Marine Corps.

(3) *Light Howitzer.* Two T-1 units and two T-2 units of the split-trail 105-mm. howitzer, M-1, have been manufactured. The T-2 Model has been adopted as standard as to type. The four units were assembled at Fort Bragg, North Carolina, early in 1928 for service test under the supervision of the Field Artillery Board. No further development will be made of the box-trail 105-mm. howitzer, Model 1925.

(4) *Medium Gun.* No development of the 4.7-inch gun was undertaken during the fiscal year 1928 on account of the priority assigned to other development items.

(5) *Medium Howitzer.*—(a) *155-mm. Howitzer, Model 1920.* Development of this howitzer has been definitely discontinued.

(b) *155-mm. Howitzer, Model T-1.* Tests of this matériel during the fiscal year 1928 developed the necessity for a redesign of certain elements. It is believed that this redesign will be completed in time for the extended service test under the supervision of the Field Artillery Board to be resumed during the ensuing year.

(6) *155-mm. Gun—8-inch Howitzer Carriers, Model 1920.* Modifications of this matériel, the necessity for which was mentioned in the last Annual Report of the Chief of Field Artillery, have been made. Further test to determine whether or not these modifications are completely satisfactory will be undertaken under the supervision of the Field Artillery Board during the ensuing year.

b. *Automotive Material.* (1) *Motor Carriages.* The two 155-mm. gun—8-inch howitzer motor carriages, one mounting the 155-mm. gun or 8-inch howitzer, and the other as a tractor only, have been tested by the Field Artillery Board. While this type of matériel shows certain advantages over commercial tractors, the special nature of the motor carriage and its great weight more than offset these advantages. Accordingly, the Chief of Field Artillery does not contemplate further development of this vehicle.

(2) *Tractors.* (a) *Caterpillar, 2-Ton.* Two batteries of the



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motorized battalion of the 1st Field Artillery, at the station of the Field Artillery School, have been equipped with this tractor and are continuing its test.

(b) *Caterpillar 20*. This is a new type tractor, developed by the Caterpillar Tractor Company. It weighs 3½ tons and incorporates all the advantages of the caterpillar line. It gives promise of becoming the best type available as a prime mover for tractor-drawn light artillery. One of these tractors is in use by the artillery of the experimental mechanized force at Fort Leonard Wood, Maryland. One of these tractors will soon be tested by the Field Artillery Board.

(c) *Caterpillar 30 and Caterpillar 60*. These types continue under test by the Field Artillery Board and are the most satisfactory tractors yet developed for use with medium and heavy artillery.

(d) *Other Tractors*. The Fordson Tractor with full crawler and Hadfield-Penfield adapters, the McCormick-Deering 10-20 tractor, and the Cletrac 30 tractor have been tested by the Field Artillery Board and have demonstrated their suitability as emergency equipment. No further test of these tractors is contemplated unless new types are developed.

(e) *Lighting Equipment for Tractors*. As visibility from the air is an important consideration for tractor lighting devices, and as equipment for night flying is not available at Fort Bragg, the Field Artillery Board has not yet completed its test of lighting equipment for tractors.

(3) *Cross-Country Cars*. The radical change in the Ford car has rendered obsolete the cross-country car built on the Model-T chassis. The Chevrolet remains the single standard in this line. Development is progressing, using the new Ford, the new Chevrolet, and the Pontiac chassis.

(4) *Cross-Country Trucks*. The Chevrolet ¾-ton truck, six wheels, and the Chevrolet ¾-ton truck, four wheels, have been under test during the past year and have demonstrated their suitability as light cargo vehicles of relatively high cross-country mobility. The Chief of Field Artillery has recommended that these trucks be adopted as standard as to type.

c. *Ammunition*. (1) *Fuzes*. (a) Fuzes for present standard issue shell ammunition are of the separate loading 1½-inch fuze hole type. They are the superquick, short and long delay fuzes. The T-1 fuze, which is being developed to replace the present standard superquick fuze (Mark III), is a modification of the Mark III fuze which gives great promise of removing the objections to the Mark III, such as uncertainty of action on hard soil at low angles of impact, necessary safety precautions, and ballistic shape.

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(b) The E-13, a fuze of the selective superquick and short delay type, has been developed for integral loading in the E-1 (false ogive) shell for the new 75-mm. gun. M-1. This fuze has shown only fairly satisfactory results in test of lots manufactured in small quantities. However, the T-3 fuze, which is a refinement of the E-13 with an improved ballistic shape, larger detonator and booster, and designed to be more certain of arming, has shown satisfactory results in preliminary ordnance tests, and a quantity is under manufacture for test by the Field Artillery Board.

(c) The T-2 fuze is also similar to the E-13 but is designed for a 2-inch thread, which will permit interchangeability with a time fuze and will insure dependable functioning. This fuze, in preliminary ordnance tests, has shown excellent results, and a quantity is under manufacture for test by the Field Artillery Board.

(d) The A. B. 3 fuze has been developed for weapons (other than the divisional gun) not requiring the short delay or ricochet element. It is similar to the E-13 fuze without the short delay element. It has been found very satisfactory in tests to date.

(e) The Frankford Arsenal twenty-one second and forty-five second time fuzes are satisfactory with shrapnel and are being tested with shell. There is a requirement for a time fuze for shell in view of the possible increased use of shell against personnel, for high burst ranging, for locating lost rounds, and for certain chemical shells. The ideal shell fuze for effect on personnel would be a combination superquick and time fuze. Although the development of the ideal has not been reached, the development of the T-2 fuze with the 2-inch thread is a step in this direction, for it will be interchangeable with the Frankford Arsenal time fuze.

(2) *Projectiles.* (a) The stream line shell of the 75-mm. Mark IV type has been found to give the best results as regards range, accuracy, and ease of supply. This type of shell has been standardized for weapons now in service. In an effort to obtain greater range, experimentation of a ballistic windshield or false ogive for projectiles for newly developed weapons has been going on. Difficulties of manufacture and transportation have led to the abandonment of the ballistic windshield and development for new weapons is now along the lines of the one-piece Mark IV type. Future development should be of the stream line shell which will carry the maximum explosive and give the most efficient fragmentation.

(b) The shell-shrapnel test is suspended and no definite conclusions on this subject are yet justified.

(3) *Propellants.* (a) Flashless non-hygroscopic smokeless powder has been adopted as standard for divisional artillery and

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although not entirely flashless in larger calibers, powder of similar chemical composition has been developed for larger calibers, which has the great advantage of being non-hygroscopic and smokeless. The Ordnance Department and commercial powder manufacturers are experimenting to further extend flashless non-hygroscopic powder to larger calibers. One difficulty with the larger calibers is that the incorporation of the complete flashless qualities tends to eliminate the smokeless quality. At the present, it is thought that the solution of this problem in these calibers will lead to the addition of the flashless element to the powder for night use only.

(b) A most important discovery, which has been brought to light by the Field Artillery Board, is that powder of the same granulation or quickness of burning for all zones of zoned weapons is not satisfactory as regards accuracy. A quicker burning powder for lower zones has been found necessary in the case of the 155-mm. howitzer, Model 1918. The solution of this problem is being worked out in the Ordnance Department.

*d. Cargo Carts.* The present type cellular caisson and limber bodies for light artillery are not adapted to carrying Mark IV shell. Modification is expensive. The indication is that this same expensive process must be repeated with any major change in shell design. The definite solution appears, therefore, to be found in the non-cellular type vehicle. The limbered vehicle is indicated. Accordingly, cargo carts have been designed and two models, T-1 and T-2, constructed and will shortly be tested by the Field Artillery Board. The soundness of this development is more apparent when consideration is given to the demand for an ammunition vehicle with the new division weapon, the 105-mm. howitzer.

*e. Panoramic Sight Mounting, 75-mm. Gun.* The 75-mm. gun, Model 1897, remains the armament of division artillery in the continental United States. A bracket mounting for the panoramic sight for this gun has been adopted as standard. Modification of this matériel in this respect will be made as funds become available.

*f. Anti-Aircraft Matériel.* A difficult problem confronting the branch is defense against aircraft. Heretofore, reliance has been on the two (2) machine guns issued per battery. Plainly, this is no solution. The following means of anti-aircraft defense are under consideration and actual test:

- (1) Caisson mounts for machine gun.
- (2) Browning automatic.
- (3) Automatic rifles.
- (4) Machine rifles.
- (5) Thompson sub-machine guns with compensator.

The caisson mounts, built and tested to date, do not solve the

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problem. Objections vary from dead angles to difficulty of manipulation. Movement of the hitched carriage, as is inevitable at the time of attack by aircraft, makes accurate operation extremely doubtful. No forecast can be given as to the ultimate solution.

*g. Reels.* Neither the Battery Reel, Model 1917, nor the Battalion Reel, Model 1909, as furnished by the Ordnance Department, have been found entirely satisfactory; but in view of the large number of these reels on hand, it is contemplated to use those on hand and to develop, for future manufacture, a new reel. A simple modification of the present battery reel has been worked out by the Field Artillery Board to make it more suitable by mounting an issue spool of wire thereon. This modification will be tested in several 75-mm. batteries under varying conditions to determine whether it should be incorporated in all these reels.

### 12. TECHNICAL DEVELOPMENTS, SIGNAL CORPS

*a. Reels.* The Signal Corps has under development a horse or motor-drawn reel incorporating the principle of the issue spool, which gives promise of giving the Field Artillery a suitable reel for future manufacture. One pilot model of this reel is being made up for test.

*b. Radio.* The Signal Corps is developing a short wave radio set to replace the SCR 109-A, for communication between ground and aircraft. The Signal Corps is also developing the SCR 161 set and SCR 131 set to replace the loop antenna set, the SCR 77-B. These sets, the 161 and the 131, are similar except for the kilocyclic band, the SCR 161 set operating in the Artillery set and the SCR 131 set operating in the Infantry net. The Field Artillery Board will soon be furnished with two SCR 131 sets for test. These are provided with hand generators which can be operated by one man, thus eliminating the storage batteries.

*c. Sound Ranging.* Section II, General Orders No. 22, War Department, December 31, 1927, placed the responsibility for sound ranging units for the mobile army under the Field Artillery. At the request of the Chief of the Field Artillery, a complete sound ranging set of latest design has just been furnished the First Observation Battery at Fort Bragg, North Carolina, by the Chief Signal Officer for test. A similar set has been used by the Coast Artillery for sound ranging in fixed fortifications, and it is planned to develop quick methods of plotting in the First Observation Battery for use in mobile sound ranging units. In order to have available specialists in sound ranging to assist in developing this important project, two officers with the necessary qualifications are undergoing instruction in accordance with Section 127-A, National Defense Act as amended, under Professor A. B. Bazzoni at the University of Pennsylvania.

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### 13. TECHNICAL DEVELOPMENTS, QUARTERMASTER

*a. Pack Saddles.* A 500-mile march by the Fourth Field Artillery Battalion, under the supervision of the Pack Artillery Board, took place during August and September, 1928, for the purpose of testing the heavy Phillips pack saddle in comparison with the aparejo as equipment for pack artillery units.

*b. Trucks.* (1) The following types of trucks have been tested by the Field Artillery Board: (a) Coleman 5-ton, (b) Coleman 2½-ton, (c) Coleman 1½-ton, (d) Rebuilt F. W. D.

(2) The following conclusions have been reached:

(a) The superiority of the 4-wheel drive type of truck for artillery cargo purpose is established.

(b) Pneumatic tire equipment is necessary for trucks.

(c) The superiority of the Coleman 5-ton truck, as the cargo vehicle for medium and heavy artillery, is established.

(d) The superiority of the 3-ton, 4-wheel drive type truck, as the cargo vehicle for light artillery, is established.

(e) The unsuitability of the 1½-ton truck for Field Artillery is established.

### 14. TECHNICAL DEVELOPMENTS, CHEMICAL WARFARE SERVICE

*a.* During the past year, the Chemical Warfare service has continued development of the offensive and protective measures considered necessary from the Field Artillery viewpoint.

*b. Diaphragm Gas Masks.* The new standard diaphragm gas mask was tested by both the Field Artillery School and the Field Artillery Board and found satisfactory.

*e. Horse Gas Mask.* A new design has been completed and a limited number are ready for issue to the Field Artillery for test.

### 15. TABLES OF EQUIPMENT

There have recently been completed, approved, and published, tables of equipment for the Division Brigade of two regiments of light artillery. The objective sought in compiling these tables was to have available within one cover the complete lists of all equipment for each organization of the division brigade. The compilation is being extended to medium, heavy, and G. H. Q. types of artillery.

### 16. WORK OF THE FIELD ARTILLERY BOARD

The past year has been a very satisfactory one in point of the volume and importance of the work performed by the Field Artillery Board. In addition to tests and reports on matériel, items of motor transport, and equipment noted elsewhere in this report, the board has completed exhaustive studies in:

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Mechanical transport for field artillery.

Effect of fire.

Comparison of shell and shrapnel.

Comparison of gun and howitzer.

### 17. PACK ARTILLERY BOARD

The Pack Artillery Board has recently been reconstituted at Fort Robinson, Nebraska. This was necessitated by the transfer of the Fourth Field Artillery Battalion from Fort McIntosh, Texas, to Fort Robinson. The principal items of investigation are those of equipment and accessories for the 75-mm. pack howitzer. During the summer of 1928, a 500-mile march by a battery of the Fourth Field Artillery Battalion was made as a medium for comparative test of various items of equipment, in connection with the new pack howitzer matériel.

## SECTION IV—ORGANIZATION

### 18. FIRST BATTALION, EIGHTY-THIRD FIELD ARTILLERY

The conversion of the First Battalion, Eighty-Third Field Artillery, from tractor-drawn to horse-drawn, which had been begun at the time of the submission of the last Annual Report of the Chief of Field Artillery, has been satisfactorily completed and reports indicate that this battalion is rendering satisfactory service as an instruction unit at the Infantry School.

### 19. CHANGES IN ORGANIZATION

During the year, Field Artillery units of the Regular Army were redesignated and constituted as follows:

*a.* The Headquarters, Headquarters Battery and Service Battery, Fourth Field Artillery, were redesignated the Headquarters, Headquarters Battery and Service Battery, Third Field Artillery.

*b.* The First Battalion, Fourth Field Artillery, was redesignated the Second Field Artillery Battalion.

*c.* The Second Battalion, Fourth Field Artillery, was redesignated the Fourth Field Artillery Battalion.

*d.* The First Battalion, Fourteenth Field Artillery, was redesignated the Second Battalion, Third Field Artillery.

*e.* The First Battalion, Second Field Artillery, was redesignated the Second Battalion, Sixteenth Field Artillery.

*f.* The First Battalion, Ninth Field Artillery, was redesignated the Second Battalion, Eighteenth Field Artillery.

*g.* The Eighty-Sixth Field Artillery was constituted as an inactive unit of the Regular Army.

*h.* By reason of the changes indicated above, the Ninth and Fourteenth Regiments of Field Artillery became inactive units.

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### 20. STUDIES FOR FUTURE CHANGES

At this time, the Office of the Chief of Field Artillery is studying the question of making inactive some sub-units of certain Field Artillery organizations for the purpose of distributing the available personnel, now at reduced strength, more effectively for training purposes among the remaining sub-units. Recommendations on this subject will be submitted shortly.

### SECTION V—WAR PLANS

21. Those duties in connection with War Department war plans and mobilization plans, which pertain to the office of the Chief of Field Artillery, have been promptly and satisfactorily performed during the past year. All Field Artillery annexes are constantly kept up-to-date. It is believed that the liaison between this office and the other agencies of the War Department, charged with the preparation of these plans, is satisfactory.

FRED T. AUSTIN,  
*Major General, U. S. Army,*  
*Chief of Field Artillery.*



# BEFORE CANTIGNY

BY CAPT. IDUS R. MCLENDON, U. S. A., RET.

(FORMERLY C. O., BTRY. C, 6TH F. A., A. E. F.)

IT HAPPENED in the latter part of May, 1918, just before the attack on Cantigny, that comparatively insignificant yet brilliant action of the First Division which was to shed a ray of light upon a gloomy Allied situation. For many nights we had been busy digging new emplacements for batteries that were to reinforce us during the coming struggle, improving our own battery positions, and bringing up ammunition. The fixing of D-day and H-hour and the issuing of final orders for the attack were expected at any time.

Sitting under the rafia at the entrance to my dugout, I gazed across the little valley in which the village of Rocquencourt lay half-hidden and wondered at the strange peace and quiet which at the moment was upon the world about me. A glorious mid-afternoon sunshine was flooding a landscape which seemed a gigantic patchwork quilt of golden grain, rich green alfalfa, tiny orchards and flaming poppy fields; hedges were overrun with blue and yellow wild-flowers; in the distance forest-capped hills and rolling ridges. The lazy hum of bees and the drone of bright-winged insects in the warm sunshine lulled the senses. The war had only recently come to this garden spot, and the muffled roll of an afternoon shoot of some battery far down the line was the only reminder that this was the battle front.

Up the slope from the cross-roads came trudging a fellow captain, skipper of a battery of heavies located down the road toward Serèvillers. We exchanged greetings, and I remarked on the wonderful weather. Landscape beauties had no interest for him at the moment. The Boches had been strafing him furiously for a couple of days. In spite of extreme care in camouflaging his position he was getting more than his share of the shelling. He had more than half a notion that a lot of the obus were overs intended for the new battery emplacement being constructed alongside the Rocquencourt-Serèvillers road directly in front of and above his own position. He had heard that this new construction was under my direction, therefore my working parties were the culprits, recklessly exposing themselves and drawing enemy fire. To allay his misgivings, I promised him I would see to it that more caution was used and changed the conversation to topics more appropriate to the golden sunshine of a May afternoon. If that captain should happen to read these lines it may give him considerable though belated satisfaction to know that I got a large dose of the same medicine the Boches had been giving him.

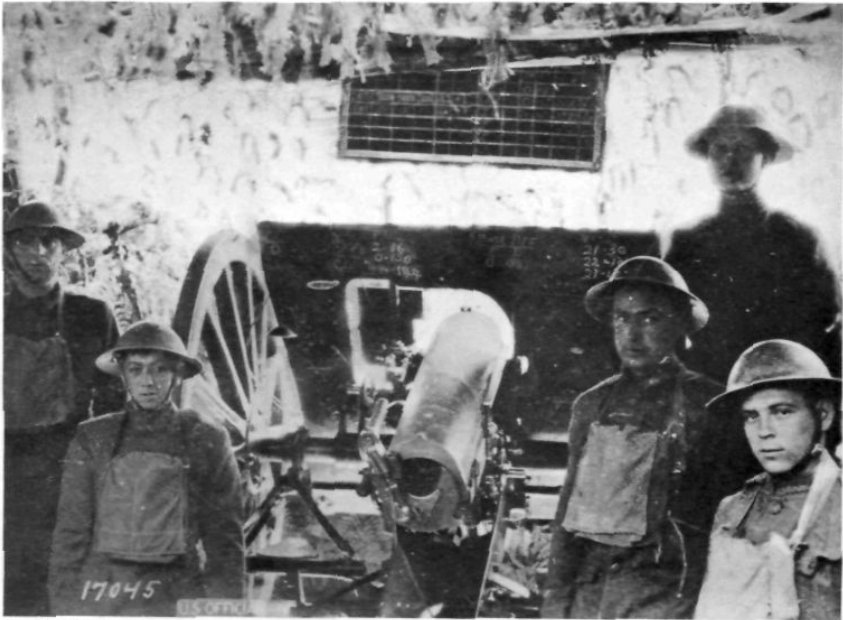


CANTIGNY, MAY, 1918



*Signal Corps Photo*

THE SNOW-WHITE ROADS OF PICARDY AND THE BATTERY'S RAFIA-COVERED EMBLEMMENTS



*Signal Corps Photo*

A GUN SQUAD OF BATTERY C, 6TH F. A. AT CANTIGNY—McLENDON'S BATTERY

## CANTIGNY RECONSTRUCTED



CANTIGNY VIEWED FROM FORMER AMERICAN LINES. THE 28TH INFANTRY ATTACKED ACROSS THIS GROUND



IN 1918 THE GERMAN FRONT LINES RAN JUST BEYOND THE POND. YOU ARE LOOKING TOWARDS THE FORMER AMERICAN LINES

## BEFORE CANTIGNY

Since Cantigny was our first real battle with the Germans, all energies were directed toward making the most thorough preparations and maintaining the utmost secrecy. We were to be reinforced with a large amount of French corps artillery. As part of the plans for keeping the enemy quiet, it had been arranged that the batteries of the First Division then in the sector should prepare many positions for the incoming French batteries, which would arrive at the last moment. Only one gun was to be taken into each of the new positions for adjustment, so in this manner the sector would not be over-run for days ahead of time with newly arriving men, guns and trucks to alarm the enemy.

Our efforts to prepare new battery positions immediately encountered a serious difficulty, namely a lack of battery positions. The country was gently rolling and intensively cultivated, offering little shelter in the way of ravines or woods. The guns of the 6th Field Artillery, supporting the left of the Division's sector, were emplaced behind the Coulemelle-Rocquencourt-Serèvillers ridge, 5 to 6 kilometers from the front lines. To put down rolling barrages which might extend for several kilometers beyond the then existing front lines required that all batteries of 75's be placed as close up behind this ridge as possible. The reverse slope dropped abruptly away and the counter slope was another broad, evenly rising bit of terrain which afforded little cover. Behind the latter the 75's would have been beyond effective range.

The position given me to prepare was about midway between Rocquencourt and Serèvillers, on the east or forward side of the broad highway joining the two towns. This road ran parallel with the covering crest and only a little way back of it, which still further restricted the available space for placing guns. It was to be kept open during the battle, and this necessitated putting the reinforcing batteries between it and the crest. In my case the guns were not going to have flash defilade during action and, what was worse, I believed that men's heads and the gun shields also would be visible to the enemy's ground observers. Once the battle had begun, however, we counted upon the enemy being too busy at the front to indulge in much counter-battery work. Preparation of the position had been postponed as long as possible so as to minimize risk of discovery. We could work only at night. Camouflage placed on stakes high enough to permit of work during the day would have blotted out a section of the white road just back of us and would have led to our immediate detection by balloon observers.

On the day of which I write the working party had straggled up to the front by twos and threes during the afternoon and were gathered at my old battery position. Details of men were sent from the horse lines so as to save the members of the firing battery

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for the ordeal which lay ahead of them during the fight. My lieutenants had had a stiff time of it for several days and nights, so I took personal charge of the detail. About dusk I started down the road toward Serèvillers with my gang strung out in ragged single file back of me. The nets were rolled back and the spades and picks got busy.

In the gathering gloom I counted myself safe enough. Individual objects a half dozen kilometers away would be blending into a dim, shapeless mass; hedges and ditches would be fading into the general background of field terrain. Even were there a balloon up, the observer would be unable to pick us out from the dark background of green fields against which we would be silhouetted for him, unless by merest chance his telescope were pointed directly at us. Even then his field of vision would be so blurred that it would be impossible for him to approximate our range with any degree of accuracy or determine our position with reference to prominent landmarks.

We had hardly begun when I heard the pop of a gun far off in the distance, followed quickly by the wail up in the sky, apparently headed in our general direction. The shell crashed into a belt of barb wire on the crest a few hundred meters in front of us. One lone shell, dropping apparently at random, near no definite target of any sort, might have gone unnoticed. But my sharpened gaze now saw the dim shape of a German sausage, high up in the air and seemingly right over the front lines. It had undoubtedly just been sent up, for it was not there at sunset. There followed a moment later a second shell which landed hardly a hundred meters distant from us and directly in line with the first. That was enough! Heinie was gunning for me and my gang.

How could he have spotted us so quickly and unerringly? It flashed on me that it must have been the road. We soon were to learn from tragic experiences that the chalk roads of Picardy were excellent guides, particularly to marauding aviators at night. When all the rest of the landscape below them was only a dark smudge the air men oriented themselves by means of the snow-white roads, and any break in their continuity was sure to bring bombs hurtling down upon the suspected spot. The German balloon observer had undoubtedly spotted us as we moved back and forth against the white ribbon of highway in our rear, still visible although nearly night. His deflection was perfect, but he was evidently guessing as to our nearness to the road. He probably had given us credit for enough sense to get away from such a prominent, well-located landmark.

We were at his mercy now. A moment's delay would prove fatal. The gun pits we were digging were not yet deep enough to

## BEFORE CANTIGNY

afford shelter, so I yelled to my men to run—to scatter in all directions and to run like hell. Never did men obey with greater alacrity. In a few moments after that second ranging shell had landed they were at top speed to all points of the compass like scampering chickens before a hawk striking in their midst. We were not nearly fast enough, however. Hardly had the last man cleared the pits when there came swooping down upon us a volley of shells neatly placed in our very midst. After that second shot Heinie had correctly guessed that we were right by the road and was not losing an instant in going to fire for effect. Shells and human bodies struck the earth simultaneously. I noted that too many of my men were sticking close to me. For some of them it was the first time under shell fire, and they instinctively followed their leader. I knew the hail had only begun, and the shell fragments had barely stopped whizzing past my ears when I leaped up and again yelled to my men to run and not to bunch together.

As I started away again there was a half-stifled scream just back of me. Some poor devil had gotten his! I dashed back to see who it was. At intervals along the highway French road gangs had dug holes about five feet square and four or five feet deep, presumably to drain water off the road. Into one hole a man had dived as the iron hail came down. A shell had landed squarely on top of the pile of excavated dirt, heaving a cartload of it in upon him and almost burying him alive. Dazed and terrified by the burst of flame and the concussion almost at his head, he was just able to let out a screech for help. We dragged him out and found that he still was able to travel. Before we could get well under way again a second volley of shells landed in our midst. As I rose and looked about me I saw that Heinie had opened his sheaf just enough to distribute his shells very neatly in the midst of my fleeing men. His first volley had fallen almost in a cluster. The rapidity and accuracy of his fire was uncanny.

My men needed no advice and urging. Fast leg work alone could save our hides, for there was not a bit of shelter other than the holes by the side of the road into which a shell might plop at any moment. My heart beat a little easier though when I saw that every man was doing a mad sprint, each for himself, in every direction away from the center of impact. Two or three I noticed going toward the top of the crest in front, negotiating a broad belt of barbed wire with astonishing ease and speed. Still another volley arrived before the last of us got out of the danger zone. I had been following a shallow ditch, barely a foot below the level of the road, instinctively taking advantage of any accident of ground that seemed to offer a semblance of protection. At each volley one or more shells had burst squarely in the middle of the road, so close

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that we were showered with dirt. Each time I wondered how I had missed being pulverized. The fragments that went over my back were singing in all the notes of battle music, from the shrill whine of the needle-like splinters to the hoarse, bass groan of a huge chunk, probably the base of an obus. There were no more screams from wounded men, but I felt that a big toll of dead was left behind.

