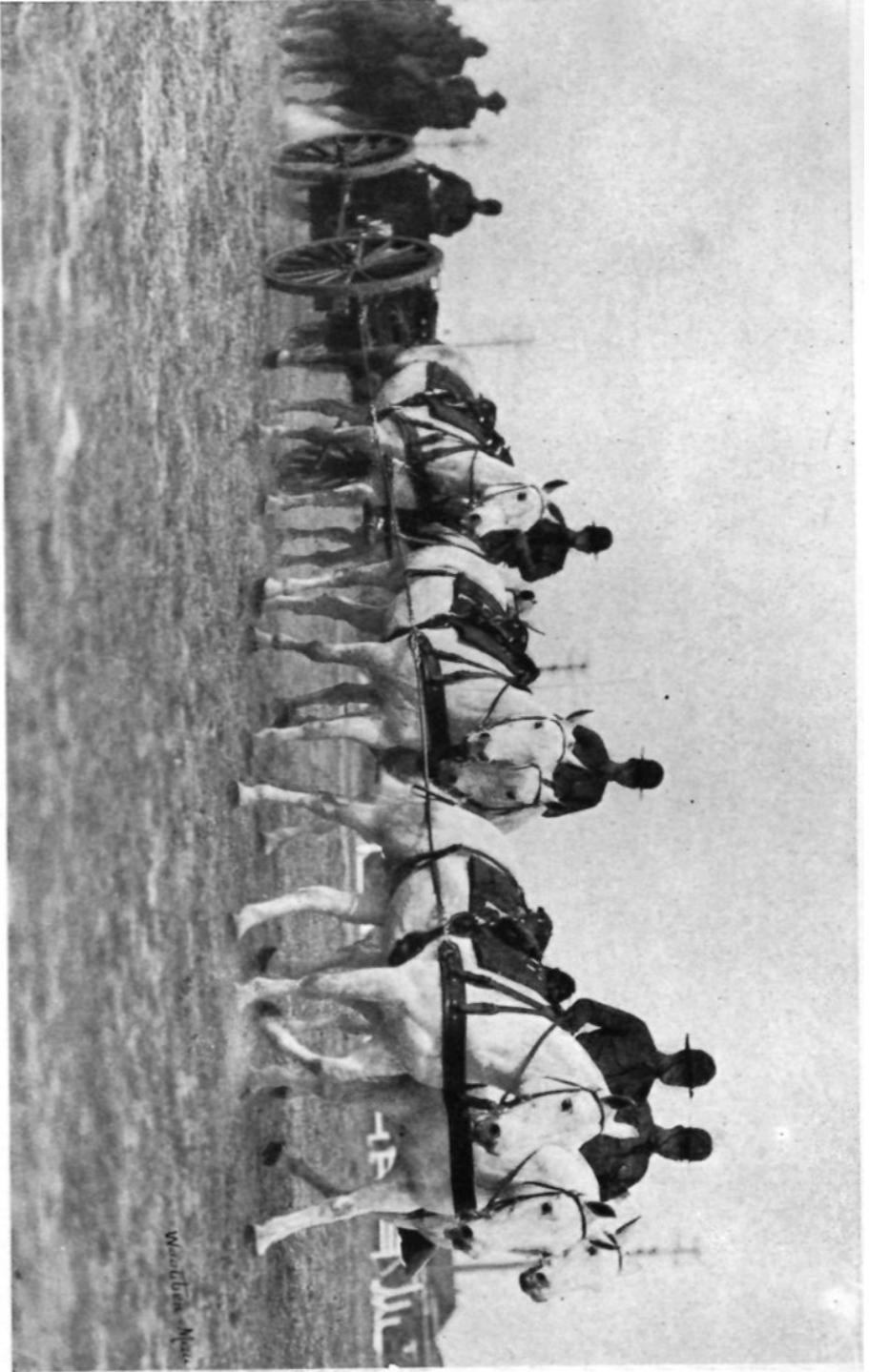


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ARTILLERY TEAM OF HEADQUARTERS BATTERY, 16TH FIELD ARTILLERY, WINNERS AT THE FORT BRAGG HORSE SHOW

## TACTICAL EMPLOYMENT OF THE OBSERVATION BATTALION

BY MAJOR H. CRAMPTON JONES, F.A.

THE SOUND RANGING SECTION

*Mission:* The sound ranging section locates active enemy batteries, identifies active enemy batteries previously located, and adjusts the fire of our own batteries. These missions can be accomplished by sound ranging when visual observation is impracticable, as at night or in a fog.

*Organization:* It would be better to call the unit a sound ranging battery. There should be a captain, four lieutenants, and eighty enlisted men in the organization. The captain needs to be a good leader who can obtain excellent teamwork; two of the lieutenants should have scientific training, one should be good on communications, and the fourth should understand motors. Each enlisted man should be above average in intelligence, for each holds an important position on the team.

The operations performed by the battery naturally cause it to be formed into four sections: topographical, communications, plotting, and maintenance. The topographical section performs the field survey work for the purpose of accurately locating the relative positions of the microphones. The communications section in the meantime installs the wire. The plotting section establishes the apparatus in the central station and the equipment in the plotting room. The maintenance section has the transportation and other facilities.

*Assignment:* Tactically, the sound ranging battery belongs more to a locality than to some certain unit. It will be required by one corps or another and should be a part of the G. H. Q. Reserve, being attached to some corps when necessary. Its installation requires from one to two days, according to circumstances.

*Operation:* When the sound ranging battery is ordered into action, the commanding officer prepares an overlay upon which is

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traced the microphone base to be used. This is usually a circular arc of 12,000 yards radius by the scale of the map to be used. At intervals, on this arc, of four sound seconds, about 1,500 yards, marks are made to represent microphone stations. Then the tracing is moved around on the map in the zone of action assigned until suitable positions have been determined for the stations. There will be six or eight microphones, according to the width of the zone, and the stations will be located from 1,500 to 4,000 yards from our front line. If the stations are closer than 1,500 yards to the front line, the wires will be interrupted too often and cannot be maintained sufficiently well. If the stations are more than 4,000 yards from the front line, the final results are less accurate, for the sound wave is lessened in intensity and the effect of atmospheric conditions and wind is greater. The center of the circular arc upon which the base is drawn should rest finally in the position of the enemy groupment of artillery which the sound ranging battery is ordered particularly to observe. Tentative positions will be chosen for the two forward observation posts, each about a thousand yards from the front line and having good audition to the front and good observation to the rear if possible, in order to see where the enemy's rounds fall. A tentative position is also selected for the central station. This should be in a protected place, in rear of the base and near the center, in order to permit the commander properly to supervise the activities of the battery and also to economize wire.

Then the topographical section makes a rapid reconnaissance and a rough survey of the base, locating the microphone stations approximately and verifying the fact that the microphones can actually be installed at each place. At the same time the communications section begins laying the wire along the base and to the forward observation stations, connecting each of these with the central station by heavy twisted pair wire which is used for the microphones and for telephone communication when necessary. Twenty miles of this wire should be available.

The length of the base will be about 12,000 yards. The zone which can be observed effectively will be 12,000 yards wide and extend 12,000 yards in front of our front line.

If on the reconnaissance it were found that one of the microphones would be in an awkward place, the whole base would have to be displaced in order to maintain a regular base. It is very desirable

## TACTICAL EMPLOYMENT OF OBSERVATION BATTALION

to have a regular base, whether straight or circular, because it is simpler for the personnel to make computations, the wind and temperature corrections are more easily applied, and standard plotting boards may be used. The regular circular base tends to equalize the time intervals for the different sub-bases so that the film is easier to read. Thus it is normal to maintain the regular base if possible, and experience has taught us that it is best to do so.

In active sectors the bases of adjacent sound ranging batteries will often overlap, and they may be shorter, usually with six microphone stations. In quiet sectors the bases do not need to overlap, and they will contain eight microphones, the end microphones often being common to two adjacent batteries.

The microphone stations must fall at places where the sound reception will be good from the direction of the enemy. At the same time they must be sheltered from an unnecessary amount of noise from friendly sources, such as from nearby friendly batteries or important roads. They should be on the slope of a hill, either forward or counterslope, never in deep valleys; they should be in the open, never in heavy woods; they should be placed where there is as little wind as possible; and finally, they should be placed where the least shelling is expected.

As soon as the positions for the microphones have been definitely selected, stakes are driven to mark their exact positions. The topographical section then completes an accurate survey of the base. The microphones are emplaced and protected from the wind and from shell bursts by being placed in boxes or surrounded by sandbags.

The communications section connects up the microphones as soon as the latter are installed. Each one has a circuit to the central station which is being established in the meantime. The observation posts in front are also connected to the central station. It is the duty of the forward observers, when they hear the discharge of the enemy guns, to signal the central station and electrically put into operation the recording apparatus. These observers hear the sound about two seconds before it reaches the microphones.

Sometimes it is the survey which takes longest and sometimes it is getting in the communications. In any case, the communications always present the greatest problem. The total weight of the

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wire used is over 3 tons and it must be gotten up early and dumped if necessary. The weight of all the rest of the equipment is about 4 tons. It consists mainly of the central station equipment, about which there is no great hurry, since it takes only two hours to set up the apparatus for recording and the plotting room equipment. So the first transportation must contain the wire. It needs to be laid by routes which avoid areas likely to be shelled, and it should be put in trenches about one foot deep and left open. The wire will thus be safe from traffic and from shell fragments and could be cut only by a direct hit. The lines should be tagged to show that they belong to a sound ranging battery.

As soon as the survey is completed, the microphone stations are accurately plotted on the plotting board in the plotting room. The plotting room, by the way, should be well lighted in order to obtain good results. The plotting section has for its function the reading of the photographic strips on which the sounds have been recorded. Calculations are then made from which it is possible to deduce the location of the source of the sound. This section is also charged with applying the necessary corrections for wind, temperature, humidity, and asymptotic difference.

*Employment:* The tactical employment of the sound ranging battery is limited by the length of time that is required for getting it into action. In the offensive sound ranging would not be used during any phase of a meeting engagement. In an attack against a defensive position it could be used to great advantage and it would be of particular advantage against a stabilized front. In the defensive sound ranging would not be used during any phase of a deployed defense. In a position or zone defense it would be of extreme value. Generally, we may say that in its present state of development sound ranging is not of use in moving situations but is valuable in all other situations. A moving situation is considered to be one in which the front line moves a mile or more each day.

The time that is required to get into action depends nearly always upon the time required to complete the topographical work. The communications cannot be finally installed until the survey has been finished. The central station and the observation posts can be established in very little time. It takes from one and one-half to two days for the sound ranging battery to be ready for action. For example, suppose that orders are received in the afternoon to

## TACTICAL EMPLOYMENT OF OBSERVATION BATTALION

move to a certain zone and go into action. Preparations will be made at once for the move, and the march started, let us say, next morning. The battery will arrive in its area about noon. At the end of twenty-four hours after arrival in the area, the battery will be ready for action.

The battery will not be ready for action within one day unless the topographical section is quick and efficient. The officers must be expert, the work must be well organized, and the personnel must be well trained. Each man must be able to carry out his duties without supervision. The work must be done by parties, each under a noncommissioned officer. Each party must accomplish its mission without supervision, and the more responsibility that can be given to the noncommissioned officers and men the better the work will be carried out.

Transportation is an important item. The minimum required consists of two trucks (2 ton), one truck (1 ton), and two trucks (light), or the equivalent. With this amount the battery can get into action with one load, but it will often be necessary to send back for another load unless transportation has been borrowed.

When not in action the sound ranging battery will move along with the other forces, but never more than 10 miles from the front. It is necessary for the commanding officer to be in close touch with the situation in order for the battery to get into action as quickly as possible. The personnel walks, the equipment sometimes requires two trips, and the roads are usually bad and congested during a movement. These conditions combine to set the figure of 10 miles from the front.

Orders to go into action will come either from the Corps Chief of Artillery or from the Army Chief of Artillery, according to the assignment of the battery. It is a difficult matter to decide just when to employ the sound ranging battery. If it is kept moving too often, the men will soon become exhausted in laying and maintaining the lines. On the other hand, if its employment is put off too long it will not be in action when it is most needed. Whoever makes the decision to use sound ranging must know the plan of his superior commander and the probable intentions of the enemy, and he must try to forecast the action for the next four days. If the situation will probably not develop into mobile warfare for three days, it is advisable to make use of the battery.

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On the day of an attack the wire should not be reeled in, but preparations should be made to do so in case the attack succeeds. By dark it will be known whether or not the attack has progressed far enough to warrant moving the battery, and then arrangements can be made to move the next morning. There should be a conference with the counterbattery officer as to the most important zone to be covered.

In a withdrawal, deliberately planned, preparations will be made beforehand to cover the new front. All of the topographical, communication, and other operations which can be accomplished ahead of time should be performed. The battery will move, get into action, and then recover the wire from the previous position.

In a retreat, when the enemy attacks and is successful, it is generally impossible to save the microphones and the wire. The men will remain in action as long as possible and then withdraw. The men must be taught what are the essential things to pick up and take away. What cannot be carried must be destroyed if of possible value to the enemy. This applies particularly to records of any kind.

*Liaison:* Liaison with the corps artillery, the nearest army groupment, and with the neighboring sound ranging batteries is essential. It is important to have good liaison with the artillery information service. It is well to have close contact with the air corps and with the balloons in order to be able to call for observation on new enemy targets just located, and to request photographs.

A sound ranging battery serves primarily the heavy artillery with the corps to which it is attached. It is the duty of the artillery being served to provide the communications to the sound ranging battery, to lay and to maintain it. If the line has not been provided, it becomes necessary for the battery commander to use his initiative in getting his information to the counterbattery officer and the other artillery commanders concerned. Usually the best way is to run a line to the nearest artillery headquarters, preferably some brigade.

Cooperation between the sound ranging and the flash ranging units is very important. They can give each other mutual assistance with transportation and with the laying of wire. They can arrange to draw rations and mail together. The sound ranging commander will often ask for information regarding the enemy front line and the enemy activities, for it must be remembered that



## TACTICAL EMPLOYMENT OF OBSERVATION BATTALION

the forward observers of the sound ranging battery are intended for hearing to the front and seeing to the rear. Sound and flash ranging units should frequently compare their results. It should be remembered that the conditions of the weather which are good for sound ranging are poor for flash ranging, and vice versa. While it is well to have the two headquarters near each other, they should not be actually together.

*Adjustment of Fire:* Sound ranging adjustment of fire permits firing on an objective which cannot be seen. It is very useful, and it compares favorably in speed and accuracy with other methods of adjustment. It provides the only method of neutralizing a hostile concealed battery which has not been previously located. The best targets to engage are new batteries just registering, batteries in woods, villages, or in other places where their location is difficult or impossible to obtain from photographs or from the air.

There are two classes of objectives for sound ranging adjustment: first, an active enemy battery; and second, an objective which is silent.

The adjustment upon an active enemy battery will be excellent for the reason that the positions of the bursts of our projectiles and the positions of the discharges of the enemy guns will both be determined under the same meteorological conditions. It will therefore not be necessary to make any corrections for these conditions, since they affect equally the locations of the bursts and the discharges. The artillery battery commander is interested only in the relation between these locations, and this can be accurately determined from the record.

Firing on targets which are silent but which have been previously located or plotted is not so accurate. This is for the reason that corrections must be applied to the time that it takes the sound to travel. These corrections are for wind and other conditions, and they can be applied accurately by a well-trained plotting section.

In the first case, against a battery firing, precision methods of adjustment should be employed, and fire for destruction may be undertaken. In the second case, against silent objectives, zone fire for effect should be employed.

The procedure during adjustment is as follows: The battery fires a salvo at five-second intervals. Then about two minutes are allowed the plotting section to locate the bursts with respect to the

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target. This time will vary as the range increases, allowing time for the flight, the sound return, and the operations at the central station. The deviation is reported to the battery commander in the same manner as in airplane adjustment, and the adjustment is also similar. The long fuze should be used.

It is important that the new commands given the firing battery be transmitted also to the sound ranging battery. Very close liaison must exist between the two organizations during the firing. If possible, there should be a direct line. It is not essential but it is advisable to have an artillery officer present at the sound ranging central. Some battery commanders prefer to conduct the fire from there. It is well also to have a sound ranging officer visit the battery position and to have a conference after the shoot. Close cooperation cannot be overemphasized.

Upon the efficiency of the counterbattery officer will depend the maximum use made of sound ranging adjustment. This officer must arrange to have a heavy battery always prepared to respond at once to the call of the sound ranging central. The sound ranging battery must know what battery is available, the hours when other batteries would be available, and the ammunition allowances.

*Limitations:* There are at present certain unavoidable difficulties which affect the results of sound ranging. Chief among these is too much wind, particularly one blowing toward the enemy. Another trouble is too much noise—too many enemy batteries active at the same time. This latter will not greatly trouble a well-trained plotting section, however.

The lines of communication are difficult to install and difficult to maintain. The amount of wire required is very large, and it is necessarily of a heavy type, though with a further development of the microphone a lighter type will be used. It is not possible to prevent the cutting of the lines during heavy enemy bombardment, though sound ranging can continue with some of the microphones out.

It is unfortunate that it takes at least one day to get into action. This practically precludes the use of sound ranging in moving situations. If it were possible to use a shorter base and still obtain as accurate results, this difficulty could be avoided.

*Advantages:* When the weather is foggy and visual observation

## TACTICAL EMPLOYMENT OF OBSERVATION BATTALION

is impossible, the conditions for sound ranging are ideal. The sound ranging batteries will be the only means of locating hostile batteries, and the locations obtained will be very accurate.

Sound ranging batteries during the World War were credited with locating 65 per cent of the enemy batteries, of which 15 per cent were located by the sound ranging units alone. During the war, the error in locating batteries was 50 yards under the best conditions and about 100 yards under average conditions. Due to improvements in methods and equipment, the probable error under average conditions is about 45 yards at the present time.

Sound ranging units can tell the caliber of the hostile battery which is firing by the record of its sound wave.

It is interesting to note the method of identifying a particular enemy battery as being in action. It is, of course, the duty of the sound ranging battery immediately to notify the counterbattery officer about an enemy battery which starts firing, so that it can be neutralized. The execution of this mission is greatly facilitated by an examination of what we might call "the line of breaks." This is a broken line constructed on the film by connecting in order the breaks on the horizontal lines, taking the breaks which correspond to the sound from the battery under observation. The resulting broken line will have a characteristic appearance and will resemble the same line of breaks which was obtained by previous sound ranging on the same battery. A chart is constructed on which are placed the lines of breaks of all enemy batteries known in location from previous ranging. When a certain line of breaks appears on the film and is recognized on the chart, the report can be made immediately of the enemy battery in action.