And then, thank Heaven, instead of sweeping right and left and following us, Heinie lengthened his range and pounced upon the battery of 155's which happened to be directly in his line of fire in a little draw about 100 meters back of the road. That gave us a respite in which to complete our getaway. He probably thought we were a party belonging to that battery, whose approximate position was evidently already known. He may have been watching in hopes of definitely fixing its position by spotting the flash of its guns.

Dead silence fell after those few lurid moments in which the mind had lived as many weeks. With lightning-like vividness and swiftness, sights and sounds had stamped themselves forever upon the memory through the medium of senses momentarily sharpened to supernatural acuteness. The sight of my men terrified and running wildly for their lives, the thought of the wounded, a vision of the mangled bodies of raw, inexperienced boys who now were the victims of their implicit confidence in a leader who had led them into a hell-hole of horror and death, the down-swooping rush of death-dealing iron, the ear-splitting crash of high explosive followed by the blinding bursts of flame and the stifling smoke and dust! The torture endured by the physical body, however infernal, is as nothing compared to mental torment. During that brief but awful crisis my mind had seemed to be a thing apart from my body, like an intangible, ghost-like Will-of-the-Wisp, hovering over my clumsy human form which it was ready to leave behind on earth at any instant.

One by one the fugitives were returning to my own battery position, panting like spent hounds, faces streaked with sweat and grime. We sat around, waiting for pitch darkness so that we might go back and gather up our dead. No one spoke. About each was that half-dazed air of one who has just come out of a trance. One man was gingerly rubbing his hand over his legs, as though pinching himself to see if he were really alive. The men of the firing battery, having heard the shell crashes and knowing that we had just saved ourselves from the jaws of death, covertly gazed at us from their dugouts and the casemates where they stood on guard. The fact that the "Old Man" himself had been trapped put a damper on conversation. Inwardly I was cussing Heinie and kicking myself.

And then I awoke to the miracle of miracles—the last man of

## BEFORE CANTIGNY

the working party came limping home! Not a single man killed! Not even a wounded man, save those who had been scratched by barbed wire. In subsequent battles I was to see squads wiped out completely by a single volley or by one big shell. As though by some special dispensation of God's grace, we had come through unscathed. But the awful tragedy that had tugged at our hearts needed time to be dispelled. It had been too real—altogether too close. Death had whispered to each and every one of that party.

Then anti-climax; enter now the jester who must poke fun even in the midst of death. Sitting on the road-bank just opposite me was a short, fat little soldier man called Johnnie who much resembled an overgrown Brownie. He was big and soft around the waist, spindle-shanked, with a large head that fitted close down upon his shoulders. His eyes were almond-shaped and the balls protruded a bit, which gave him the appearance of being "skittish," apparently seeing not only to the front but to the right and left at the same time. This was his first time under fire, and he had stayed close on my heels during the wild foot race. He had drawn my particular attention because of his persistence in sticking to the middle of the high road instead of getting over in the ditch ahead of or behind me. I carried a distinct picture of him teetering forward on his stomach, like an over-turned barrel, just as a shell burst a dozen feet behind us. How he escaped is one of the mysteries of shell-fire. He was still puffing as he sat facing me, and his tummy heaved and quivered like a big bag of jelly. Then the wag of the battery, recovering his breath, cackled forth:

"Hey, Boys; did ya see Johnnie doin' that marathon jes' now? I shore thought he was Ribeaucourt-bound, to see his sweetie Sallie Manure. Say, Johnnie, if you could 'a kept that pace you'd 'a bin thar now."

With infinite contempt and sarcasm worthy of an old-time Top Kick, Johnnie took in a deep breath, spat and said:

"Laff now, you dam fool; a minit ago you wuz prayin'."

And I guess that went for the whole bunch of us.

# ALEXANDER MCKINLOCK

BY MAJOR GENERAL CHARLES P. SUMMERALL

[General Summerall gave this address at the dedication of McKinlock Hall, the newest of the Freshman Dormitories at Harvard. The building is a memorial to G. A. McKinlock, Jr., Harvard '16, who was killed in action, in France, on July 21, 1918. The address was obtained through the courtesy of the *Harvard Alumni Bulletin*.—EDITOR.]

WAR is a discriminating agency, and it exacts and takes only the best. Nothing was more natural, therefore, than that Alexander McKinlock should have been one of the first to respond to the call to arms in 1917. As soon as the first training camp was established at Fort Sheridan, near his home, on May 13, 1917, a little more than a month after we declared war, he offered his services. On August 13 he completed the course. The records of the War Department show that his commanding officer, General Nicholson, gave him the rating, "excellent," which was the highest possible mark that anyone could receive and was exceptional in the camps. He was recommended for assignment to the cavalry. The peculiar character of the War, however, limited the operations of cavalry, and his ardent nature led him to demand service at the front. He received an assignment overseas and sailed from New York on September 15.

One of the most difficult, depressing, and trying periods for the American troops was in January, 1918, when the First Division took over the Toul Sector in Lorraine. It was a bitter, cruel winter there, as I have heard that it was here. As the troops were about to undertake the march from the training area, there joined it a number of young officers who were the first contribution of the training camps to the Regular Army overseas. They were all selected men; among them was Alexander McKinlock. He was at once assigned to the 2d Machine Gun Battalion and, as you must know, the machine guns were regarded as élite troops, if one might consider that such a designation could be applied to any particular branch of our forces. As soon as he took his place with the 2d Brigade, his qualities were revealed to the strange men about him who did not know him as a boy or as a college youth. They were grim and merciless in their demands from everyone, and nothing but stern realities could appeal to them. They were facing a ruthless enemy, and day by day they saw their comrades falling about them, and the cemeteries with their open graves being constantly enlarged. It was among such men and such surroundings that he made a place for himself. He was constantly being commented upon for his fearlessness, his resourcefulness, and his leadership.



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When the great German offensive was made in March, 1918, the First Division was hurried from Lorraine to Picardy, and took over the defense of the Cantigny Sector. It was an active area, and the battle continued ceaselessly day and night. The culmination of service in that sector came on the 28th of May, 1918, when the First Division, led by the 28th Infantry, assaulted and captured Cantigny. This was the first American offensive of the war. It was significant beyond the scope of the operation, because it proclaimed to the world that American troops had no superiors either among the allies or with the enemy. It marked the first change that took place in the psychology of the war after 1914. It was a desperate fight, because it was essential not only that Cantigny should be captured, but also that it should be held. The machine guns played a very important part in that battle, and Alexander McKinlock was the second in command of the barrage machine guns close to the lines and accompanying the infantry. For his fearlessness and distinguished gallantry in this action, he was cited, and a recommendation was sent to Division Headquarters that he be awarded the Croix de Guerre with Palm. In searching the records, I have been surprised to find that in the confusion of war and campaign and battle the citation seems never to have been acted upon by higher authority, but the complete record is in his file in the War Department.

Shortly after that operation, great events followed quickly. It was learned by the Allied High Command that the Germans were planning a last, final drive on Paris. Enormous forces were collected in the Marne salient, and it appeared that the blow would be well-nigh irresistible. As a counter-move, the French High Command determined to assault the upper end of the salient south of Soissons, with a view to cutting the enemy's line of communications. The spearhead for this assault was to consist of the First American Division, the Second American Division, and the First Moroccan Division, which was known as the flower of the French Army and had citations in excess of those of any other portion of the French troops. While these troops were hurrying to the point of concentration, the enemy blow was struck. On the night of the 14th of July, the Germans crossed the Marne on a front of 40 kilometers. They brushed aside the French forces and swept by the flank of the American Division that was holding a part of this front. They were advancing rapidly towards Epernay, and there was nothing substantially between them and Paris. It looked to the Allied world as though our forces had crumbled and that the war was over with defeat. At that moment, Marshal Foch assembled his troops for the counter-offensive. The First and Second American Divisions and the First Moroccan Division were assigned to the 20th French

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Corps, which had been one of the most distinguished combat units from the beginning of the War. It was commanded by one of France's most redoubtable leaders. The corps was assigned to the 10th French Army under General Mangin, who had no superior, if any equal, as a fighting leader. It was to be a last desperate effort. If it failed, there would be defeat for the Allies. If it succeeded, victory would be in our hands. There were other fierce battles of the war and there were battles where the losses were approximately as great, but in all history I have never read, nor have I ever heard, of such a heart-breaking and desperate struggle as took place south of Soissons between the 18th and the 21st of July.

The assault began in the early morning of July 18. Because of his outstanding leadership, Alexander McKinlock was assigned to the staff of the 2d Brigade as intelligence officer. It was his duty to secure information about the enemy upon which our plan of operations was based. In doing so, it was necessary for him to determine exactly the location of our troops and the positions of the enemy, and to expose himself constantly by visiting the front lines. The battle raged terrifically on the 18th and 19th. On the morning of the 20th, the French generals commanding the divisions on my right and left came to my headquarters and said that the 153d French Division on the left of the First Division was unable to take Berzy-le-Sec, which was one of its objectives, and that they wanted the First Division to take it. I replied that I would not undertake any operation that was not ordered by the Army. My losses were already very heavy and I still had very desperate fighting to arrive at my final objective. They replied that it was essential for the First Division to take this position or their line would be unable to advance. I insisted that I would not accept such a mission unless the orders came from the Army. I was under no delusion as to the cost of this assault, and it was in accordance with sound military principles not to depart from the plan given by higher authority without competent orders. In a few minutes orders came over the telephone from the 10th Army for the First Division to take Berzy-le-Sec.

The village stood on a small prominence, commanding with its fire every approach. The enemy had organized their position and occupied it with machine guns and artillery. German reinforcements had been steadily arriving for the past three days, and on account of its importance they had made this point well-nigh impregnable. The plan of attack was prepared and communicated to the troops. The hour for the assault was fixed at 2 o'clock on the afternoon of the 20th. At 4 o'clock the Commander-in-Chief of our army and the Commander of the 10th French Army came to my headquarters and asked if Berzy-le-Sec had been taken. I replied

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that I had no reports, but that Berzy-le-Sec would be taken. I was just then leaving my headquarters for the line, and I knew that the absence of reports meant that our troops had not been successful. I was not altogether unprepared for such a result of the first assault, and I fully expected that repeated assaults might be necessary. As I approached the position, I found great numbers of dead, many wounded, and every form of destruction. The first headquarters that I reached was that of the 2d Brigade. I was eager to know exactly what the situation was. For three days these men had suffered great nervous strain and exhaustion. They had gone without sleep and largely without food.

The first man whom I saw as I entered was Alexander McKinlock. I knew him well, and was deeply interested in him, not only because of his fine soldierly character but because he was a friend of one of my aides who had been at Harvard with him. I turned to him spontaneously as though no one else could have enlightened me as he could. He told me with poise and certainty, and even solemnity, the situation as he had just seen it on visiting the line. I think it was the only time I ever saw him when he did not smile, but the tragedy and the fatigue were such that no one could have thought of anything but the serious business in hand. He had taken on that look of grim determination which comes to fighting men when their resolution becomes supreme. There was something almost spiritual about the man that made victory seem almost within our grasp, although the brigade had not moved from where it was before the assault was ordered.

If I have told you these details, it is because I want you to know that the sacrifice which he made was not in vain. It seemed at that moment almost as though the fate of the battle depended on what he told me, because as I looked into those resolute eyes I learned from him exactly what the situation was, and how we should proceed to meet it.

I took the telephone and reported to Division Headquarters and to the Commander-in-Chief that all was well with the 2d Brigade. Orders were at once given to renew the assault, desperate as the situation was, early the next morning. I told the Brigade Commander that he and his staff must be with the assaulting wave when the artillery barrage dropped, and that he must lead his men personally across the enemy's lines. It was the only time that I ever gave such an order, but it was necessary at that moment to adopt the most extreme measures. He was a lion-hearted man, and his men worshipped him. He and his staff, including Alexander McKinlock, spent the time from 2 o'clock until 4:30 o'clock the next morning organizing the assault lines.

Our position was only about 300 yards from the enemy's guns,

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and we had but a thin and scattered line. The assault was made on schedule time. The reports came in promptly that every position was carried, and that the First Division from flank to flank was on the objectives given to it when the Army attacked on the morning of July 18. There was triumph and exultation in the hearts of our men, and it shone in their faces. It was the First Division, it had never failed, and they were resolved that it should not fail now. Nothing but complete selflessness and spiritual courage could have taken them through that ordeal. I had told them that, if we captured our objectives, the war would change. That very night the Germans recrossed the Marne, their communications were cut by the operation, and they began that retreat which never stopped until the Armistice silenced our guns.

Immediately after the troops had reached their positions, McKinlock started along the lines to verify the exact locations of our advanced elements in order to have our artillery protective fire delivered without endangering our own men. He never returned. We knew that he was not captured, because he was not the type of man to submit to capture. Every hospital and camp in France was searched. Every hospital and prison camp in Germany was investigated. Hundreds of inquiries went forth from every agency, and yet we could only report that he was missing.

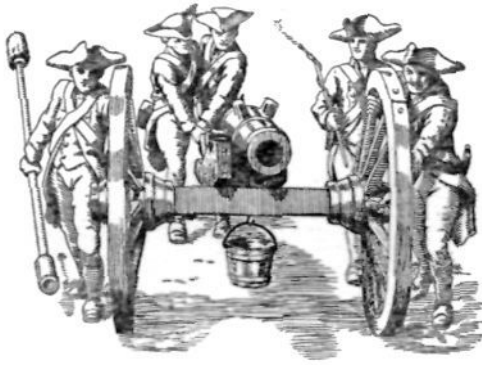
You have just heard almost exactly what happened. He fell near the front line while passing through a terrific fire from the enemy's machine guns. He need not have been killed. He could have stopped as he approached this fire-swept zone, and his courage would never have been questioned. He would not thereby have failed in his duty, but he never placed any limit on the measure of his performance. His mission was to go to the front line and to tell the artillery where to fire without endangering our troops in case a counter-attack should be made. Nothing could stop or swerve him from the responsibility. His life was on the altar of his country, and he was above such reasoning as life and death. He died, but the spirit of Alexander McKinlock, and of comrades like him who also fell, lived in the hearts of the men of the First Division.

When we came out of that battle, it was said that the Division was ruined. Sixty per cent of the officers of this great fighting machine, and more than 50 per cent of the men, were among the killed and wounded, and to some it might have appeared that the Division was crushed. I replied that it was a thousand times better than when it went in, and that the spirit of our dead would animate the souls of our countrymen who succeeded them in our ranks. We received 10,000 replacements within a few days after the battle, and they inherited the pride of service and the high sense of duty shown by Alexander McKinlock and nearly 2,000 souls among his comrades

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who went with him to the Great Beyond on that terrible field of Soissons.

He needs no memorial from our hands. His deeds will live in the history that he made, in the betterment of a world, and in the triumph of a great and righteous cause, beyond any works of architecture or memorials that our feeble hands can erect. We are not honoring his memory by this beautiful building, because he has honored us. Harvard cannot honor Alexander McKinlock. He was an ornament and an honor to Harvard, to his country, to his race, and to the world. There were disclosed in him at the supreme moment those divine attributes that the Maker gave when He created man in His own image. Those who live under the roof of this beautiful dormitory, the stranger, and the passer-by, will not fail to have their hearts strengthened and their lives ennobled by the memory of what Alexander McKinlock did.



# UNIT TRAINING AT CAMP McCOY

BY MAJOR T. J. J. CHRISTIAN, F. A. (D. O. L.)

CAMP MCCOY, Sparta, Wisconsin, is an important Field Artillery training camp because it affords a combined firing center for the Sixth and Seventh Corps Areas; it is an interesting and unique camp because all Field Artillery elements of National Defense, Regular Army, National Guard, Organized Reserves, C. M. T. C. and R. O. T. C. are simultaneously represented in the training which takes place there, and they work together "one for all, and all for one."

A panorama of the training facilities, ranges and organization of the several elements in the entire camp covers a very wide sector to sketch briefly. This article has two objectives: A secondary effort to present a close-up of the F. A. Organized Reserves' active duty training, in general, and a main effort of describing the peak of the summer training—namely, the unit operation of the 161st F. A. Brigade, in particular.

## UNIT TRAINING

Of the twenty-three Reserve organizations ordered to camp, some few were superimposed on National Guard regiments for associated training, while recently graduated R. O. T. C. lieutenants received battery instruction with the Regular troops. Other selected Reserve officers successfully conducted, for the first time in the Sixth Corps Area, the organization, administration and training of the C. M. T. C. for a ten-day period, but unit training was generally employed throughout for all other reserve officers.

Wherever practicable, unit training is considered the correct principle to follow in Reserve instruction, for the reason that it stimulates initiative and develops leadership. Upon mobilization, Reserve units would largely be placed "on their own" for organization, administration and training. If eventually, why not do it now, particularly when too rigid control and excessive guidance tends to stifle preparation for M-day?

Balanced schedules of instruction embraced basic training in fire power, mobility, communications and tactics, common to all field artillery units. While tactical training was based primarily on the battalion as the unit for field problems and fire direction, the qualifications and requirements of each regiment differed so materially that it was necessary, in measuring a unit for its schedule, to cut the cloth to fit the organization according to the particular shape of the respective regiment.

## UNIT TRAINING AT CAMP McCOY

### THE 161ST F. A. BRIGADE PERSONNEL

The 161st F. A. Brigade, composed of the 331st F. A., 332nd F. A. (75-mm.), reinforced by the 497th F. A. (240-mm. howitzers), all Chicago regiments, had the advantage of systematic group training during the winter with the practical field work in the summer as its training objective. A large per cent of the officers comprising the brigade personnel were World War veterans, many of whom had attended camp the previous summer, and were prepared to progress to a more advanced degree of training. The Brigade was commanded by Colonel Nobel Brandon Judah, who, as Ambassador to Cuba, made a special trip from Havana to attend camp with his regiment, the 332nd F. A. Colonel Judah served with distinction in the war as a battalion commander of the 149th Field Artillery, and as G-2 of the 42nd Division. Officers of the 149 F. A.—Reilly's Regiment of the Rainbow Division—now form the nucleus of the 332nd F. A. and were commanded in camp by Lieutenant Colonel Lawrence B. Robbins, a battery commander of the old 149th.

The personnel of the 331st F. A., commanded by Lieutenant Colonel Irving Odell, was composed principally of officers who attended the first Officers' Training Camps. The 497th, commanded by Lieutenant Colonel P. T. Bohan, had been organized from a nucleus of five veterans of the 123rd F. A. (155-mm. howitzers). Lieutenant Colonel E. N. Wentworth, formerly Operations Officer of the 164th F. A. Brigade, 89th Division, and later G-5 at G. H. Q., acted as Brigade Executive. The staff included Major John Curry, a former Artillery Staff officer of the 26th Division, and Captain James N. Hamilton, who had served as an Artillery Staff officer of the 76th F. A., 3rd Division.

The experience and training of the brigade personnel made it able to stand on its own feet, so that its unit training was entirely self-sustained, with responsibility for brigade administration and initiative for operations placed squarely on it.

The objective of the Brigade was initially defined as of an assumed M-day, to be able on M plus 13 days to take the field equipped and prepared to operate under war conditions as a reinforced F. A. Brigade, and to support effectively an infantry division in attack. This rather ambitious objective was considered by some officers such an advanced mission to be accomplished within a 78-hour training period, that initial doubts were expressed as to its success. However, this mission is the *raison d'etre* of this or any other military organization. Preparation of war, judged by peacetime efficiency, can best be attained and measured by the yardstick of practical work in the field under conditions which simulate as closely as possible actual warfare.

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### BRIGADE PROBLEM

During the first week of training the 161st F. A. Brigade progressed so rapidly and with such abundant enthusiasm for its final task that doubts of its ability to carry on successfully in the field as a real brigade were soon dispelled.

The second week was devoted entirely to service practice and terrain exercises, some of the latter including regimental problems. The training culminated on the last day in a brigade maneuver in which the three regiments, acting together for the first time, participated. The problem drawn up by the Brigade Staff consisted of five phases: (a) March to positions in two columns and entry into action; (b) support of a division attack; (c) night firing; (d) displacement; (e) support of an active defensive position. These phases were successively accomplished between 7:15 a. m. and 11:45 p. m. On account of the limitations of the range and necessary safety requirements, it was a tight fit to squeeze a tactical war-time foot into a practical peace-time shoe, but reconnaissance was made for tactically correct positions. Areas actually occupied for firing were later designated to comply with safety regulations.

An interesting and rather complex problem was also presented in providing the modus operandi to act as a reinforced Field Artillery Brigade. It was necessary to expand one regular battalion, at reduced strength, into a brigade of division artillery—another parable of feeding the multitude with a loaf of bread, and verily there were no basketfuls left over. The 2nd Battalion, 3rd Field Artillery, commanded by Major John G. Tyndall, cooperated wholeheartedly and enthusiastically in the undertaking, and not only made the problem possible but greatly added to its success by the efficiency of its personnel. The expansion was accomplished by designating one gun section to represent a battery within the two light regiments, and by the procurement of additional signal equipment. Within the brigade net battery switchboards were used for battalion, battalion for regiment, and regiment for brigade.

The 497th F. A., acting as the 155-mm. Howitzer Regiment, attached, took over National Guard 155-mm. howitzer material, consisting of six gun sections and fourteen tractors, and manned the regiment entirely with their officer personnel.

Every detail of actual combat was closely simulated throughout. The Red position was marked on the ground by trenches and panels, and liaison lines were laid to concrete dug-outs on the flank of the Blue line of departure. The enemy's observation did not suffer by blinding with smoke any more than did our own, as smoke candles inopportunely screened Blue O. P.'s following the assignment of important missions.



## UNIT TRAINING AT CAMP McCOY

An observation plane from Chanute Field simulated hostile air attacks, furnished battle reconnaissance and conducted aerial shoots during the attack.

After the brigade net was complete and lines tested, it was hard to disrupt communications, but important lines were "shot out" spasmodically by a much abused pair of pliers. Even the weather assisted in lending a warlike hand, as a drenching rain all day and night was by no means simulated and made conditions, though arduous and adverse, all the more realistic.

The march table was computed on the basis of actual brigade time, space, and rate of march factors. The advance guard battalion having moved out early in the morning, the heads of the leading columns of the main body, marching in two columns, passed initial points on such exact schedule time that watches might have been accurately synchronized thereby.

After reconnaissance and a 4-mile march in deep sand, the 332nd F. A. was reported as established in position and ready to fire at 10:45 a. m., followed closely by similar reports from the other two regiments.

Particular precautions were taken to secure cover and concealment from ground and air observation, with the result that observers in Red territory were only able to report the movement of one reel cart, and several umpires exposed on the skyline.

A slight delay occurred in one regimental net, due to shortage of wire. The 497th (155 mm. howitzer) laid over 11 miles of wire. The brigade net was a normal one. Wire communication, the usual fly in the ointment, functioned well, and breaks were quickly repaired. The S. C. R. 109 sets worked satisfactorily with the plane, but difficulty arose with the 77 set for liaison. Projector lamp signalling was used to advantage for distant ground communication to the rear. Owing to shortage of personnel, 32 C. M. T. C. students, selected from the Blue course, acted as telephone operators at various C. P.'s and O. P.'s. All these lads performed their duties in an excellent manner. A total of 67 telephones were used within the net.

The brigade order provided for the support of the division attack at H-hour, preceded by a ten-minutes' preparation, and successive concentrations thereafter on selected sensitive points. H-hour was set by Division as 11:50 a. m. The preparation fire was accurate in direction and control, and came down speedily in spite of the undue load on switchboards and the necessity of checking all data at the guns by the safety officers.

During the afternoon a series of varying fire missions was promptly and accurately executed. The situations had been prepared by the Brigade Staff as a chronological narrative of events.

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The light regiments had sufficient ammunitions for their fires, but the howitzer regiment simply transmitted commands to its batteries and prepared its data, as it was not practicable to fire 155-mm. ammunition. The execution of all missions was promptly reported to Brigade, and the Brigade C. P. Message Center register is a very complete and interesting document.

At 4:15 p. m. an emergency barrage in front of the reorganized Blue front lines was signalled by a green rocket from the Infantry. All the guns of both light regiments were firing their barrage before the smoke of the rocket had dissipated. The barrage line between Thorpe Ridge and Stevan's Knoll was entirely accurate in range and distribution. The barrage was anticipated, but at 5:00 p. m., without any warning, a concentration of the entire Brigade on Thorpe Hill was ordered to neutralize a Red counter-attack. The execution of this mission was almost immediate, and it is extremely doubtful if any enemy infantry could have advanced in the face of the effective concentration put down. Central control is a principle and mass of fire power is a characteristic of Field Artillery. The Brigade Commander was able to mass the fire of his entire brigade on any point at once.

### NIGHT FIRING

At 8:00 p. m. in a heavy thunderstorm, the officers of the 497th F. A. took over the guns of the 332nd F. A. for night firing. The fire was observed axially from the O. P. on Maul's Bluff and laterally from the infantry liaison bomb proof on Stevan's Knoll. Observation of the shrapnel bursts was difficult on account of the mixing of frequent flashes of lightning with the bursts. The electrical effect on one occasion knocked the telephone operators away from the phones. The adjustment of fire would have been excellent under ideal conditions, but to obtain "line" shots axially and range "correct" laterally under the existing conditions of darkness and storm signified excellent work in laying at the batteries and in conduct of fire at the O. P.

The 497th F. A. maneuvered its tractors, placed the howitzers into position, laid its wire and handled the complete operation of its regiment with a complement of 38 officers, unassisted by enlisted personnel. That was an extraordinary job.

At 9:00 p. m., when all ammunition was exhausted, the brigade was directed to commence a withdrawal to positions behind the range of hills to support a new line on which the division was ordered to assume a defense. Reconnaissance parties were started to the rear at 6:00 p. m. The 497th F. A. moved out at 9:30 with its tractor exhausts sputtering fire in a deluge of rain, followed by the 332nd F. A. and 331st F. A. on separate roads. All columns

## UNIT TRAINING AT CAMP McCOY

moved to new positions well closed up and without trouble in spite of the darkness and heavy rain. One near casualty occurred when a mule-drawn ambulance containing most of the Brigade Medical Staff overturned on a hill, and they successfully displaced down the slope, but, unlike Jack and Jill, broke no crowns. The troops closed stations for camp at 11:35 p. m.