*Conclusions:* Sound ranging is very valuable. It may prove of even more value in the future. It provides a wide field for experimentation, and the equipment will continue to improve. It rounds out the other methods of observation for locating targets and adjusting fire. With an increase in the use of long range guns and in the use of more howitzers, the sound ranging batteries will become more and more indispensable to the field artillery. These weapons will be able to take perfect flash defilade and take better advantage of concealment than can the present weapons, so sound will be the only way to find them.

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### THE FLASH RANGING BATTERY

*Mission:* The purposes of the flash ranging battery are very much the same as those of the sound ranging battery. They are to locate enemy batteries and to assist in ranging on them. An additional function is to assist in reporting enemy movements and activities as seen from the observation posts.

*Organization:* There are three main divisions of the battery: the central station, the observation posts, and the communications. Each of these sections should have the necessary personnel for operation and one lieutenant in charge. The battery should be commanded by a captain.

*Assignment:* In the Army there should be a flash ranging battalion. The Army will attach a flash ranging battery, or batteries, to whatever corps need it. There should be four batteries in the flash ranging battalion, as well as the necessary battalion headquarters and headquarters battery.

*Operation:* A number of observation posts are selected, about five, so situated that every part of the enemy terrain will be visible from at least two observation stations. Each observation post is equipped with instruments for measuring deflections and sites.

When an observer sees the flash of an enemy gun, he presses a key which lights a light in the central station. When lights belonging to several stations come on at the same time, it may be assumed that the corresponding observers are observing on the same flash. The direction of the flash is sent in from each station, and by means of a plotting board the location is obtained by intersections.

*Employment:* When an enemy battery is located, the information is sent at once to persons most concerned, and to the counter-battery officer.

The battery can be installed, with complete communications, in one-half day. It is therefore of much more use in mobile warfare than the sound ranging battery. When it becomes necessary, on account of rapid movement, to change position forward at once, only three stations will be located at first. The others will follow.

The communications take the time. Adequate transportation is essential. There may come a time when radio will be used for communication, in which case the battery will be able to get into action very quickly. The time required then will depend only upon

## TACTICAL EMPLOYMENT OF OBSERVATION BATTALION

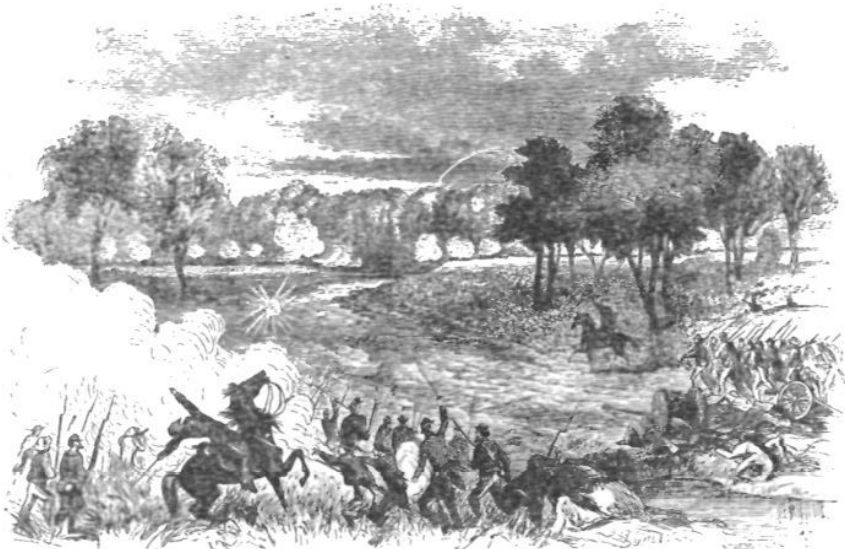
getting the observation posts correctly plotted on the plotting board.

Flash ranging batteries are expected to produce very accurate results on account of the long base lines used. The battery can serve a corps front of about 12,000 yards, just as a sound ranging battery can. Of course the stations must be accurately located.

Adjustment of fire by flash ranging is out of date, having been replaced by high burst ranging.

Flash ranging can be used either by day or by night. The batteries located by flash ranging will be accurately located, but few batteries can be observed nowadays due to the increased range of weapons and the fact that they can be more easily concealed. The flash ranging battery is useful in locating rapidly any balloons in the air.

The flash ranging battery supplements the sound ranging battery in the location of enemy batteries, but the sound ranging battery will be the more useful and deserves the maximum effort in bringing it to perfection.



**BATTLE OF BIG BETHEL: DEATH OF LIEUT. GREBLE**

## **FIELD ARTILLERY TRAINING IN AIR OBSERVATION**

VERY gratifying improvements over previous years in instruction in air observation have been noted at the Field Artillery School, Fort Sill, Oklahoma. This instruction was given to students of the Refresher, Advanced, Battery Officers', National Guard and Reserve Battery Officers' Spring and Fall Classes.

Two factors which contributed greatly to the improvement in instruction were the stationing of an observation squadron and photo detachment at the Field Artillery School and the placing of two Field Artillery gunnery instructors on a flying status.

In the Fall and Spring National Guard and Reserve Battery Officers' Classes, 1928-29, there was a total of 66.5 hours flying for the Fall Class and 22 hours for the Spring Class.

In the Advanced Class there were thirty-two observation flights, fourteen communication flights, and thirty-four adjustments. Last year the Advanced Class had only ten adjustments attempted, of which eight were successful.

In the Battery Officers' Class 1928-29, the average flying time per student was 145.6 minutes, which gave an average of 5.4 problems per student. This class had thirty-seven flying days scheduled, of which five were lost on account of bad weather. The Battery Officers' Class took an average of three to four salvos to obtain a satisfactory adjustment. A satisfactory adjustment was one which had an error in range of less than 50 yards and an error in deflection of less than 40 yards. This required an average time of about four minutes per adjustment.

Altogether about 400 hours were flown for the Department of Gunnery of the Field Artillery School by the 88th Observation Squadron at Post Field. With the total flying time spent on Air Observation greatly increased over previous years not only the number of students who received this instruction was vastly increased, but the amount of experience gained by the individual students was also much greater. The cooperation of the 88th Observation Squadron was most satisfactory and helpful.

The following is an analysis by class of the results of air observation instruction at the Field Artillery school:

## FIELD ARTILLERY TRAINING IN AIR OBSERVATION

### FLYING TIME, ADVANCED CLASS, 1928-29

	1928-29	1927-28
Orientation flights .....	32	?
Average time per officer (mins.).....	85	31
Average time per flight (mins.).....	48	31
Communication flights .....	14	?
Average time per flight (mins.).....	11	22
Baranoff machine instruction (mins.).....	45	45
Adjustments attempted .....	34	10
Adjustments successful .....	29	8
Adjustments unsuccessful .....	4	2
Adjustments graded "no problem".....	1	0
Average time in air per adjustment (mins.).....	17	17
Average total air time per student (mins.).....	129	78
Average error in initial data given, range (yds.).....	186	
deflection (yds.) .....	91	
Average error in first sensing, range (yds.).....	86	
deflection (yds.) .....	71	
Average error in second sensing, range (yds.).....	45	
deflection (yds.) .....	31	
Average error in third sensing, range (yds.).....	31	
deflection (yds.).....	29	
Average number of sensings per adjustment .....	3.3	
Average total time for adjustment, BA to last sensing .....	4 min. 33 sec	
Average time per salvo .....	1 min. 11 sec.	

### FLYING TIME, BATTERY OFFICERS' CLASS, 1928-29

	1928	1927	1926
Officers completing course .....	51	30	30
Total flying time (hours).....	148	69.8	68.8
Average flying time per student (mins.).....	145.6	133	129
Purpose of flying time:			
1st orientation flights (hours).....	41.9		
2nd orientation flights (hours).....	14.2		
Communication flights (hours).....	12.0		
Shoots (hours) .....	79.9		
Total adjustments attempted .....	290	162	98
Satisfactory adjustments .....	233	132	55
Unsatisfactory adjustments .....	42	22	22
No problems (communication failure).....	15	8	21
Average number of problems per student.....	5.4	5.1	2.5
Number of days for which flying was scheduled .....	37	21	16
Lost on account bad weather.....	5	6	4
Baranoff machine (mins.) .....	100	50	
Average error in initial data:			
1st shoots, range (yds.).....	205		
deflection (yds.) .....	81		
2d and 3d shoots, range (yds.).....	263		
deflection (yds.) .....	129		
Average error in first sensing:			
1st shoots, range (yds.).....	86		
deflection (yds.) .....	76		
2d and 3d shoots, range (yds.).....	121		
deflection (yds.) .....	84		
Average error in second sensing:			
1st shoots, range (yds.).....	47		
deflection (yds.) .....	33		
2d and 3d shoots, range (yds.).....	50		
deflection (yds.) .....	52		
Average error in third sensing:			
1st shoots, range (yds.).....	22		
deflection (yds.) .....	25		
2d and 3d shoots, range (yds.).....	22		
deflection (yds.) .....	35		
Average range error when observer gives range .....	162		

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Average deflection error when direction obtained by "Lay on me" (yds.) .....	145
Average time for adjustment:	
1st shoots .....	3 min. 56 sec.
2d and 3d shoots .....	5 min. 06 sec.
Average number of sensings per adjustment:	
1st shoots .....	2.72
2d and 3d shoots .....	3.87
Average time per salvo:	
1st shoots .....	1 min. 10 sec.
2d and 3d shoots .....	1 min. 0 sec.

### FLYING TIME, FALL N. G. AND RESERVE BATTERY OFFICERS' CLASS, 1928-29 COURSE

Flying scheduled (October 17 to December 4, inclusive).....	16 days
Lost account bad weather .....	4 days—25%
Total flying time .....	66.5 hours
As follows:	
1st Orientation flight.....	25.1 hours
2nd Orientation flight .....	39.5 hours
Shoots .....	2.15 hours
No. of Orientation flights:	
1st .....	35 flights, average time 43 min.
2nd .....	36 flights, average time 65 min.
23 communication flights, of about 10 minutes each, were included in the second orientation flights.	
Four adjustments were attempted, three satisfactory. 1 No Problem account communications.	

### FLYING TIME, SPRING N. G. AND RESERVE BATTERY OFFICERS' CLASS, 1928-29 COURSE

Flying scheduled (April 8 to 16) .....	4 days
Lost account bad weather .....	None
Total flying time .....	22 hours
As follows:	
1st Orientation flights, 27, average time 43 min. 19.5 hours	
2nd Orientation flights, 5, average time 30 min. 2.5 hours	
No shoots were conducted.	

### STATISTICS FROM AIR OBSERVATION, 1928-29 COURSE

Errors in initial data:	<i>Yards</i>
When data were given by BC on ground, range.....	200-260
When data were given by observer estimating range, "Lay on Plane for direction," range .....	162
deflection .....	145

*Note:* The deflection errors obtained by laying on plane are too large. They should not exceed 50 yards. These errors are due to inexperienced pilots and observers and can be greatly reduced. Figures also show that the errors totaled 5,000 yards right to 800 yards left. This is caused by tendency of pilot to keep target in view to *left* of fuselage, and must be corrected by bringing it to attention of pilots.

Errors in sensings:

	(Per cent of error corrected)		
	<i>1st Sensing</i>	<i>2nd Sensing</i>	<i>3rd Sensing</i>
Range .....	54-58%	45-59%	53-56%
Deflection .....	5-35%	38-57%	26-36%
	(Remaining error in yards)		
	<i>1st Sensing</i>	<i>2nd Sensing</i>	<i>3rd Sensing</i>
Range .....	85-120	45-49	22
Deflection .....	76-84	33-52	25-33

*Note:* The initial errors given are believed to be a fair average of what may be expected in actual service. The sensings were all made by comparatively inexperienced



## FIELD ARTILLERY TRAINING IN AIR OBSERVATION

observers. If an adjustment within fifty yards of the target in range and in deflection is considered accurate enough for fire for effect in an air bracket adjustment, then *two sensings* from an air observer are sufficient to warrant fire for effect through the indicated bracket. It may be noted that the figures indicate that two sensings from an air observer are the equivalent of

- (1) Map data corrected.
- (2) The start of fire for effect in lateral bracket.

In case the adjustment is interrupted after the *second* sensings, 10 mils (40 yards), right and left, will include the target. In either case 50 yards over and short will include the target. With an experienced observer these figures would doubtless be improved.

Time for adjustment:

3 minutes 56 seconds for the smaller initial errors and 5 minutes 6 seconds for the larger.

*Note:* This shows 4 to 5 minutes for an air adjustment under the conditions obtaining here. The adjustments were often carried beyond the point strictly necessary for effective fire, and the times are large.

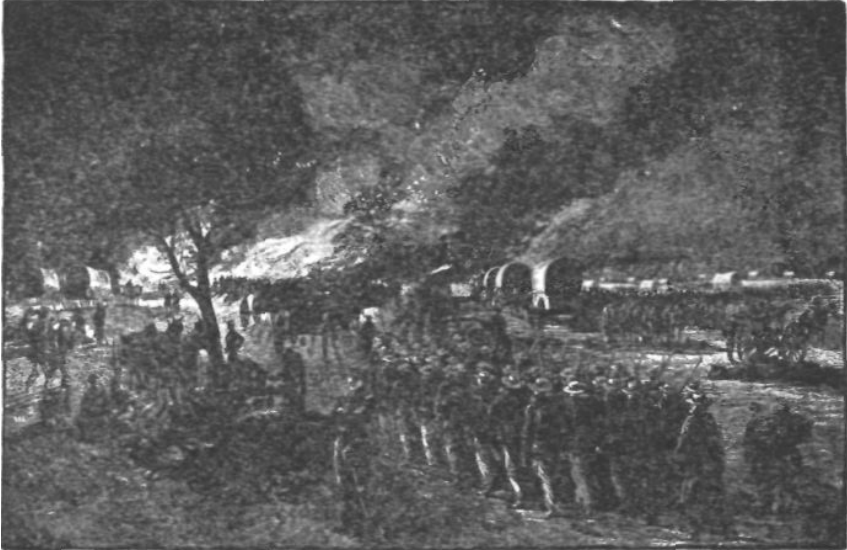
Salvos for adjustment:

To reach an error less than 50 yards in range and 40 yards in deflection:

Average number of salvos—2.72 and 3.87 (3 to 4 salvos).

Average time per salvo (total):

1 minute to 1 minute 10 seconds.



FEDERAL ARTILLERY COVERING THE RETREAT FROM THE CHICAHOMINY

# ENTRAINMENT OF HEAVY FIELD ARTILLERY

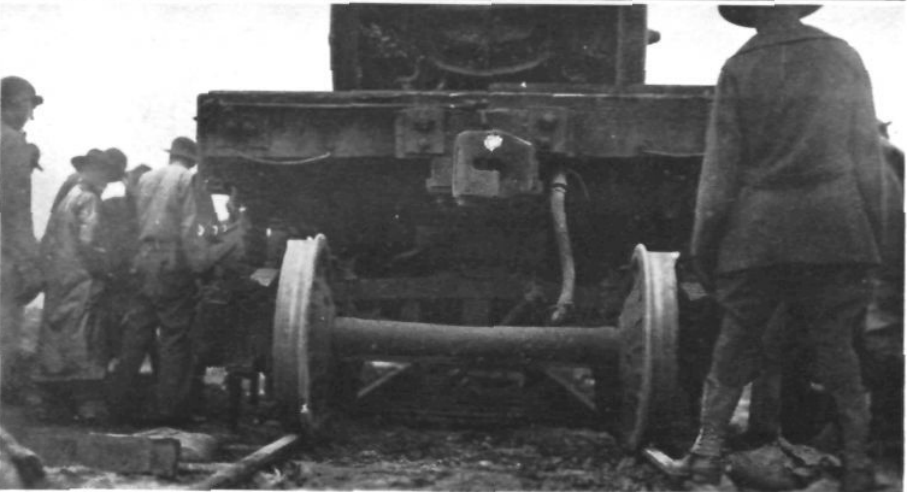
BY 1ST LIEUTENANT JOHN R. CULLETON, 5TH F. A.

DURING the course of the 1928-29 training program, the 5th Field Artillery (Colonel A. U. Faulkner, Commanding) completed a theoretical and practical study of the problems involved in entraining heavy field artillery. Consideration was given to units equipped with the 155-mm. gun and 240-mm. howitzer. This matériel is of such mass and size that its entrainment presents some problems not found in the loading of light artillery. In order that this may be visualized, a table of the principal dimensions and weights of some of the more ponderous items of equipment is given below.

<i>Item</i>	<i>Weight</i>	<i>Length</i>	<i>Width</i>
10-ton tractor .....	22,600	14' 10"	7' 6"
155-mm. gun, limbered .....	26,000	29'	9'
240-mm. tube on transport wagon .....	15,300	27' 2"	6' 10"
240-mm. platform on transport wagon .....	16,300	25' 2"	9' 2"
155-mm. gun coupled to 10-ton tractor .....	48,600	42' 8"	
155-mm. gun and 10-ton tractor on car uncoupled .....	48,600	40' 1"	
240-mm. tube coupled to 10-ton tractor .....	38,900	40' 10"	

It seems self-evident that, without much special equipment, matériel of such size and mass must be loaded from a platform or ramp flush with the top of the cars and running in prolongation of the line on which the cars are spotted. Also that each tractor must haul its own load aboard and remain in place directly in front of the load so as to be in position to haul it from the train at the journey's end. Ramps or platforms of the type mentioned will not be available at the ordinary railroad siding or yard. To load a heavy regiment quickly a number of such ramps must be improvised, since the total number of units in the matériel and motor equipment of a 155-mm. regiment (war strength) is 418, of a 240-mm. regiment, 711.

Where sufficient time and matériel are available, ramps of conventional type may be built of timber, but such ramps are heavy and unwieldy and require expert construction. Two interesting methods by which temporary ramps could be constructed were tested with 240-mm. howitzer matériel with marked success by the Second Battalion, 5th F.A. (Major Kenneth S. Perkins, Commanding).



**FIG. 1: SHOWING LATERAL BRACES TO PREVENT CAR FROM SWAYING**  
**FIG. 2: EACH CATERPILLAR TRACTOR HAULS ITS OWN LOAD AND REMAINS IN FRONT OF IT**  
**FIG. 3: REMOVING THE FRONT TRUCK OF A LOADED CAR**



FIG. 4: RAMP MADE ENTIRELY OF SAND BAGS, ABOUT 600 REQUIRED  
FIG. 5: END FLAT CAR USED AS RAMP FOR 155 GUN  
FIG. 6: CATERPILLAR HAULING 240-MM. TUBE OVER SAND BAG RAMP

## ENTRAINMENT OF HEAVY FIELD ARTILLERY

With the refinements suggested by experience they were later tested with the heavier and more unwieldy 155-mm. gun matériel by the First Battalion, 5th F.A. (Major George M. Peek, Commanding), and again fulfilled all requirements. Captains Mellville S. Creusere and Buhl Moore were in direct charge of the experiments for the Second and First Battalion tests respectively.

In the first test, a ramp was made entirely of sand bags (see illustrations). The ramp was built up to 6 inches above the height of the car deck (to allow for settling of the bags) and was extended about one foot on either side of the deck in width. The face of the ramp was given a 1 on 4 slope (about 20 degrees) and the sides a 1 on 1 slope (45 degrees). Loose earth was thrown on top of the ramp to level the surface and protect the upper layer of bags. During use a few of the outer bags were broken but were replaced at once without interrupting the use of the ramp; 600 bags were needed for a ramp of this type. With a detail of forty or fifty men such a ramp can be constructed in two hours and can be torn down and the track cleared in ten minutes. The bags used can be emptied and carried along for use at the end of the journey. Bags can be obtained from the Engineers or can be accumulated by saving grain and potato sacks.

A second expedient, suggested by Lieut. Albert Brill, 5th F.A., was found to be very successful. The end of the last car in the train was jacked up, the trucks removed, and the end of the car lowered to the road bed. Thus, in effect, the car itself became a ramp. A very few sand bags, about 100, placed around the foot of the car, served to complete a quite satisfactory ramp for either entraining or detraining. All the jacks and blocks necessary for the process are part of the normal equipment of either a 240-mm. or 155-mm. unit. It was found that, without previous practice, a flat car could be converted into a ramp or back again into a flat car in less than twenty minutes after assembling the working party and the necessary equipment.

In the actual operation of this method, three simple details were found to be of importance. First, lateral braces must be used to keep the car from swaying while being raised or lowered (see Figure 1). Second, the lowered end of the car must be blocked up enough to prevent the coupling from resting on the ground and thus bearing the weight of the car (see Figure 5).

## THE FIELD ARTILLERY JOURNAL

Third, blocks should be placed between the remaining trucks and the car deck to prevent its tipping up when the weight of a load comes on the upper end of the ramp.

It was found that in addition to the ramps it was necessary to construct wooden trestles or bridges to provide tracks upon which the vehicles could run from one flat car to the next. Since the various vehicles differ greatly in width of tread, it was necessary to make each bridge 3 feet wide to avoid shifting them constantly as wide or narrow loads cross them. (The difference in width between the inside of the 10-ton tractor track and the outside of the 155-mm. gun wheel track is 4' 8".) A pair of these trestles are needed for every car intended to be loaded at one time. The trestles can be constructed and kept on hand prior to the receipt of entrainment orders.

It was developed that some loads are actually wider than the flat cars on which it may be necessary to load them. The widest track is about 9 feet while standard box cars vary from 8' 6" to 9' 6" in width. Even on the widest cars this load cannot be chocked outside the wheels. Reliance must be placed in making secure and tight fitting of the chocks inside the wheels; 6" × 6" timbers are a proper size for chocks.

With their tractors, the longest loads (155-mm. gun and 240-mm. tube) require a 40 foot flat car. The total matériel and motor equipment of a heavy organization is so bulky that a proportion of three or four flat cars to one box car is required to load a complete organization efficiently. In this connection the following is quoted from official sources:

War Department prescribes that in the theater of operations "type" trains will be employed for rail transportation of troops, and prescribes two type trains, viz.:

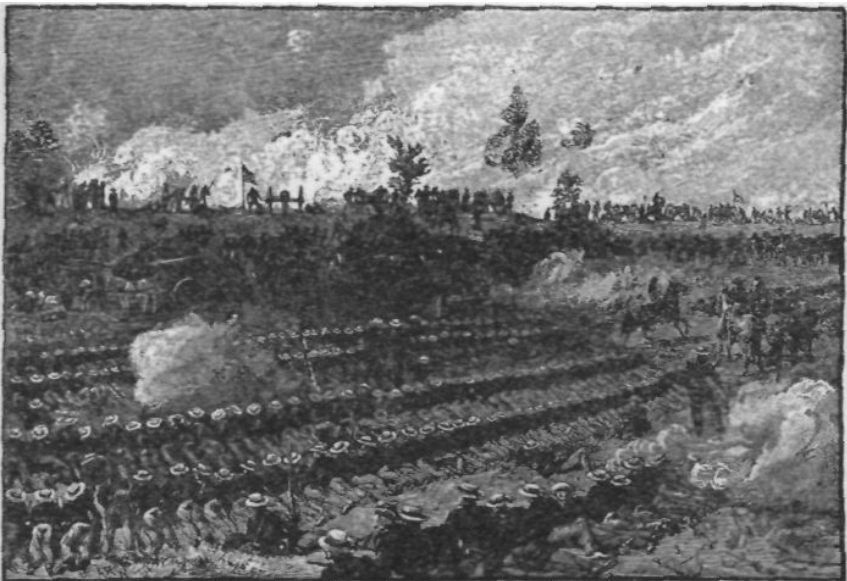
Type A—1 passenger car for officers, 23 box cars for men, animals, baggage, forage, rations, etc., 9 flat cars for vehicles. Caboose for train crew. Total 34 cars.

Type B—1 passenger car for officers, 11 box cars (as above), 17 flat cars (as above), caboose for train crew. Total 30 cars.

Flat cars of 36 feet length, nothing prescribed as to box cars.

## ENTRAINMENT OF HEAVY FIELD ARTILLERY

A detailed discussion of how a heavy regiment would be loaded on "type" trains is beyond the scope of this article. It is believed, however, that "type" trains can be used by heavy field artillery only by splitting batteries on more than one train, and by wasting the capacity of a large portion of the box and passenger cars involved.



SLOCUM'S ARTILLERY AT FRAYSER'S FARM; THE 16TH NEW YORK INFANTRY WITH STRAW HATS

# THE CONDUCT OF WAR

BY MARSHAL FERDINAND FOCH

AUTHOR OF "THE PRINCIPLES OF WAR"

TRANSLATED BY CAPTAIN W. F. KERNAN, FIELD ARTILLERY, U. S. ARMY  
(Third Installment)

## CHAPTER IV

### GROUPING OF FORCES

MOLTKE passed next to the organization of the forces which he intended to use in battle. Battle was the first objective he sought, and one which he went after in a definite manner.

"Masses so considerable as these are only able to operate when broken up into several armies." The question then arose as to how this subdividing of forces was to be accomplished. Could a logical principle be employed or was everything to be left to chance?

"The strength of each one of the three armies had to be suited to the special mission to be carried out by it ('in the maneuvers incident to battle' he would have added if he had expressed his thought completely), and the assignments of the various army corps were regulated so as to permit them all to be ready in the shortest space of time."

No symmetry, no harmony was attempted as regards the armies themselves. The forces composing each army were variable and were determined by their special missions. This is our first conclusion.

This is, then, the first principle observed in Moltke's organization of forces. However, before studying these special missions and the corresponding and variable strengths assigned to each, let us see what was the general arrangement of Moltke's dispositions with regard to the attack. Moltke arranged his troops for the attack by forming them into a center, two wings and a reserve, a solution which is a very harmonious arrangement of his command. He did not arbitrarily form three, five, six or seven armies, but from the very first fixed upon four, stationed as follows:

1st Army: consisting of two corps; it constituted the right wing at Wittlich.

2nd Army: consisting of four corps; it constituted the center at Neunkirchen-Hombourg.



## THE CONDUCT OF WAR

3rd Army: consisting of five corps; it constituted the left wing at Landau-Rastadt.

4th Army: consisting of two corps; it formed the reserve in front of Mainz.

A center, two wings, a reserve: that was his solution. For his main effort a center protected by two wings. For any emergency, a reserve. The reserve was there in the event the Third Army should have to meet an attack against South Germany. If this should have occurred, the Third Army would have had to concentrate on the left bank of the Rhine and hold the enemy by maneuver until the main body could intervene.

But it might be objected that in this case the "whole force idea," upon which the Prussian theory of attack was based, was not carried out. The whole force resembled a man having but one arm. However, this objection may be met by pointing out that there would be still another reserve, viz., the reserve composed of the Guard and the X Corps, which was intended to act as the left wing of the Second Army if circumstances demanded it.

We may observe here how the rôle of a strategic reserve became a minor part in Moltke's system. The idea of such reserves, armies, as it were of the second line, has never met favor with great generals. The truth is a strategic reserve has no place in a plan of attack.

The function of a reserve is: to reinforce combat troops, to guard against surprise, or to gain a decision on the field of battle. With the first function mentioned strategy is not concerned, for strategy deals with the maneuvers of armies. With regard to the second function of a reserve we may note the following: A battalion repulsed can be brought back into active combat by a fresh company or a new battalion, but "there has never been an example," says Clausewitz, "of an army once defeated being enabled to take up the battle again on anything like even terms, through the arrival, however timely, of another army." The disorganization is always too complete. In this connection we would do well to recall the aftermaths of Waterloo, of Sadowa, or Froeschwiller.

Should the decision be obtained by a decisive attack? We

have seen clearly in our study of tactics what methods of employment, what economy of forces, what successions of efforts are used to postpone the decision to the end of the battle when the adversary is tired and his strength used up.

The rule of successive efforts in tactics is replaced in strategy by the necessity for simultaneous efforts. Therefore let us never entertain the idea of a reserve army of the second line gaining the decision in an offensive action. If an army is not in line when the action commences, it will neither have the time, nor the space, nor the morale, necessary to gain a victory.

A surprise, on the other hand, may be encountered in strategy as well as in tactics. However, the larger the scale of operations the less risk we run of being taken by surprise. Major strategical operations are generally accomplished so slowly, are so extended in space, and once begun are so difficult to alter that we are able to observe them in time to take the necessary defensive measures. It follows that a strategic reserve, whose function is to guard against surprise, is illogical except where an offensive action is out of the question and we are forced to await the attack of the enemy. For example, the Prussian reserve would have proven of value in the event that France should have taken the initiative and invaded South Germany or Belgium. On the other hand, this reserve would have become useless the moment the German commander assumed the offensive. This is the reason for Clausewitz's remark that "The whole idea of a strategic reserve becomes illogical before the main decision is ready to be made, and therefore the strategic reserve is no longer necessary after that decision has been taken. Accordingly a strategic reserve should never be created where the sole end in view is to guard against getting surprised."

The moment Moltke took the offensive his strategic reserve had ceased to exist; it was merged in his main body, the Second Army. Nor did his plan of attack include the use of his reserve as such. Indeed he contemplated no use for it other than that mentioned above, i. e., in case the French should have taken the initiative and commenced an offensive action against the flank of the Prussian concentration. But

## THE CONDUCT OF WAR

in that case the advantages of his having arranged his forces in two lines are evident, if either South Germany or Belgium had been invaded by France.

The considerations urged against the use of a strategic reserve in an offensive action vanish when the action becomes defensive. In the latter case a reserve must be accepted as the only means of successfully countering the main effort of the enemy when it becomes apparent. The only method, for example, of guarding against Moltke's attack on the Saar (planned but never executed) of the 8th and 9th of August, 1870, would have been by the use of large reserves in a counter-attack over a considerable area. In this manner the enveloping movement which the Third Army was expected to attempt on the upper Saar could have been successfully countered.

However, such maneuvers require the movement of troops over considerable distances, and these distances are increased in proportion to the strength of the forces employed and the space which they must cover effectively. The three German armies on the 5th and 6th of August, 1870, covered a front of about 100 kilometers, and an analogous extension of front will not be uncommon in the wars of the future. Under such conditions a reserve must be prepared to march 50 or 60 kilometers or even more to reach its zone of action and to deploy in front of its objective. Such a maneuver, in order to be consummated in proper time, would demand the utmost expedition, and, lacking this, it is bound to be unsuccessful. A carefully planned use of railways seems to be the only way of putting it into effect under ordinary conditions.

As we have seen above, Moltke divided his troops into several armies, a system which permitted him to maneuver in any direction he desired. This was in sharp contrast to the system of a single army (in block or cordon) used by the Austrians in 1866 and also by the French in 1870. Moltke's plan provided for four armies during the period of preparation, that is to say, as long as he had to provide against a possible offensive from the French. When he took the offensive this number was reduced to three—a center and two wings, a body and two arms.

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Moltke describes his formation for the attack as follows:

"Operations against France will consist simply of a march into French territory with our forces united as far as practicable. Our march will continue until we encounter the enemy and engage him in battle. The general direction of our movement will be Paris, because in marching against that city we may count more surely on encountering our objective—the army of the enemy."

But, as we have seen above, this hostile army, the first objective which Moltke counted on meeting in order to defeat it, was not his final objective. Paris and the Loire were beyond the French Army, and it was upon these that Moltke had fixed his eyes. He depended on his power of maneuver to separate the French Army from these ultimate objectives. He intended to execute his maneuver on the enemy's right, and his whole system of attack was planned for that purpose. Moreover, the composition of each one of the German armies was determined by the special rôle assigned it.

According to this plan, Moltke's center was to make a frontal attack; his left wing, the Third Army, was to have the important mission of delivering the decisive enveloping attack. For this reason the Third Army was made as strong as possible in order that it might have a numerical superiority over the French Army then supposed to be forming in Alsace. By this means it was assured of reaching the battlefield of the Saar and accomplishing its mission. To the army of the right wing was assigned the mission of acting as a protecting force—a guard, and it was therefore smaller than the others.

These were the considerations which governed the formation of a system of attack which comprised:

*A center or main body* to make its thrust directly against the enemy's front. This was the Second Army, consisting, after the breaking up of the reserve, of six army corps, III, IV, IX, X, XII, and the Guard, as well as four divisions of Cavalry, the 5th and 6th Cavalry of the Guard and the Saxon Division.

*An offensive wing*, for maneuver; for making the decisive attack of the battle. This was the Third Army composed of

## THE CONDUCT OF WAR

five corps, as follows: V and XI Prussian, I and II Bavarian, and the Baden-Wurtembergian Corps and two cavalry divisions (2nd and 4th).

*A defensive wing* for the protection of his flank. This was the First Army composed of two corps, VII and VIII, and one cavalry division, the 3rd.

One might be led to suppose that Moltke's organization of troops into armies was influenced by the number of troops at his disposal and that, given more army corps, he would have formed additional armies. This was by no means the case. The three corps maintained in the interior of Germany for political reasons (I, II and VI) were soon available, and Moltke could have formed of them another army. But he saw no reason for doing so. Indeed, to do so would have been to break both the harmony and the economy of his system, which, to be rational, must consist of a center and two wings totalling three groups of army corps, each having its special mission. The organization of his system of attack remained unchanged. The last remaining corps served no purpose in entering the campaign other than to reenforce the armies already formed, and they were assigned as follows: I Corps to the First Army, II Corps to the Second Army, VI Corps to the Third Army. Nor did Moltke hesitate to assign to the Second Army seven corps and four cavalry divisions, an enormous mass representing the largest body of troops ever heretofore united under a single command.

The three armies as thus constituted had routes of march of different lengths to traverse and different missions to carry out even before engaging in battle with the French. Thus the Third Army, recruited in the Bavarian Palatinate, had to conquer the French forces of Alsace, clear the relatively difficult passes of the Vosges Mountains and make long marches before being able to influence the course of the battle which was planned to take place as soon as possible in the Saar. The First and Second Armies were able to approach the Saar immediately without any preliminary difficulty. Therefore the organization of the Third Army had to be completed more rapidly than the others. These considerations of time influenced the assignment of the army corps to armies in Moltke's system.

## THE FIELD ARTILLERY JOURNAL

An attack like that of 1870 executed today by a similar German force would result in a part of the troops encountering obstacles near the French frontier. They would find, without doubt, certain of their routes barred by the forts of Toul, Epinal, Verdun, and by the strong points of the Meuse and upper Moselle. Although these forts have lost much of their value since the invention of melinite, they still represent important obstacles for field artillery, and would have to be reduced before the enemy could continue his march beyond them. It is for this purpose that the armies' artillery is supplemented by large caliber mobile artillery.

But in the future, as in the past, there will be armies of maneuver as well as armies of frontal attack. The former will reap the victories which the latter prepare. Whether the latter are called advance guards, according to the Napoleonic system, or centers, according to Moltke's, the tendency will always be to increase the number of troops which compose the maneuvering bodies, because they are charged with the decisive attack, and to reduce the strength of the frontal attack as much as is consistent with the solidity and invulnerability of the fronts which they must maintain. But artillery and fortifications can be employed here to good purpose, and hence today the extended use of large caliber artillery well concealed, of guns with shields, and of fortifications on the field of battle itself.<sup>1</sup>

This explains the present composition of the German field artillery. In addition to the light, rapid fire guns each army corps has a group of 10.5-centimeter howitzer batteries and in certain corps there are horse-drawn batteries of 21-centimeter mortars for attacking strong points as well as a great number of 15-centimeter howitzers (with a projectile of 40 kilograms and a very strong charge).

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<sup>1</sup>Von der Goltz wrote: "The close association between wars of movement and siege warfare is becoming more and more apparent. While up to the present siege warfare was considered a specialization, we are now beginning to apply its principles of rapid fortification to open warfare, and even the attacking party must resort to pick and shovel.

"The extended use of field fortifications in battle is resulting in the development of curved and high angle fire by the artillery, which is forced to use mortars or to modify the construction of its projectiles, in order to obtain the demolition required by modern battle conditions.

"A good idea is to surround one's accurate, rapid fire guns with armor and to shelter the cannoners and ammunition with portable means of protection against small arms fire, in order that it would be most difficult to capture them with the usual means employed in open warfare."

## THE CONDUCT OF WAR

What do they demand of this artillery?

First, to destroy the field fortifications of the enemy. Second, to reenforce the German field fortifications. Third, counter-battery missions. Fourth, to destroy with immeasurably superior fire the objective of the decisive attack. Saint Privat was bombarded not only by the artillery of the Guard and of the XII and X Corps, but also by the army artillery.

The result is the addition of a new element of force to the fire power of the field artillery, in order to beat down the resistance of the enemy as it increases from day to day. Thus the 38,000 men composing the siege artillery, instead of waiting to be attacked at Metz or Strasbourg, or themselves attacking Toul or Epinal, are thrown into the battle of maneuver. Here we observe the development of the principle of economy of forces, which, instead of assigning special missions to the artillery, or reserving it for a particular purpose, throws all calibers into the decisive action of warfare, the battle.

But these new pieces, differing in design and weight as they do, will not be distributed uniformly throughout all the armies. The special mission of each army will decide the amount and type of artillery to be assigned to it.