Interesting features of the problem consisted in the participation of other divisional services—C. W. S., Air Service, Ordnance—a complete administrative order by an acting G-4 from Corps Area, brigade ammunition supply and medical plan of evacuation. These installations operated practically, on the ground, not theoretically, on the map.

In the general critique, a parallel was drawn between the use of World War ordnance and equipment and the latest types of Field Artillery matériel to determine the effect of the new 75-mm. gun, 105-mm. howitzer, and improved infantry auxiliary weapons on the tactics of the problem. Motorization, mechanization, increased fire power, range and accuracy will not change the principles, but it was thought they would certainly change the tactics of future Field Artillery.

From the point of view of close simulation of war conditions, with many real difficulties to overcome, the problem chronicled herein was a success. The conclusion, reached from actual test, is that the 161st is prepared to take the field on call, and that this Reserve organization is ready now on M-plus zero day to accomplish its mission. The infantry of the 86th Division will always know that their caissons are rolling along to blaze the way to victory.

# THE INVESTIGATOR'S REPORT

BY A VERY JUNIOR BOARD

*Note:* This investigation, and consequent research, was made in 1925, on the Island of Oahu, Hawaii, without benefit of clergy or authorization of the high command. It is thus uncolored by religious or political prejudice, and stands alone in its sphere as an example of the depths to which the interests of pure science will ascend. It deals, more or less briefly, with the origin, nature, care, lubrication and maintenance of doby, dobie or dhoobie itch, referred to *infra*, as "the itch."

HORSES in Hawaii suffer from an affliction known as the itch, which attacks their heads and necks, gradually denuding them of hair. The Junior Investigator's private mount was thus attacked, despite careful quarantine methods. In great panic he ran to a veterinary, who informed him the itch was a subtle disease. It appears that the germ is invisible under the microscope, is insoluble in alcohol, will not propagate in hitherto unaffected animals even under the influence of subcutaneous injections of infected matter, will pass readily through a porcelain filter, and is altogether unresponsive to laboratory methods and stubborn and hateful beyond belief.

Various compounds, such as tar and lard, having been nevertheless heartily recommended for this admittedly incurable disease, they were tried. The itch throve mightily in these ill-smelling surroundings.

The horse was a Hawaiian horse, from the celebrated Parker Ranch. He had never had the itch before, and it puzzled him. He kept scratching his head about it all day, and in the course of time managed not only to scratch most of his hide off, but wore the feedbox and manger thin.

He was moved to a new stable; population 40 horses, 20 mules. The Junior Investigator was placed in charge of this zoo, and one of the first things that came to his attention was the condition of these animals, with long fuzzy wool where nice sleek coats should be. Out with the clippers! Let the fleece fall where it will! It was done. Next morning there were bumps on half the horses. The following week there was the itch on the same horses.

Q. E. D. The itch begins with bumps.

Let us look through the descriptive cards. Half these horses are Hawaiian; the rest from the mainland. Lo, none of the mainland horses had been itched!

Q. E. D. Mainland horses are immune to the itch.

Comparison of results with other amateur investigators:

"When the Hawaiian Division polo team took its horses to the West Coast in 1924, many had the itch when placed aboard the transport, but new hair was growing when they landed."

"When we went to camp last year on the Windward Shore, we took six horses with us. All had the itch, but all were cured during our six weeks stay because we took them sea bathing every day."

## THE INVESTIGATOR'S REPORT

Splendid! Salt water is the answer.

Salt water did not work. Neither did salt water with iodine.

Neither was authentic sea water, painfully conveyed in barrels from the coast, more productive of a cure.

Followed then a race for results. The Junior Investigator's immediate commander declared for treatment from the outside in, and began rubbing his horse with bacon rind, rubbing it assiduously, by the hour, while his mount purred with relief as the salty sting of it permeated his itchy hide.

The Junior Investigator went juramentado and decided for treatment from the inside out. He declared there was no such thing as itch; that the condition was a delusion and snare, occasioned by nothing more nor less than a debilitated and rundown condition due to lack of vitamins, and that he intended to feed his mount three cakes of yeast a day to effect a cure, failing which he would try Christian Science.

Fifteen cents a day for yeast for one month. No soap.

The bacon rubber switched to mange cure. Immediate results! The itchy sores healed up! New hair began to sprout! Eureka!

But who can afford to bathe sixty animals in mange cure? Not the Junior Investigator. The Vet. was again appealed to. The Vet. had no mange cure. He was out of tar, even. Because of the Junior Investigator's mania for dressing thrush cases with iodine, formaldehyde, and cupric sulphate, he was almost out of those delightful chemicals, and would have no more until next quarter's allowance. He was tired of amateur experiments, anyway. Those who didn't like thrush could listen to mocking birds, for all he cared, and those who didn't like itch could scratch it. Besides, the itch was a subtle disease. The germ was invisible—The Junior Investigator left.

The Junior Investigator went home to his stables and clipped two horses, one American, one Hawaiian. The weather was colder by now, and he left orders for these animals to be blanketed overnight.

Next morning he went to the stables again, full of strange thoughts and theories. He examined his mules. Clipped or unclipped, none of the mules in that particular stable had ever had itch. Indeed, so far as he knew, cases of itch among mules were rather rare. He examined his two experimental animals of the night before. The mainland horse had never a mark on him. But the other—about his head and neck, and about the rump and dock, were numerous large, hard bumps. Where the horsecover had rested were no bumps.

Q. E. D. The itch follows clipping, but avoids blankets.

The Junior Investigator stared a long, long time. He walked

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thoughtfully away, his mind running over what the estimable Pete Hannon, manager of the Hawaii Polo and Racing Club, had told him months before.

The estimable Pete had said, "I've been with these stables twenty year, and I've always had some horses with the itch. I give up trying to cure it years ago."

Enter the Senior Investigator. The S. I. accosted the J. I.

"Say, I found out all about the itch. I want to know. It's—."

"Don't bother me, Al; I'm trying to follow a line of thought."

"Well, before you run into a head-on collision with it, let me tell you something. There's no such thing as dhoobie itch for horses. It's nothing more than mosquito bites. I'm having hoods made for two of my horses, and one box stall screened in for the other, and within two weeks I'll have all three of them cured. What do you think of that?"

The Junior Investigator returned to his stables and established controls. That is, he placed mange cure on two itchy horses, he bathed two others with citronella oil, and he placed the leaves of the eucalyptus, abhorrent to mosquitoes, in the stalls of Numbers Five and Six. This treatment he continued for a week, at the end of which time a new coat was sprouting on the heads and necks of all six animals.

He then told the Vets all about it. These worthies were doubtful, not to say dubious. One of them shook his head. "The itch," he said, clearing his throat, "is a very subtle"——. But the Junior Investigator had left again.

Some months later he told another Vet. of his experiences. He was told kindly that there were a good many varieties of itch, some of which came and went, and still others which persisted for a while and then desisted, somewhat like the winds of heaven. In all probability it would be years before medical science had completed its classifications of these varieties and was enabled to affirm, positively, which would come and which would go. In the meantime the itch remained one of Nature's mysteries, a most subtle, and, he might add, interesting disease.

These remarks concluded the taking of testimony by the board.

The board proceeded to its conclusions with due caution. It admitted that the itch was a widespread curse and was an effective equine depilatory.

The board recognized further that persons with vision 20-20 have been known to run past stop signs. It deplores this tendency, but steadfastly maintains, in the face of criticism from all persons whomsoever, encountered wheresoever, that it has succeeded in curing a series of the most interesting mosquito bites that ever tortured our poor dumb friend, the horse.

The board then adjourned, to meet at the call of the president.

# BILLY BARTON

BY CAPTAIN H. S. WILKINS, ORDNANCE DEPARTMENT

I FOLLOWED Billy Barton with great interest ever since he was purchased by Mr. Howard Bruce of Baltimore off the track in the Spring of 1923. In the Autumn of 1924 Mr. Bruce began hunting him with the Elkridge Hounds, and I rode behind him for two seasons in the hunting field. When he began his cross country career in the Spring of 1926 he was an unknown quantity except to those who had ridden with him, yet that Spring he made the unprecedented record of winning the American Grand National, the Maryland Hunt Cup, and the Virginia Gold Cup on three successive Saturdays. His record in 1927 was equally outstanding, and consequently, when Mr. Bruce sent him to compete in the English Grand National, March 30, 1928, I felt that this was the occasion of a lifetime for me, and that I must see the race.

The horse was trained by the Hon. Aubrey Hastings at his place just outside of Wroughton, England. He won his first preliminary race in fine style, which caused the English to give him for the first time some consideration as a serious contender for the National. The other preliminary races were, however, most disappointing, as on at least one occasion he appeared so much out of condition that it was necessary to pull him up. Consequently, when Mr. Bruce arrived in England about three weeks before the race, all Billy Barton's supporters were very depressed.

The day before the big race I walked around the National course and had an opportunity to examine the jumps about which we had all heard so much. The course is 4 miles and 856 yards in length and there are fourteen jumps which are taken twice and two which are taken only once, making a total of *thirty jumps*. All of the jumps are hedges, closely packed with new furze and so stiff that it is impossible for a horse to drag through one, although they can jump them much closer than is possible with a post and rail, almost sliding over the top on their bellies. The only marks on Billy Barton after the race were slight scratches on his belly from the furze. Their stiffness is apparent, however, from the fact that Easter Hero was hung up momentarily on the top of the Canal Turn fence and slid off it backward into the dry ditch without making any gap which was noticeable from the landing side. The height varies from around 4 feet 6 inches to 5 feet 3 inches, but the most characteristic feature is the great drop on the landing side which in several cases is as much as 1½ feet lower than the take-off. There is, however, a certain amount of resilience to these

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hedges which is lacking in a post and rail or stone wall, and as a result horses do not seem to be thrown as violently; and although there are great numbers of falls, riders are seldom seriously injured.

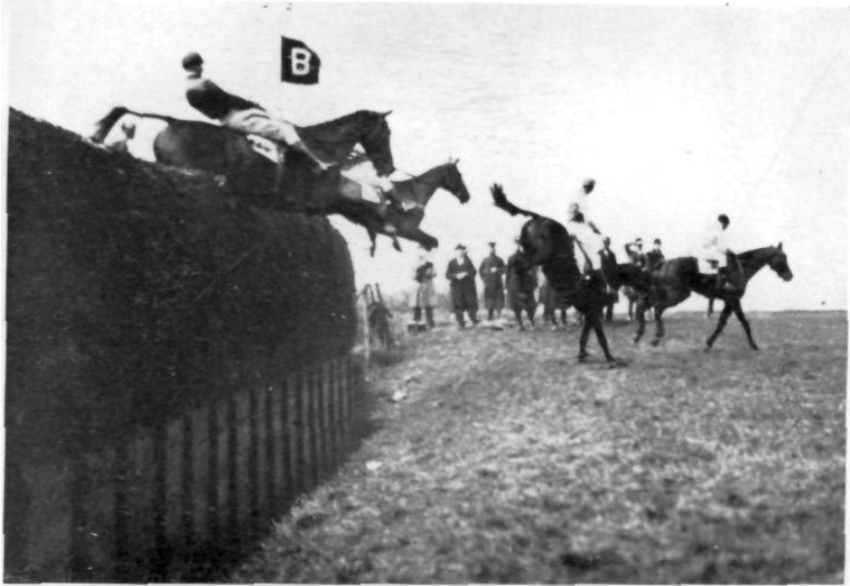
Going to the post, each horse, with his jockey up and led by his groom, was brought in front of the grand stand and, turning back, galloped to the post. Billy Barton and one other appeared decidedly the smallest horses of the lot, although he stands sixteen one. The start with forty-two horses at the post was a most impressive sight. The quietness of the horses was especially noticeable in contrast with that of horses in the ordinary flat race. This was doubtless due to their age and experience, few being under nine or ten years of age.

Finally they were off. After the third jump they disappeared in the haze. An interminable time, then the leaders appeared, coming toward the grand stand from Valentine's Brook. The excitement of the American spectators may be imagined when it was seen that of the forty-two starts only half a dozen remained and that the old rose colors of Howard Bruce were in the lead by a decided margin. Clearing the water jump directly in front of the stand halfway around the course, Billy Barton was still in the lead, and my own feeling was that if he didn't go a foot farther he had done enough for me. He had jumped the cruel course and shown the way to England's best horses, of whom over thirty had disappeared.

Billy maintained his lead and was still ahead when they again disappeared in the haze. I did not expect to see him again, but, when after another interminable wait of a few seconds the horses again appeared, the old rose colors were still ahead. At next to the last jump Great Span's saddle slipped and he lost his rider. The race then became complicated with the greatest terror of Grand Nationals—a loose horse. On he came edging over towards Billy almost like one polo pony riding off another until it looked as though he would force him into the wings of the last jump. At this jump he took off slightly ahead of Billy, who appeared to be tiring. Billy hit the jump, but got over, stumbled along a stride or two, then fell and rolled completely over, throwing the jockey so hard that he was somewhat groggy. Spectators standing nearby caught the horse and in assisting Cullinan to remount nearly threw him clear over, as is shown quite plainly in the accompanying photograph. Finally recovering his seat he went on and finished second, all the other starters with the exception of the winner having disappeared.

Everyone then began asking, "Who was the winner?" This proved to be Tipperary Tim, a horse which had received no consideration as a serious contender and whom few had watched during the race. The photographs showed, however, that he had been

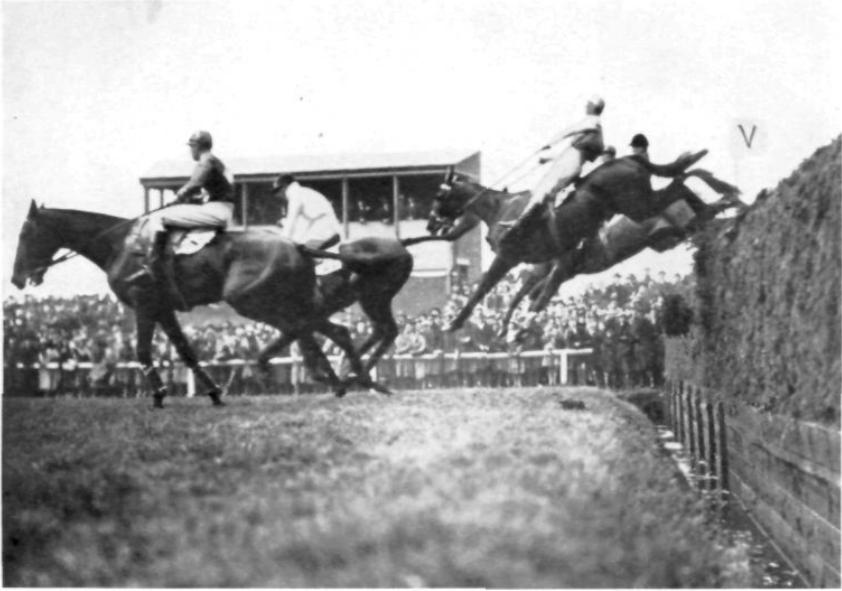




BEECHER'S BROOK, FIRST TIME AROUND, BILLY BARTON LANDING



SAME JUMP A MOMENT LATER, BILLY BARTON (25) RECOVERING



VALENTINES BROOK, FIRST TIME AROUND, BILLY BARTON NEAREST OF THE THREE IN THE AIR



CULLINAN, SOMEWHAT DAZED AFTER THE FALL, CANNOT QUITE FIND THE SADDLE

## BILLY BARTON

well up all along and had jumped the course beautifully. He was ridden by an amateur, a young English lawyer, or rather solicitor, as they call them. The most remarkable thing about "Tim," however, was that he was a "tubed" horse. This tube can be seen in the photograph of the last jump as a slight projection on his neck about halfway between his breast and jaw. I did not have an opportunity to see him at close hand, but did see a similarly "tubed" horse at the Warwickshire Hunt Races. He had a silver or nicked disc about 2 inches in diameter on the front of his throat about halfway between his jaws and breast. In the center of this was a plug with a ring in it, which jingled as he walked. This plug was somewhat similar to the stopper in an ordinary bath tub and was removed just before the race, thus providing an auxiliary air inlet below the restriction in his windpipe which made this necessary. This horse was leading over the last fence in his race, but was beaten out on the flat. I have never seen similar tubes in the United States, but apparently they are not uncommon in England and enable good horses, which would otherwise be incapacitated, to keep on racing.

Immediately after the race the spectators crowded about the riders as they came over to the paddock to weigh out. Among these was King Amanullah of Afghanistan, who crowded close to Billy Barton. The latter let fly with one of his hind legs, but fortunately missed. However, for a moment the Americans foresaw new international complications.

The first thing after the horses were led back to the stables, their shoes were removed and the nails were eagerly sought by some American girls of the Elkridge Hunt who had followed the horse they knew so well. The reason for removing the shoes so promptly was that the horses had been shod immediately before the race and the nails pulled very tightly in order to prevent losing a shoe in the heavy going. The nails had wedge-shaped heads to give the horses additional footing in the slippery going.

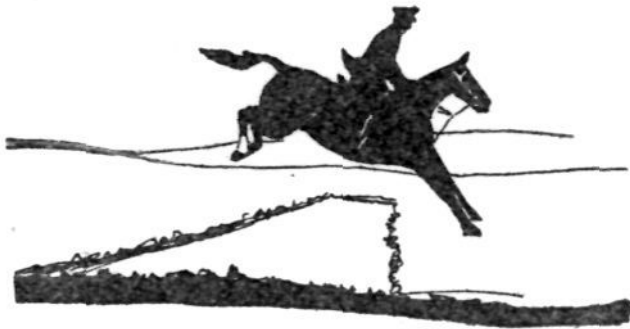
The English seat in riding this course, as shown in the photographs, was naturally a matter of great interest to Americans. In taking jumps over the great drops existing at the National many horses stumble or pitch in landing and go down. Therefore one of the most essential points is to keep a horse on his feet, and the English appear to feel that it is necessary to let the reins out and lie back on the horse's loins in order to do this. A study of the horses landing almost vertically, as shown in the photographs, makes it appear that if the riders used the forward seat and were well up on the withers, they very probably would topple the horse over. With the rider's body well back, he is better able to help his mount out of a staggering stumble.

One of the features of the Grand National is the dinner dance

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following the race at the Hotel Adelphia. This hotel was especially designed to accommodate this affair, so that the entire ground floor can be used for the purpose. It is far from being an exclusive affair; anyone having the necessary two guineas may come. Consequently the crowd of perhaps 1,700 consists of English nobility, American millionaires, distinguished personages, travelers, jockeys and chorus girls—all brought together by a common interest in horses and, at least in the latter part of the evening, often on terms of considerable intimacy.

The extensive participation of the military in English hunting and racing affairs is very interesting and has done a great deal to encourage horsemanship and sportsmanship in the British Army. In addition to polo, many of the point-to-point races are contested by officers jointly with some Hunt Club. At the Warwickshire Hunt Races a large military band played all the afternoon and about half the races were limited to officers. Officers are given considerable leave, particularly so that they may participate in fox hunting during the season, and the rules regarding the use of government mounts, which are of a very high type, are most liberal.



THE LAST JUMP



## WORLD'S NON-STOP TRACTOR RECORD

AT TWELVE o'clock noon on September 18, 1928, a non-stop tractor run of seventeen days and nights was completed. This run establishes a new world's record of 408 hours' continuous operation. It was made by a Caterpillar Twenty tractor on the Hastings Ranch of the California Packing Corporation, near Rio Vista, Calif., under the supervision of Professors Stirniman and Barbee of the University of California.

This new record of 408 hours tops by 168 hours the non-stop record established in April of this year by Battaglia Brothers of San Jose, Calif., with a Caterpillar Thirty tractor. Prior to that the record had been held in New Zealand, where a two-ton Caterpillar had accomplished a non-stop run of 168½ hours.

In the 408 hours the tractor which established the new world's record traveled 1,329.97 miles. The maximum speed was 3.56 m. p. h. and the average speed was 3.45 m. p. h. The tractor was operated in second speed throughout the test. Crank case oil was changed eight times during the seventeen-day-and-night run, during which period 106½ quarts were put in and 75 quarts were drained out. No change of transmission oil was made. One and one-half pints of oil was added during the run to the supply in the final drive cases. A total of 1,143.5 gallons of gasoline was used.

At the servicing periods (replenishing fuel and oil and greasing, taking readings, etc.) the aim was thoroughness rather than extreme speed. The servicing periods therefore averaged about twenty minutes every six hours. The engine, of course, did not stop any time during the run.

During the 408 hours of the run the Caterpillar Twenty worked 1,261 acres. The load pulled by the tractor varied considerably throughout the first part of the test due to the uneven ground. A draw-bar pull of ten to eleven horsepower was maintained the first ten days during the first time over the field. The load was increased to more than eighteen horsepower for the remainder of the test. An eight-foot twenty-two-inch double disc of the cover crop type was used alone for the first time over the field. A plank float and spike-tooth harrow were used to increase the loading when necessary.

After the completion of the test approximately one-eighth inch adjustment was required on each track to secure the same tension it had before the test. Wear on the track shoe lugs was not measured. No adjustment was made on any part of the chassis during the test. A leaf of the equalizer spring was broken the thirteenth

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day of the test, but was not replaced during the run, since it did not interfere with the tractor's operation.

After the official test was completed the tractor was tested in the condition in which it finished without adjustment or any changes being made, for maximum drawbar pull. The maximum pull observed was 3,000 pounds, and the maximum drawbar horsepower was 21.09, more than the rated power of the tractor.

In the dissembling and measurement of the tractor parts, which had been weighed and measured before the test, it was found that the wear of the parts most susceptible to wear, the top piston rings and ring grooves, was so slight that replacement was entirely unnecessary, while the wear of the other rings was so slight as to avoid detection except by weighing on very accurate scales. The wear on all other parts of the engine other than the piston rings was inappreciable. In fact, as the examining engineers described it, the engine was just "nicely run in."

The test was a cooperative one between the tractor manufacturer and the University of California agricultural engineering division, the latter being interested primarily in securing data relative to an agricultural experiment station project dealing with engine wear as affected by the character and condition of the lubricant used. Engineers from the college were with the tractor almost constantly during the test, making observations of the operation and taking data necessary for their investigation.

The tractor which was used as a standard model, equipped with the standard accessories usually provided. It had been loaned to the division of agricultural engineering about six months previous to the test, and during that time had been used for instructional purposes approximately twenty hours, five hours of which was student practice driving, without load.

# SOME ASPECTS OF MECHANIZATION

BY COLONEL H. ROWAN-ROBINSON, C.M.G., D.S.O., p.s.g.

[This is the first installment of a short book which gives some very new and interesting British views on this important subject. The writer is a distinguished military author whose opinions are receiving great attention in England. The book is reproduced in serial form in the FIELD ARTILLERY JOURNAL through the courtesy of the publishers, William Clowes and Son, Limited, London.—EDITOR.]

## PREFACE

IT HAS been commonly noted that though we owe to mechanization many land victories in the Great War, and though we were so convinced of its value that we had intended to multiply largely our production of tracked vehicles for the campaign of 1919, yet on the advent of peace we immediately scrapped the greater part of our armoured vehicles and reverted to pre-war methods of movement and protection. And it has since taken us nearly a decade to recapture our lost conceptions. Whether this curious ineptitude should be ascribed to military conservatism or to the effect of vested interests is not a matter of moment. The fault is now corrected; the machine is at last moving, and the bulk of military opinion is urging it upon its course.

The genesis of this book was this renaissance movement. The Experimental Mechanized Brigade was born in 1927. Towards the end of that year it received an official blessing and was rechristened the Experimental Armoured Force, in which guise it is now operating. The writer had no official connection with the Force in 1927. Generally speaking, the subject of mechanization is treated herein, not with regard to particular events, nor with regard to details, but in a few of its broader aspects. Both the wide and the narrow treatments are essential if a correct picture of the whole subject is to be painted. For, in the first place, we shall make egregious blunders in our tactical and strategic efforts if time and space, time and labour, repair, salvage, supply and maintenance have not been definitely worked out. And, in the second place, no accuracy of detail will compensate for a false general direction. Detail, however, can be elaborated only by a series of experiments each instituted with a definite object, whereas tactical and strategic manipulation are matters that will benefit by open discussion. On most of the subjects mentioned in the book we may expect to obtain much valuable information during the training of the Armoured Force this year.

What is perhaps the most important matter treated concerns, however, neither technical details nor tactical methods. It is contained



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in the last chapter and deals with the application of mechanization to India. It is of course obvious that the Cardwell system must fall to the ground unless India accepts for the British troops of her garrison a degree of mechanization approximately equal to that obtaining in England. And there is certainly no desire to change the Cardwell system, partly because it has successfully passed the test of two great wars and partly because it would be exceedingly difficult to find an effective substitute for it.

Practically the whole of the chapters contained in the book appeared in the *Army, Navy and Air Force Gazette*. My thanks are therefore due to the Editor of that journal for permission to publish. The greater part of Chapter III and a portion of Chapter IV are taken by permission from an article by the author in the *Army Quarterly*.

### CHAPTER I THE EXPERIMENTAL MECHANIZED FORCE

The realities of the tank-world are often a little blurred by the writings of enthusiasts. It is sometimes difficult indeed for the plain man, whose acquaintance with the subject is limited to what he can imbibe from magazines, to realize that tank-life is still in the larval stage: that the heavy tank can neither swim nor fly; that the tankette\* is still under experiment; that the dragon still dwarfs the gun it has in tow; and, generally, that the dim mists of futurity still wrap the vista of the vanished horse and the fleet of landships.

The enthusiasts are, however, correct in looking to the far-away goal; for, just as it is wise for travellers to guide their steps by the distant peak rather than by proximate landmarks, and for builders to have a clear mind-picture of the edifice while they are laying the foundation, so is it right for the advocates of a mechanized army to fix their gaze on the Mount if they are to take a correct line across the obstacle-strewn country intervening between the Slough of Despond and the City of Zion.

They may regard the institution of an experimental mechanized force as their first victory; for they have now rescued the germ of mechanization from the suction of the Slough and placed its feet firmly on the road to fulfillment. Moreover, the official blessing recently bestowed upon it has lifted it and its whole connexion to some extent off the plane of controversy.