Without considering the two wings which will encounter forts and strong points along their routes of march, and which will therefore be assigned mortars, we can expect the center with its mission of frontal attack to be given the howitzers. For the troops which form the army of the center are unable to maneuver. In order to advance they must break down and destroy whatever holds up their march. The means of accomplishing this is the heavy artillery; and if they reach the limit of their offensive power it is still necessary that they assume the defensive and hold the ground they have taken. For example: In 1870 the plan of Moltke contemplated the First and Second armies arriving on the Saar on the 7th and 8th of August, while the Third Army which was to deliver the decisive attack was unable to reach the battlefield until the 9th. There were two days, then, during which the two first armies had to get along by themselves. Methods of siege warfare were therefore employed to enable them to hold.

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They were strengthened by the addition of heavy caliber batteries in great numbers. They sought protection from curved fire by utilizing the advantages of the terrain, and from fire of guns with flat trajectories by building breastworks and bastions.

But, in addition to this, the reenforcement of the armies of the center by artillery of all calibers presents in the final analysis a very considerable economy in infantry. It seems to be admitted today that a long line of artillery which is superior to the adversary either in numbers, or in the technique of its personnel, or on account of better matériel or better emplaced positions, is sufficient to halt the advance of the enemy without very much help from its infantry.

The German maneuver of 1870 considered from the standpoint of today might take on a different complexion. In addition to a center arriving on the Moselle (as the II Army planned its advance to the Saar in 1870), and emplacing its batteries of howitzers on the right bank of that river to halt peremptorily our advance, we can imagine one or both wings of the enemy's army being increased by troops wisely economized and drawn from his center. One or both wings would then have a numerical superiority sufficient to break down all resistance and to make a violent and decisive attack. Here we observe the influence exercised by industrial development on warfare, which, thanks to machinery, is able to take on new forms without making any change in its eternal principle; i. e., the necessity to make preparations to bring about the desired outcome. In fact, nothing is changed except that this preparation must be more detailed and more specialized, and military foresight must be all the more active because its technique can no longer derive examples from the past. Were it not for 1866, we would perhaps still be discussing the value of breech loading rifles, and it was 1870 that brought modern artillery into use.

The next war, making great use of balloons, telegraph, railways and rapid fire artillery of large caliber, while still following the unchanging principles of war, will deal with its problems in an entirely new manner. For example, it will produce German armies organized and equipped with special engines of war corresponding to the mission assigned to each,



## THE CONDUCT OF WAR

and destined to support each other in a final maneuver in which all forces will take part. It will demonstrate also that this carefully planned maneuver of all forces, numerically superior to the enemy and logically divided into various armies, is bound to have a success which would be denied to operations improvised at the last moment, and lacking special engines of war to reenforce the troops engaged. To defeat such a maneuver we would have to utilize all of our troops, divide them into armies, and equip each army throughout with modern weapons. This latter precaution would be necessary because of the special mission assigned each army in an offensive operation prepared in detail in advance.

It would indeed be in vain if we were to postpone making up our minds about our part in this maneuver and in the war of position it would involve, because of the indeterminate data upon which to work or on account of questions about the time and space factors. It is easy to figure out that from Nancy to Chateau Salins is 27 kilometers; that there are 50 kilometers of railway along the line Metz-Sarrebourg-the-Moselle. The field of hypothesis here is as narrow and restricted as are the natural difficulties to be overcome, and the spaces to be traversed.

### CHAPTER V

#### REUNION OF FORCES IN TIME

##### COVERING FORCES

THE concentration being decided upon as regards the space factor, it was then necessary to regulate it as regards time, in order to attain the following ends: First, to halt any possible operations commenced by the enemy; second, to attack immediately and thus prevent the enemy from repairing any of his weaknesses, particularly his numerical inferiority; third, to permit each army to accomplish its special mission.

As we have seen above, the Third Army had to take the field in advance of the others. Therefore, it could not consist of slowly mobilizing or distant corps. It is in just this manner that the projected battle influences the concentration in both its time and space aspects. Furthermore, it is this projected battle which determines what dispositions must

## THE FIELD ARTILLERY JOURNAL

be made in time of peace for the transportation and the mobilization of armies.

We may as well admit here that in modern war our operations are commenced in time of peace; this only goes to show how important, from the point of view of strategy, are the dispositions regarding transportation and mobilization which have to be worked out before the outbreak of active hostilities. And these dispositions must always be made with the idea of battle in mind; never without it. If we want to have a successful battle, we must incorporate it in our plans.

Time is a prime consideration, particularly during concentration. During this critical period the nation is unable to meet an attack unless its concentration is covered.

Let us examine the use Moltke made of these two factors, time and covering forces, in order to insure the success of the Prussian concentration and to place his troops as follows:

First Army at Wittlich—75 kilometers from the French frontier (three days' march).

Second Army around Kaiserslauten—25 kilometers from the French frontier (one day's march).

Third Army at Landau-Rastatt—20 kilometers from the French frontier (one day's march).

In Moltke's opinion, the success of the concentration was to be guaranteed by the rapidity with which he was able to carry it out. Nothing short of an actual attack by the enemy could compromise it, and this contingency was amply provided against by his more speedy mobilization and by his careful preparation of adequate means of transportation. (We shall see later the fallacy of this sort of reasoning.)

Moreover, when the question arose, as Moltke puts it, "of determining whether, without being disturbed, we could safely effect our first concentration beyond the Rhine in the Palatinate near the French frontier" he had no justification for the answer which he gave: "This question must be solved by answering 'Yes' "—a peculiar decision which, having no foundation in logic, was promptly proved false by the force of circumstances.

Moltke took two possibilities into consideration:

First case: That the French having mobilized in two echelons

## THE CONDUCT OF WAR

might commence operations against the German main body by launching an offensive with a part of their forces.

"It is certain," Moltke continues, "that because of the numerous garrisons and camps in Northeastern France, as well as the completely organized railway system there, the French would be able to assemble on their frontier with the least possible delay an army of 150,000 men without having to depend on the influence of the war on the minds of the civil population to speed up recruiting. This possibility of the French rapidly taking the initiative is quite in keeping with their national character and has already been discussed in military circles. But admitting that this improvised army, even if abundantly supplied with artillery and cavalry, might be concentrated around Metz on the eighth day of the war, we would still be able to complete the transportation of our troops by rail and to detrain them along the Rhine in sufficient time. The army of invasion could not possibly reach the Rhine in less time than six days and on the fourteenth day would be halted by superior forces."

$8 + 6 = 14$ : A result mathematically certain—a strategy of figures which is unquestionably of great value. On the fourteenth day, according to this reasoning, the French army would be halted and defeated on the Rhine by the numerical superiority which they would encounter there. However, this is still not the highest form of strategy, for, as we review it today, we observe that it presents several very serious difficulties, as follows:

(a) More than 120 kilometers of terrain with all of its resources abandoned without a blow.

(b) The total abandonment of the frontier to the depredations of the enemy.

(c) A delay of six marches when finally the offensive is assumed.

(d) Contact with the enemy lost during an appreciable length of time.

Such are the difficulties and inconveniences resulting from the lack of covering troops, the result being a fictitious security made up of time and space factors without considering the forces involved; in other words, a variable, one function of which is mission.

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Second case: That the French, taking advantage of the readiness of their reservists, should take the offensive before the German concentration is completed. It was Moltke's opinion that this contingency could not arise before the eighth day—that is to say before the German plan of concentration had gone into effect and he planned on meeting it in this manner:

"If we suppose," he says, "that the French are able to unite all of their forces against the German Second Army (131,000 men) and that the latter must draw on its reserves (63,000 men) we shall then be ready to accept battle with 200,000 men in the excellent position of Marnheim. In this case the French would be unable to attempt any serious expedition against either the upper Rhine or the Moselle—and it would be easily possible for us to reenforce our main body of 194,000 men with the entire Third Army (130,000 men), and with the First Army along the Nahe threatening the flank and the rear of the enemy. Such an action on the part of the French would be greatly to our advantage in that it would enable us to throw 310,000 men into the decisive action."

In this case, as in the former, Moltke planned to reply to an attack by a decisive battle in which he would possess an indubitable numerical superiority over the forces of the enemy. His defensive position in this case is taken sufficiently to the rear to enable him to throw into the battle all of his forces: namely, First, Second and Third armies and the reserve.

Here is a good conception of a defensive position for an army, and even more so for a group of armies. Moltke did not select an advantageous position from a tactical standpoint so much as a region where he, with all forces united, could meet the enemy when he arrived and gain a decision by weight of numbers.

The true characteristics of Moltke's strategy are here apparent. He sought victory through the use of numerical superiority and space. His conception of strategy is mathematical, and from this conception he developed the concentration on the Rhine and the plan for the battle of Marnheim. This was again demonstrated on the 25th of August, when he

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attempted to halt the French Army between Chalons and Metz. Moltke's idea in this instance was a very simple one. Assuming that the French Army of four corps, which on the 23rd of August was reported at Rheims, would be on the Aisne on the 25th and would reach the Meuse on the 27th, he counted on halting it by a concentration at Damvilliers because in three days (or by the 28th) he could concentrate there the following troops: Two corps of the Army of Metz, three corps of the Army of the Meuse, two corps of the Third Army.

A total of seven corps, and thus on the 28th of August (so Moltke's reasoning ran) the French would be forced to give battle at a point on the Meuse with forces greatly inferior to those of the enemy

As we see by a glance at the map, Damvilliers is on the road RHEIMS-VOUZIERS-METZ and is the center of a circle whose radius is less than the distance DAMVILLIERS-VOUZIERS and within whose circumference are seven German corps.

Considered from the point of view of the result sought, the strategy of Moltke possessed the advantages of mathematical certainty, grandeur and simplicity. Granted the success of his concentrations at Damvilliers and Marnheim, Moltke would have been able to fight his battles under the most favorable conditions. The only question which arose was whether these concentrations were possible when we consider the close proximity of the enemy.

Furthermore, when we look at the plans prepared for the operations of the first part of August, 1870, we observe various difficulties standing in the way of their execution. In particular we note the change of front which would be imposed on the troops which Moltke had concentrated at these points. Deployed for an attack, they would have had to assume the defensive or even retreat, and a retreat of 100 kilometers for the main body of an army which was not yet completely organized for such a maneuver, and over a difficult terrain, and with the channels of communication to the rear limited to two roads, might indeed prove disastrous.

Here the inferiority of Moltke's strategy to that of Napoleon

is clearly apparent. In 1806, for example, Napoleon was able to prepare and carry out a concentration which was skillfully defensive at its inception and openly offensive at its close, the entire operation being protected by covering troops during all of its various phases, viz., allocation of units; deployment; defensive and offensive action. The covering forces, which guaranteed the strategic security of this maneuver while the action of the French was purely defensive, became a general advance guard as soon as the Emperor assumed the offensive. Napoleon never depended upon the space factor alone for security. He always held in readiness forces capable of maneuver or of resistance, according to his need. To his mind the function of strategic security was a variable and, as such, was susceptible of many combinations. Because of this the result sought—namely, the union of forces—could be accomplished with certainty in close proximity to the enemy, and during the course of a concentration he was not only protected from attack, but he also was in position to maneuver if the need arose.

The theory of strategic security was put into practice by the German General Staff with considerable success in 1814 and 1815. Clausewitz deals with it at some length in his chapter on strategic advance guards and shows how the abandonment of this principle by certain French marshals during the latter period of the Empire was fatal. He shows also how Blucher in 1815 was able to cover his forces effectively by the use of two covering corps: the I at Charleroi and the II at Ciney, in order to make certain the possibility of reuniting all forces at Sombeffe if this should be necessary.

Moltke, in the war of 1870, paid little attention to the theories of Clausewitz. Apparently, strategic security, for him, was an empty phrase. He made absolutely no provision for a covering force for we can certainly not apply the expression "coverture" to the detachment of four squadrons, four battalions and one battery which he sent from Mayence to Treves to cover the assembly of the First Army at Wittlich, or to the detachment of two battalions and four squadrons which occupied Saarlouis and the line SAARLOUIS-SAAR-BRUCKEN along the front of the Second Army. Only

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Moltke's Third Army, with the Bavarian Brigade in front of it, can be said to have had something remotely resembling a covering force. In order really to provide sufficient security for his concentration in 1870, Moltke would have had to mass two army corps on the frontier, as, for example, the Sixth and Seventh Corps, the mobilization of which could have been accelerated at will. However, during this epoch the course of mobilization of an army was still too rigidly fixed to permit one part of the forces mobilized in two echelons to be withdrawn without seriously interfering with the mobilization of the remaining part. Furthermore, in dispensing with a covering force and trusting to distance alone for the security of his concentration, Moltke was greatly influenced by considerations of morale.

He conceived a very high idea of the fighting qualities of the French from his observation of the wars in the Crimea, in Italy, and in Mexico. His first desire was therefore to avoid all chances of an initial defeat—of being forced to retreat. The neutrality of Austria and Italy and alliance with South Germany all depended on this consideration. Could he suppose that the I Prussian Corps, placed in positions from which they could cover his concentrations, would be, in the event of an attack by the French, sufficient to ward off the ruin and disaster? Could he, in any case, trust them to carry out the necessary maneuvers? The tactics of "Vorwarts" taught over a long period of time, might thus at the very commencement of hostilities receive a formidable repulse—a blow capable of destroying all of his plans. How could such tactics be counted on to produce a successful maneuver during a retreat? And how could he ever resume the offensive? Such are indeed the difficulties which attended the execution of Moltke's plan. Nor can we doubt that these difficulties exercised considerable influence over the mind of the Prussian Chief of Staff, disciple of Clausewitz though he was. Here again we observe the inevitable hiatus between theory and practice. Moltke placed his trust more in mathematics than on maneuver; more in weight of numbers than in morale. He was incapable of a strategy greater than the one that he adopted, and for this reason we must relegate him to a place considerably below Napoleon.

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Nevertheless we are forced to admire the cleverness of a general who could accommodate his ideas to the means at his disposal, and who, conservatively abandoning the great strokes of genius, was still able by means of exact knowledge and careful observation of the enemy's movements to attain results never surpassed in history.

To turn to our argument; once the concentration on the Saar was completed, two possibilities were open to Moltke:

- (1) He could execute a turning movement towards the Rhine.
- (2) He could take up the position at Marnheim. The question which arose was: How could he know which of these two enterprises should be undertaken?

"This information will come from the covering force," said Moltke. As we have already seen, the covering force for the operations on the Saar consisted of four battalions, four squadrons, and one battery, sent from Mayence to Treves to cover the First Army in process of formation on the Moselle, near Wittlich, and the two battalions and four squadrons on the line SAARBRUCKEN-SAARLOUIS in front of the Second Army. It was to these forces that Moltke entrusted the function of reconnaissance. They would act, he believed, as a sort of "alarm bell" to give him the necessary information. He would be able to decide thereupon which of the two alternatives outlined above should be adopted.

As he put it: "If during the period of our concentration, let us say on the eighth or ninth day, doubt should arise regarding the possibility of finishing it along the line of HOMBORG-NEUNKIRCHEN, as originally chosen, *acting on information received from the troops holding the Saar*, the concentration may be withdrawn and moved to the Rhine."

The futility of this sort of reasoning is very evident. Moltke's "alarm bell" on the Saar might be forced to function under the pressure of a regiment or of a brigade, and thus cause a modification of his plans not at all justified by the actual military situation.

In order to avoid in the future the recurrence of such mistakes; to prevent any lack of security due to the assignment of insufficient forces to these missions, and to have on hand a body sufficiently substantial for any reconnaissance



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that might be necessary, the German General Staff has formed the XIV Army Corps. This corps, reenforced by neighboring units, should enable Germany to assemble in Alsace, immediately upon war being declared, a covering force consisting of the three German Army Corps, namely, the XVI, the XV, and the XIV, and a part of the VIII. Within twenty-four hours two strong divisions of cavalry, two army corps almost completely mobilized, and three divisions mobilized in two lines could be advanced to the French frontier. At the end of the four days necessary to assemble equipment, the army assigned to the advance guard would have had at its disposal the whole of the German cavalry.

The military organization of frontiers is increasing daily in importance. When Verdy du Vernois, Minister of War, requested the Reichstag to add a third division to each Corps from the I to the IX, his words were as follows:

"The necessity of reenforcement both in the East and West depends on circumstances over which we have no control, but which we understand quite well, and such circumstances, and no others, determine the missions assigned to our troops in time of war. We must therefore so organize our armies as to assure complete protection to our concentration.

"The necessities arising out of the execution of a general plan of action must govern the organization and assignment of these troops. In any case, the chiefs of the higher commands must have the responsibility for the accomplishment of the missions assigned to them.

"Finally, in order to silence all doubts on this subject, I will say that there will be many cases where these troops will not return to the corps to which they were originally assigned, but will remain indefinitely away on missions of security and reconnaissance."

A strong covering force once formed will be sure to make itself felt during the first days following a declaration of war. The same Verdy du Vernois who, as Minister of War, formed the XIV Army Corps, was able to foresee the consequences arising out of its formation when he wrote the following:

"We may well ask whether in the future the beginning

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of a European war will present the same spectacle of complete inactivity as was the case in 1870. One thing is certain, and that is that the events arising along the frontier will be of vastly increased importance.

"In the future it will be necessary to observe the adversary from the very commencement of hostilities and this mission will be assigned to special forces. Furthermore, there arises the necessity of safeguarding our own territory against invasion. The purely military details of mobilization (involving the muster of troops, requisitioning of horses, transportation of supplies, safety of railways, etc.) render this protection of threatened territory necessary.

"As in the past, it will be necessary in the majority of cases, and especially in the event of our taking the offensive, to settle beforehand the points to be used for the detraining of troops, which means also that the covering troops must be ready to advance to their forward positions before the concentration is begun.

"In addition, the following points must be noted as combining to change in the future the probable course of events: we must not wait until the French have mobilized along the frontier, as in 1870. Since that time the great powers have greatly increased their peace time garrisons along the frontier. They have at the same time prepared themselves, in part at least, to commence major operations the moment war is declared. Finally, we have come to attach, in theory, a considerable importance to an offensive action initiated on the frontier before the commencement of major operations. All measures bearing on the reenforcement of garrisons along the frontier have come to assume more importance in our minds than the need of furnishing detachments for reconnaissance. Such measures indicate the inception of a tendency to fortify ourselves in advance against a supposed invasion by the enemy, and the fact that we have troops in readiness permits us, besides, to undertake whatever offensive operations the general situation may require.