The force as initiated last year was mechanized throughout and was composed as follows:

Headquarters and Signal Section.  
One battalion tanks.

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\*Now officially known as the "light tank."

## SOME ASPECTS OF MECHANIZATION

- One company armoured cars.
- One company tankettes (one section Carden-Loyds and one section Morris-Martels).
- One mechanized field artillery brigade.
- One light battery (in half-track lorries).
- One battery self-propelled 18-pounders.
- One field company Royal Engineers.
- One mechanized machine-gun battalion (36 guns).
- Mechanized transport.

It can be seen that it contained examples of all mechanical arms of the Service and all forms of mechanical vehicles. It was therefore able, within certain limitations, of which more hereafter, to put theories both technical and tactical to a practical test. And now after one year of training-life some investigation may be made of its experiences.

Colonel Collins—the commander of the force—speaking at the R. A. Institution, gave an admirable account of his stewardship. He was careful, however, to limit his lecture to the tale of his doings and declined to base upon the latter any adventurous excursions into the future. He dwelt rather on difficulties and hindrances than on achievements, and was chary in the drawing of lessons at this early stage of development.

In this he was undoubtedly correct. The conditions under which his force was trained were well adapted to the education of a fledgeling, but they were not war conditions. The opponent was unmechanized, the ground was open, the area limited, and hence many of the operations undertaken were necessarily of an unreal nature. Any deductions from them must therefore be subjected to severe scrutiny. If the composition of the force, for instance, was found satisfactory for the work involved, it might well not fit the conditions of wide areas and opposing tanks. Similarly a system of communication equal to the demands made last year might not prove quick enough if the rate of approach of the opposing forces were doubled. Then there is a real danger that technical difficulties experienced at the outset, if specially stressed, might obscure wider issues and drive the whole scheme into ruts, extraction from which might prove no light matter after the mechanical problems had been solved. There is the further danger that the unmechanized forces might draw unsound lessons if the unreality of the circumstances were to be ignored. After, for example, having been attacked several times in position, they might expect this to be the normal procedure of an independent mechanized force, whereas in fact it would be to a high degree abnormal.

A certain amount of value may, however, be definitely placed on the credit side of the account; practice in marches, in staff work

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and in logistics; the attunement of minds to the administrative problems involved, if not to their solution; and the study of the minor tactics of petrol-driven forces when opposed to those of the muscle-driven order. This is all to the good and is as much as could have been expected of any new enterprise placed in capable hands.

No report has yet been published, but much of interest may be gathered from the reports of experienced observers. The latter are all clear upon one point, namely, that the experiment proved a triumph for armoured forces over unarmoured forces of much greater strength. Captain Liddell Hart, writing on the final exercise, says,\* "the 3rd Division, even with the aid of a cavalry brigade, was virtually paralyzed by the presence—the omnipresence—of the Mechanized Force."

On previous maneuvers of this nature ordinary forces on the march have always found themselves to a great extent immobilized by flank attacks of armoured cars. This year their disability was accentuated by similar attacks by tankettes. And when the six-wheeler gives cross-country movement to armoured cars, they will be herded as by sheep-dogs into pens appropriate to their destruction by aeroplanes and guns.

For anti-tank work both on the march and in position reliance was placed mainly on the field-gun. On several occasions the latter found good targets and was awarded a fair number of "destruction" hits; but, on the whole, the tank, either advancing under cover of smoke or taking the guns in flank, had the better of the deal. In fact, to anticipate anything else is to claim mental equality with the Chinese general, who, when defeated by an attack in rear, bitterly complained that his adversaries had not noticed the direction in which his guns were pointing. Heavy machine-guns (dummies) were issued on the scale of two per battalion, but they were found exceedingly cumbersome to transport by hand and did not often come into the picture.

Although infantry in lorries appear occasionally to have accompanied the mechanized force, they did not definitely form part of it. This may have been due to a disbelief in the theory that infantry are required to hold a position captured by tanks; and the decision was in this respect undoubtedly sound. On the other hand, some lightly equipped infantry will certainly be required for technical and tactical duties on foot and possibly as relief crews if it be found that the strain on *personnel* is greater than the wear of material. The question of their organization, equipment, and means of transport, and the handling and utilization of that transport when empty, are matters that might well be explored this year.

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\**R. U. S. I. Journal*, November, 1927.

## SOME ASPECTS OF MECHANIZATION

It is, of course, important that we study and practice the action of armoured *versus* unarmoured forces, for we hope, if we are unlucky enough to have to fight again on a big scale, to profit exceedingly thereby. It may be, however, that we have done enough in this direction for the present. The shape, contents, and size of a mechanized army will be ultimately determined by the nature of struggles between mechanized forces and so, in order to get on to the right lines, we should begin our investigations into the possibilities and implications of such struggles. There is, moreover, no great value to be obtained by the unmechanized forces in a continuation of the experiment. It affords but little training for middle-eastern warfare; and to be continually harassed and often defeated is not a strong stimulant to *moral*. As this year the experiment is being pursued with a force of approximately the same composition, it would seem advisable to undertake a series of operations from which a large number of deductions useful for the future might be drawn; and there are many theories awaiting tests which cannot be applied under the procedure followed last year.

The schemes likely to afford most interest would be:

The experimental brigade to act as an advanced guard against a skeleton mechanized army; the action in skeleton of a mechanized division against a flagged mechanized force of similar size and composition; a battle between two skeleton mechanized brigades; and a raid from the south against northern railways through the unmobilized, unmechanized forces of the Northern, Western, and Scottish Commands.

Mechanized forces can very conveniently be split up to act in skeleton without any serious draft on the imagination; and however far we may advance in mechanization, a lot of training will have to be carried out in this way, partly to save P.O.L. expenses and partly owing to scarcity of vehicles prior to mobilization. Motorcars, as was shown by the 4th Divisional exercises in Kent last year, can represent a flagged enemy, though subject to the inconvenience of being unable to move across country.

In only one of the suggested schemes would ordinary forces be employed. In all the other cases, the composition and methods of command and communication of mechanized forces acting against each other would be tested; and in three of the schemes there are many administrative problems to solve.

Winter war-games ought also to be of great value. They are inexpensive in petrol; they can embrace forces and areas of any required magnitude; they enforce attempts to solve tactical and administrative problems; and they would certainly suggest ideas for the ensuing training seasons.

# **THE MECHANIZED FORCE. FACTS AND THEORIES**

**BY LIEUTENANT COLONEL P. D. GLASSFORD, FIRST F. A.**

[The following remarks, observations and theories are based upon my opportunity to observe the work of the Experimental Mechanized Force at Fort Leonard Wood, Maryland, from July 13 to August 11, 1928, and upon the splendid opportunity I had during this period to hear discussions and to exchange ideas with officers who had had considerable tank experience during and since the World War, and who have given considerable thought to the subject of "mechanization." Also I have been able to devote a modicum of time to reflection and reading. (List of references with a few extracts at end of this article.)]

SO FAR as my observations extended, the work of the Experimental Mechanized Force of necessity was limited this year largely to road and cross-country tests of many types of motor-driven vehicles, to the conduct of road marches, to the technique of entrucking and detrucking automotive equipment, and to the minor tactics of component elements of the Force.

The experiments were conservative and practical, avoided the frequently made error of attempting to do too many things at once, and constitute a sane line of departure for future development.

Unfortunately a large proportion of the equipment available was obsolete.

The subject is so extensive and has so many ramifications that I am attempting in this discussion to cover only the more important points, and to emphasize the necessity for developing a tactical doctrine.

## **OBJECTS OF MECHANIZATION**

The primary objects of mechanization are to increase strategical mobility, to restore mobility to the battlefield, and to provide greater speed, power, and weight in a decisive attack.

In keeping with the progress of this rapidly moving mechanical age, it is certain that mechanization will be applied increasingly to all combat elements of a fighting force, as well as to units charged with maintenance and supply. A force entirely mechanized is comparatively new in conception; it opens up new possibilities for modern military development, and merits a high priority in the preparation of this nation for national defense.

## **CHARACTERISTICS OF A MECHANIZED FORCE**

The principal characteristics of a mechanized force may be said to be the following:

High strategical mobility under favorable road and weather conditions.

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Vulnerability to air observation and air attack, particularly in daylight movement.

Great speed, power, and weight in an attack on a limited front, or in a counterattack.

Limited holding power.

Effective tactical employment limited to certain types of terrain.

Vulnerability against a strongly organized defense.

High demoralizing effect against an enemy inferior in morale and equipment.

Effectiveness heavily dependent upon the quality of its commander, the morale, training, and discipline of its personnel, and the quality and condition of its equipment.

### EMPLOYMENT IN OPERATIONS

The proper conception of a mechanized force is a powerful *weapon of opportunity* as a component part of a corps or larger unit for particular missions appropriate to its characteristics. Its rôle is essentially offensive.

The high cost of such a force, its specialized training, and the difficulties in the replacement of equipment and trained personnel preclude its dissipation in minor missions, its employment where other types of fighting forces can be used to equal or greater advantage, or the suicidal annihilation of its effectiveness in a duel with a similar force available to the enemy.

As a rule its employment should be decisive to the outcome of an operation; never on a mission of insufficient importance to warrant the temporary or permanent decrease in effectiveness which it might be expected to sustain.

Surprise invariably should be an element in its employment.

Its strategical mobility may be utilized to seize important localities and hold them temporarily; to make a wide turning movement or flank attack; or even to raid the enemy's line of communications in connection with a powerful offensive operation which is expected soon to catch up with the mechanized force.

Its attack against a strongly organized defense would be futile in most cases if not disastrous; but it may be used for a deep penetration at a weak point, supported strongly by other troops on both flanks, and by reserves to fill the gap and eventually relieve the mechanized force after it has reached the limit of its exploitation.

Its value would be minimized by turning it loose for independent missions or raids. It should be held closely under the control of the commander of the larger unit to which it belongs, yet when thrown into battle it should operate normally without limitation to its objective.

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In the defense or retreat it would be of little use other than for a powerful counterattack, or for an opportune turning movement with the object of changing the direction of movement and initiating an immediate counteroffensive.

The possible uses of mechanized forces in our national defense should be studied in connection with war plans. Organization and composition of such forces will vary with the theater of operations, type of terrain, characteristics of the operations anticipated, and to a lesser extent with climate.

### ORGANIZATION AND COMPOSITION

The recent development of a light tank with great speed opens up a new chapter in offensive warfare. In a mechanized force the light tank becomes the principal weapon which all other elements are designed to support.

With the armament of this tank limited to one 37-mm. gun and one 30-caliber machine gun, accompanying artillery will be required in an attack where resistance with anti-tank guns may be expected. Artillery for this purpose should be equipped with self-propelled mounts of the same speed as the tanks; consequently the guns might properly be mounted on the same type of chassis. It would require experimentation in tactical exercises to determine a correct ratio of these guns to tanks. The weight and power of the gun itself would be limited to that which the tank chassis could carry with ease and permit to fire from its back, so to speak, without injury to its tracks and propelling mechanism. The self-propelled mounts with the Experimental Mechanized Force this summer (1928) lacked adequate speed, were unreliable, and required too much time to prepare for firing.

With the very limited holding power of tanks, infantry will be required for mopping up localities to which the tanks cannot penetrate, and for organizing and holding captured ground. This infantry must be a component part of the mechanized force, because it will require highly specialized training and familiarity with the tactics peculiar to a mechanized force. Its armament should consist of a larger proportion of machine guns and automatic rifles than the normal infantry unit. It must be provided with cross-country transportation equal, or almost equal, in speed to that of the tanks.

The infantry must have artillery support in organizing and holding captured ground. The artillery provided for this purpose has also the important mission of supporting the tank attack with destructive or neutralizing fire against the enemy's position or defensive zone, and must be capable of laying a smoke screen when required. Experiments at Fort Leonard Wood demonstrated conclusively that the 75-mm. gun, tractor drawn, has insufficient tactical

## THE MECHANIZED FORCE: FACTS AND THEORIES

mobility for use as supporting artillery with a mechanized force, and furthermore that its entrucking and detrucking is entirely too slow. Consequently the 75-mm. gun or 105-mm. howitzer should be drawn by a fast truck capable of cross-country maneuver (such as the Coleman truck); the gun or howitzer should be mounted on a light two-wheeled trailer designed to protect the mechanism of these weapons against injury from travel vibration and towed by the truck.

To supplement the supporting artillery and for economical use in creating smoke screens, a mechanized force should be provided with rifled mortars such as the excellent 4.2-inch caliber mortar developed recently by the Chemical Warfare Service. These mortars, with the necessary personnel and ammunition, can be carried in trucks capable of rapid cross-country speed.

For distant reconnaissance, screening, and flank protection when required, an armored car unit should be provided.

The auxiliary troops should consist of maintenance units for armament and motor vehicles, a small ammunition and supply train, a signal corps detachment for communications, an engineer detachment for such work as the reenforcement of bridges, and a military police detachment to assist in the conduct of marches. All these auxiliaries may be grouped in one command as "special troops."

The headquarters of a mechanized force should be small and mobile, with a commander, an executive (or second in command), and a small staff.

No anti-aircraft unit is contemplated as a component part of the force. Defense against air attack best can be assured by a machine gun mounted on every truck in the column.

Air units for reconnaissance, screening, and attack should be provided for use with a mechanized force as circumstances require by the commander of the corps or larger unit of which the mechanized force forms a part. Contact planes frequently will be required to keep the commander informed as to the progress of the attack, and in some cases the action may be so rapid as to make it advisable to command the mechanized force from the air.

The recommendation of the Infantry Board that a mechanized force be constituted entirely with infantry units is not concurred in. Already the infantry arm has sufficient, perhaps too many weapons to deal with, which precludes the organization of "cannon companies" for the service of field guns and howitzers.

Whatever the organization of a mechanized force, it should be based upon simplicity and maximum economy in personnel and equipment.



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### COMMENTS ON ESPRIT DE CORPS

It is essential that a mechanized force of several combined arms develop a strong esprit for the unit as a whole, with a willingness to cooperate and to sacrifice benefits to individual units for the welfare of the whole. This cannot be accomplished unless all units are trained at the same locality.

Though the esprit of each component unit was splendid, a high spirit of mutual cooperation was difficult to obtain at Fort Leonard Wood because the units composing the Experimental Mechanized Force were assembled from several stations. During one of the marches a unit commander refused gasoline to another until he had gassed his own trucks, well knowing and admitting afterwards that he had a surplus of at least 150 gallons above his requirements. Another unit commander near the head of the column towed a heavy disabled truck and thereby reduced the speed of the entire column. His primary interest was in gaining a clean record for his own unit by bringing all his transportation into camp. These incidents occurred soon after the organization of the Experimental Mechanized Force, before a high esprit for the Force itself had been inculcated.

### STRATEGICAL MOBILITY

In the same way that tactical mobility should be based upon the speed of the light tank, the speed of the tank carrier should constitute the basis for strategical mobility. No element of a mechanized force should have a lesser road speed.

In the experiments at Fort Leonard Wood this year, the Coleman truck proved superior to all other vehicles tested as a tank carrier. A modified Liberty truck, with body platform only 36 inches from the ground and a tailgate ramp, presented a valuable innovation in body design, but the truck itself had insufficient power and speed. In order to have adequate strategical mobility it is believed that under favorable conditions a mechanized force should be able to travel not less than 150 miles in ten hours.

It was demonstrated conclusively at Fort Leonard Wood that all road movements must be preceded by a thorough reconnaissance, and that a definite plan must be made for the march.

Surprise being a salient element in the employment of a mechanized force, it was contended by many officers that all strategical movements of necessity would be made at night. It is not believed that this would be true in all cases, even though the enemy were superior in the air. Our knowledge of the time and route of movement, information which we must assume would be denied the

## THE MECHANIZED FORCE: FACTS AND THEORIES

enemy, in many cases would enable sufficient patrolling by pursuit planes to prevent air observation or air attack on the column.

### TACTICAL EMPLOYMENT

Except for the accepted theory that surprise, speed, and depth of attack must be the predominant characteristics, and that the light tanks are the principal attack element of a mechanized force, the matter of tactical employment is left for future experimentation, as there was very little opportunity this year in the Experimental Mechanized Force to make experiments along tactical lines. Our information concerning the British maneuvers of August, 1927, is very meager.\* Until a correct doctrine for the battlefield employment of such a force is determined, there can be no sound basis for fixing the total strength or the relative strength of component units.

With reference to the attack against an organized defense, consideration must be given to the changes that "mechanization" will produce in the tactics of defense. We may expect thinner lines, greater depth, stronger reserves, and more weapons to combat the tank, skillfully spotted and echeloned to cover the lanes through which tanks must advance.

### FURTHER DEVELOPMENT AND EXPERIMENTATION

The progress of the Experimental Mechanized force this year of necessity was very limited and was confined almost exclusively to mechanical transportation and maintenance. Many new and promising types of trucks, armored cars, and other motor vehicles were tested, but on the whole the motor equipment was obsolete so far as it could be of utility to an effective mechanized force, and there were available for use only four of the new light tanks, model 1928, with two cargo carriers on the same chassis.

A sound policy was followed in adhering as far as possible to the use of commercial vehicles that would be available in quantity at the outbreak of war. Further experimentation is essential and should be based upon modern motor equipment, principally of commercial type.

Most important are the tactical doctrines. It is believed that their development should be initiated with an experimental force of small size, the strength of which can be increased from year to year and its composition varied as progress is made. Because rapid strides are being made in the development of automotive power and its application to commercial transportation, to acquire a large number of motor vehicles that would soon become obsolete, would not be in keeping with the economy that surely will be required.

At the present stage of development, the formulation of a table

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\*See Col. Rowan-Robinson's "Some Aspects of Mechanization" in this and future numbers of the F. A. Journal. EDITOR.

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of organization and equipment for a mechanized force, with any expectation of permanency, would be the height of presumption.

### REFERENCES

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"Training Program for E. M. F., 1928." Letter from Adjutant General to Commanding General, 3d Corps Area, February 2, 1928.

"A Mechanized Force." Memorandum for the Chief of Staff prepared by the G-3 Division, March, 1928.

Extract: "No machine can replace the brains of men. But machines in the past have extended the striking power of his arms and legs, and will do so to an increasing extent in the future."

"Organization of a Mechanized Force." Infantry Board, April 19, 1928.

Extract: "We may perhaps look forward to the time when all parts of a mechanized force will be able to move across country."

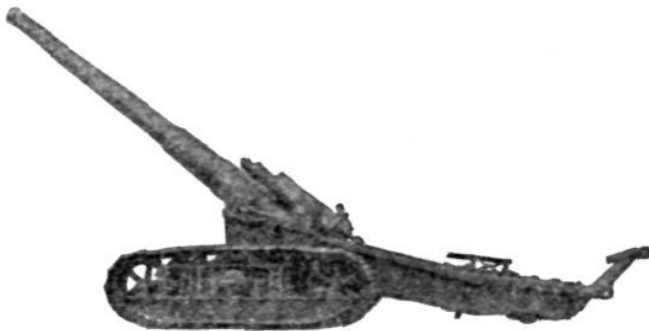
"Motorization," by Colonel Allehaut. *La Revue d' Infanterie*. In five parts beginning with the February number, 1928. (Of particular interest is Part II, March number, describing and commenting on the British maneuvers with an experimental mechanized force in August, 1927.)

Extract: "Tanks open the way—infantry achieves, perfects, and confirms the conquest—Infantry remains in combat 'arm indispensable,' without which the machine, no matter how powerful it may be, is stricken with sterility."

"The Progress of Mechanization," by Major General Sir J. Burnett-Stuart. *The Army Quarterly*, April, 1928.

"Armoured Warfare"—A plea for common sense, by Victor Wallace Germain.

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# 185TH FIELD ARTILLERY



# IOWA NATIONAL GUARD

THE 185th Field Artillery, Iowa National Guard, is a part of the Seventh Corps Artillery. At the present time but two complete battalions, with a skeleton regimental headquarters and a two-battalion medical detachment, are organized. The 3rd Battalion, allocated to the State of South Dakota, and the Headquarters Battery and Service Battery have not as yet been organized, due to insufficient appropriations. The headquarters of the regiment is at Davenport, with the batteries in Davenport, Clinton, Boone, and Grand Junction.

Shortly after the Civil War, a group of Union veterans sponsored the organization of a militia unit in Davenport, which was taken into the state service as Company "B," 9th Infantry, Iowa National Guard. From available records, this took place in May, 1878. In 1892 the designation of the unit was changed to Company "B," 50th Infantry, Iowa National Guard. This organization was called to active service in the War with Spain, and was in camp near Jacksonville, Fla., from April to November, 1898. In 1900 the 50th Iowa was re-designated the 54th Infantry, Iowa National Guard.

On June 10, 1915, Companies "A," "B," and "C," at Clinton, Davenport, and Muscatine, respectively, were converted into the 1st Battalion, 1st Iowa Field Artillery, and the same year took part in the field training at Sparta, Wis. On June 20 the following year they were mobilized for Mexican Border Service and served in the vicinity of Brownsville, Tex., until December 29, 1916.

At the outbreak of the World War a complete regiment of Field Artillery was organized, and mobilized for service on June 23, 1917. On August 5 the designation was changed from the 1st Field Artillery, Iowa National Guard, to the 126th Field Artillery. The new regiment was part of the 34th Division, and trained at Camp Cody, Deming, N. M.

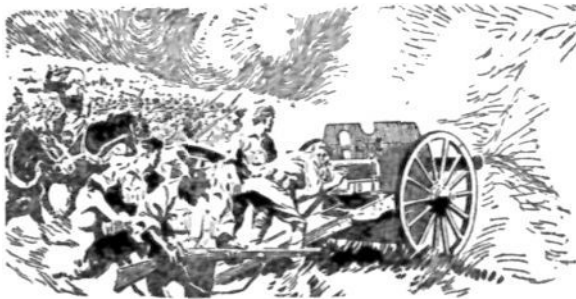
As one of the regiments of the 59th F. A. Brigade, the 126th sailed from New York on the steamer *Kashmir* September 25, 1928. On October 6, the *Kashmir* collided with the *Otranto* near the Isle of Islay, and approximately 400 men lost their lives when

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the *Otranto* sank, none of the casualties, however, being from the Iowa regiment. The *Kashmir* limped into Glasgow, and the troops proceeded overland to Southampton, thence to France.

The Armistice found the regiment training at Camp De Souge. On December 24, 1918, they sailed for the United States on the steamship *Pocohontas* and arrived at Newport News January 4. On January 20, 1919, the 126th Field Artillery was mustered out of the service.

Battery "B," at Davenport, was re-born on June 10, 1920, and other units were subsequently organized at Keokuk, Boone, Clinton, and Grand Junction. The battery at Keokuk has since been mustered out of service. In June, 1922, the regiment was re-designated the 185th F. A. and assigned to the Seventh Corps.



# FIELD ARTILLERY: PAST, PRESENT, AND FUTURE

BY GENERAL HERR OF THE FRENCH ARMY

TENTH INSTALLMENT

[This treatise by General Frédéric Georges Herr, published in French by Berger-Levaul, Paris, is believed to be an outstanding book on the subject of field artillery. In the belief that heretofore there has not been an opportunity to read this in English, it is hoped that its publication in serial form, beginning in the May-June, 1927, JOURNAL, will be the means of acquainting more of our officers with this excellent work. During the World War, General Herr was successively the commander of an artillery brigade, an infantry division, an army corps and of an army detachment. He then became Inspector General of the French Artillery.—EDITOR.]

## PART IV

### THE BUDGETS OF 1922

#### CHAPTER I

#### WHAT HAS BEEN DONE IN FRANCE AND ELSEWHERE SINCE THE WAR

SINCE the armistice intellectual activity has been great in all armies, among the former belligerents and also among neutral countries. Everywhere old military journals have reappeared in spite of difficulties of edition, and new ones have sprung up; everywhere great efforts have been made to study the lessons to be drawn from that prodigious war and to profit by them promptly, each according to his resources and his particular situation. A pamphlet recently edited in Russia by the General Staff of the Red army appreciates the florescence of military literature in France:\*

"The victory has greatly excited the interest, already naturally very live, which the different circles of society in France have for things military. The pale literature of before-the-war has taken a remarkable flight, not only from the point of view of quantity, but, much more important, from the point of view of quality! Artists, savants, professors, political men and industrialists, dragged by the World War into an active participation in military affairs, express their opinion, along with the most noted generals and specialists of the different arms. Such a large exchange of views facilitates extraordinarily the discovery of the best means of obtaining progress. As a result, current French military literature presents rich material for any professional soldier desirous of completing and developing his knowledge."

This participation of all spheres in military questions which the Russians have noticed in France is a general phenomenon which can be found in every country in the world. Nothing could be more natural, since, in our epoch of integral war, mobilization is of interest to the entire nation, and there is no profession which is not affected by it.

It will be particularly interesting and instructive to draw a picture of what has been done in the last four years in France and elsewhere. Unfortunately, it is very difficult to know the results of technical studies carried out abroad on military subjects, and if we are a little better informed concerning our own personal studies and those of our allies

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\* Extract from the *Revue Militaire Francaise*, Dec. 1, 1922.

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and friends, it would be improper to divulge what we know. But, by attentively perusing military publications, we can nearly always recognize tendencies, current ideas and even future trend, because they are the subjects of numerous articles for propaganda or for discussion. Also, all the large armies have revised their military regulations and we are certain to find there the expression of official doctrines.

These are the sources which we shall use. The reader should therefore not expect to find any sensational revelation or any documents from the Military Intelligence. We have contented ourselves with grouping information from the press of the entire world, stressing particularly those furnished monthly by the *Revue Militaire Francaise*, the organ of the General Staff of the Army, and from the *Revue d'Artillerie*, the organ of the Chief of Artillery.

### GERMANY

Defeat at first created a veritable stupor in Germany. But the Spartacus attempt promptly awoke the instinct of self-preservation, and the Prussian officer immediately recovered sufficient energy to drown the menacing revolution in its own blood. Since then the military element has raised its head, has regained confidence and, feeling the support of the mass of the nation, has applied itself resolutely to the work of preparing for revenge.

The army of 100,000 men, imposed upon Germany by the Treaty of Versailles, is considered only as an organ of transition. The Minister of War, Dr. Gessler, declared this openly in a session of the Reichstag on January 28, 1921: "The treaty of Versailles imposes upon us an army system which we can only support as a transitory affair. The end toward which we must strive is a regular army with short-term service."

So, from now on, all organization and all instruction are uniquely conceived in view of re-establishing obligatory service. For fifteen years more, Germany will have instructed reservists who have been through the war, ready to enter immediately into the officers' lists of the army. She should therefore, above all, busy herself with forming these lists; next she should look to building up her matériel.

The question of the officers' list is now solved in the following fashion. The army of 100,000 men includes an unwanted proportion of high ranking officers. There are as many as eleven field officers in a single regiment of infantry. The best men from among the officers of arms forbidden by the treaty (aviation, heavy artillery, anti-aircraft) have been kept and temporarily attached to other arms. The surplus officers have been listed on the rolls as noncommissioned officers. There are numerous "demilitarized" officers, that is, they wear no uniform, but they receive pay and work secretly. As for the noncommissioned officers, the effective strength of the army normally and officially includes a proportion of one noncommissioned officer for four men, but many former noncommissioned officers count as soldiers for purposes of roster, so there are actually more noncommissioned officers and ex-noncommissioned officers in the army than there are privates.

The procurement and instruction of officers are matters of solicitude for the High Command. According to the military law, "Officers are selected from volunteers of irreproachable conduct, who distinguish themselves by their military aptitude and their general culture." The officer candidate should possess a diploma from a secondary school of

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instruction which is the equivalent to our baccalaureat (about equivalent to U. S. high school diplomas), or if he has no diploma he must undergo two difficult examinations. As in the past, no one is accepted as an officer if he has not been proposed by his chief of corps and accepted by his future comrades. The program for military schools has been greatly augmented. As a result of these various precautions the intellectual level of the corps of officers tends to rise considerably, while at the same time the corps conserves the aristocratic traditions of the old army.

Once given his epaulettes, an officer continues his education. He attends technical conferences on subjects of interest to the army; he takes part in map exercises which are organized with minute care; he takes part in tactical maneuvers in the field; numerous publications keep him informed of actual military questions.

The material and social situation of the officers remains as brilliant as in the past. The law governing salaries and allowances of functionaries ranks a lieutenant general with ambassadors, and a general with under-secretaries of state.

We know that the Treaty of Peace intended to suppress the Great General Staff and to put an end to training for it by discontinuing the Military Academy. The latter has in fact disappeared, but it is replaced by real general staff schools, organized in each of the Wehrkreise. The entrance examination is identical with that of the old Academy, and the schools furnish each year appreciably more "general material" than came formerly from the Academy. During the years 1920 and 1921, the "Heeresleitung" was transformed bit by bit into a "Great General Staff," nearly identical with that of pre-war days, containing the same organization under a form barely camouflaged. Its chief has become a veritable generalissimo of the German army, endowed with much more extensive powers than were ever possessed by the Moltkes or Schlieffens.

As for matériel, the treaty of Versailles only authorizes Germany to have: 204 77-mm. guns provided with 1,000 rounds per piece; 84 105-mm. howitzers provided with 800 rounds per piece, and forbids the possession of aviation, anti-aircraft artillery and heavy artillery. Nevertheless, she has the right to keep the heavy artillery necessary for the armament of a certain number of permanent forts, that artillery being limited to the number and caliber of weapons constituting the armament of these forts on the date when the Treaty became effective. We can place at about 600 the number of supplementary weapons which Germany has officially maintained under this authority.

Thanks to the vigilance of the control commissions and according to the figures recently furnished by the German authorities, the matériel destroyed or delivered to the Allies should be as follows:

Guns and spare tubes.....	54,415
Gun carriages.....	27,869
Projectiles .....	36,000,000
Airplanes.....	14,000
Airplane motors .....	27,700
Machine guns .....	86,700
Small arms .....	(approx.) 4,000,000

We might be tempted to conclude that Germany has loyally executed the clauses of the Treaty and that she is today deprived of all matériel for war, or at least that she possesses only the arms which were accorded her for her army of 100,000 men.



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We are assured that this is not so, and for proof we need only the numerous and rich depots of clandestine arms which are discovered continually. But there is something more significant and more serious. This is the open resistance of her industries to the destruction or transformation of the tools of war. The most typical case is that of the "Deutsche Werke" of which all newspapers have spoken so often of late. We must also remark that many factories, although giving the appearance of having satisfied the requirements of the Treaty, remain in a position to recommence war production without delay. This is particularly true of the aeronautical factories and all the chemical plants. We will come back to that question a little further on.

Besides, it is patent that Germany is building outside, in friendly or neutral countries, factories which entirely escape our control.

Lastly, we also know surely that immediately after the armistice Germany began to buy abroad, in considerable quantities, indispensable raw materials for war production which she does not find in her own country: cotton, copper, rare metals which enter into the composition of gun steel, etc. The stocks which she thus accumulates with feverish activity already represent the supplies necessary for more than one year of production.

We therefore have the right to affirm that we will see war material come out everywhere from its hiding places, and the great factories recommencing intensive manufacture of new matériel as soon as the Central Commission is withdrawn.

The first duty considered by everyone in Germany has been to find out the causes of defeat and the lessons of the war. Publications appearing on this subject already form a complete library. The most interesting words to read are without doubt the military regulations edited by the Ministry of War which give the official policy, and the different books treating of controversies on tactical questions.

Their reading is most instructive. It shows clearly that the High Command regards the army of 100,000 men only "as an army of officers who await the moment when a new combination of powers will permit the people under arms, but actually on leave, to come back to the colors.\* The Heeresleitung covers, in its regulations, not only the army of 100,000 men, but the great army which should replace it. The Regulations of September 1, 1921, on the conduct of combat for troops of all arms, signed by General Von Seeckt, says precisely this: "The present regulations has as a basis, not the army of 100,000 men prescribed by the treaty, but an army possessing the effective strength, armament and equipment of an army belonging to a great modern military power."

The Notes on Employment of Aircraft of April 30, 1921, incidentally make this significant statement: "For the distribution and use of aviation organizations,† we have taken as a basis an army with modern equipment designed to carry out decisive combats." In addition, it predicts the following allowances: 24 airplanes per division, and for an army a total of 456 to 702 airplanes.‡

Concerning the artillery in particular, the Heeresleitung has prescribed that instruction be carried out in such a manner that each one

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\* Captain W. Pfeifer, *Proposed Regulations for Infantry Maneuvers*, Chapter on preparation for combat.

† The Treaty of Peace forbids Germany to have military airplanes; these notes pretend to be theoretical only, and to serve only as a guide "to be used for tactical studies, war games, training of officers and maneuvers."

‡ *Revue Militaire Francaise*, April 1, 1922.

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of the junior officers, according to his ability, can become "an instructor and chief in some determined field of activity." It has provided the arm with all necessary regulations. Not to mention the *Instructions of Sept. 1, 1921*, cited above, which apply to artillery as well as to other arms, and also without considering the *Regulations for Artillery Combat*, which is announced as supplemental to the general instruction order, there appeared on December 4, 1919, an *Instruction for Fire*, and since July 1, 1921, there has appeared a series of pamphlets which will constitute the *Regulations for Artillery Maneuvers*. Even though Germany has no right to have heavy artillery, the Instruction for Fire is applicable to all types of matériel including even the A. L. G. P. (long range heavy artillery). We can well believe that the pamphlets of the *Regulations for Maneuvers* not yet printed (numbers 6 to 10), which are complete for light, horse and motor-drawn artillery, will treat of the maneuver of heavy pieces and anti-aircraft guns.

Lastly, on Sept. 25, 1921, the High Command sent a document to all troop units and military schools which gave the composition, effective strengths and armament of an infantry division and a cavalry division for a modern army.\*

The impression clearly obtained from reading all these documents is that the Germans, like us, have drawn from the experience of the war the clear lesson that artillery will occupy in the next war an even more important place than in the last, and that consequently it is necessary to increase its proportion in the army. Certain studies picture units which include more artillery than infantry. Others simply ask that the allowance of artillery realized toward the end of the war be doubled. An army corps† of three divisions would then include about 450 guns, not counting numerous anti-aircraft weapons, anti-tank weapons and minenwerfers, that is, more than 16 guns per battalion of infantry,‡ although at the beginning of the summer of 1918, when the German artillery reached its maximum, there were only a few more than 8 guns per battalion.§ Lastly, we go back to the example we have already given of the composition of artillery of an attacking division, in the map exercises, where the density of artillery deployed reached 47 batteries per kilometer.¶

But it will be said that these are only theoretical studies. Let us take, then, the situation actually existing and seek the conclusions that can be drawn therefrom. The seven divisions of the German army of 100,000 men actually exist and their organization is known. A study of these will show us the actual tendencies.

Each division legally includes three regiments of infantry of three battalions and one minenwerfer (trench mortar) company each, detachments of cavalry, engineers, trains and a brigade of artillery.

To be sure this brigade is made up of one regiment of three battalions, conforming to the requirements of the Treaty of Peace. It is, nevertheless,

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\* *Revue Militaire Francaise* of April 1, 1922.

† We know that the Treaty of Peace does not authorize the existence of an Army Corps in Germany.

‡ Note that in 1917, General Rohne, the great German artillery scholar, considered seven as the maximum figure in this case. He has since changed his mind.

§ Counting 700 men to a battalion, the maximum figure today, 16 guns per battalion is equivalent to 23 for 1,000 infantrymen, and a fraction more than 8 guns per battalion is equivalent to 12 per 1,000 infantrymen. Compare these figures with those we gave in studying the question of equilibrium of arms. (Part II, Chapter IV.)

¶ Part II, Chapter IV.

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commanded by a general whose staff includes two field officers, one of whom is breveted in the general staff, one captain, six noncommissioned officers and 24 privates.

The communication service is well manned in the battalions as well as in the regiments.

The battalions are mixed. One battery is armed with 77-mm. guns, M-1916 (range 10,700 meters); a second with 105-mm. light howitzers, M-1916 (range 9,700 meters); a third with variable armament: in the first battalion, this third battery is armed with four infantry guns, M-96-1916;\* in the third battalion there are 77-mm. mortorized guns whose official reason for existing is rapid intervention against fleeting objectives, but they are actually anti-aircraft weapons,† lastly, in the second battalion, the third battery is called an observation battery, charged with centralizing the instruction of observers and personnel who, during the War, belonged to the "Artillerie-Messtrupp" and the meteorological sections.

Each battalion has a light ammunition train of 39 wagons capable of carrying a total of 29 tons. In addition the division has non-specialized means of transportation.

One thing immediately noticeable in this organization is the variety of matériels belonging to the division, which thus possesses specimens of all matériels and all services authorized by the Treaty of Peace. The reasons for this are evident. Since the army of 100,000 men must at the same time be an army of instructors and a nucleus for the future mobilized army, it is indispensable both for instruction and mobilization that examples of all these permissible kinds of matériel should be found. The abundance of officers and noncommissioned officers on the staffs and in the batteries will easily permit expanding each of these units to three on mobilization. They have three sets of harness and trappings and a superabundance of transport wagons, optical instruments‡ and accessories of all kinds. Each peace-time battery will, without difficulty, form an excellent battalion, perfectly officered. The only actual difficulty lies in the *apparent* small number of available weapons. But we have already seen what we must expect in this respect.

Thus the organization and mobilization plans of the light artillery are well arranged. Evidently this is not the case as regards heavy artillery. Still, the Germans are trying hard to remedy this fault. As we have already stated, the Peace Treaty left Germany only 600 pieces of heavy artillery with which to defend its fortresses and coasts. They took advantage of this authorization in order to maintain specimens of all modern types of heavy matériel. But these pieces of heavy artillery have not been left at the places to which they were assigned, as they should have been. They have been allotted to instruction camps in order that, each summer for several weeks, all artillerymen with light regiments could get practice in serving them under the instruction of competent

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\* This is a weapon made with the tube of a 96-mm. gun mounted on a M-1916 howitzer carriage. This material is only a makeshift. Initially, the Germans began by supplying the infantry batteries with a new model gun, the infantry gun M-1918, weighing only 650 kg. in battery with a useful range of 5,000 meters. But the new gun was not satisfactory; furthermore, the Interallied Control Commission protested against its being placed in service and stopped its production. It has now been withdrawn; but we believe the Germans have not abandoned the idea, and they will continue to correct its imperfections.

† Very likely, also, these batteries constitute a center of instruction for the preparation of personnel in handling the future motor-drawn artillery.

‡ For example, each battery has 10 range finders.

## FIELD ARTILLERY—PAST, PRESENT AND FUTURE

heavy artillerymen. The control commissions, to be sure, have forbidden this sending of heavy pieces to instruction camps; but nothing will prevent the light artillerymen from being sent to the fortresses to study heavy matériel.

Since the Armistice the Germans have studied new kinds of matériel or have perfected types of matériel which were already started at the end of the War. Thus they have the motorized anti-aircraft M-1919 gun, and we have already called attention to the infantry M-1918 gun; they have spoken in divers publications of accompanying weapons of smaller caliber, of anti-tank guns and guns for use against low flying aircraft, of 30-cm. pieces with considerable range and rapidity of fire, equipped with appliances to reduce the noise of firing. The press has cited very numerous patents taken during the last year by Krupp and diverse other firms who continue their interest in war machines; let us cite only:

*Krupp*: Device for supporting the chassis of a railway artillery carriage on a revolving platform; mechanical time fuze; recoil mechanism for an artillery gun on its carriage; caterpillar for artillery vehicles.

*Hugo E. Bremer*: Caterpillar vehicle corresponding particularly to the needs of the army.

*Goerz*: Periscope with variable magnification, etc., etc.

They are still interested in very large matériel. According to the *Technik und Wehrmacht*, the Germans think that their 420-mm. is insufficient and they foresee larger calibers.

Neither do they forget the ever-increasing interest in range, even though they know they are well advanced in this respect in relation to all other countries. They ask that the proportion of guns to howitzers in the heavy artillery be increased. From 28 per cent, which it was, it would become 40 per cent.

Another preoccupation: The increase in mass of artillery will render adjustment more difficult in spite of the care taken with the organization of observation. It is therefore necessary to head the artillerymen toward the scientific preparation of fire. They insist upon this in the firing instructions and in tactical regulations.

We know that the Conference of Ambassadors has authorized Germany to recommence manufacture, importation and exportation of commercial aeronautical material, provided she accepts certain rules for differentiation between commercial and military machines and recognizes the authority of a Committee of Guarantee for Aeronautics as a permanent organ of control. The Reichstag accepted all these conditions and officially recommenced manufacture on May 5, 1922. But the surveillance of the Committee of Guarantee is very aleatory, and it is now apparent that Germany seeks, with all the means in her power, to free herself from this control and to avoid the regulations imposed upon her. Germany is having machines built abroad; the firms of Junker at Dessau and Zeppelin at Friederichshafen are manufacturing parts for these machines in quantity; all aviation firms are carrying on secret research in their laboratories. The recent sensational success acquired by the German hydroplanes in the Italian races indicates that all this secret work is already bearing fruit. The easy transformation of commercial manufacture to military manufacture will soon permit Germany to have powerful military aviation in spite of all control.

A still graver menace appears in the hegemony which Germany still continues to exercise in the chemical field, which she has even augmented

## THE FIELD ARTILLERY JOURNAL

since the War. It is no secret to anyone that the chemical production plants, especially the color dye producers, can adapt themselves in a very short time to the production of asphyxiant and toxic gases. Besides, since the beginning of peace, she has produced considerable quantities of substances indispensable for commercial use which are also ingredients of toxic gases; for example, chlorine and oxide of carbon which are the constituents of phosgene, sulphur and ethylene which serve to manufacture mustard gas, chloride of lime, and picric acid from which chloropicrine is derived. Germany is assured of a real monopoly in the manufacture of these products, the use of which no one could think of prohibiting in time of peace. She has grouped her most important chemical plants (Badische, Agfa, Beyer, Farbenwerke, etc., etc.) in a vast cartel under the name "Interessen Gemeinschaft," whose producing power is formidable\* and which could furnish in a few days, without change in equipment, thousands of tons of toxic gases.†

In concluding this hasty exposé of the German post-war effort, it may be interesting to cite a few recent opinions of high German military officials on the question of artillery.

General Rohne, in the October-November, 1919, number of "Artilleristische Monatshefte," gives Ludendorff's ideas on artillery as follows:

"The fundamental idea of liaison between arms is included in this phrase of the *Regulations for Infantry Maneuvers*: 'The infantry bears the principal burden of combat; it is the arm which suffers most; it also gets the greatest glory.' The artillery, even though it played more and more, during the course of the War, the principal combat rôle, and though it constituted the very foundation of the front, cannot deny that this phrase is perfectly applicable to the infantry. On the other hand, it had to struggle against the idea which unfortunately came from instructors for the use of artillery, that the infantry was the principal arm. 'There is no principal arm,' said Ludendorff; we see from that the high esteem he had for the artillery.

"All efforts should logically tend toward intimate cooperation of the two arms. When Ludendorff took up his duties as Commander-in-Chief his first care was personally to inspect the manner in which this cooperation was assured on the Western Front.

"He became certain that for the infantry to retain its capacity for resistance, especially in the face of *superior enemy artillery*, it was necessary to reenforce the artillery to the limit in matériel and supply of ammunition."

Rohne spoke of the superiority of the French artillery.‡ It is interesting to know what Hindenburg and Ludendorff thought of this.

Hindenburg wrote, in his memoirs, that at the time of choosing the front of attack for the great offensive of March, 1918, it was necessary to take into account the following consideration:

"German officers and soldiers considered the French artillery as a redoubtable adversary—as the principal adversary."

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\* 12,000 tons of coloring matter in January, 1921, exceeding the pre-war monthly production by 750 tons.

† On this subject see the book of Major Lefébure of the English army, where the author very justly qualifies as "the riddle of the Rhine" formidable problems raised by these questions, which are both economical and military.

‡ We have already cited a statement from him which renders homage to this superiority and attributed it to the method of obtaining artillery officers.

## FIELD ARTILLERY—PAST, PRESENT AND FUTURE

And a little later, when the great offensive was stopped before Amiens, he adds:

"The French have come back; their successive attacks and their artillery so skillful in battle, have saved the situation for their allies as well as for themselves . . . The great battle of France is ended."

As for Ludendorff, he cited our artillery as an example for his cannoneers repeatedly during the War. On July 20, 1917, he wrote:

"Our troops have declared many times that the French are superior in the art of fire."

And, on August 1, 1918:

"In one month the enemy fire has destroyed 13 per cent, in round figures, of our weapons engaged in battle."

Lastly, in an article which appeared in 1920, in the "Technik und Wehrmacht," the author, after glorifying the German army, recognized that this powerful machine organized by the Hohenzollerns presented certain defects:

"In particular, he said, the special arms, principally the artillery, did not receive the consideration they should have been given by us. Encouragement and favors were reserved for the principal arms of the old army, the infantry and the cavalry. And even in the artillery itself the horse artillery was held above the light artillery, and fortress artillery was relegated to the last rank.

"This situation was far from being favorable to the field artillery, which was thus forcibly deprived of its technical character, while the War has shown, on the contrary, how much more important technical studies are than equestrian performances!

"In other countries, France in particular, the artillery enjoyed a privileged existence. It should have been the same in Germany. Did not Frederick the Great write in 1777: 'If bravery and strength of combatants was formerly sufficient to assure victory, today it is the artillery which decides all.' And did not the War of 1870-1871 prove the preponderant influence of that arm? Since that epoch how inferior the rôle of the cavalry appears compared with that of the artillery!

"But Germany did not profit by these lessons, and qualification as an *arme d' elite*, with the advantages which it carried, were uniquely reserved for a certain number of infantry regiments, but principally for the cavalry. The number of members of royal families commanding regiments of artillery was very small compared to those commanding regiments of cavalry. The training of the Ex-Crown Prince would not have been considered complete if he had not acquired full competence in the infantry and the cavalry; but he had only one tour of command in the artillery, without even taking the uniform of the arm! Also certain generals who came from the artillery and who distinguished themselves during the war as army commanders, Schubert, Gronan, Scholtz, Gallevitz, were not considered sufficiently qualified to command any army corps before the War. They were employed uniquely in special artillery work or as governors of fortified places, and one would hardly be mistaken in seeking the motive of this exclusion in the fact that they were only artillerymen (Nur Artilleristen). They had without doubt forgotten that Napoleon I came from a technical arm and was also *only an artilleryman!*"

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Unfortunately for us, it is obvious enough today that this sort of ostracism of the artillery did not survive the War and that this arm has gained a place in Germany which may surprise us.

### ENGLAND

It seems at first glance that England has not gained much from the lessons of War. Since the armistice compulsory service has been abolished; recruiting for the army is only by voluntary enlistments, the same as prior to 1914; for economical reasons the size of the budget decreases every year. It is fair to recognize that the danger of invasion of the United Kingdom has momentarily disappeared, since the German fleet has ceased to exist,\* and that the country should profit thereby to rest after the admirable effort she made during the War and to think only of her economic development.

A more careful examination of the question gives a different impression. If the peace-time effective strength of the army is sensibly reduced, numerous measures have been taken to compensate for this cause of weakness such as more powerful armament, increase in matériel, intensive use of all the new means which industry places at the disposal of combatants, and by improvements in instruction.

The reorganization of the army has given a large place to scientific and industrial research applicable to the art of war. As the British army unquestionably lacks technicians, the War Office has called upon scholars and engineers; numerous Technical Committees for direction or research have been created or reconstituted, and most of them include a large number of civilians. There are several purely civilian organizations (chemical, mechanical, civil, radio, etc.) with which the army keeps in close touch, and which have been grouped in an independent ministry, the *Scientific and Industrial Research Department*. This ministry possesses a laboratory which carries out numerous experiments for the War Ministry. The Directing Committees, composed of members from the army, of representatives from diverse ministries and of experts belonging to commerce and industry, are the following:

1. Ordnance Committee, which handles all questions relating to construction and use of cannon, munitions and explosives, and studies all progress of science from the point of view of their application to artillery.
2. Royal Artillery Committee, which handles accessory equipment for artillery matériel, sights, range finders, etc.
3. Small Arms Committee.
4. Chemical Warfare Committee.
5. Royal Engineer Board.
6. Research Committee.
7. Imperial Mineral Resources Bureau.

These committees have at their disposal experimental commissions, the principal ones of which are the following:

1. Research Department at Woolwich charged with studies prescribed by the Ordnance Committee, the Navy, Aviation, and the Minister of War.

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\* During the discussion of the budget for 1922-1923, Marshal Wilson, nevertheless, called attention to the fact that this argument was not valid because at no time before the war had the eventuality of danger from Germany ever been considered in connection with the organization of the army.

## FIELD ARTILLERY—PAST, PRESENT AND FUTURE

2. Experimental Establishment for Artillery at Shoeburyness.
3. Small Arms and Machine Guns Experimental Establishment.
4. Chemical Warfare Experimental Station.
5. Tank Design and Experimental Establishment.
6. Signal Experimental Establishment, which is charged with communications and sound ranging.
7. Searchlight Experimental Establishment.
8. Camouflage Experimental Establishment.
9. Experimental Bridging Company.
10. Experimental Section, Royal Engineers, which is charged especially with mine work.

To appreciate fully the interest which the British government is taking in the development of technical studies, it will suffice to compare the sums appropriated in the last pre-war budget with those of today. The following table is wholly characteristic in this respect:\*

	1913-1914†	1920-1921	1921-1922
Total budget of the War Department .....	1,540,000,000	2,037,500,000	3,455,800,000
Expenditures of the Committees of			
Direction .....	1,043,000	9,542,000	13,635,000
Expenditures of the Experimental			
Committees .....	1,425,000	25,362,000	38,360,000
Total Technical Expenditures .....	2,468,000	34,804,000	51,995,000
Proportion in the total Budget.....	0.1%	1.1%	1.5%

The division of funds between the different committees and commissions is no less interesting to reveal.

In 1921-1922, the 13,635,000 francs allotted to the committees were apportioned as follows:

Ordnance Committee .....	6,715,000 or 49.5%	} Total 55.9%
Artillery Committee .....	875,000 or 6.4%	
Small Arms Committee.....	3,260,000 or 24.0%	
Chemical Warfare Committee .....	2,000,000 or 14.5%	
Engineer Committee .....	785,000 or 5.6%	

In addition the Ordnance Committee receives a total of 2,250,000 francs from the Navy and from the Aviation, and the Chemical Warfare Committee works in partial collaboration with it. We see then that the artillery receives much more than half of this budget.

It is the same thing for the experimental commissions. The two commissions of artillery and chemical warfare alone receive more than twice all the others put together.

To evaluate properly these figures, we must not forget that Great Britain maintains three distinct and independent ministries: War, Navy, and Air Force. The War budget is completely independent of the two others, and the War Office receives scarcely one-quarter of the sums devoted to national defense.

The new arms, aviation, tanks and gas, have in particular held the attention of the War Office.

As far as aviation is concerned, the English think that it constitutes with the navy the principal element of defense of the national soil, the army having most value in the colonies. So aeronautics has undergone considerable development; it comes under an Air Ministry which is wholly independent and which has a special budget which, after representing only 1.8 per cent of the total budget for national defense in 1914,

\* All the figures enumerated in this table are expressed in francs at a rate of exchange of 50 francs per pound.

† The English fiscal year is from April 1 to March 31.



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attained 14 per cent in 1920-1921, and reaches 17 per cent in 1921-1922 (900,000,000 francs). After the economies demanded by the Geddes Committee, these figures were reduced to 780,000,000 for 1922-1923; but we should note nevertheless that aviation effectives were increased by 1,000 men, and that the funds allotted to experimental services and technical research were raised from 25 to 41 millions. Let us add that the Air Ministry is aided by an Air Council, just as the War Ministry is aided by the Army Council, and that the Air Force possesses its own military school for obtaining its officers.

The English see in tanks, independently of their offensive power in liaison with the infantry, an arm for support of the cavalry, especially in colonial countries. Thus, after having sought above all to perfect the heavy and powerful armed tanks, like the Mark V Composite (30 tons, speed 5 km., armed with one 57 gun and 5 machine guns), then the Medium C (20 tons, speed 6.5 km., armament 3 machine guns), they tried out a lighter and speedier model, the Medium D, which is supposed to pass through water,\* follow the cavalry at any pace, and which is only armed with machine guns and grenades. The expenditures made for all tank studies, which reached 2,000,000 francs in 1920-1921, were raised to 3,250,000 francs in 1921-1922.