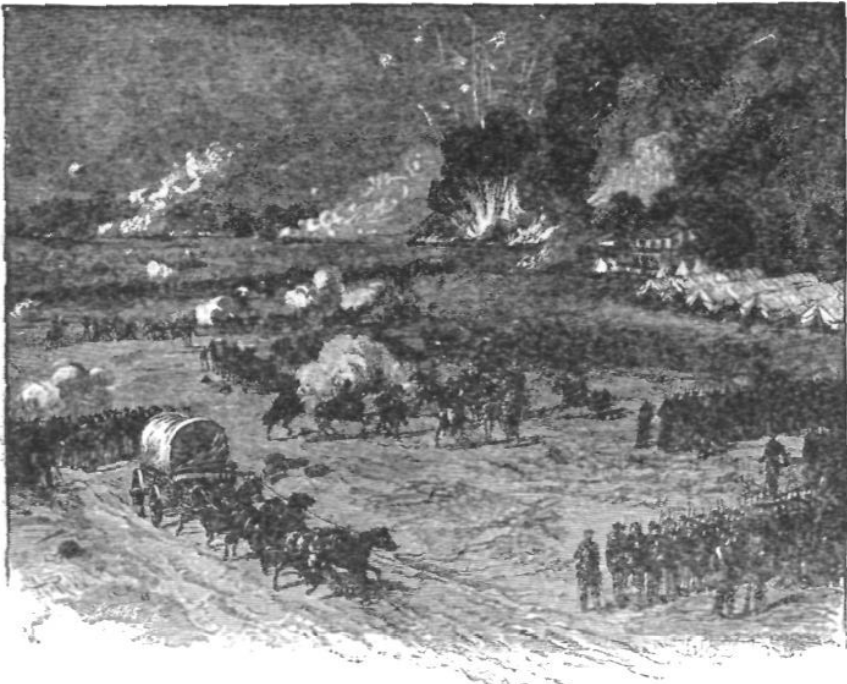
"The deployment of forces along the frontier at the beginning of hostilities simply increases the possibilities

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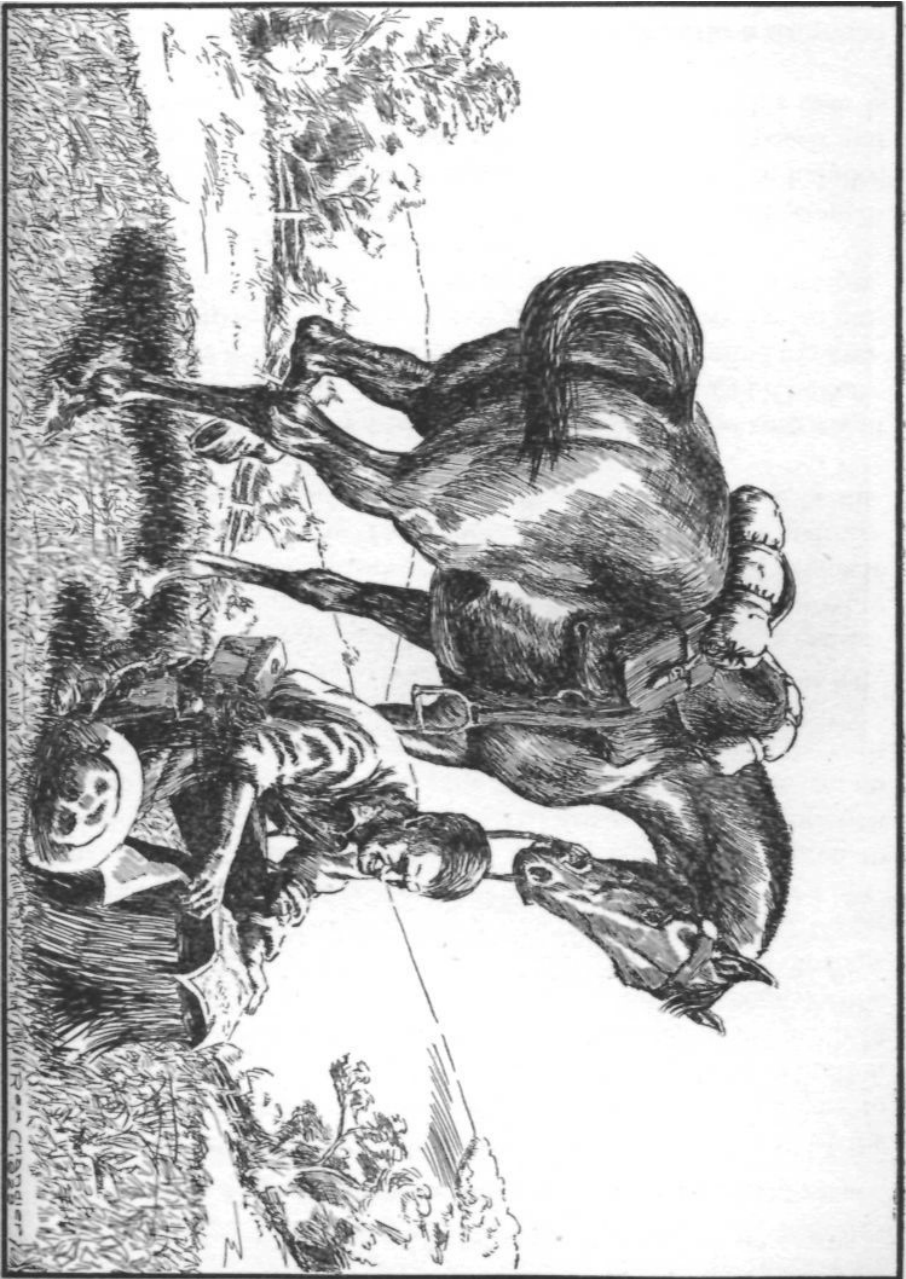
of minor engagements, and these are bound to take place sometimes without the knowledge and against the will of the commander. The military ardor of the troops involved, the *esprit de corps* of a regiment or a brigade, may easily convert an action of minor importance into a major operation, and make necessary the advance of the main body.

"We can also commence active operations on a small scale simply by protecting the frontier; that is, if our troops are considered sufficient to undertake such enterprises with any probability of success. But in any case we should be able to await the outcome of all such minor engagements before commencing our important operations."

*(To be continued)*



FEDERAL BATTERY AT SAVAGES STATION DEFENDING THE BASE—JUNE 29, 1862



"COME ON, SOLDIER—I KNOW THE WAY HOME!"

# COMPLETE ROUNDS OF AMMUNITION

A DISCUSSION OF IMPROVEMENTS TO MEET TACTICAL DEMANDS

BY H. M. BRAYTON,\* BY COURTESY OF "ARMY ORDNANCE"

A COMPLETE round of ammunition may be defined as all of the components which have to be inserted into the cannon in order to fire the piece and accomplish the mission. This general definition would seem to hold whether or not all of the components are held together and handled as a single unit or as separate components. That it is necessary to have each component of the round is obvious.

During a great national emergency our industrial and transportation facilities will be working under a greatly increased burden. Many thousands of different articles must be delivered to designated points from widely scattered areas. The co-ordination of such effort is a stupendous task and anything which we can do to reduce the work will represent a real contribution toward the winning of a possible war.

The purpose of this article is to endeavor to point out briefly some of the things which either have been done or are being considered by the Ordnance Department to reduce the effort required to furnish ammunition and insure the arrival of the entire complete round at the front in perfect condition. The changes which are being made to increase the safety of ammunition also will be discussed.

For administrative and technical reasons it is found convenient to class complete rounds of artillery ammunition as: (a) The complete round of fixed ammunition; (b) the complete round of semifixed ammunition; (c) the complete round of separate-loaded ammunition, which includes (1) the propelling charge in brass cartridge case, or (2) the propelling charge in silk bags.

A fixed round of ammunition is one in which all of the components are rigidly fastened together and can, therefore, be handled as a unit and so inserted into the cannon. The adapter-booster and fuze are tightly assembled into the shell and the cartridge case is crimped to the projectile.

A semi-fixed round of ammunition is the same as the fixed round

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except that the cartridge case is not crimped to the projectile. The mouth of the case is made slightly larger than in the fixed round so that the projectile may be inserted and withdrawn freely. The round can, however, be handled and inserted into the cannon as a unit.

A separate-loaded round of ammunition is, as the name implies, one which has two or more of its components loaded into the cannon separately. There are two subclasses of separate-loaded ammunition as indicated in the outline given above. The first of these two—where a cartridge case is used to hold the powder—consists of but two components, namely, the projectile with adapter-booster and fuze, which is inserted into the cannon first; and the assembled cartridge case which contains the primer, propelling powder and diaphragm to close the mouth of the case. The second subclass is when the powder is carried in silk bags. In this type there are three components, namely, the completely assembled projectile, the propelling charge in bags and the primer, which component is inserted into the breech block. The powder charge may be in one bag or in several bags.

There are certain basic considerations which determine the type of complete round used in the various cannon. For example, brass cartridge cases are not used in our service in the larger calibers because they are too costly to make, too heavy to handle and are actually not needed except where the rate of fire is high. The Germans used them in their larger calibers during the World War. They were unable to obtain the required amount of copper and were forced to use substitutes which were not satisfactory. They used a case because their cannon were made with sliding breech blocks with no obturating head. Such construction aids in the design of the cannon but places a very serious burden on the ammunition supply.

Generally speaking the fixed round is used in all guns up to and including the 105-mm. antiaircraft; the semifixed round in all howitzers and mortars up to and including the 105-mm. howitzer; and the separate-loaded round for all larger calibers of guns, howitzers and mortars.

The semifixed or separate-loaded round has to be used when it is necessary to vary the powder charge for any reason at the cannon as is the case of howitzers.

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One of the elements of a complete round of ammunition which offers a real hazard in handling and in the bore of the cannon is the fuze. The fuze, of necessity, contains sensitive high explosives which may detonate when least expected, due to careless loading or to unusually severe conditions of handling or storage. For the most part, the fuzes used by our Army during and prior to the war were so designed that if this sensitive explosive detonated when the fuze was assembled to the shell, the shell charge would also detonate and this in turn would be most apt to set off others piled near by or blow up the gun should the projectile be in the bore.

This situation was a most serious one. To minimize the hazard the rounds were shipped without fuzes, the final assembly being made just before the round was inserted into the cannon. Even then many prematures in and just outside the bore occurred. If within the bore, the cannon was generally destroyed and the crew killed. Such disasters are serious not only because of the men killed and injured but also because of the loss of valuable cannon which may be very hard to replace. Furthermore, the effect of such prematures on the morale of the soldier is, to say the least, not desired.

The necessity of shipping the fuzes separately from the round made the problem of supply a very difficult one. Time and again the round would arrive at the front without the proper fuzes or the fuzes without the round.

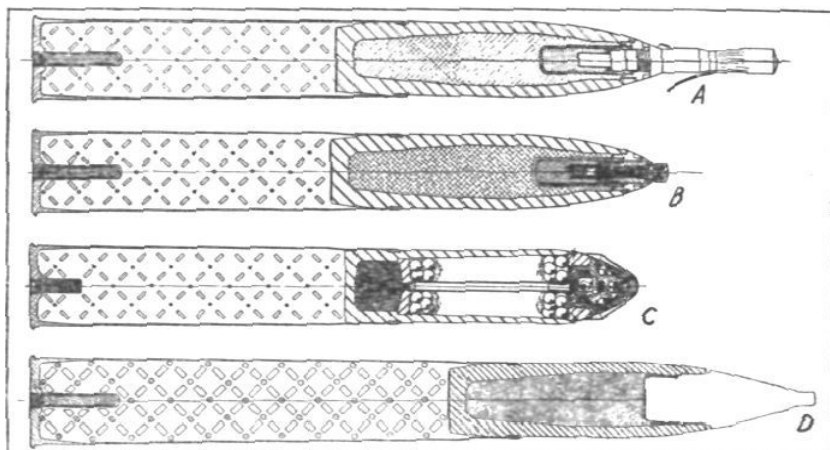


FIG. 1. A. COMPLETE ROUND OF H.E. SHELL (LONG FUZE) FOR 75-MM. GUN, WORLD WAR PERIOD. B. COMPLETE ROUND OF H.E. SHELL (SHORT FUZE) FOR 75-MM. GUN, WORLD WAR PERIOD. C. COMPLETE ROUND OF SHRAPNEL, WORLD WAR PERIOD. D. COMPLETE ROUND OF H.E. SHELL (NEW FUZE) FOR 75-MM. GUN, POST WORLD WAR PERIOD.

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Again the fuzes used in our ammunition during the war were single-purpose fuzes. By this we mean, they were designed to give only a single action, such as superquick, nondelay, short delay or long delay. As tactical considerations might require the use of any of these types of fuzes at any time it was obviously necessary to have available at the front a sufficient supply of each fuze to enable the artilleryman to use his ammunition as conditions demanded. Such a system of fuzing seriously burdened our supply service, and would often cause important plans to miscarry for lack of some component of the ammunition.

Fig. 1, A and B, shows the complete rounds of high explosive shell ammunition used in the 75-mm. field gun during the war. The long superquick fuze (Mk. III) was made in but one basic type, but the short fuze (Mk. V) was made with three different loadings, viz., nondelay, short delay and long delay. In effect, then, there were four fuzes at that time believed necessary for this one high explosive round for the one gun.

War teaches many lessons. From it we learn both what we should not do and what we should do. The years which have passed since the war have given ordnance engineers time to study the ammunition problem in detail in all its many phases. Conflicting factors have been weighed carefully to determine their effect on supply, storage, issue and tactical needs. As a result of all this study our system of ammunition has undergone some really important changes.

It has now been concluded that the 75-mm. divisional gun which uses high explosive fixed ammunition does not need a non-delay or a long-delay action fuze. The superquick and short-delay action will apparently meet every reasonable tactical requirement. Thus the number of actions required has been reduced to one-half the number believed needed during the war in this one very important weapon.

Considerable difference of opinion arose regarding the question of using single-purpose or combination fuzes, that is as to whether the policy should be to make and issue two fuzes; one a superquick and the other a short-delay type, or a combination of these two actions into one fuze, and so design it that either action could be obtained by the artilleryman. If we were to have single-purpose fuzes and make them bore safe so that we could obtain



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the advantage of shipping the round fuzed, then we would have to manufacture, store and transport a larger number of complete rounds than we actually need because it is never known what percentage of each type of fuze action will be required in battle. It may be decided in advance that perhaps 90 per cent of the fire will be with superquick action and 10 per cent with short delay action, but these quantities could not be held to in any one sector because greater percentages might be needed of either type. Additional ammunition would have to be delivered to the forward dumps to meet every contingency and this would not only represent an economic waste but might be a real hazard.

On the other hand, if we combine the two actions into one fuze we add to the cost of the fuze and hence to the burden on our manufacturing facilities. Each round fired carries with it a fuze feature not required.

It is the general consensus of opinion at the present time that the advantages of the combination bore-safe fuze more than compensate for the added cost and that the total cost of ammunition to fight a war would not be greater as a result of its use and might be less.

The use of such a fuze means that we can assemble, pack and ship our round complete for divisional weapons. The effort saved over the four-fuzed separate-packed round is obvious.

The rate of fire of artillery weapons decreases as the caliber increases. Furthermore, the larger the cannon the farther they are located back from the front fighting line. Because of these two factors the furnishing of ammunition to the smaller field weapons is a much greater problem than to the larger ones. It is not considered necessary to ship projectiles of 155-mm. or larger calibers fuzed. The combination superquick short-delay fuze is considered necessary in all point-fuzed common steel projectiles. The problem of keeping all components of the round assembled together for shipment is, therefore, necessary only in ammunition for weapons up to and including 105-mm. This has now been accomplished and it is indicated that in any future war high explosive divisional artillery ammunition will be packed, shipped and issued as complete rounds with bore-safe double-action fuzes. Fig. 1, D, shows one of these new rounds for the new 75-mm. field gun. It will be noted that the front end of the fuzed projectile

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now has a decided streamline appearance, consequently a better ballistic shape.

The explosive components of ammunition may become unserviceable if exposed to moisture for any length of time. To a lesser extent the metal components will corrode and in time cease to perform their function properly. Ammunition is costly and when once made should be so packed that it will remain in good condition for many years.

As our ammunition may be stored anywhere in this country or in our foreign possessions, where a wide variety of climatic conditions is encountered, it is necessary to give special attention to the packing problem. Ammunition must, furthermore, be so packed that it will withstand long transportation by rail, boat and truck where it will receive much rough handling and arrive at its destination in good condition.

During the war artillery ammunition for the smaller calibers (such as 75-mm.) was packed for the most part in tin containers the open end of which was closed by a cover held on by a soldered tear strip. Containers made from fiber board were also used to some extent. These containers were in turn packed in wood boxes of various designs. Some of the still smaller calibers (such as the 37-mm.) and most of the fuzes were packed in metal-lined wood boxes. The fact that tin is a strategic material made it essential that we find a better method of packing complete rounds of ammunition.

Observations led ordnance engineers to pursue their investigations further into this field. It was found that notable improvements had been made in recent years in the manufacture of fiber board impregnated with asphalt to make it moisture and waterproof. As a result of the cooperation of commercial concerns a new type of fiber container has been developed which is greatly superior to the one made during the war. Fig. 2 shows a section of this new container with both the fixed and semifixed complete round in place. The weight of the fixed round is carried on the open end of the container against which the under surface of the head of the cartridge case bears. In the case of the semifixed round the weight of the projectile is taken at its forward end against a wood block and the weight of the cartridge case on its head. The container is closed by a slip-on cover and the joint is made water- and moisture-proof by two wrappings of surgeon's

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adhesive tape covered with waterproof cement. The tubes of the container are made from asphalt-impregnated paper spirally wrapped. The lower end of the body of the container and the top of the cover are closed with a metal cover crimped to the tube. Sodium silicate is used as a sealing material. These containers are very strong and waterproof. They can be placed under water for days without showing signs of leakage to the interior.

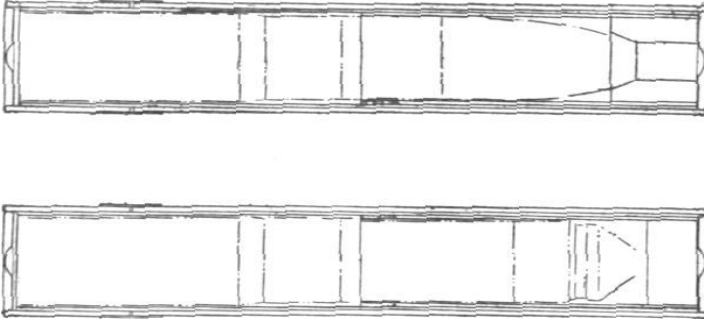


FIG. 2

It has been found necessary in the past when packing the larger containers to use wood spacers in the packing box for support. These spacers, in addition to adding to the cost of the box, caused much trouble by warping and shrinking, thus preventing easy removal of the rounds. When these new fiber containers are used no spacers are required due to the much greater rigidity of the container. A simple design of end-opening box (Figs. 3 and 4) holding four rounds in these new fiber containers, without spacers and with ample clearance to allow for shrinkage and warping of the wood, has been found very satisfactory. Revolving drum tests have shown this type of packing to be greatly superior to the methods used previously.

When considering for adoption a new article which has been proved to be technically satisfactory and which would be used in large quantity in the event of war, two major considerations determine the final decision: First its availability and second its cost. All of the materials entering into the new fiber container are available in abundance in this country, namely, wood fiber, soft sheet steel which can be rust-proofed by a variety of methods, and asphalt which is mined in Utah. Even when manufactured in lots consisting of a few thousand each, these containers have cost

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only a little more than the unsatisfactory tin container. When made in large war-time quantity the price should be no greater than the tin container.

These new fiber containers are so strong that it should be possible, if conditions warranted, to ship ammunition in them without using a packing box. If the theatre of operations were so located that direct rail shipment from the loading plant to the rail head at the front were possible it is conceivable that the ammunition could be packed in these containers and stacked in the box car. At the rail head they would be transferred to trucks and carried to the dumps. Such a procedure would be productive of a real saving in several ways. The cost of the box would be saved. The space required to stack a given number of rounds in a box car or truck would be reduced, thus increasing the road capacity—a vital factor close to the front. (It is estimated that the elimination of the box will reduce the weight to be carried for the same number of rounds by 20 per cent and the volume occupied by 35 per cent, approximately.) Again, when wood boxes are taken to the forward dumps they may become a hazard. They are easily seen from the air and the disposal of the empty boxes is not always easy.

If ammunition has to be shipped overseas or be passed through several transfer points where handling is required, the cost of this handling would offset the cost of the box. If boxes were used under these conditions, however, they could be opened at the rail head and the fiber containers loaded on trucks, thus gaining the added road capacity in the congested area of operations and eliminate the boxes at the front.

It has been possible in this article to discuss briefly only a few of the many improvements made in artillery ammunition during the ten years since the war ended. These years of peace have been very productive of improvements in ammunition. We have been working constantly to make our ammunition more dependable, more practical to manufacture under possible war-time conditions, safer in loading, handling and in the bore and so that it will meet the ever-changing tactical needs of the combat branches of the Army to their entire satisfaction. It should be possible not only to maintain our present standard of ammunition but to improve upon it in the coming years so at all times it may be said that it is second to none in the world. This is the real solution to the problem of ammunition preparedness.

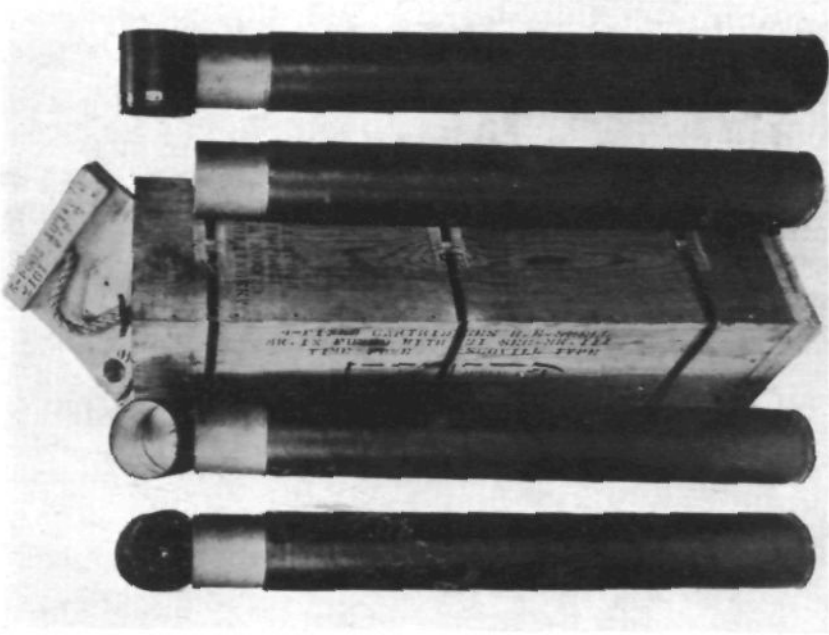


FIG. 4. END OPENING PACKING BOX AND SLIP COVER TYPE OF FIBER CONTAINER

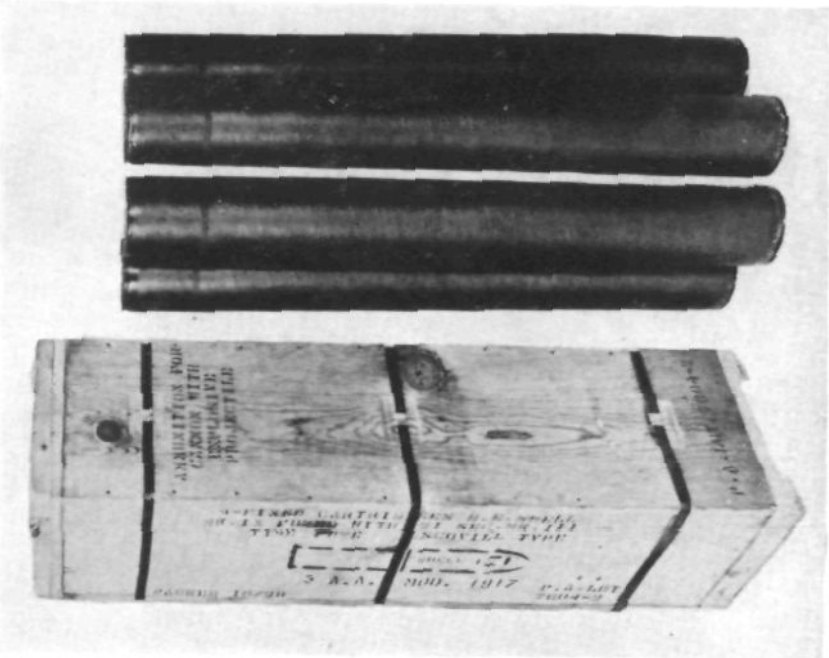


FIG. 3. ASSEMBLED 4-ROUND PACKING BOX AND ASSEMBLED SLIP COVER TYPE OF FIBER CONTAINER

# THE FORT SILL HORSE SHOW

BY CAPTAIN WM. H. COLBERN, F. A.

IN THE thirty-six classes offered this year in the Seventh Annual Horse Show at the Field Artillery School, entries totaled nearly 900, and, of that total, 328 were for privately owned mounts. The setting of the show ring in the wooded flat between the Academic Area and the New Post was beautiful, the weather ideal, the gallery keen and rich in Oklahoma local color.

During the past seven years interest and knowledge of horses have been so carefully stimulated that the cold blooded "dog" has



disappeared and, of the number of authorized mounts on the post, nearly all carry a degree of thoroughbred blood, from half-bred to registered clean-bred. In those classes where private mounts predominated as polo ponies, hunters, chargers or "suitable to become," they were of a type and quality presentable in any company.

Two colt or suitable classes were shown, chiefly to interest local farmers in breeding and showing good colts and also to allow officers to locate suitable horses for purchase. Both were for colts "suitable to become hunters or officers' mounts," and

## THE FORT SILL HORSE SHOW

the get of any thoroughbred stallion. In the class for yearlings, it was interesting to note the number of different sires represented, while in the class of two- and three-year-olds, eleven out of sixteen entries were sired by Slip-a-long, a remount stallion standing in Lawton, Oklahoma. There must be new blood in the community to avoid in-breeding, but Slip-a-long has done more than any other horse to improve the class of horse flesh at Fort Sill.

The purely military classes consisted of Artillery Horses, shown in hand, Troopers' Mounts, Officers' Chargers, four-year-olds suitable to become chargers, Officers' Private Mount Jumpers, open only to owners or a member of the family, School Troop



Officers' jumpers, in which only those officers on duty with School Troops were eligible, and Enlisted Men's Jumpers. These classes were well filled, and there was a decided improvement seen in horsemanship, not only of the officers but of the enlisted men. The appearance and condition of horses showed a long period of preparation.

One of the purposes of this horse show is to encourage the student officers in horsemanship and to give those who haven't had it some experience in the show ring. To this end there were arranged four classes open only to students—the Commandant's

## THE FIELD ARTILLERY JOURNAL

Cup, a jumping class for Battery Officers; the Bowman Cup, a jumping class for the Advanced Class in Horsemanship; the Lorillard Cup for remount training by members of the same class; and the American Remount Association Cup, open to remounts of the Battery Officers' Class. The Field Officers' Class "did not choose" to ride.

Real type and training were shown in the five polo classes, and most of the entries were privately owned. There was a class for light-weights, one for middle-and heavy-weights, a stake race, a "suitable class," and one for groups of eight polo ponies. In this last



"DOUGLAS," RIDDEN BY PVT. E. SPRINKLE, BTRY. E. 1ST F.A. WINNER OF TROOPERS' MOUNTS

class the entry of the Academic Division, consisting of eight grey ponies, was especially interesting.

The saddle classes, i.e., Ladies' Saddle Horses, Road Hacks, Pairs of Saddle Horses, Parent and Child Saddle Pairs and the Children's Ponies, were well filled, and mostly with horses of thoroughbred type. These classes were unusually nice in turnout of both horses and riders. The majority of the entries were young horses, privately owned and trained, and their manners and "square going" were most creditable.

In the opinion of the writer, the most interesting classes of the show were those for hunters. The six classes brought out 117



## THE FORT SILL HORSE SHOW

entries, good fronted horses with the ability to move and the bone and substance to stay. As a type, they should be of particular interest to the service. Classes were offered for Novice Hunters, Green Hunters, Light-weight, Middle and Heavy-weight and Ladies' Hunters and Hunt Teams. Performance was over a course which necessitated jumping out of the show ring, taking an outside course, and jumping back to finish in the ring. The jumping scores were, as a whole, good, and in most cases the judges were obliged to pin the



"ANADARKO JEAN." A REGISTERED COLT BY "GO THROUGH." OWNED BY J. E. GAMBLE, WINNER OF YEARLING CLASS

ribbons according to conformation. The class for hunt teams was unusually large, having nine "teams of three" in the ring for the final judging. With several of the teams in pink, the picture was quite impressive.

Jumping classes, performance only to count, were arranged with a "touch and out" class every afternoon, one open class, a ladies' class and a bare-back class. All had over forty entries with the exception of the ladies' class, which had eighteen, a big increase over preceding years. These classes were characterized by quietness of performance of the horses and ease of control on the part of the riders.

With the exception of the "Bare-back" and Ladies' events, all performance classes were over the Olympia Course "A," modified

## THE FIELD ARTILLERY JOURNAL

slightly in height. It has been the aim of the director, Major C. P. George, to increase gradually the height and difficulty of obstacles in each succeeding show, in an endeavor to raise the standard of performance.

The bare-back jumping was over a straight course, but as exhibitors were limited in equipment to a halter and tie rope, with one end loose, they experienced thrills aplenty. For once the mutton withered horse was at a premium.

The consistent winning of these classes by three of the oldest jumpers on the post was a reminder that, in addition to natural ability, it takes years of experience to make a successful competition horse.

Capable judging can make or mar the satisfaction of a horse show and is a source of instruction to a community when proper types are selected. Fort Sill was fortunate in having Mr. R. W. Waring of San Angelo, Texas, and Mr. D. L. Henderson of Ponca City, Oklahoma, in the ring as hunter judges; Captain H. R. Gay, Fort Riley, Kansas, to judge polo ponies; and Mr. Sam Haines of Oklahoma City to judge saddle classes. The soundness of their decisions was attested by the noticeable absence of "beefing" around the paddock and at the post-mortems after the show.

The exhibitors who won first prizes probably wondered where the pieces of sterling came from. The trophies were all sterling and were made possible by the enthusiastic support of the merchants of Lawton, Oklahoma City and Wichita Falls in subscribing to advertising space in the program.

The officers and ladies of Fort Sill, who show such wholehearted interest in horses; the executive committee and the director, who staged a well-arranged, smooth running exhibition; and the citizens of the community are to be congratulated on the success of the Seventh Annual Horse Show and the high quality of the horses entered.

### CLASSES

Class 1. Colts suitable to become hunters' or officers' mounts; foaled in 1928.

1st—Anadarko Jean.	Mr. J. E. Gamble.
2nd—Brer Rabbit.	Capt. J. G. Watkins.
3rd—Silver Heels.	Capt. Henson.
4th—Sweet Scamp.	Maj. A. R. Harris.
5th—Cricket.	Lt. W. R. Schaffer.
6th—Mother Bullard.	Carl Bullard

Class 2. Colts suitable to become officers' mounts or hunters; foaled in 1926 or 1927.

1st—Justice.	Capt. J. J. Waters.
2nd—Captain Gilley.	Capt. N. J. McMahon.
3rd—Jim S.	Mr. Jim Speck.
4th—Comanche.	Capt. Henson.
5th—So Tired.	Mr. Carl Bullard.
6th—Roxy Lee.	Capt. G. J. Rife.

## THE FORT SILL HORSE SHOW

- Class 3. Artillery Horses.  
 1st—Strangler. Academic Div., F.A.S.  
 2nd—Prince. Battery A, 18th F.A.  
 3rd—Tim. Battery D, 1st F.A.  
 4th—Pat. Academic Div., F.A.S.
- Class 4. Troopers' Mounts.  
 1st—Douglas. Battery E, 1st F.A.  
 2nd—Major. Battery D, 1st F.A.  
 3rd—Sonora. Battery D, 1st F.A.  
 4th—Tornado. Academic Div., F.A.S.
- Class 5. Officers' Chargers.  
 1st—Harmony. Lt. I. D. Yeaton.  
 2nd—Krippalong. Maj. I. T. Wyche.  
 3rd—Johnny Walker. Lt. L. J. Stewart.  
 4th—Stormalong. Lt. C. E. Sargent.
- Class 6. Horses Suitable to Become Officers' Chargers (4 yrs. or under).  
 1st—Don Donno. Lt. Col. W. P. Ennis.  
 2nd—Justice. Capt. J. J. Waters.  
 3rd—Golden Rule. Capt. J. H. Kintner.  
 4th—Swingalong. Maj. J. M. McDowell.
- Class 7. Officers' Private Mount Jumpers.  
 1st—Burnt Fingers. Lt. C. E. Sargent.  
 2nd—Black Ivory. Lt. W. D. Paschall.  
 3rd—Lone Star. Maj. I. T. Wyche.  
 4th—Woolflower. Maj. J. M. McDowell.
- Class 8. School Troops Officers' Jumpers.  
 1st—Nigger. Capt. G. P. Hays.  
 2nd—Fleet. Lt. L. V. Harris.  
 3rd—Lone Star. Maj. I. T. Wyche.  
 4th—O'Grady. Capt. C. E. Boyle.
- Class 9. Enlisted Men's Jumpers.  
 1st—Dinty. Hq. Btry., 18th F.A.  
 2nd—Jack. Btry. B, 18th F.A.  
 3rd—Diamond. Btry. B, 18th F.A.  
 4th—Buccaneer. Academic Div., F.A.S.
- Class 10. The Commandant's Cup (Battery Officers' Jumping).  
 1st—Bisop. Capt. J. M. Reynolds.  
 2nd—Trooper. Lt. D. P. Poteet.  
 3rd—Dixie. Lt. E. C. Burkart.  
 4th—Buck. Lt. A. B. Kastner.
- Class 11. The Bowman Cup (Remount Jumpers, Advanced Equitation Class).  
 1st—Alcazar. Lt. W. C. Stout.  
 2nd—Andy Gump. Lt. I. D. Yeaton.  
 3rd—Valencia. Lt. A. L. Shreve.  
 4th—Juryman. Lt. W. E. Shallene.
- Class 12. The Lorillard Cup (Remount Training, Advanced Equitation Class).  
 1st—Verdict. Lt. W. E. Shallene.  
 2nd—Dryad. Lt. W. C. Stout.  
 3rd—Harmony. Lt. I. D. Yeaton.  
 4th—Havana. Lt. D. V. Johnson.
- Class 13. American Remount Association Cup (Remount Training, Battery Officers' Class).  
 1st—Roamer. Lt. A. B. Kastner.  
 2nd—Portia. Lt. R. L. Taylor.  
 3rd—Nelson. Lt. W. R. Pierce.  
 4th—Black Night. Capt. J. M. Reynolds.
- Class 14. Polo Mounts, Lightweight.  
 1st—Arnette. Lt. L. J. Stewart.  
 2nd—The Red Knight. Lt. A. R. S. Barden.  
 3rd—Kona. Maj. C. Brewer.  
 4th—Beauty. Lt. I. L. Kitts.
- Class 15. Polo Mount, Middle and Heavyweight.  
 1st—Shadowland. Capt. C. E. Boyle.  
 2nd—Hoster. Mr. D. L. Henderson.  
 3rd—Honest John. Capt. J. J. Waters.  
 4th—Terry Allen. Lt. P. R. M. Miller.
- Class 16. Polo Pony Stake Race.  
 1st—Peanuts. Maj. A. R. Harris.  
 2nd—Nancy. Lt. H. D. Baker.  
 3rd—George. Lt. E. O. Hopkins.  
 4th—Beachlight. Capt. J. J. Waters.
- Class 17. Groups of Eight Polo Ponies.  
 1st—Academic Div., F.A.S.  
 2nd—Adv. Equit. Class, F.A.S.
- Class 18. Horses Suitable to Become Polo Ponies.  
 1st—Wings. Lt. A. R. S. Barden.  
 2nd—Shotwell. Lt. C. E. Sargent.  
 3rd—Tiffany. Lt. L. J. Stewart.  
 4th—Memory. Lt. I. D. Yeaton.
- Class 19. Ladies' Saddle Horses.  
 1st—Verdict. Mrs. Jack Thompson.  
 2nd—Folly. Mrs. I. T. Wyche.  
 3rd—Slipper. Capt. H. W. Blakely.  
 4th—Honest John. Capt. J. J. Waters.
- Class 20. Road Hacks.  
 1st—Sirus. Capt. W. H. Colbern.  
 2nd—Folly. Lt. Col. W. P. Ennis.  
 3rd—Folly. Mrs. I. T. Wyche.  
 4th—Woolflower. Maj. J. M. McDowell.
- Class 21. Pairs of Saddle Horses (Ladies and Gentlemen).  
 1st—Krippalong. Maj. I. T. Wyche.  
     Folly.  
 2nd—Santee. F. A. Horse Show  
     Sagacious. Team.  
 3rd—Slipper. Capt. H. W. Blakely  
     Sox.  
 4th—Sirus. Capt. W. H. Colbern.  
     Kayson.