Also, the importance of gas has not escaped the English. During the War, the British Government founded, for the needs of the chemical industry, a powerful society with a capital of 200,000,000 francs, The British Dyes Company. The Government put up 84,000,000 francs of this. Since then this society has been conserved and strengthened and its capital has been raised to 480,000,000 francs.

To fight against German competition, which has become more redoubtable than ever, the government voted a law protecting the dye industries in 1921, which places prohibitive tariff on the entry of foreign products. During the debate which preceded the passage of that law, the Minister of Commerce and the Secretary of War declared:

"There is close connection between the manufacture of dye products and that of explosives and chemical ammunition. It is easy to change from one to the other.

"The security of our country requires a marvelous organization of the chemical industry.

"The principal lesson of the last war is that the nation which possesses powerful dye product companies possesses the strongest arm which will assist in winning a war."

To organize this industry still better, Lord Moulton, the director of the British Dyes Company, sent out pleas for a public subscription of 12,500,000 francs for the purpose of creating at London a sort of general headquarters for chemists, where industrial men, scholars and military personnel could exchange ideas, work in common and have laboratories with modern equipment, a well-stocked library and a well-informed periodical review.

Lastly, let us remark that the expenditures for gases, which were 3,250,000 francs in 1920-1921, were raised to 6,250,000 francs in 1921-1922.

Like all other nations, England attaches great importance to questions of instruction. New schools were created in 1920: Central School for

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\* During experimentation this tank was able to cross a swamp floating, but it sank while attempting to cross the Thames River.

## FIELD ARTILLERY—PAST, PRESENT AND FUTURE

Small Arms, Machine Gun School, Gas School, Tank School, School of Liaison, and the Artillery and Engineer Technical Schools. The funds allotted for all schools and centers of military instruction are increasing regularly, as shown by the following table:

	1920-1921	1921-1922
College at Sandhurst.....	6,625,000 francs	11,500,000 francs
Staff School.....	3,000,000 francs	4,250,000 francs
Miscellaneous Schools.....	5,600,000 francs	6,800,000 francs
Artillery School.....	4,430,000 francs	11,150,000 francs
Engineer School.....	3,250,000 francs	5,600,000 francs
Total.....	22,905,000 francs	39,300,000 francs

As a comparison let us add that in 1913-1914 the total funds allotted to schools did not exceed 1,500,000 francs, or 0.16 per cent of the War Department budget; in 1921-1922 it reached 39,000,000 francs, or 1.1 per cent of the War Department budget.

Before the War, engineer officers received special pay. During the War all pay was equal, but after the armistice the increases given to technical officers were reestablished and extended to include supply, tanks, and communications. The officers of these arms or services receive an increase in monthly pay which amounts to 20 francs for lieutenant colonels, 15 francs for majors, 8 francs for captains and 6 francs for lieutenants. Awake to the importance which specialists of all kinds have gained in modern armies, the British government also allows increases in pay to soldiers who know a trade applicable to things military.

Special measures have been taken to assure the instruction of officers of the Territorial Army; strict collaboration exists between the army and the experimental establishments.

Primary schools prepare the soldiers. Secondary schools and universities train the officers with the aid of a special military organization, the Officers' Training Corps. The young men in the secondary schools constitute the division of "Junior" Cadets, actually numbering 30,000; the university students form the division of "Senior" Cadets to the number of about 3,200.\* Each of these divisions must put in fifteen days each year in a camp of instruction. In 1922, about 11,000 "Juniors" and 2,700 "Seniors" responded to the call of the military authorities. However, there are courses of military instruction conducted in 150 colleges and universities. Candidates who successfully pass the final examination are given certificates which permit them to enter the territorial army as lieutenants and even as captains.

The High Command has been completely reorganized. We know that the general staff contained three bureaus during the War:

The Bureau of Operations, analogous to our G-3.

The Bureau of Intelligence, corresponding to our G-2.

The Bureau of Staff Duties, charged with instruction and organization.

In July 1922, the General Staff was reorganized. The two first bureaus were united, going back to the pre-war scheme, and the old bureau of military instruction was reestablished. The three bureaus are therefore the following:

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\* This relatively low figure is explained by the fact that most of the present university students were in the War and feel that they are sufficiently instructed in the military art.

## THE FIELD ARTILLERY JOURNAL

1st Bureau: Operations and intelligence.

2nd Bureau: Military Instruction.

3rd Bureau: Staff Duties (Military Organization and Preparation).

As for the War Office, it is divided in six departments, reporting directly to the Minister without interposition of any other office, and with well-defined duties which do not overlap.\*

Here it is interesting to compare the services which are connected with artillery in the War Office with similar services at the French Ministry of War.

In France, the General Staff of the army is one authority, the Director of Artillery is another; it appears that the Chief of the General Staff and the Director of Artillery report direct to the Minister. Questions of mobilization, personnel, organization, tactics, schools, etc., are handled conjointly by the General Staff and the Artillery. If no conflicts arise among them, if this dual responsibility and initiative generally leads to no difficulties, this is wholly because the officers of these two organizations are filled with the best intentions and animated by an excellent spirit of friendship.

In England, mobilization, recruiting, and personnel are directed by the Adjutant General, who reports directly to the Ministry. Maintenance and surveillance of war supplies, etc., are handled by the Quartermaster General, who also reports directly to the Ministry. There is therefore no dual responsibility. As for technical questions, whether they pertain to artillery or engineers, they are all a responsibility of the Ordnance, which is considered as a capital organization because industry, science and technique played a rôle of first importance during the War.

Thus the Ordnance Department centralizes in itself all questions of armament. On mobilization, it can be formed instantly, with the directing committees and experimental commissions which are responsible to it, into a veritable Ministry of Armament. The funds allotted to it have more than doubled since 1914, although its personnel has been reduced 50 per cent. The English justly believe that it is preferable to have fewer employees with plentiful facilities than too many employees with insufficient facilities.

A committee for the reorganization of the army has been created. Composed of the highest military authorities, it has furnished extremely interesting reports.

They believe that the present necessities require that a division be supplied with as many guns as it can permanently maintain without losing its mobility and without being incapable of supplying the necessary ammunition. The British division will therefore be organized for war of movement or open warfare; it will include only field guns and light howitzers. The artillery matériel which will be necessary to face the situation created by "the intervals of trench warfare" will be grouped apart in elements of the corps or of the army.

Actually the British division includes, for twelve battalions, 54 18-pounder guns (83.8 mm.), and 18 4.5 inch howitzers (114.3 mm.)

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\* 1st, the General Staff (The Chief of the General Staff).

2nd, General Administration (Adjutant General).

3rd, Supply and Transportation (Quartermaster General).

4th, Ordnance (in charge of all armament).

5th, Territorial Affairs (Under Secretary of State).

6th, Finance (Credit and Pay of the Army).

## FIELD ARTILLERY—PAST, PRESENT AND FUTURE

totalling 72 guns. But they plan besides, for each division, a minimum of:

- One or several battalions of 18-pounders.
- 24 6-inch howitzers.
- 8 60-pounder guns.
- 4 8-inch howitzers.
- 18 medium caliber trench mortars.
- Eventually more very heavy howitzers.

Note that the field battery, which had 6 pieces formerly, now has 4 pieces like all other armies, in imitation of our own.

The committee has demanded the creation of a "commander of artillery for the group of armies." This general officer, aided by an appropriate staff, would be placed near the Chief of Staff of the group of armies to advise him and to control the work and use of the artillery.

The different artillery staffs, although already richly supplied, are considered to have insufficient officers, secretaries, means of transportation and communication.

Lastly, they believe that the personnel of the observation sections, sound ranging and orientation, should belong to the artillery, and that each army should possess a calibration section.

In concluding, let us sum up the tendencies which are now coming to light in artillery matters.

Different writers emphasize the importance of the scientific training of artillery officers.

The *Woolwich Review* having started a competition on the subject of "the reorganization of the artillery with a view to obtaining the best efficiency from modern armament in war with a minimum expenditure of human energy," an interesting work, signed by Lieutenant Colonel Vandeleur of the British artillery, has appeared on this subject in the *Journal of the Royal Artillery*. This officer believes that "gunnery is becoming more of an exact science every day. All guns, from the largest 'Big Bertha' to the smallest rapid fire gun, have numerous points in common, and, in a certain measure, all artillerymen should be instructed in the same school." He asks that the heavy artillery and the light artillery be combined and that the anti-aircraft batteries be attached to the artillery. He insists upon suitable officers directing scientific research, studies and even production, be able, if necessary, to guide the constructors of industry. "The best brains of the nation," he adds, "are interested today in these questions of armament."

The English were very well supplied with matériel and munitions at the end of the War. We do not know how they stand now, and we are little informed on the results of their studies of matériel. At any rate we know two things:

Very long range weapons excite a legitimate interest. Parliament has invited the government to follow closely the experiments of a certain French engineer who claims to obtain ranges of 200 kilometers with his "turbo-cannon." In fact they have not forgotten that the Germans have demonstrated the possibility of crossing the channel of Calais with certain trajectories.

Automobile transportation is the order of the day for all artillery, even light artillery. All 6-inch howitzer batteries are already equipped with tractors, and tests are going on also to motorize the 18-pounder guns and the 4.5-inch howitzers. They hope thus, while realizing important economies in men and horses, to increase strategical and tactical mobility.

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It appears that a system of flexible caterpillar treads will permit of obtaining speeds in excess of 30 kilometers over the road and of easily progressing over all terrain.

From all of which we can conclude that England, obliged by the economical situation to reduce her contingents and to limit her military credits, tries with all the means in her power to compensate for this cause of weakness.

The territorial army has become a veritable second line army, endowed with the same facilities as the regular army. The volunteers for that army must consent to serve overseas.

In order to obtain the necessary number of enlistments, and particularly the specialists who are so indispensable to modern armies, pay, allowances and longevities of all kinds have been increased.

The military schools have been increased in number and allotted increased credits.

Armament, matériel, and technical facilities have been developed; a powerful air force has been established.

Lastly, the technical committees and the experimental commissions have gained considerable importance and have been given increased allowances; close collaboration is established between the army, science and industry.

*(To be continued)*

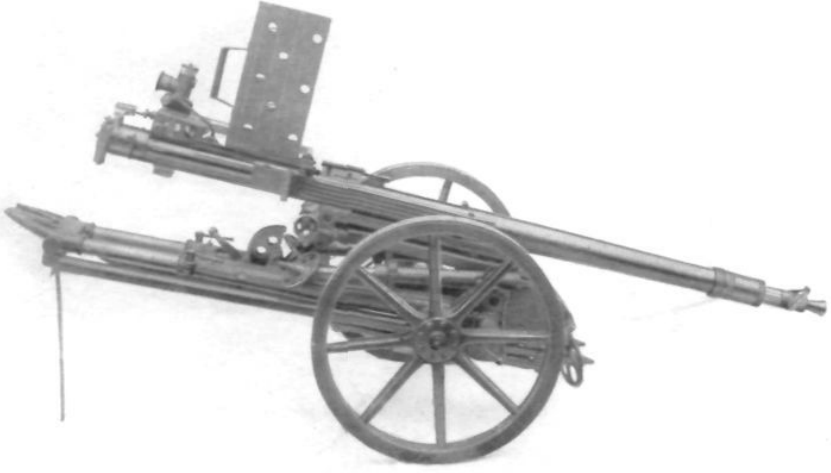


PLATE I

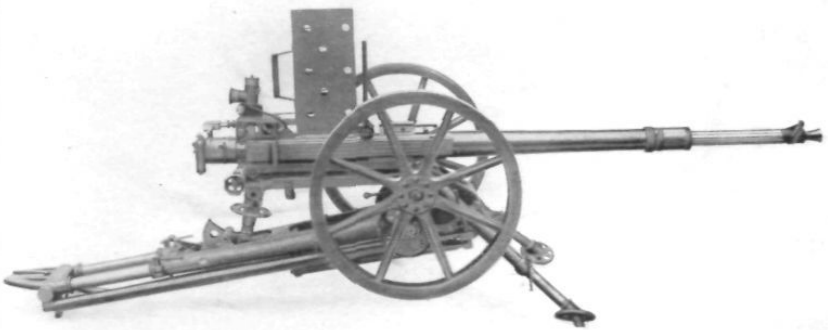


PLATE II

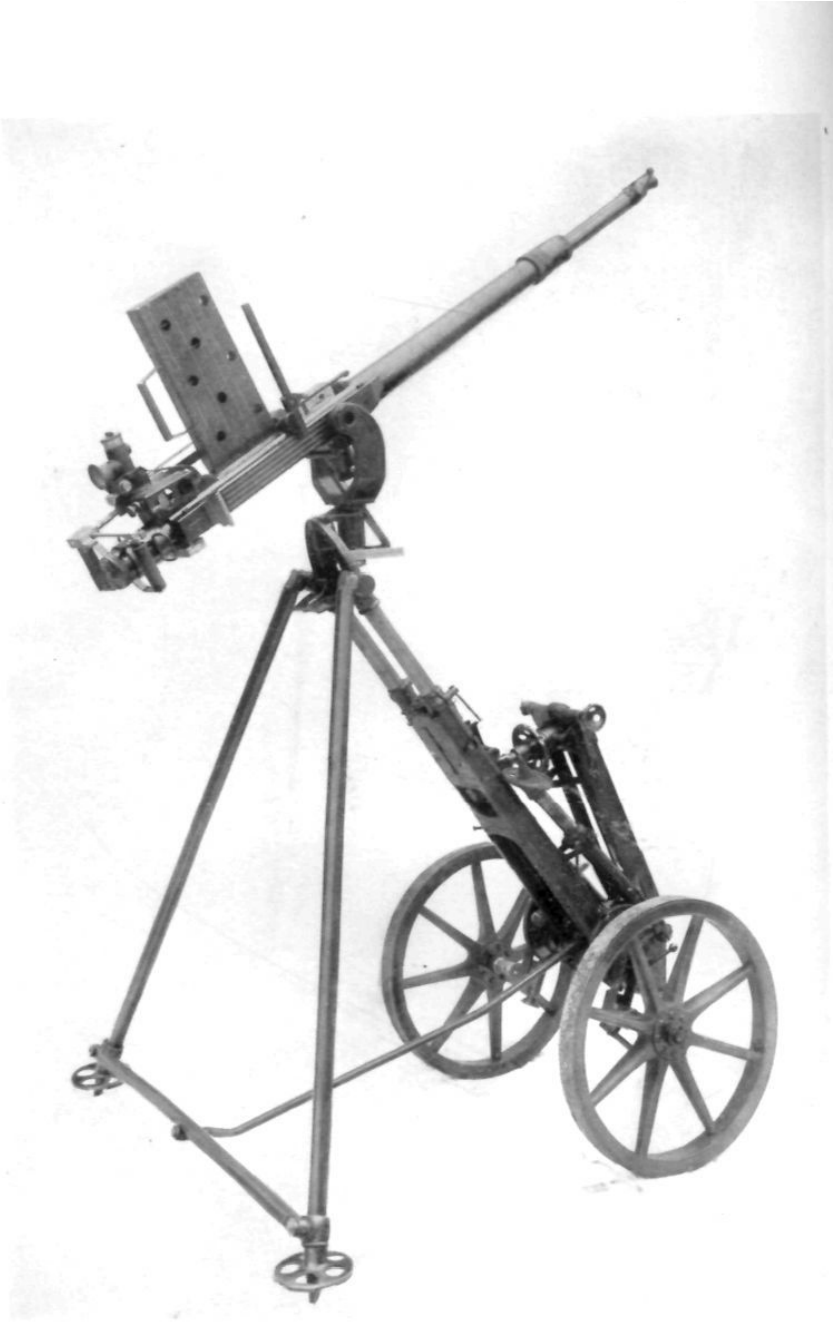


PLATE III

## OERLIKON ANTI-TANK AND ANTI-AIRCRAFT GUN

IN A RECENT number of the *Revue d'Artillerie*, Major Morel of the French Army describes a weapon which has been perfected in Switzerland and which possesses characteristics that render it particularly valuable against both tanks and aircraft. The history of its development is briefly as follows: Towards the end of 1918 the Becker automatic gun, designed for use against mechanized elements, made its appearance. After the Armistice all patents were sold to a Swiss concern, which made some improvements and presented the weapon under the name of the "Semag" gun. Finally the Oerlikon Company of Zurich, Switzerland, took over all patents and, after considerable experimentation and perfecting, has turned out the weapon described below.

The gun is the magazine loading, recoil operated type, 20-mm. caliber. The magazine carries fifteen cartridges. The following table gives the characteristics of the weapon:

Length of piece .....	2m.	Maximum pressure .....	2600 kg.
Number of grooves .....	9	Weight without magazine .....	60 kg.
Depth of grooves .....	0.4 mm.	Weight of magazine (empty) .....	3 kg. 250
Pitch of rifling .....	5°	Weight of magazine (loaded) .....	7 kg. 300
Muzzle velocity .....	860-900 m. sec.	Rate of fire.....	280-300 rds. per min.

The excellent photographs which illustrate this article were loaned through the courtesy of the *Revue d'Artillerie*.

As the gun is intended for accompanying infantry, the mount is made so as to permit either hauling or carrying (Plate 1). It also provides for high angle fire against aircraft.

The mount comprises an adjustable tripod carrying a cradle trunnioned on it and operated by an elevating screw. The cradle itself carries a plate to which the gun is attached and which is operated in azimuth by the traversing screw. The whole is mounted on wheels from which the gun can be fired if necessary.

Ordinarily, however, the wheels are lifted, the front tripod legs are lowered, and the gun fired from the tripod base (Plate 2). If the piece has been transported by hand, the wheels must be mounted prior to firing, as their weight is used to assure the stability of the mount in its firing position. The piece may be assembled in one minute, the gun crew remaining completely under cover.

For action against aircraft, the trail is raised and a pair of supporting legs are let down from the trail spade (Plate 3). The gun is taken from the carriage and mounted on an anti-aircraft attachment pivoting on the spade. The gunner firing from a kneeling position can rapidly manipulate the gun at any azimuth. The



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anti-aircraft attachment can also be placed on the mount in its normal position (Plate 4), allowing rapid manipulation in azimuth for fire against tanks and also a certain amount of anti-aircraft action.

The mount weighs 242 pounds. It provides a horizontal field of fire of  $16^{\circ}$  and a vertical field of minus 35 to plus 200 mils.

Transport by hand requires two men for the gun, two men for the cradle and anti-aircraft attachment, two men for the tripod, and two men for the wheels and spare part kit. The transport of ammunition requires one man for eighty cartridges.

An armor piercing shell with high explosive or incendiary filler and without fuse is provided for use against tanks; against personnel and aircraft, and to indicate targets to the artillery, a high explosive or incendiary shell with super-quick fuse is used (Plate 4). A proportion of tracer shells, visible to 2,000 meters, is provided. The A. P. shell weighs about a third of a pound and will penetrate six-tenths of an inch of armor plate at 1,200 meters.

The manufacturers claim that the weapon functions with great reliability even during long sustained fire. The mount has been carefully designed to provide stability with light weight, and the only defect appears to be the small horizontal field of fire, which would be insufficient against tanks. The anti-aircraft attachment, however, when placed on the mount provides for a free all-around motion in azimuth.

The Oerlikon gun is at present believed to be the most simple and powerful weapon of its type and marks an interesting development of the automatic weapons.

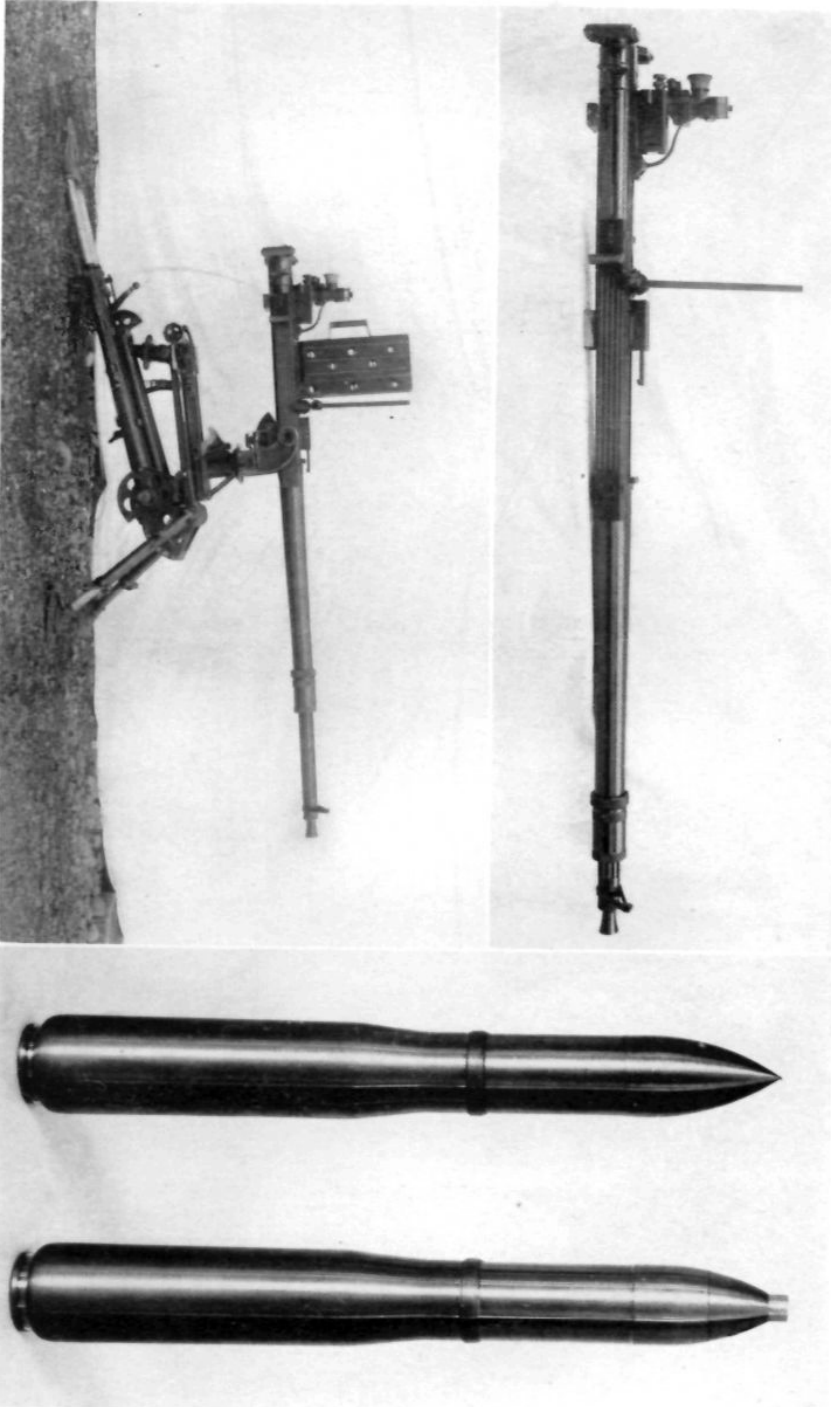


PLATE IV



CAPT. Z. E. LAWHON, F. A.

MR. LEONARD FIRESTONE

MR. ARTHUR BORDEN

CAPT. W. C. LATTIMORE, F. A.

# POLO

## ARMY POLO ON LONG ISLAND

ACTIVITIES at the Army Polo Center at Mitchell Field were completed for 1928 by the participation of the Army team in the Open Championship and Monty Waterbury Cup matches. These tournaments were delayed and suffered somewhat through the postponement of the Championship of the Americas; until the excitement of the series between the Argentines and Americans was over, nobody could give much thought to any other polo. Considerable interest was added to the Open Championship and Monty Waterbury Cup by the fact that civilian teams were made up almost entirely of international polo players, with both the American and Argentine players combining new line-ups and playing as teammates instead of opponents. Players and scores were as follows:

### OPEN CHAMPIONSHIP

#### *First Match, October 9*

<i>U. S. Army, 9</i>	<i>Eastcott, 8</i>
Capt. C. A. Wilkinson } .....	Mr. A. C. Schwartz
Lieut. M. McD. Jones } .....	
Capt. C. H. Gerhardt .....	Mr. Earl Hopping, Jr.
Capt. Peter P. Rodes .....	Mr. Earl Hopping
Capt. G. E. Huthsteiner .....	Mr. Manuel Andrada

Referee: Mr. J. C. Cooley

#### *Second Match, October 9*

<i>Meadow Brook, 10</i>	<i>Sands Point, 9</i>
Mr. C. V. Whitney .....	Mr. S. B. Iglehart
Mr. Winston F. C. Guest .....	Mr. Stephen Sanford
Mr. John B. Miles .....	Mr. Thomas Hitchcock, Jr.
Mr. Malcolm Stevenson .....	Mr. Lewis L. Lacey

Referee: Capt. Wesley J. White

#### *Final Match, October 11*

<i>Meadow Brook, 8</i>	<i>U. S. Army</i>
Mr. C. V. Whitney .....	Lieut. M. McD. Jones
Mr. Winston F. C. Guest .....	Capt. C. H. Gerhardt
Mr. John B. Miles .....	Capt. Peter P. Rodes
Mr. Malcolm Stevenson .....	Capt. G. E. Huthsteiner

Referee: Mr. J. C. Cooley

### MONTY WATERBURY CUP

#### *First Match, October 11*

<i>Sands Point, 12</i>	<i>Eastcott, 11</i>
Mr. E. T. Gerry .....	Mr. Stephen Sanford
Mr. W. Averell Harriman .....	Mr. Earle Hopping, Jr.
Mr. S. B. Iglehart .....	Mr. Earle Hopping
Mr. Thomas Hitchcock, Jr. ....	Mr. A. C. Schwartz
Earned, 12	Earned, 9; Hcp. 2

Referee: Capt. Wesley J. White

## THE FIELD ARTILLERY JOURNAL

### *Second Match, October 11*

<i>U. S. Army, 10</i>	<i>Meadow Brook, 8</i>
Lieut. M. McD. Jones.....	Mr. C. V. Whitney
Capt. C. H. Gerhardt.....	Mr. Winston F. C. Guest
Capt. Peter P. Rodes.....	Mr. John B. Miles
Capt. G. E. Huthsteiner.....	Mr. Malcolm Stevenson
Earned, 5; Hcp.5	Earned, 3

Referee: Mr. J. C. Cooley

### *Final Match, October 13*

<i>Sands Point, 13</i>	<i>U. S. Army</i>
Mr. E. T. Gerry.....	Lieut. M. McD. Jones
Mr. W. Averell Harriman.....	Capt. C. H. Gerhardt
Mr. Thomas Hitchcock, Jr.,.....	Capt. Peter P. Rodes
Mr. S. B. Iglehart.....	Capt. G. E. Huthsteiner
Earned, 13	Earned, 9; Hcp. 2

Referee: Capt. Wesley J. White

In the Army-Eastcott game, which was played on International Field, Captain Wilkinson was hit so hard in the face with a ball that his jaw was broken, necessitating his retirement from the series. This has been his hard luck year. An excellent polo field is being made by the Army team at Mitchell Field. It will be a great help to the Army to have a field of its own on Long Island.