## THE FIELD ARTILLERY JOURNAL

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| <p>Class 22. Parent and Child Saddle Pairs.<br/>           1st—Betty Golden.      Mrs. J. M. McDowell.<br/>               Mist.<br/>           2nd—Big Six.            Maj. J. A. Crane.<br/>               Red Elk.<br/>           3rd—The Madam.        Maj. C. P. George.<br/>               Lady.<br/>           4th—Honest John.      Capt. J. J. Waters.<br/>               Jenny Wren.</p> <p>Class 23. Children's Ponies (Children under 10 years).<br/>           1st—Jenny Wren.        Jerome Waters, 3rd.<br/>           2nd—Sue.                Lee Henderson.<br/>           3rd—Daisy.              Helen Wallace.<br/>           4th—Lady.                Curtis George.</p> <p>Class 24. Children's Ponies (Children under 16 years).<br/>           1st—Mist.                Marjorie McDowell.<br/>           2nd—Red Elk.            Mary Crane.<br/>           3rd—Minnie.             Carolyn Waterman.<br/>           4th—Andy.                Evelyn Peyton.</p> <p>Class 25. Novice Hunters.<br/>           1st—Krippalong.        Maj. I. T. Wyche.<br/>           2nd—Folly.                Maj. I. T. Wyche.<br/>           3rd—Woolflower.        Maj. J. M. McDowell.<br/>           4th—Dryad.                Lt. W. C. Stout.</p> <p>Class 26. Green Hunters.<br/>           1st—Chasseur.            Capt. W. H. Colbern.<br/>           2nd—Krippalong.        Maj. I. T. Wyche.<br/>           3rd—Judge.                Lt. C. E. Sargent.<br/>           4th—Woolflower.        Maj. J. M. McDowell.</p> <p>Class 27. Ladies' Hunters.<br/>           1st—Grove Cullum.      Mr. D. L. Henderson.<br/>           2nd—Johnny Walker      Mrs. C. H. Brown.<br/>           3rd—Flurry Knox.        Maj. I. T. Wyche.<br/>           4th—The Madam.        Maj. C. P. George.</p> <p>Class 28. Hunters, Lightweight.<br/>           1st—Bombardier.        Lt. D. V. Johnson.<br/>           2nd—Johnny Walker      Lt. L. J. Stewart.<br/>           3rd—John Lucas.         Maj. J. A. Crane.<br/>           4th—Buddy.                Capt. F. C. Mellon.</p> | <p>Class 29. Hunters, Middle and Heavyweight.<br/>           1st—Grove Cullum.      Mr. D. L. Henderson.<br/>           2nd—Kentucky.          Capt. J. J. Waters.<br/>           3rd—The Madam.        Maj. C. P. George.<br/>           4th—Chasseur.          Capt. W. H. Colbern.</p> <p>Class 30. Hunt Teams (Teams of Three Horses).<br/>           1st—The F. A. Horse Show Team.<br/>           2nd—The F. A. School Hunt.<br/>           3rd—The Marland Hunt.<br/>           4th—The Adv. Equit. Class, F.A.S.</p> <p>Class 31. Bareback Jumping (Equipment—Halter and tie rope, only).<br/>           1st—Bucknose.          Lt. W. R. Pierce.<br/>           2nd—Triangle.            Capt. J. J. Waters.<br/>           3rd—Judge.                Lt. C. E. Sargent.<br/>           4th—Nigger.                Capt. G. P. Hays.</p> <p>Class 32. Ladies' Jumpers.<br/>           1st—The Madam.          Maj. C. P. George.<br/>           2nd—Raven.                Mrs. S. Y. McGiffert.<br/>           3rd—Woolflower.        Mrs. J. M. McDowell.<br/>           4th—Attaboy.             Mrs. C. H. Brown.</p> <p>Class 33. Touch and Out (First Day).<br/>           1st—Kentucky.            Capt. J. J. Waters.<br/>           2nd—Nigger.                Capt. G. P. Hays.<br/>           3rd—Triangle.            Capt. J. J. Waters.<br/>           4th—Carlisle.             Capt. N. J. McMahon.</p> <p>Class 34. Open Jumping.<br/>           1st—Johnny Walker      Lt. L. J. Stewart.<br/>           2nd—Nigger.                Capt. G. P. Hays.<br/>           3rd—Kentucky.            Capt. J. J. Waters.<br/>           4th—Triangle.             Capt. J. J. Waters.</p> <p>Class 35. Touch and Out (Second Day).<br/>           1st—Triangle.            Capt. J. J. Waters.<br/>           2nd—Kentucky.          Capt. J. J. Waters.<br/>           3rd—Carlisle.             Capt. N. J. McMahon.<br/>           4th—Tantor.                Hdq. Btry., 18th F.A.</p> <p>Class 36. Touch and Out (Third Day).<br/>           1st—Nigger.                Capt. G. P. Hays.<br/>           2nd—Triangle.            Capt. J. J. Waters.<br/>           3rd—Yaqui.                Lt. G. R. Carpenter.<br/>           4th—Carlisle.             Capt. N. J. McMahon.</p> |
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2400 SIXTEENTH ST., N. W.  
WASHINGTON, D. C.

May 20, 1929.

MAJOR GENERAL FRED T. AUSTIN,  
*President, The U. S. Field Artillery Association,*  
*Washington, D. C.*

MY DEAR GENERAL:

I want to thank you, the members of the Executive Council, and, through you, the entire membership of the U. S. Field Artillery Association for the Engrossed Set of Resolutions recently received by me and which were adopted by the Association at its annual meeting in December, 1927.

The occasion for these resolutions was my retirement from active service as Chief of Field Artillery and as President of the Field Artillery Association, and they constitute a highly commendatory summary of my long service in the Arm.

These resolutions are a wonderful encomium, the adoption of which by the Association was a most gracious act, and they form a document I shall always treasure.

Both in the sentiments expressed and in the physical appearance of the document itself, resembling, as it does, an ancient illuminated manuscript, and really being a work of art, there is presented to me a beautiful memorial that will be cherished by my descendants long after my time.

It is this manifestation of respect and confidence on the part of the Field Artillery generally that has done much to mitigate the regret I felt at being compelled, by physical infirmities, to relinquish my leadership in the Arm.

May I take this opportunity to again express my thanks for the wonderful support the entire Arm always gave me while I was at its head? And may I again repeat what I have often stated, that no Chief of any arm was ever served with a greater degree of loyalty and confidence than was I? To be the head of such an Arm for so many years constituted for me both a sacred trust and an inspiration.

I again extend to The U. S. Field Artillery Association my best wishes for its continued growth and prosperity; and with renewed thanks for its generosity to me. I am.

Sincerely,

WM. J. SNOW,  
*Major General, U. S. Army, Retired.*



# WAR BUGS

*BEING*

*A WORM'S-EYE VIEW OF THE WAR TO END WAR*

BY COURTESY OF

**LIBERTY MAGAZINE**

PART FOUR

WHEN Sherman said war was hell, he stuttered. Besides, he was marching through Georgia at the time, and everybody knows that Southerners are horribly hospitable; whereas we were being tossed from one front to another like a medicine ball.

On entraining for Champagne, the officers made off that we were going to Chateau-Thierry, where the Marines were doing their stuff. The news was a little depressing. We were not on the best terms with the Marines at the moment. For one thing, the M. P. section of that otherwise admirable unit had rather soured us by the zeal with which they played Copper. And then, the Fighting Few seemed to be grabbing all the credit for the war.

The Marines shared our dislike cordially. We never passed them on the road without some leatherneck bawling out: "What comes out after a storm?" And, hearing, two thousand Marines yelled back: "The Rainbow?"

Our instant reply was: "Go home and tell your mother you



BY

**CHARLES  
MACARTHUR**

Formerly Private Second Class  
Battery F, 149th F. A., 42nd  
(Rainbow) Division, A. E. F.

Pictures  
By  
RAYMOND  
SISLEY  
Formerly of  
Battery C  
149th F. A.

seen the soldiers!" and there were quite a few black eyes between us.

"What's the biggest color in the Rainbow?" was another of their wise cracks, the answer being: "YELLOW!"

We had a reply for this goofy libel that surpassed any sample of repartee invented in the war. Unfortunately, it was in lingo difficult to reproduce—except on asbestos. Suffice it to say that the Marines *had* to be First to Fight whenever it was applied.

We respected their courage, yet were a little worried over the possibility of being brigaded with them in action. It is weakening to lick Marines and Germans at the same time. So, when the train stopped at Chalons sur Marne and no Marines were about, we were grateful for the opportunity to concentrate on the enemy.

## THE FIELD ARTILLERY JOURNAL

This change in plans worked some disadvantage. For instance, we had calculated on a four day trip, whereas we were bundled out in two. Some of the boys rode on flat cars to guard the guns, which meant exposure to the cold rain and the necessity of preventing pneumonia with frequent libations of rum. With four days' leeway it was possible to get sober and debark decently under individual power. But with forty-eight hours lopped out of the journey—

The writer has no wish to obtrude his personality into this narrative of his fellows. But it might just as well go into the minutes that nobody (since Noah) was so wantonly, so completely stewed as when the flat car serving as his catafalque came to be unloaded. Ramps and a pair of mules were needed to get him off and into the line of march, with serious consequences, as follows:

In the first place, the French High Command had experienced considerable misgivings over our participation in this most crucial battle of the war. Not that they doubted our spirit: our heroism was the talk of Europe. But the situation called for most experienced troops and most desperate courage. If the Champagne was lost, so was Paris—and perhaps the war.

So they stood with Colonel Reilly and watched us swing by. Eyes—left! Forward—march! Hep, hep, hep. We were sweet to see. Uniforms tidy, faces washed, shoes shined—everything just dandy. The worried Frogs perked up. We looked like Hot Stuff coming up.

Then—at the very end of the procession—along came Mr. M., strapped to one of the guns and singing loudly. The parade was stopped. The writer was untied and propped up before several gold plated generals, including the hardest, coldest, and most disciplinarian colonel in the American Army.

Colonel Reilly pointed his finger like a 12-inch railroad gun and asked what in the so-and-so-and-so-and-so was this so-and-so-and-so doing in the world, let alone in an army. Lieutenant Stone, who had galloped up to shoot the writer, blanched. The French generals ordered a halt in the war while they talked things over.

Resuming, the colonel asked the unhappy private if he had no pride in his country, which moved the private to weep and declare his patriotism in such ardent terms that the French General Staff nearly wept themselves. Encouraged, the private offered to

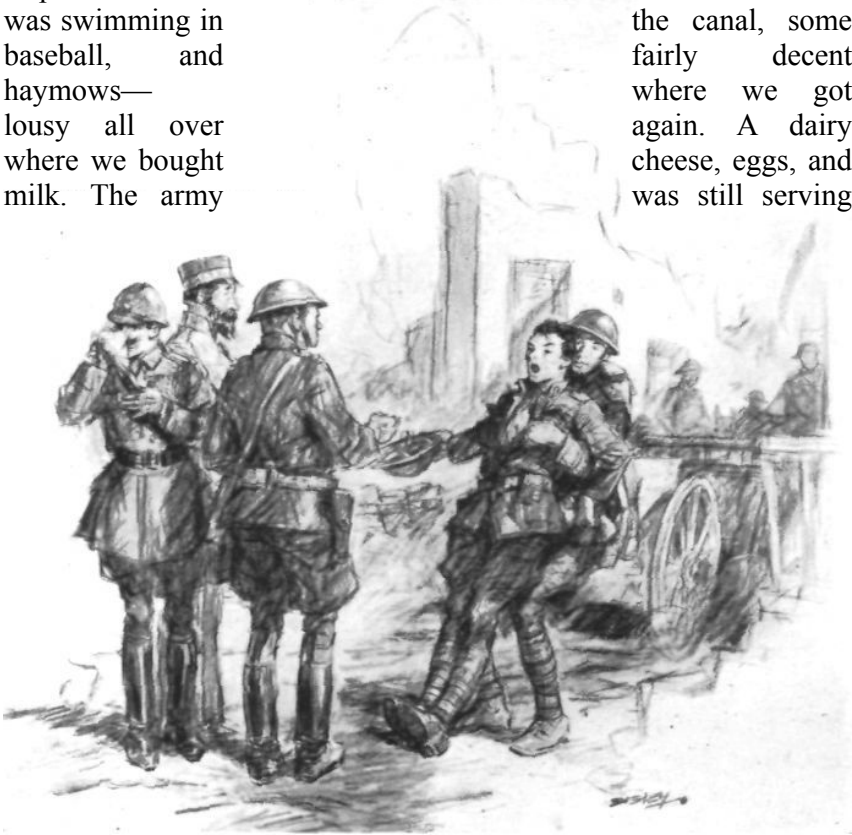


## WAR BUGS

die on the spot to show his loyalty, and nearly got kissed by a big Frog who would have got a sock on the button if he'd gone through with it.

In the end, Colonel Reilly himself buttoned the private's blouse and adjusted his helmet—and smiled for the first time in his life. The war was declared on.

To Chêpy, a little chalk town on the Marne Canal, where we rested four days, if constant drills, pinking up the guns, and standing inspection can be called rest. There was swimming in the canal, some fairly decent baseball, and decent haymows—where we got lousy all over again. A dairy where we bought milk. The army was still serving



Ford tires and goldfish. In fact, the food was so bad that the colonel ordered an inspection, and we were tipped off by a lieutenant to say it was elegant. Draggy Kurtz had the guts to show the inspecting officer his mess kit full of dehydrated onions, stewed sawdust, etc., and got socked for extra duty.

## THE FIELD ARTILLERY JOURNAL

Late on the fourth day we started for the front. Boots, boots, boots all night long, and like it! Ever since Lorraine it had been a crime to ride on the carriages, or to dump packs in the supply wagons. At daybreak we arrived at the Camp de Carrière, a collection of wooden barracks pancaked over a chalk plain. We squatted among the scrubby pine trees and laid low. A few German airplanes were about. It was too hot to talk, or even shoot craps. We wondered how Attila stuck it out on the same plain long ago.

June 30 came along and marked the first anniversary of our service for home, country, and democracy. To celebrate, there was a band concert when the sun went down. Colonel Reilly and Major Redden spoke.

The major was an ex-football star with a Number 99 heart. He's dead now, may God rest his gallant soul! He talked of the emotional side of the war, what we owed to France, and threw a kiss to the lovely ladies we had left behind. (The major was a Crusader, astray from his proper century.)

Then Reilly spoke. He folded his hands in front of him and filed away at our spines in his best West Point voice. He could have got Pittsburgh that day, and he wasn't even trying.

The colonel's celebrated father died on the wall of China, and Reilly Junior seemed bent on following his example then and there.

"Ideals," he said, "are splendid, and it is pleasant to share Major Redden's views on the chivalrous aspect of war. But you have seen your dead and are now soldiers.

"You are going into a battle in which many of you will be wounded. That is unfortunate, but it doesn't matter in the least. Some of you will be killed. That does not matter, either. You are cogs in a wheel, and the only important thing is that you function—that you do exactly what you are told during the fighting, instantly and without question."

Unsentimental, but somehow thrilling.

The front line was a few kilometers ahead of the camp. There were a dozen false starts before we crept up during the night of July 4, and took position. Lieutenant Stone decided on a saucer shaped hollow a hundred yards in advance of a little chalk road. We

## WAR BUGS

worked like one armed paper hangers getting the camouflage up before dawn.

The hot sun rose on endless miles of flat gray prairie, wrinkled with white chalk trench. Here and there stood an optimistic tree or patch of pine. At the left, the dim outline of Reims Cathedral. Over all and interminable sticky silence.

A glaring white trench in front of the position. Here we slept—or tried to sleep. All work was done at night, and when the sun began to beat down on that white chalk we could smell our burning flesh. So we sat and sweated and cursed the damn fools who sent us there until all known words wore out.

Now and then a distant boom, and high over our heads a load of dynamite whispered past, soft as the rustle of a dress. A still fainter boom as it fell miles behind the lines.

We prayed for a breeze, but the heat closed in, still and terrible. Water was worth a million francs a canteenful, and there was no water—only hot dribblets smuggled up during the night. Centuries ago the grass had withered and dried, and from out of the gray remains a few poppies blazed. Otherwise, dreary desert waste, humming with a ceaseless and invisible activity. That was by day.

With the first signs of dusk the armies came trooping over the rearward crest. Miles and miles of men, walking in single file; machine guns and *Minenwerfers* silhouetted against the red sky like the spars of a shipyard. Doughboys, doughboys, doughboys—French, American, and Pole—marched into the wilderness, and the earth swallowed them up.

By morning it was the same waste land—empty, silent as the grave.

So many thousands upon thousands swarmed under the earth, so many thousands kept coming in, that the impending battle seemed like the end of the world. A good time to dig—and dig deep. We wore out fifty picks and shovels the first three nights, and so arranged our gun pits that it would take a direct hit to kill. Every cubic inch of chalk went into a sandbag and was piled around the guns.

Not a man stuck his nose from under the camouflage, except at night, when there were official powwows in the second section gunpit. The officers discussed the battle and our probable part.

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Armor piercing shells were passed out for use against the tanks.

An officer in one of the other batteries went off his nut from continued tension, and prophesied the Germans would mow through as they had on the Somme; and that we would all be killed. The men liked him and kept his remarks from reaching the colonel.

We were rehearsed in pointblank fire and destruction of the gun in the event of capture. Machine guns were mounted to the right and left of the battery to cover possible retreat.

Still the silence and furnace heat. The air quivered with it. A hot wind whirled tons of chalk dust into our eyes and lungs. The men were white as millers. The tension became unbearable.

July 10. Suddenly the air swarmed with planes. Concealment was abandoned on both sides. From our forward observation



*Pappy threw the Polack in the first ration cart going to the front*

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posts we watched innumerable steel gray caissons of the enemy roll up to the front lines and empty their loads of shell. Openly, countless German engineers arrived with ramps with which to bridge the trenches. Field guns wheeled up and were placed.

On our side of the lines thousands of Chasseurs appeared from the rear in broad daylight and sank into the earth, already bloated with men. Battery after battery of 75s lined up beside us on the plain. Had they been placed in straight lines, the field guns alone would have stood hub to hub, two deep, across the entire front—the heaviest artillery concentration in the history of the world. Still not a shot.

July 11. General Gouraud addressed the following order to the Fourth French Army, of which the Rainbow Division was a part. The order was read at sunset by a little French lieutenant, his uniform shining blue in the clear dusk, his voice shrill with excitement:

"Soldiers of the Fourth Army! You will be attacked at any moment. All of you must feel that a battle was never fought before under more favorable conditions. You are warned. You are on your guard. You will fight on ground you have transformed by your hard work into a mighty fortress. You will be invincible if the passages are guarded.

"The bombardment will be terrible—but you will withstand it without weakening. The assault will be made in clouds of smoke, dust and gas. It will be terrific. But your position and your arms are formidable.

"In your breasts beat the brave, strong hearts of freemen. No one will yield an inch. Each of you will have but one thought—to kill, and to kill, and to kill!