#### POLO AT FORT SILL

During the last year interest in polo has increased rapidly both among players and spectators at Sill. There are now two fields at the Club House, and the Sunday games attract large crowds, including many civilians.

The Academic Division carries ten goals when lined up with the strongest players. There are really two Academic teams, the "Whites" and the "Black and Whites." The polo playing instructors are Majors Brewer, Devers, Daly, McBride, Harris, Peyton, Swing, Captains Watkins, Shea, Lieutenants Stewart, Carpenter, Sargent and Kitts.

The regiments also have teams as follows: 1st F. A., Captain Hart, Lieutenants Hood, Moore, Hopkins and Harris; 18th F. A., Captain Hayes, Lieutenants Uncles, Borden, Miller and Potter.

#### POLO AT PRINCETON

Princeton University now has two good playing fields, one of which is used for practice and the other kept in shape for match play.

The R. O. T. C. building surrounds a splendid riding hall, dimensions 90 feet by 300 feet, which is used throughout the winter months for indoor play. Indoor polo usually begins about November

## POLO

10 and continues until April, which is the earliest practicable to resume outdoor play in this climate.

There are sixty playing members of the Princeton polo squad this year, about thirty of whom are freshmen, eighteen are upper classmen on the second squad, and the balance make up the varsity team and most likely aspirants.

Each man on the freshman and second squad gets two days of play weekly, the freshman Monday and Friday, and the second squad on Tuesday and Thursday. The varsity practices on Monday and Friday and scrimmages against picked opposition on Wednesday.

There are about forty private ponies owned by players and maintained in private stables in the vicinity of the campus. Aspirants who are unable to provide their own mounts are mounted on the best available ponies from the R. O. T. C. stables. This privilege, of course, is extended only to students who are members of the R. O. T. C. unit. Practically all polo players at Princeton, however, are members of the unit, whether or not they depend on it for mounts.

Two officers on duty with the artillery R. O. T. C. unit at Princeton act as coaches and attend to maintenance of fields, etc. The business management, arrangement of schedules, etc., are handled by undergraduate members and alumni of Princeton who are interested in polo.

A team from Princeton composed of two R. O. T. C. students, Mr. Arthur Borden and Mr. Leonard Firestone, and two officers on duty with the unit, Capt. Z. E. Lawhon and Capt. W. C. Lattimore, defeated the 1st Division team from Fort Hamilton in the finals of the Second Corps Area Military Championship at Governors Island on October 2, 1928, winning the second leg of the Commander's Cup, presented by General Summerall in 1926. The score was 15-5. The tournament was held at Governors Island between September 9 and October 2, 1928. The following teams were entered: 102nd Cavalry, Governor's Island, 105th F. A., 112th F. A., 104th F. A., Organized Reserves, Fort Hamilton, Cornell, Squadron A, 101st Cavalry, and Princeton R. O. T. C.

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"The Journal of the Royal Artillery," October, 1928.

"Duncan" Silver Medal Essay, 1927-28. This essay, by Major R. G. Cherry, M. C., R. A., won the second prize for the silver medal. The essay which won the gold prize was printed in the July number of the *Royal Artillery Journal*, and reviewed in the last number of the FIELD ARTILLERY JOURNAL. Since all essays submitted in this competition had the same subject, a large amount of duplication is naturally found. However, various points of view appear. Major Cherry's opinion of Anti-Aircraft Artillery is summed up in his conclusion, in part as follows:

"In a subject like this, which deals with a branch of the Regiment [The British at times say 'Regiment' where we would say 'Arm.'—ED.] still in its infancy, almost unknown to the rest of the Army, being, as it were, a link between the Army and the Air Force, it is necessary to avoid extreme views. On the one hand, there are many who state that A. A. gunnery is quite different from ordinary gunnery, and there is no meeting point. On the other hand, there is the school who think that a gun should be able to take on any and every sort of target. The answer to the problem appears to be that a compromise must be found. Admitted that A. A. gunnery at high altitudes presents a problem quite different to that presented by objects on or near the ground, then this problem must be solved by the special instruments held by the A. A. batteries. Admitted that the increase of mechanization will lead to more low flying, then it is imperative that means should be devised to make such low flying costly to the aeroplane. It cannot be emphasized too strongly that the antidote to the ground strafing aeroplane is the light automatic, and that much more attention should be devoted to the use of this weapon against aeroplanes, even up to 3,000 feet. It cannot, however, be expected that many casualties will be caused at the moderately low heights, especially as the aeroplane of the future will probably have the bottom of the engine and fusilage lightly armored."

**E/B R. H. A. at Maiwand, 27th July, 1880**, by Captain H. B. Latham, R. H. A.

The above title may be a little cryptic to our eyes, as some of our designations would be to the British. This article concerns itself with the action of a part of "E" Battery, "B" Brigade, Royal

## FOREIGN MILITARY JOURNALS—A CURRENT RÉSUMÉ

Horse Artillery, in a part of the campaigns in Afghanistan where the late Lord Roberts, the immortal "Bobs," made his reputation.

The British Army in India has always been used to going up against large native forces with a comparatively small number of white troops, but the Afghan tribesmen have been wicked fighters since the beginning of time, and at Maiwand was recorded a distinct British disaster. The British troops fought under unfortunate circumstances and were overwhelmed, but one of the redeeming features of the battle was the heroic rescue of the guns. The guns were actually limbered up and gotten out during the most desperate hand-to-hand fighting, and their handling thereafter was superb.

Captain Latham says:

"Slade retired with E/B after he had reorganized, and, picking up the smooth-bore battery en route, came into action south of the ravine near Mahmudabad to cover the retreat. Here he was joined by Nuttall with such of the cavalry as he had been able to rally, and here also some of the native troops were rallied. But many, totally overcome by thirst and oblivious of all that was happening around them, straggled past the guns and became engulfed in the stream of fugitive transport drivers and followers who, witnessing the success of the Ghazi rush, had set out on a wild stampede for Kandahar. The enemy's artillery soon picked up the range, and, when his cavalry began to work its way round the flanks, Nuttall ordered the battery to fall back.

"Slade, who had picked up on his carriages all the wounded that they could carry, retired and, coming into action twice on the way, finally reached a position about three miles from Mahmudabad. Here a halt was called, as the pursuit had slackened when the Ghazis had found the British baggage and turned to looting it.

"Slade sent on Maclaine with two guns and the smoothbore battery whilst he remained with the other two guns to bring up the rear and shepherd on the fugitives. Unfortunately many of these had taken the direct route to Kandahar via Sinjiri, and their sufferings during this 30-mile march without water must have been ghastly in the extreme.

"The main body had, however, been deflected along the track to Hauz-i-Madat in the hope of water being found there, and Slade following the same route. By coming into action often, and, using his gunners armed with battery carbines as riflemen, he was able to safeguard the rear until night covered the miseries of the struggling column.

"Hauz-i-Madat was reached at midnight but scarcely any water was found there, so the fugitives drifted on along the



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track to Ashu-Khan, all efforts made by Burrows to sort out the men into their own units or to get them into some military formation having failed. The cavalry rejoined the column here, and Nuttall, leaving some volunteers to assist Slade in bringing on the stragglers, pushed on with the bulk of his brigade to act as advanced guard. But the sowars [A type of Indian troops.—ED.] had now also reached the limit beyond which discipline could not be upheld, and they gradually abandoned their formation, left the column and pushed on to Ashu-Khan.

"All through the night the retreat continued, and the lack of water, telling fearfully on the now exhausted horses, rendered them almost incapable of moving the guns. So that at various stages after passing Hauz-i-Madat it was found necessary to abandon the three remaining wagons of the R. H. A., the spare gun carriage and store limber wagon, and also five of the smooth-bore guns, whilst the horses and bullocks thus made available were used to assist the struggling teams still pulling the guns of E/B or the limbers still loaded with their human freight. The rear of the column struggled into Ashu-Khan at about 4:30 a. m. just after dawn, and Slade found that with the coming of daylight his troubles increased, for the rear was now almost continuously under fire and the attacks of the tribesmen grew bolder as the weakness of the force opposed to them became evident. Furthermore, as the heat increased, many who had striven thus far 'dazed, footsore, dying of thirst, with a look of bewildered agony on their swollen faces and bloodshot eyes,' now fell exhausted and were butchered where they lay.

"Eventually a plentiful supply of water was found at Sinjiri, which was reached at about 7 a. m., and here Burrows was able to effect some reorganization in his weary troops who had marched forty-five miles in twenty-four hours and fought a battle in addition. The revivifying effect of the water was quickly apparent, and what had been a disorganized rabble an hour previously, quickly became again a military force, units reformed rapidly, and when the retreat was continued Burrows was able to do so with both a small advanced guard and rear guard.

"For their gallantry on this occasion the men of E/B were rewarded with two D. C.'s and eight D. C. M.'s, while on Slade, the only officer left unwounded, was conferred the C. B., and rarely can this honor have been more richly earned. For, taking command of the battery in the crisis of the fight, he had kept his head when the line broke, and got most of his guns away. And in the long retreat afterwards many of the wounded, both

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officers and men, owed their lives to his tenacity in refusing to allow them to be abandoned to a pitiless foe; whilst many an exhausted man must have plucked up the energy to struggle on towards Kandahar inspired by his courage and example."

**Despatch of an Expeditionary Force—Long Sea Voyage**, by Major S. D. Graham, M. C., R. A.

This is a short but interesting discussion of a subject of current interest. The despatch of the British Expeditionary Force to France in the early days of the war, was on the whole a most creditable achievement, but, as the author points out, it was made easier by the shortness of the sea voyage and the amount of suitable shipping available. The handling of an expeditionary force for a long sea voyage presents other complications. The Gallipoli Campaign showed that, and Major Graham indicates sound lines along which this may be studied. Our isolated position might very well involve this most important question in any possible future war.

**An Air Force "Small War,"** by Ubique.

Facing the necessity for operations against a small hill tribe, early in 1925 the Indian Government reluctantly decided that, as an experiment, the Royal Air Force should be without the assistance of ground troops in any way. This was admittedly asking the air arm to carry out a very difficult task, but the authorities were confident of their ability to accomplish all that was required, and welcomed the opportunity of demonstrating the effectiveness of the aeroplane as a weapon in frontier warfare.

The force involved included something over four squadrons of bombers and fighters. It operated for six weeks. It dropped over 150 tons of bombs, fired 100,000 rounds of small arms ammunition at ground targets, and spent 2,070 hours in the air. The casualties among the tribesmen were very small, but the harassment was so successful as to cause them to come to terms. The British losses involved only one machine crash with pilot and observer killed.

This number also contains:

Ludendorff's Last Great Bid for Victory.

Training and Administration in a Mechanized Unit.

A Discussion on the Present Organization of the Artillery Brigade.

Economics and Modern Warfare.

Military Administration in the Palestine Campaign.

Infantry and Tanks.

Some German Views of Artillery.

**An t-Oglach, Irish Army Quarterly, September, 1928**

**The Battle of Kilmallock**, by C. Q. M. S. Michael Quirke, 4th Infantry Battalion.

This is an account of an attack on an isolated barracks occupied by a small British force during the Sinn Fein fighting in 1920. The British garrison consisted of only twenty-eight men, and the irregular Irish forces involved were never very large. It seems curious to call this a battle, and yet it had many of the characteristics of battle and a great deal more picturesqueness than most of them.

The Irish forces fought with armament which they had captured and concealed, entirely small arms. In the lack of artillery other means had to be improvised. The following is illuminating:

"About six paces from the gable-end of the barracks, facing southwest, another building towered above it. From the roof of the building our leader was to give three flashes of a lamp, which was the signal to begin the attack. All eyes were now straining towards this point. There was no sign of life or activity from the barracks, and we seemed to have occupied the surrounding houses without arousing any suspicions.

"Suddenly from the roof-top three flashes of light winked out into the night, and were instantly answered by the roar of thirty rifles. At the same moment a 56-pound weight went crashing through the slates of the barrack roof. Two other 56-pound weights followed in quick succession, their crashing noise passing almost unnoticed in the din of rifles and bursting bombs.

"This unique method of breaking a fort was very effective, causing a large gaping hole in the roof. Into this opening our leader, from his position on the roof, hurled bottle after bottle of petrol. The bottles broke into smithereens and saturated the roof with petrol. Then our leader hurled bomb after bomb into this petrol-soaked breach. Each bomb burst with terrific force, causing considerable damage but completely failing to set the roof on fire.

"Meanwhile the fight was raging fiercely all round the barrack. The garrison had manned every loophole and were returning a hot fire to our attack. It looked as if we would not succeed in forcing them either to surrender or evacuate. The bombing of the petrol-soaked roof, upon which great hopes had been set, did not appear to be working out according to expectations, and unless some other means of reducing the structure of the building was brought into play it was evident that bomb and rifle fire would be unavailing.

"It was under those conditions that the real genius of our

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leader rose to the occasion. He detailed a small party of those guarding the exits to proceed to a yard in the town where there was an American paraffin oil car. The car had arrived in the evening and put into one of the yards, the driver staying overnight in the town. It was the tank-shaped type so commonly used in distributing supplies to country traders, and contained a huge quantity of paraffin oil. This car was now brought up the street, and with considerable difficulty and danger placed in juxtaposition to the barracks. By means of a hose this supply of paraffin was now poured into the breach in the roof. For the best part of an hour, right in the center of the battle zone, this stream of paraffin was kept playing on the roof. Then another Mills bomb hurled into the breach had the desired effect, and the roof burst into a blaze. Even after the roof had taken fire the stream of paraffin was kept playing on the roof, with the result that in a few minutes it became a roaring furnace."

The defending Britishers fought bravely against heavy odds, even with their barracks on fire above them, and when forced out retreated into a small outbuilding where they defended themselves until daylight. The certainty of strong British reinforcements caused the Irish forces to withdraw.

The following quotation which closes the article shows with some vividness the bitterness involved in this conflict:

"The R. I. C. sergeant who was responsible for inducing his men to hold out to the bitter end was promoted to the rank of District-Inspector the following week, but was shot dead in Listowel a few months later.

"Savage reprisals were carried out next night, and some of the most prominent buildings in Kilmallock were reduced to ashes. Needless to say, the people who suffered these brutalities had nothing whatever to do with the attack, as sometimes happens in reprisals."

**The U. S. General Service Schools**, by Major General H. MacNeill, General Staff.

General MacNeill visited the United States in 1926 with an Irish Military Mission. His views on one of our great schools are naturally interesting, but present nothing particularly new to us. It is pleasant, however, to recognize the appreciative and friendly tone in which the article is written.

**Our Uniform**, by Captain Denis J. Lawlor.

We are not alone in having trouble with our uniform. Most nations probably are; indeed the Irish Free State certainly is. One

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particular trouble seems to be the high standing collar which was originally adopted. Just why, the reviewer is naturally unable to say. It may be that the Free State was anxious to get away from the British open collar. It may be that they honestly liked the standing collar which we at that time included in our uniform, or it may be that they just happened to fall into the same blunder which we made years before them. At any rate they now have the standing collar and will probably never be entirely happy until they get rid of it.

### **Big Game Fishing in Irish Waters,** by Doctor O'Donel Browne.

This is a sporting article by an Irish soldier along the lines of articles so common in the British military journals. Some of our service publications are beginning to adopt the custom of including such articles. It is an excellent idea, for they can be read with intelligent interest by sportsmen of many nations.

This issue also includes:

- Wolfe Tone Commemoration, 1928.
- The Resettlement of Officers in Civilian Life.
- The Manoeuvre of Bantry Bay.
- The Strategic Unity of Ireland.
- The Swiss Militia System.
- The Making and Use of Maps.
- A Comparison of Signal Systems in the Field.
- Personnel Aspects of Military Systems.
- Types and Properties of War Gases.
- A Dithyramb of Air.
- The Rebellion of 1803.
- The Quinine Treatment for Varicose Veins.
- Compulsory Vocational Training.

### **"Revue Militaire Francaise," July-August, 1928**

**"Reform of Military Law,"** by Captain Andrieux, explains the new military code recently adopted by the French, where are found several radical changes.

The French military court now deals only with military crimes or misdemeanors. A soldier who commits a non-military offense in a city or town is punished by a civil court.

**"Crossing Rivers in the Presence of the Enemy,"** by Colonel Baills, begins in the July number.

In discussing ancient river crossings, Colonel Baills quotes Frederick the Great and Napoleon. These two great captains agreed

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that it was an almost impossible task to prevent an attacking force

"Nothing is so difficult, not to say impossible, as to defend a river crossing, especially when the front of attack is extended." Napoleon writes in the same tone:

"A river has never been considered an obstacle which should delay an army more than a few days, and the crossing can be defended only by placing troops in force at the bridge heads on the opposite bank ready to resume the offensive when the enemy begins its crossing. But wishing to confine oneself to the defensive, the only course is to distribute troops in such a way as to be able to reunite them in mass and fall on the enemy before the crossing is achieved; but the terrain must lend itself to such tactics and all dispositions must be made in advance."

Until the last war these principles were true; armies always succeeded in crossing rivers by well-planned surprise attacks. However, until 1914 continuous fronts were unknown and rarely did two forces so equal in strength and leadership as those in the last war face each other across a stream. The defeat of the Germans on the Marne in 1918 marks a change in conditions and illustrates a successful defense of a river crossing.

From his study of a number of ancient river crossings Colonel Baills evolves an estimate of the necessary conditions which will insure success to modern armies in operations of this type. Before the last war the advance guard of the attacking army had to advance only 1,000 meters beyond the river to safeguard the main body from enemy fire during the crossing. Due to the increase in range of artillery, the advance guard of the modern army must cross the river, advance beyond the enemy's principal defensive position and against the second defensive position to which the enemy will have rushed his reserves. To attack this position the attacking force must carry across the river its light artillery and part of its corps artillery. This requires an immense amount of pontoon equipment.

Other changed conditions which have simplified the defensive task of the modern army are: (1) an intelligence service which makes surprise attacks much more difficult; (2) improvement in means of communication and transportation to warn and move troops to a threatened point in time to limit the success of the enemy.

Colonel Baills concludes this phase of his study by remarking that, to cross a river successfully, a modern army must engage the enemy along the entire battle front so that the defending forces cannot rush reserves to a point of crossing. Moreover, to transport artillery and trucks across the river with the advance guard, a vast

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reserve of pontoon equipment must be assembled by the attacking forces.

In the September number Colonel Baills will study several river crossings effected by the Germans between 1914 and 1918.

**"The Conquest of La Ghouta,"** by Lieutenant Colonel Bru and Major Cortot, begins in the August number and describes events between July 15 and September 12, 1926, which year marked the height of the revolt in Syria and the final defeat of the revolting tribes.

La Ghouta is in an area heavily wooded by fruit trees, traversed by hedges, patches of briars, and unfordable rivers. In such a terrain the action of aviation was limited and artillery was powerless. The infantry was obliged to move in small columns, and along paths. The cavalry was forced to follow well-defined roads and to fight on foot.

The enemy organized the region very strongly for defense by destroying bridges, digging deep ditches across old roads, and by planting mines. These obstacles were designed chiefly to stop French tanks.

In their offensive, the French surrounded the region and by a concentric march of five columns forced their way to the center of the forest. At times the fighting was severe, but in the end all rebel tribesmen were either killed, wounded, captured or scattered.

The French infantry had little artillery or cavalry support. However, lightened of all unnecessary equipment, with a minimum of animals, with airplane reconnaissance and support, and accompanied by a few tanks, the infantry was able to overcome all resistance.

In the August number, General Camon concludes **"The Battles of Napoleon."** He described particularly the battles of Marengo, Austerlitz, Friedland, Wagram, and Waterloo. General Camon emphasizes Napoleon's habitual scheme of maneuver: not to attempt a frontal attack, but before engaging the enemy to spread demoralization in his ranks by a maneuver against his flank and rear.

Other articles are: "The Battle of the Avre," "Defense of Bois de Ville and of Herbebois," and "Military Souvenirs of the French Revolution."

### **Revue d'Artillerie, June, 1928**

In the article, **The Telemetric Sections,\*** Lieutenant Duvignac discusses their characteristics and use. He states that the difficulty

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\*High burst ranging sections.

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of organizing observation, inherent in the rapid development of large masses of artillery, may be greatly decreased by the use of these sections. Easily installed and operated, they are able to adjust a large number of batteries by the simple and rapid means of high burst ranging, thus facilitating surprise concentrations.

The issue of new equipment to the telemetric sections of the French Army has greatly simplified their installations and increased the scope of their use. The old instruments required a base from one-third to one-quarter as long as the range sought. As a result the ranging sections needed a relatively long period for the accurate determination of long base lines and for the establishment of the resulting wire lines. Communication over such long lines was subject to many difficulties and delays.

The new S. O. M. (*Société d'Optique et de Mécanique de Précision*) instrument is extremely accurate. The degree of precision allows the use of bases from one-tenth to one-fifteenth of the range, i. e., from 500 to 1,500 meters. Also, only one of the two observation posts needs to be accurately located on the terrain by topographic methods. With the short bases used, the other post is quickly located by making a simple stadia reading and a direction reading with the instrument. The telephone lines required are rapidly installed and easily maintained and may be supplemented by visual signalling.

An S. O. M. instrument is installed at each of the two O. P.'s on the base line. At the directing O. P. a site measuring instrument is installed also.

At present a section can ordinarily be installed in half a day, instead of the forty-eight hours required during the war. At times it may be ready for operation in two or three hours. It can easily carry out three adjustments an hour and under favorable circumstances, five or six.

The section is a motorized unit, commanded by a lieutenant. It comprises observers, recorders, computers, and telephone operators—twenty specialists in all. All are trained in the operation and installation of telephones.

As soon as the section is installed, it needs only information as to the direction in which the high bursts are to be fired in order to begin operations. No knowledge of the battery position, the caliber, or the targets is required. The method used is as follows:

1. The battery fires a high bursting round.
2. The section trains its instruments on this burst.
3. The battery executes a fire of 12 or more rounds with the same laying.
4. The section sends the coordinates ( $x$ ,  $y$ , and  $z$ ) of the mean point of burst to the battery.



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5. The battery commander determines the point of impact of the mean trajectory on the horizontal plane through the target and deduces the errors in range and direction.

6. The battery commander makes his corrections and begins fire for effect.

With skilled personnel, the time between the last high burst and the opening of fire for effect will not exceed fifteen minutes. In this time atmospheric conditions will rarely change sufficiently to cause appreciable errors in the fire.

The results obtained with these sections have been very satisfactory. In addition to their work in high burst ranging the telemetric sections constitute complete and accurate topographic units. They are able quickly to locate battery positions, orienting lines, and base points, and will be a most useful adjunct in the topographical organization of a sector. Their use may be further extended to include the observation and location of enemy batteries, other installations and activities.

The telemetric sections must be judiciously located with regard to the batteries which they are to serve. An assignment of one section to the artillery of each division and one to each long range heavy regiment seems logical.

Captain Ragonnet bases his study, **Fire Against Tanks**, on the necessity for opening fire by single piece on such targets without delay and in continuing it with rapidity and precision.

From a consideration of the various elements involved, he concludes that the most effective range for 75's against tanks is about 1,000 meters. For effective fire the range determined must be accurate within two probable errors. The drift is negligible and correction can be made for any ordinary wind by pointing at the right or left third of the tank, as may be required. The error in deflection must not be greater than one mil.

Fire against tanks in motion must be delivered through a series of predetermined zones. The scientific procedure is as follows:

1. Establish various registered points throughout the field of fire.
2. When a tank approaches within three probable errors (60 meters) of such a point, fire at it with the registration points adjusted range. Continue the fire at this range until the tank has moved seven probable errors (140 meters) ahead.
3. Aim one-third a tank length ahead of the target when the wind is negligible, at the head of the target when the wind is blowing in the direction of movement, and two-thirds a tank length ahead when the wind blows in the opposite direction.
4. Fire 14 rounds at a rate of about 6 per minute.

## FOREIGN MILITARY JOURNALS—A CURRENT RÉSUMÉ

Armor piercing shell should be used whenever available. With this projectile the method described is useful at the following ranges:

<i>Height of tank</i>	<i>Range</i>
3 feet	600 meters
5 feet	1,000 meters
6 feet	1,200 meters

Beyond 2,000 meters it becomes of no value. In this way, it is believed that a few guns judiciously placed could rapidly interdict a zone of 500 to 600 meters in depth over a front of one kilometer.

**Training in a Regiment of Horse Drawn Artillery**, by Colonel Foulén, gives the details of a regimental training plan, under the new recruiting law which provides two contingents yearly. In this particular regiment, the recruits are sent at once to their batteries and the greater part of the training is carried on there. One month of basic training is given to all recruits. At the end of this time, they are separated into groups: part for specialist training as chiefs of section, gunners, mechanics, telephone and signal men, and the remainder for training as cannoners or drivers. After the first month, individual and unit training is alternated daily, in order to keep up teamwork in the batteries. The subjects covered are about the same as those in our artillery. The training of specialists and of candidates for chiefs of section, gunners, and other noncommissioned grades is begun early and pushed rapidly on account of the short enlistment period.

Colonel Paquet's article, **Artillery in the First Attack at Verdun**, which began in the May number, is completed in this issue. The ease and secrecy with which the Germans were able to emplace a very large number of reinforcing batteries and the powerful effects of this artillery at the outset were largely responsible for their initial successes. Colonel Paquet analyses the artillery information received by the French prior to the attack and concludes that the reorganization then in progress in the artillery information service (S.R.A.) and the shortage of planes, combined with bad weather, were responsible for the general lack of knowledge regarding enemy batteries. Many batteries were indicated on intelligence maps, but the locations were old and had not been brought up to date by constant photographing of the sector.

The importance of aerial photography for the location of batteries was not sufficiently recognized by the High Command. Orders for aerial reconnaissance gave as missions the observation of troop movements, rear establishments, and the photographing of new

## THE FIELD ARTILLERY JOURNAL

enemy field works. Nothing was said about the enemy artillery dispositions, which, nevertheless, give the most certain indication of impending attack.

General Headquarters (G.Q.G.) remained undecided as to the point of the main German blow until the middle of February, when it was too late to take any counter measures. The Verdun Command under General Herr had believed since the end of January that the attack was to strike at Verdun and had so reported to G.Q.G. However, the 4th and 6th Armies made the same claim and, as General Herr was unable to furnish conclusive proofs as to the point of attack, no decision was made.

The strategical surprise obtained by the Germans was undoubtedly caused by lack of tactical information on the part of the French. However, in spite of the extremely skillful measures taken by the Germans to insure secrecy, this information could have been secured by aerial photography. In fact, the photographs actually made, when interpreted on the 17th of February by an expert from G.Q.G., gave sufficient information to enable him to predict the actual sector for the attack and the fact that the assault was to be made through the wooded portions of the front. A study of the photographs shows the location of a large number of batteries which were not indicated on the intelligence maps.

The indecision of G.Q.G. was, of course, responsible for the lack of means to meet the attack. Particularly serious was the shortage in artillery. The guns were insufficient, both in number and caliber, and the ammunition allotments were far too meager.

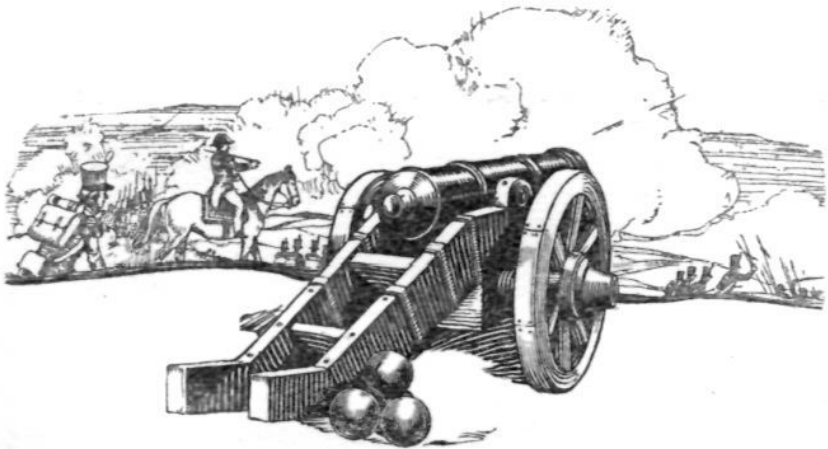
The missions assigned to the light artillery were concentrations on enemy trenches, just prior to and at H hour, and defensive barrages in front of the French trenches as the enemy advanced. The heavy artillery also was to bombard the enemy front lines. The barrage plans were made for the entire front and did not in general cover the assembly points indicated on the 18th of February by the Air Service as particularly likely to be used for the assault. As the lines often ran very close together in the woods, the concentrations ordered on the enemy assembly trenches would have been equally dangerous to the French who had been ordered to hold the front line trenches. Under the circumstances the localities from which the Germans attacked were not covered, and when barrages were finally placed there on call, it was too late. Moreover, the 75s had unusually large fronts to cover in their concentrations and barrages—about 400 meters per battery.

On the day of the attack, the greater part of the French artillery was subjected to extremely powerful zone fires followed shortly by methodical concentrations of unexpected violence. General Herr

## FOREIGN MILITARY JOURNALS—A CURRENT RÉSUMÉ

said these fires had no great effect, but the author states that they effectively neutralized the French batteries for some time.

In his book on artillery, General Herr writes: "Our light batteries, which had in part escaped the enemy preparation, retained for the most part the mastery of their fire and demonstrated it at the beginning of the attack, which was particularly costly for the German infantry."



## **CURRENT FIELD ARTILLERY NOTES**

### **Sixteenth Field Artillery Not To Train Cadets Next Summer**

The First Battalion, 16th Field Artillery, Fort Myer, Virginia, will not be utilized for the Field Artillery training of the First Class, United States Corps of Cadets, at Fort Eustis, Virginia, in the 1929 training season, as was the case during the past summer. Instead sufficient matériel will be maintained in storage at Eustis for this training work. In the future, it is the War Department's intention that the cadets shall man the batteries completely, including the tractors, and that the use of enlisted men other than for upkeep and administration be kept at the minimum. The matériel available at Eustis will consist of 12 French 75's, 12 caissons, 14 tractors.

The proposed arrangement will result in a continuation during the summer training period of the Field Artillery instruction carried on throughout the academic year at West Point; it will afford the desired training of cadets in the operation of tractors; it will not interfere with Coast Artillery training at Eustis and will release the First Battalion, 16th Field Artillery, to the control of the Corps Area Commander during the entire summer training season for firing and tactical training at Tobyhanna, Leonard Wood, or elsewhere. During that period the battalion quarters at Fort Myer will be available for civilian trainees.

### **Readjustment in R. O. T. C. Unit at Virginia Military Institute**

With the approval of the school authorities, the Engineer unit of the Reserve Officers' Training Corps at Virginia Military Institute will be withdrawn at the end of the school year 1928-29, in order that the Field Artillery unit at that institution may be expanded. This action has been made necessary by the shortage in the production of Reserve Officers of Field Artillery from the existing Reserve Officers' Training Corps units of that branch of the service. As legal restrictions prevent an increase in the number of mounted Reserve Officers' Training Corps units, it has been found necessary to obtain the necessary production of Reserve officers by expanding existing units.

### **New Gun Sheds at Fort Hoyle**

The Commanding General, Third Corps Area, has been authorized to complete the construction of six gun sheds at Fort Hoyle, Maryland, at an expense not to exceed \$18,000.

## CURRENT FIELD ARTILLERY NOTES

### **Night Riding for 143d F. A.**

The most "brilliant" and "glaring" idea in all the annals of the 143d F. A., California National Guard, is credited to Captain White. For years the Sunday mounted drill has been a difficult problem to handle at Oakland, but now the hurdle has been successfully negotiated. A riding ring has been erected and equipped with powerful lights. This proved to be an ideal arrangement for night riding and is very popular with officers and men alike.

### **Distinguished Service Cross Citation**

The War Department recently announced the award of the Distinguished Service Cross, under the provisions of an Act of Congress approved May 26, 1928, as follows:

"David L. Mason, Army serial No. 1327189, formerly private, Battery D, 115th Field Artillery, 30th Division, American Expeditionary Forces. For extraordinary heroism in action north of Montfaucon, France, October 5, 1918. He, with another soldier, on two occasions ran the telephone line between the battery and the forward observation post, passing through a heavy enemy barrage. Having accomplished this task they discovered that the wire had again been cut and proceeded to repair the line. While so engaged his companion was wounded and died almost instantly. Private Mason continued to repair the line under shell fire, thereby enabling the batteries of his battalion to continue firing effectively."

### **Citation for Gallantry in Action**

"William E. Corkill, Captain, Field Artillery, then First Lieutenant, 10th F. A., 3d Division, A. E. F. For gallantry in action near Greves Ferme and St. Eugene, France, during the night of July 14-15, 1918. With utter disregard for his own personal safety and with untiring energy he repeatedly traversed shell-swept roads with convoys of ammunition, often driving the trucks himself when the drivers were wounded or exhausted, thereby keeping the batteries supplied with ammunition at a time when a shortage would have been disastrous." W. D., October 2, 1928.

### **Almost Fifty Thousand Animals Used in Army**

The latest figures on the animal census of the Army indicate that there are at present 48,391 horses and mules on active duty throughout the service. These animals include the following classification:

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Horses:		Mules:	
Draft .....	11,919	Draft .....	10,905
Riding .....	22,372	Pack .....	2,697
Pack .....	498		
	34,789	Total .....	13,602
Total .....			

The Field Artillery leads with 10,079, with the Cavalry second with 9,850. The Chemical Warfare Service has the smallest assignment of animals, with a total of 34. The National Guard comes in for a large number, with a total of 10,198.

The following comparison of the average prices paid for the different classes of horses and mules for the fiscal year 1928 with those of the fiscal year 1927 shows marked decrease in the Government cost of mules:

	1927	1928
Horses, riding .....	163.28	163.30
Horses, draft .....	163.48	163.00
Horses, riding, small (for use in Philippines).....	88.62	85.93
Mules, draft .....	167.81	152.01
Mules, pack and riding.....	156.77	137.45

Since July, 1924, 14,886 animals have been purchased by the Army. The Remount Purchasing Agent, Fort Reno, Oklahoma, leads all others with a total of 5,236 animals purchased since 1924. Kansas City is next with 2,882.

The report of purchases made follows:

Fort Reno, Oklahoma.....	5,236	Fort Douglas, Utah.....	1,917
Kansas City, Missouri.....	2,882	Colorado Springs, Colorado .....	1,315
Lexington, Kentucky .....	2,381	Front Royal, Virginia.....	1,155

Of this number only 124 or approximately eight-tenths of one per cent turned out to be outlaws when subjected to training. This per cent is deemed quite satisfactory in view of the varied sources and wide territory from which the animals were obtained.

### **Heavy Trench Mortars to the F. A.**

With the issue of G. O. 22, W. D., 1927, the missions of the Coast Artillery have been logically defined and the embarrassments to instruction and to preparation of training regulations removed. Responsibility for heavy trench mortars has been transferred to the Field Artillery, leaving the Coast Artillery charged only with the development and use of weapons intended for fire on moving targets (naval or air) and of the auxiliaries necessary for control of such fire.

### **West Point Field Artillery Detachment To Participate in National Horse Show.**

The Secretary of War has approved the request of Mr. John McE. Bowman, president of the National Horse Association, that

## CURRENT FIELD ARTILLERY NOTES

the United States Military Academy Field Artillery Horse Show Exhibition Team, from West Point, New York, be sent to the National Horse Show to be held in the Madison Square Garden, New York City, November 8-14, 1928. This will be without expense to the Government.

### **U. S. To Make Survey of Trans-Isthmian Highway**

The Secretary of War has advised the Governor of the Panama Canal of the acceptance by the Panaman Government of the offer of the United States to make a preliminary survey of the Trans-Isthmian Highway. In order that this survey may be completed at the earliest practical date the Panama Canal will be reimbursed to the amount of \$45,000, or so much thereof as may be necessary, from the appropriation "Military Surveys and Maps."

At the present time there is no wagon road or even trail across the Isthmus of Panama, the old Spanish highways having been completely obliterated by the jungle, and by the creation of Gatun Lake, which was necessary in building a lock canal.

All the troop movements across the Isthmus are now made on the Panama Railroad. The only military organization which has crossed the Isthmus of Panama since the days of the Spaniards and the buccaneers is Battery A, Fourth Field Artillery, now Battery A, Second Field Artillery Battalion. It crossed, in 1923, in thirteen days of gruelling trail cutting, bridge building and mountain climbing, at times on short rations and so completely swallowed up by the jungle that the pack artillerymen were unable to communicate with airplanes which were hunting for them.

### **Report of the Chief of Ordnance**

The following items in the annual report of the Chief of Ordnance are of Field Artillery interest:

*Pack Artillery.* The 75-mm. pack howitzer has been standardized. Three additional pack howitzers are nearing completion at the Rock Island Arsenal. The drawings of this matériel have been traced and put in permanent form for future manufacture under the ten-year program. Orders for matériel carried on this program will be placed early in the fiscal year 1929.

*Division Artillery.* In order to check the manufacturing drawings of this matériel, an order for one 75-mm. gun carriage M1 was placed with the Rock Island Arsenal. This carriage is nearing completion. A battery of four units of the 75-mm. matériel has been under test at Fort Sill, Oklahoma.

As a result of the test of the 75-mm. gun carriage M1 925E at Fort Bragg, final decision has been reached in favor of the split-trail type for the division gun carriage. This type of mount permits



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wide traverse, and facilitates the use of this matériel against moving targets.

One battery of 105-mm. howitzer matériel has been tested at Fort Bragg, and the 105-mm. howitzer matériel T2 has been standardized.

*Army Artillery.* The 155-mm. gun carriage 1920, which mounts interchangeably either the 155-mm. gun or the 8-inch howitzer, has been modified as recommended by the Field Artillery Board; it is being retained by the Board for further tests. As a result of service tests, studies of a new unit of this type of matériel will be inaugurated.

*Fire Control.* A number of sets of improved binoculars and monoculars have been completed at the Frankford Arsenal and will be submitted to the various service boards for test. A supply of commercial glasses will be purchased and also submitted for test.

*Cross-Country Transport.* The development of vehicles for tractor-drawn cross-country cargo transport has been confined to two distinct types of carriers. These designs are based largely on information obtained in tests of the earlier type of limber and wagon type cargo carriers. Pilot vehicles of the newer designs are being manufactured. A test of a cargo cart as a single axle 1½-ton transport vehicle indicated that this vehicle, originally intended to carry ¾-ton, is satisfactory for transporting 1½ tons at tractor speeds.

The 3-inch field gun trailer M1 918, with suitable tires, body, ramps, and other accessory equipment necessary for the transportation of tractors of the light or medium class, has been standardized as a tractor transport trailer. A design of ramp for use with this trailer was completed and one set of ramps was built and tested. Minor changes indicated as desirable during the test have been made and the drawings revised.

*Dynamometer.* The development of the dynamometer equipment at the Aberdeen Proving Ground has been completed as far as available funds would permit. This equipment has been used in routine test work during the year. Much valuable data have been compiled, giving information concerning the pull required to move loads of practically all varieties common to military work with present matériel, operating on a wide variety of grades, etc.

*Oil Laboratory.* The work of the oil laboratory at the Aberdeen Proving Ground has resulted in the completion of a tentative specification for the procurement of lubricants to be used in Ordnance Department automotive equipment. Lubricants procured under this specification have been used in vehicles under test during the year with entirely satisfactory results.

A partial list has been prepared and furnished to the Quartermaster General for use in procuring lubricants for these vehicles.

## CURRENT FIELD ARTILLERY NOTES

Work is progressing on tests to determine what additional lubricants are suitable for inclusion in this list. Additional satisfactory lubricants are being added to the approved list as the tests are completed. Tests to develop a satisfactory specification for recoil oil are in progress.

*Fuses.* A mechanical time fuse, for use in the 3-inch anti-aircraft gun, has been standardized, and manufacture of this fuse is being inaugurated at the Frankford Arsenal. Two types of combination super-quick and short-delay point detonating fuses have been tested with very promising results.

*Loading of Ammunition.* Satisfactory progress has been made in the development and installation at the Picatinny Arsenal of new apparatus for the handling of TNT in the loading of ammunition. A mechanical arrangement has been installed for stirring the liquid TNT during the process of cooling to the temperature at which it is poured into the ammunition. This will supersede the previous expensive and unhealthy method of manual stirring.

*Propellants and Explosives.* Prior to the fiscal year 1928, a flashless, non-hygroscopic, smokeless powder was approved as standard for service use in the 75-mm. gun, model 1897, and a non-hygroscopic type was approved as standard for the 155-mm. G. P. F. gun, model 1918. During the past year satisfactory flashless, non-hygroscopic powders of similar type have been developed for the 2.95-inch mountain gun, the 75-mm. pack howitzer, and the 105-mm. howitzer.

*Captured Enemy Matériel.* During the year the second and last allotment of these trophies was apportioned and distributed to the states in accordance with the Act of Congress approved May 22, 1926. Seventeen states and three overseas territories have accepted and requested shipment of their entire allotment of trophies; while nineteen states have requested practically all of their allotments. Approximately 80 per cent of the field pieces and 75 per cent of the smaller trophies have been distributed since November 17, 1927.

### **Another Belief Exploded**

Scientists, citizens and soldiers have, since the beginning of time, been under the belief that a person falling from a great altitude would either be rendered unconscious or would travel at such a terrific speed as to kill him before he reached the ground.

Today the Experimental Department of Wright Field of the Army Air Corps can definitely state that a man falling from any altitude never attains a velocity greater than 118 miles per hour and does not lose consciousness. A dummy of the size and weight of a 180-pound man with a service parachute attached and unopened, attains that velocity within a period of eleven seconds

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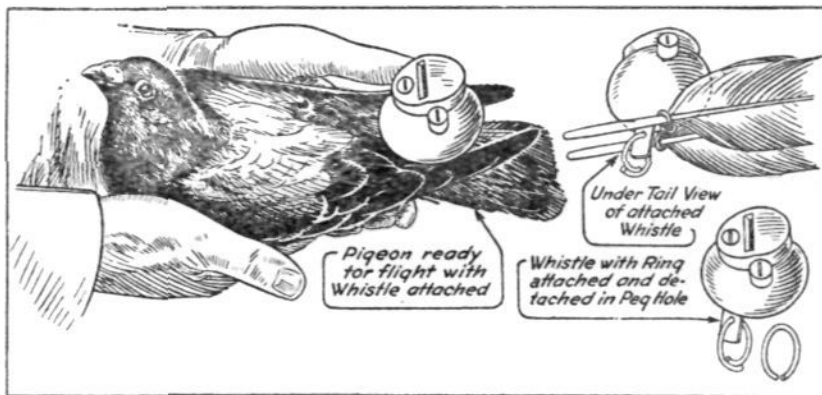
and after falling the distance of 1,200 feet in quiet air. From then on down no increase in speed is attained. These facts were established after numerous tests.

According to tests conducted some time ago at the Air Corps Experimental Engineering Station at Dayton, Ohio, the normal rate of descent with a parachute from an airplane flying from 800 to 1,000 feet altitude varies from 18 to 27 feet per second.

### Army Pigeons Equipped with Whistles

Equipping carrier pigeons of the United States Army with bamboo whistles is the latest experiment being made at the Signal School, Fort Monmouth, New Jersey. These whistles, which are made of featherweight bamboo and are attached to the pigeon's tail, protect these feathered messengers against hawks and, in time of war, against trained falcons. Trained falcons were used to retrieve enemy pigeons during the siege of Paris in the Franco-Prussian War and again during the World War.

The whistles are made in China and, being quite large, interfere somewhat with the bird's aerodynamics. Once attached, the whistle is left on the pigeon. It causes little or no discomfort and does not interfere with breeding. It needs only to be refastened when the bird molts the feathers to which it is attached.



The pigeon whistle is an ancient Chinese invention and is made in all colors and shapes. Great numbers of pigeons are equipped with tail whistles for the amusement and sport of the Chinese fancier. When the pigeons are released in numbers, each carrying a different pitch of whistle, the resultant noise is claimed to be one of beautiful music to the Chinese ear.

The use of homing pigeons is one of the earliest methods of carrying messages. Such pigeons were kept under domestication in the fifth Egyptian Dynasty about 3000 B. C. They were also

## CURRENT FIELD ARTILLERY NOTES

used by the ancient Greeks, to whom the art of training the birds probably came from the Persians. Pigeons were used to carry the names of Olympic victors to their home cities. There is also evidence that a regular message system using pigeons was established in Bagdad by the Sultan in 1150 and lasted until 1258.

The use of pigeons in transmitting messages during war dates to the time of Decimus Junius Brutus, then besieged by Mark Antony. Their use has increased with each succeeding war and reached its peak during the World War, when the various combatants used over 500,000 homing pigeons.

Approximately 1,251 pigeons are maintained by the Army during peace-time in the sixteen lofts in the United States, the Canal Zone, Hawaii and the Philippines.

### **Amateur Radio Operator Plays Important Role in Scheme of National Defense**

In a communication to Judge Ira E. Robinson, Chairman, Federal Radio Commission, Washington, D. C., the Secretary of War has stated that the importance of the amateur radio operator in our scheme of national defense justifies an allotment of an additional band of frequencies for amateur use, and proposes an assignment of some definite band of frequencies between 5,000 and 10,000 kilocycles not already allocated for Army use to the American Radio Relay League for use in its work with the Army Amateur Radio Stations under supervision of the War Department. Excerpts of the letter follow:

"The importance of the amateur operator rests upon the fact that the demand for radio operators contemplated in plans for mobilization, is far in excess of the numbers available in the armed forces of the country and in the commercial radio companies. In order to partially train and organize this source of operators, the War Department in 1925 began building a network of stations known as Army Amateur Radio Stations. The American Radio Relay League has cooperated in this movement and has been of great assistance. Some 1,500 of the fastest and most reliable operators in all parts of the United States have been enrolled.

"The success of this venture may be measured by the invaluable work done during the Vermont flood and the commendable ability displayed by the Army Amateurs in support of the 'Blue' Army in the Joint Army and Navy Maneuvers in 1927.

"It is realized that the mere assignment to general unrestricted amateur use of a 50-kilocycle band of frequencies within that contemplated by the International Radiotelegraph Conference for fixed stations might serve to bring confusion to the

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whole 6,675-7,000 kilocycle fixed station band, and this could hardly bring any practical relief to the hubbub created by 25,000 amateurs trying to be heard in their present bands aggregating 700 kilocycles for exclusive and several thousand kilocycles for joint use.

"I believe that the present Army Amateur organization, thus encouraged by the Radio Commission, will continue its splendid growth and amply repay the nation by service in time of need."

### **German Firing Board for 15th F. A. Officers' Club**

Colonel E. D. Scott, commanding the Fifteenth Field Artillery, recently presented to the regiment a very interesting relic of the Great War. It was a German firing board such as was used by practically all artillery in stabilized positions. A firing board is usually made of several layers of wood in order to avoid warping, and on the board is pasted a map or "plan directeur"—usually 1/20,000—showing the battery position and targets within range of the guns. Ranges, deflections and other data are on the map so that any designated target may be quickly taken under fire. Colonel Scott's memorandum follows:

"On September 12th, 1918, the 5th Corps attacked the Northwest side of St. Michiel Salient, the American 26th Division on the right and the 15th French Colonial Division on the left. The direction of advance was Southwesterly, the 15th French Colonial passing through San Remy. About 9:00 a. m. the German battery to which this firing board belonged opened an accurate fire on San Remy, and the French Commander called on the Corps Artillery. The battery was quickly silenced but soon reopened fire, and the silencing was repeated. It became evident that the battery fire was controlled probably from some overlooked station now in rear of our own lines. Its fire became well sustained and destruction was necessary. By 11:00 a. m. at least fifty guns of the Corps Artillery were firing on it. At that time only one of its guns was in action and the last shot came from it about 11:15.

"On the 13th, Lieutenant Colonel Tessier, French Artillery, visited the battery position and brought away this board.

"The action of this German battery is one of the highest of the many examples of devotion to duty that stand to the honor of the Artillery services of every land."

It is planned to have this German firing board put in a box with a glass top and placed in the Officers' Club of the Fifteenth.

# THE UNITED STATES FIELD ARTILLERY ASSOCIATION

TO MEMBERS:

In compliance with Article VII, Section 1, of the Constitution, notice is hereby given that the Executive Council has fixed 4:30 p. m., Saturday, December 15, 1928, as the time of the annual meeting of the Association, to be held at the Army and Navy Club, Washington, D. C.

The business to be disposed of will be the election of one member of the Executive Council from the regular army to succeed Major General Fox Connor, whose term of office will expire this year, action on the proposed amendment to the Constitution, and such other business as may properly come before the meeting.

PROPOSED AMENDMENT TO THE CONSTITUTION

Washington, D. C.,  
May 12, 1928.

The Secretary, United States Field Artillery Association,  
Washington, D. C.

Sir:

In conformity with Article IX of the Constitution of the United States Field Artillery Association, the undersigned, being active members of the Association, hereby propose a certain change in said Constitution for the following principal reasons:

The usefulness of the Association to its active members is needlessly impaired by the requirement that all publications shall be furnished to active members without payment other than the annual dues. Much available matter, of vital interest to field artillerymen, might be published and offered for sale to active members, which cannot be published gratis on account of the expense involved. It is believed that the interest of the active members in this regard will be safeguarded by the Executive Council.

The proposed amendment to said Constitution is clearly set forth as follows:

It is proposed to amend Section 3, of Article V, by striking out the period at the end of said Section, substituting therefor a comma, and adding to said Section the words "except such publications, other than the Journal, as may be designated by the Executive Council.", so that said Section shall read, when amended, as follows:

Sec. 3.—Active members shall be entitled to receive all publications

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issued by the Association without payment other than the annual dues, except such publications, other than the Journal, as may be designated by the Executive Council.

Respectfully submitted,

- |                                      |                                     |
|--------------------------------------|-------------------------------------|
| ANDREW MOSES, Col., F. A.            | A. C. MCBRIDE, Major, G. S.         |
| E. P. KING, JR., Major, F. A.        | (F. A.)                             |
| E. H. DEARMOND, Lt. Col., F. A.      | R. S. PRATT, Lt. Col., G. S.        |
| E. R. REDMOND, Col., F. A. Res.      | (F. A.)                             |
| MILES A. COWLES, Capt., F. A.        | K. S. PERKINS, Major, G. S. (F. A.) |
| T. G. M. OLIPHANT, Major, F. A.      | A. C. SANDEFORD, Major, F. A.       |
| C. A. SELLECK, Major, F. A.          | A. F. BREWSTER, Lt. Col., F. A.     |
| J. N. GREELY, Major, G. S. (F. A.)   | R. M. DANFORD, Major, F. A.         |
| CORTLANDT PARKER, Major              | D. C. CUBBISON, Major, F. A.        |
| G. S. (F. A.)                        | E. J. DAWLEY, Major, F. A.          |
| R. E. D. HOYLE, Major, G. S.         | H. L. LANDERS, Lt. Col., F. A.      |
| (F. A.)                              | J. A. CRANE, Major, F. A.           |
| H. W. HUNTLEY, Major, G. S.          | H. PARKHURST, Major, F. A.          |
| (F. A.)                              | LEROY W. HERRON, Col., F. A.        |
| G. R. ALLIN, Lt. Col., G. S. (F. A.) | Res.                                |
|                                      | D. M. BEERE, Major, F. A.           |

TO MEMBERS: If you have not sent in your proxy card and do not expect to attend the annual meeting, please fill in and mail this form.—SECRETARY.

..... 1928

I { shall } be present at the annual meeting of the United States Field Artillery  
 { shall not } Association, at the Army and Navy Club, Washington, D. C., December 15, 1928.  
 I hereby designate the Secretary of the Association

or .....  
 as my proxy, to cast my vote at said meeting or any adjourned meeting thereof, subject  
 only to the following instructions:

My vote for member of the Executive Council is:

.....

My vote on the constitutional amendment is:

(indicate by X): For ..... Against .....

If desired to vote on amendment separately, please reply by letter. If blanks are left  
 blank, they will be filled by your proxy.

(Signature) .....