"Your general says you will break this assault—gloriously!

"It will be a great day for France! "GOURAUD."

At the bottom of this prose poem were the idiotic words: "Approved: Major General So-and-So. Order to be read to troops: Colonel So-and-So, Chief of Staff." But even these evidences of red tape did not diminish the effect on the spine.

Still the silence. On the 12th planes became more numerous, more active. At sunrise and sunset the sky was black with them. More and more ammunition came up. We dug a little deeper, banked a little higher.

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The 14th was Bastille Day. Barrels of Pinard were rolled openly up to the first line. The whisper ran around the plain that if the Germans held their fire any longer, the French would attack first in celebration of their national holiday.

We rolled in that night, certain that something would happen. Sure enough, at 10 o'clock a hot barrage drummed on the left. It ended as suddenly as it began. A gallant handful of French volunteers had made a quick raid for prisoners. They caught a few shock troops entering the German front lines and dragged them back. Gouraud learned the hour of attack.

Just to be sure, he shot a few of the boys over on the right, under another swift barrage. Their prisoners corroborated the news. The German attack was to commence at midnight. Fifty miles back the Kaiser was sitting in a watch tower with a bucket of Iron Crosses and a nickel's worth of cut plug.

Gouraud was one of those boys who thought on his feet. He immediately withdrew all of his troops from the impregnable first line trench. Next the dugouts, 60 feet underground, were filled with mustard gas. A few immortal volunteers—all dead now—were left in the trench, with orders to send up caterpillar rockets on the arrival of the Germans. Half the field pieces, our own included, were then trained on our abandoned first line.

Fifteen minutes to 12.

The men were awakened and told the attack had come. Blankets were rolled. We scrambled into gas coats and masks, and the crews were beside the guns at the second of 12. At that second the silent night was ripped apart by a sheet of flame forty miles long, as thousands of cannon trained on the front line cut loose.

The crash of sound that followed is comparable to nothing on earth. The world bucked like a mule. After the first deafening roar the guns hit a crescendo that went up, up, up, and never seemed to ease. A deeper, rolling roar as the Germans started in. Bright flashes ahead and to the right as shells smashed around the positions; dense gray and black clouds in the red night.

We yelled at the top of our lungs and pointed out new bursts. Voices vanished in the cataclysm of sound. Harley Tucker's dog Topsy tore around the gunpits in a frenzy, trying to add her yips to the tumult.

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Number One men braced against the guns waiting for the signal to fire. Officers strained their eyes against the blazing front, waiting for the caterpillar rockets announcing the arrival of the enemy and the death of the volunteers. Rockets of every color and description streamed across the sky, but never the right one. Overhead, the rush of shell; behind, around, in front, a jumping sheet of flame. In the fluttering glare, clouds of smoke pushed up as the shells wheeled in. The whistle of fragments around the position.

We were too spellbound to duck. Cannoneers hovered near the pieces and nervously rolled cigarettes. Why the hell didn't we fire? Gunners looked at their sight bubbles for the thousandth time. Number Two men fondled the shells.

Up went a rocket dump—thousands of blues and greens and reds popping in the cluster.

"Whoopee!" yelled Johnny Stovich. "That got 'em." He attempted a slight Czecho-Slovakian hornpipe. The entire sky dripped with pretty color.

An indistinct crash and shower of sparks two feet from the second gun. A couple of sand bags were knocked away. We thanked our God we had dug deep. The big shells were coming closer now. They were hardly noticed in the excitement. Now and then the curious, penetrating ping of gas, and coats were drawn a little tighter. The wind was in our favor and the fumes were carried forward.

White hot incendiary shells sailed over our heads like comets, and landed in a pine wood. Immediately the entire plain lighted up in a wild shade of cerise. Miles away it was possible to read a newspaper. (Nobody was caught reading one.)

An extra big shell found an ammunition dump. There was a volcano of smoke and flame, and the pink sky was peppered with 10,000 white puffs—cute little things, like snowballs. A feeble rattle of shrapnel came through the uproar.

At the first ray of dawn the Germans came over. The caterpillar rockets finally burst in squirming beads of pearls. Down came Lieutenant Stone's arm. We were at last pumping them over, cursing the easy cadence. Range, 1,700 meters.

The noise following the last rocket burst was unbelievable.

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Anyone not present in the Champagne on the morning of July 15, 1918, may be able to imagine a minimum of the inferno by riding the bumpers of a freight train going a million miles an hour over a wabby trestle. Words are no good, certainly.

Hundreds of German planes boiled up from nowhere and dived up and down the trenches, raking the doughboys with machine gun fire. The French—hopelessly out-numbered—swarmed out to meet them, and were shot down in flames.

One bright German dived on the battery position and emptied his belts into the camouflage. Vic Stangel, Cush Pryor, and Quisno sicked our machine guns, "Min" and "Andy Gump," on the big slob, and he ran like a whitehead.

With magnificent disdain for certain death, a Frog battery galloped across the field, Crimean style, and planked their guns 100 yards to the right. No camouflage. No gunpits. Nothing but guts and hope of the hereafter.

Their guns were trained. The firing officer stood beside them with a field glass. We pinched ourselves. Were these the bimbos that used the dive in the Lunéville abris whenever a shell fell a mile away? Well, that's a Frog for you. Put them on a safe front and they want to live forever. Sing the Marseillaise and they'll jump into hell fire yelling hallelujah.

Three minutes after they were in position the Frogs were pegging them over. The surrounding noise made their fire sound like popcorn, but they were raising hell all right. Their officer was firing pointblank at moving targets.

All of a sudden—*whoosh!* and it looked as if Vesuvius had opened under their feet. A mass of black and gray-brown smoke mush-roomed up from where we saw them last, as a flock of 6-inch shells dumped in. One of the prettiest sights of the war followed. A streak of fire shot through the dark cloud. The first gun was still firing. Another flash. The third was still there. For five minutes, intermittent bursts. Then a single brave flash, twice.

The cloud drifted away, leaving a clutter of gun tubes and broken wheels. Two or three survivors writhed on the ground.

Over on the left, black clouds arose from Reims Cathedral, on fire. In front, a boiling bank of dirty smoke, hiding the flower of



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the Prussian Guard. In back, the ammunition trains racing across the fields at a dead gallop, the drivers beating their horses with steel helmets. Shells landed right in their way, as they performed a brilliant right into line. More shells. A left turn back to the road, with everybody in the field cheering the corporal in charge. Ten times he outguessed the German gunners and missed death by an eyelash. They were from the 117th Ammunition Train, an expert bunch.

Our own teams galloped up, with shells dropping between the carriages. With the added thrill of knowing all the drivers, our helmets bounced off the camouflage every time they appeared out of the smoke—every man bent over in the saddle, every man glued to his horse.

Three German sausage balloons were set on fire within five minutes, filling the dusky sky with smoke and flames. Six tiny observers danced down on parachutes—an aerial Punch and Judy show. One was caught in a falling balloon and burned alive. A battery of heavies which had displaced our kitchen was smothered with shellfire. Don McArthur had his face burned off while he was swabbing out the gun. Somebody yanked the lanyard too soon. A shell landed in one of the gunpits and wounded Lieutenant Wegner. He lay like Wolfe at Quebec (except that he didn't say anything about Gray's Elegy. He said a lot of other things, though, just as good.)

A detail of heroes ran the gantlet and brought coffee at 9 o'clock. The guns were so hot now that they had to be swabbed after every shot. The cadence increased. Germans were getting through.

A shell hit the post of command and buried Lieutenant Stone, who was trying to sneak over a shave. It blew his shaving materials into Russia, where they weren't needed. Otherwise, no damage.

Meanwhile the drivers were chasing more ammunition. They reached one dump just in time to see it blow up. The same thing happened at the second, third, and fourth dumps. It got to be silly. Finally they got a load back to the guns early in the afternoon.

What with this and what with that, they had been having a hot time at the horse lines. Before the battle started, the drivers had been screaming their hearts out because Colonel Reilly had

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chucked them in an acre of scrub pine, whereas Indiana basked in comfortable barracks 500 meters away.

They were still pretty sore when the battle started and Indiana's barracks suddenly arose and began turning over and over. The air was filled with horses, men, and more profanity than was necessary. Of course, the survivors bolted for our woods. The drivers hinted that they'd better move on. Nobody knew where the next consignment of T. N. T. was going to land, and we wanted a fast track. Also, a great love for Colonel Reilly suddenly was born in the bosom of every man present.

Indiana's horses broke loose and ran all around the battery, getting killed and putting us on edge with their screams. Sam Wallace and Bob Beuhler shot the daylights out of a German plane.

Meanwhile the battle hung in the balance. An interpreter dodged past the position, on the run. We buttonholed, fed him corn willie, and shook him down for information.

We were especially interested in news of Alabama. For a week the French had been fuming at the presence of our prize battlers in the lines. The boys had been champing at the bit and pulling the poilus' whiskers to pass the time away. One night they stole some of our ammunition boxes and erected a signboard along the front that ran, subject to some expurgation, as follows:

Germans, Give Your Heart and Soul to Jesus, Because Your Neck Belongs to Alabam'.

They further diverted themselves by scraping the warm red paint from the ammunition boxes and fixing themselves up to look like Red Indians. They stripped to the waist and painted terrifying designs on their arms, faces, and chests, applying what was left to the indignant Frogs. The latter demanded that Alabama quit clowning or get out of the sector. They had some feeling that such maniacs would do more harm than good.

So we were delighted when the interpreter told how our favorite hoodlums had mixed with the Prussian Guard. At the moment of collision Alabam' boiled over the trenches like all the fiends in hell and began throwing the Germans up for grabs. They worked with knives and hand grenades exclusively. (One squad polished off twenty-six of the Guard without firing a shot.) When they ran out of hand grenades, they threw their helmets and cans of corn

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willie, whooping like wild Indians all through the day. Their losses in killed and wounded were shocking, but not a German lived within reach of their steel.

"They are eensane—those men," the interpreter complained. "They do not know the meaning of death. But what fighters! They make the English look like children!"

So with New York and Iowa. At the key point of the River Suippes we were eating them alive. Every hour or two our doughboys had to clear away the dead that were piled in front of the machine gun emplacements. The front line abris, filled with mustard gas, were choked with the Germans who had sought refuge from the murderous fire of our own guns. It was a holy cleanup.

These optimistic tidings were slightly offset by the spectacle of five or six hundred men in blue doing a Marathon toward the rear. Since they wore the mortarboard *kepris* of the Foreign Legion, notoriously a gang of fighting fools, it was quite disturbing. We tripped a couple as they whizzed by and asked them where they thought they were going.

"Chicago!" they replied, and kept on running.

A few paused at the position for their second wind, and went into the matter at greater length. They were not the Foreign Legion, as we had supposed, but the Polish Legion, recruited a few months before from the stockyards of Chicago. Ten minutes after hitting the front line they discovered that it was all a terrible mistake, and were doing their best to forget it. We gave them some letters to mail and the Marathon continued.

As they were passing the horse line, Pappy Le Prohon lassoed one of them and, also misled by the blue uniform, demanded news of the battle in voluble French. The Pole looked at Pappy's silver shoulder bars and gave him a big push. Evidently, he was disgusted.

"Where do you get this French chatter?" he asked. "Isn't your own language good enough for you? And you a lieutenant! Shame on you! Talk English, if you got anything to say!"

Pappy's eyes bulged. His underlip became a blue toy balloon. He socked the Polack in the jaw and threw him in the first rations cart going to the front line.

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Noon. We were abruptly ordered to cease fire. Gradually the bubbling roar slowed down. The German attack was broken.

Early in the afternoon they reformed. The guns roared back for five hours. Soon they got sick of it and quit. The firing dwindled again into the haphazard pot shots of any active sector.

We shed our gas clothes and undershirts and flopped in the chalk to sleep—sun or no sun, shells or no shells. We were dirty as pigs, tired to death, and very happy. Colonel Reilly sent his compliments for our day's work. The Intelligence reported an overwhelming victory, with thousands of German dead.

During the night we kept a harassing fire on the enemy lines. We were shelled heavily, and again saved by the strength of our positions. A German plane dived at the guns, firing at the flashes. Steel helmets shed a few bullets.

Another German attack the next morning. More firing, and rumors of a counterattack. Gas, and those suffocating masks. Then a drenching rain. After nearly two weeks without sleep or much food, the rain was a bad poke in the morale. The men flopped in their slickers and slept,, the rain beating in their faces.

On July 18 it was announced that the French and Americans had struck from Soissons to Reims and were going through. Early reports were that the salient was cut and that 1,000,000 Germans were prisoners. Moreover, that the attack was made possible by our defense of the Champagne.

Immediately our morale jumped to 1,000. We felt that the Allies would never stop going now, and that the war was about over. When it was announced that we were leaving for Chateau-Thierry to help run them ragged, our feelings ran away with us.

When the moon rose that night, we pulled out, covered with chalk and glory. The French turned out to cheer and say good-by. The rendezvous was 5 kilometers from the guns. We made it on the double, for superstitious reasons. After five days of death by an eyelash, we weren't going to get knocked off on any country road.

We talked it over on the run. In three days we had fired 5,000 rounds into infantry advancing in mass formation. In our little department, eight waves of shock troops with do or die orders had been repulsed without setting foot in the first line trench. We

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knew then that the Forty-second Division could spot the German army five lines of trench and lick them, hands down. We admitted it while rolling Bull Durham cigarettes in the rain and lighting them with French sulphur matches. The blue sulphur flame asphyxiated, but it was better than getting shot for showing a light on the march. Thereafter we smoked them in the palms of our hands, crushing the coal like Spartans at the approach of an officer.

We shook a few bones and bottles and slept in the woods with the other logs. The next night we moved on to Vitry la Ville, our entraining point. Some of the drivers went to Chalons for horses, and reported that the town had been nearly destroyed by shells and incendiary bombs. Thousands of women and children were sleeping in the fields and along the roads.

The little Greek installed his kitchen in a lady's front yard and at once began making passes. He was again caught peddling with the rations with many winks and gestures. Somebody crowned him.

Lieutenant Stone was promoted to captain, a just and welcome reward for our work of the past few days. Seeking to celebrate, he passed out quantities of Minerva bis-kweet, tasty but slightly greasy. There was an immediate epidemic of bellyache and we wished he had been reduced to the ranks instead.

In the early dawn of July 22 we entrained for Chateau-Thierry. We loaded in forty-five minutes—a regimental record. Every town through which we passed was hung with American flags. Women and children cheered and threw kisses, and we hit the next line in a swell frame of mind.

*(To be continued)*

# SOME ASPECTS OF MECHANIZATION

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

[This is the fifth and last 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.]

## CHAPTER VII

### MOBILITY AND POWER—GUNS AND ARMOUR—SHOCK- POWER AND FIRE-POWER

The three age-old war problems denoted in the heading of this article find their reflections in the modernized army. They are all to some extent interdependent and have therefore to be considered together. It is not proposed to follow their action and reaction through their long history from the Parthian to the tankette. It will suffice, for the purpose of succeeding arguments, merely to indicate their relationships during the Great War.

In the Western—the decisive—theatre, fire-power was dominant. In the absence of armour, the devastating effect of the machine-gun killed mobility and emasculated shock-power. It was easy to move that weapon by lorry in time to forestall and bring to a standstill at any required point the advance either of cavalry or infantry. The amount of artillery support required to nullify its efforts when concealed and protected and to renew the power of movement of the infantry entailed such large provision, such cumbrous appliances and such a negation of tactical skill that the movement was generally strangled at the moment of renewal. So, for nearly four years, static warfare reigned in the West; and final victory appeared to depend on relative rates of attrition rather than on that combination of shock-power and fire-power which all history and all our training manuals had indicated as the ruling factor in war.

Warfare became dynamic again with the advent of the tank. The special feature of this weapon was that it afforded protected movement to fire-power. It owed its success to the fact that it combined fire-power, shock-power, armour and mobility in the correct proportions for dealing with the immediate issue. The future tank

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or combination of types of tanks must also fulfil this condition if it is to continue to rule the battlefield.

In the first round—that is from the conception of the tank to the present date—armour has beaten the gun, for the protection of the tank rendered it immune from rifle and machine-gun bullets and from the shrapnel and splinters of artillery projectiles. It is not to be expected, however, that this immunity will long continue. The gunner will eventually realize that the field-gun is not a suitable anti-tank weapon. He will perceive that, for the attack of quick-moving armoured vehicles, he needs a weapon firing in a given time a large number of rounds each just capable of the necessary penetration, rather than one projecting relatively few large shells which throw off harmless splinters. That is, instead of the 18-pounder he will need a 3-pounder, the latter giving nearly an equivalent value per round, greatly enhanced rate of fire, disposing of far more rounds, requiring a smaller crew, presenting a much less conspicuous target and having much greater mobility. On the other hand, the present inefficiency of the machine-gun against its most dangerous enemy will cause it to take the opposite trend and grow in calibre till it can penetrate tank walls. It might even be convenient, as the one weapon comes down in size and the other goes up, to combine the two, as regards anti-tank work, into a single weapon—say the 3-pounder. Then if we were to consider the tank to retain his present form and to make a direct attack, it is pretty certain that the guns with their large numbers and rapid fire would beat the armour—thus winning the second round.

Such a victory, however, presumes a lack of tactical mobility on the part of the tank. It is unlikely that he will make a frontal attack. He will rather seek the hostile flanks, rear and line of communications. If that be his probable action, clearly the 3-pounders must be made equally mobile to present a front to him wherever he may attack. To effect this they may be placed either in self-propelled armoured bodies, or self-propelled shielded carriages, or be carried in six-wheelers. The first case leads to the battle of mechanized forces, while the trend of the other two is towards stalemate.

The relative value of carrying these guns in armoured and unarmoured vehicles is ably discussed in a recent number of the *R. U. S. I. Journal* by Captain R. Hilton, M.C., D.F.C., R.A.

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Captain Hilton regards the battle between guns and armour to be over in favour of the guns, once the 3-pounder is introduced. A tank cannot, for obvious reasons, thicken its armour almost indefinitely as does a battleship in its perpetual attempts to become gun-proof. Slight increases are hardly worth making, for they entail drawbacks far more severe than those of the slight addition to gun-calibre required to counteract them.

As regards relative mobility, naturally the self-propelled unarmoured 3-pounder is much more mobile than the heavily armoured tank, as would be also a section of 3-pounders in a six-wheeler. "A force of mechanized anti-tank guns, working in conjunction with aircraft, could forestall advancing tanks, even more effectively than machine-guns in lorries were able—in the Great War—to forestall advancing infantry." Tanks will then not be able to advance without the support of mechanized artillery. Why then armour tanks at all? Where infantry is scarce, the whole sweep of calibre-values will be changed and armour will merely blind and encumber without compensating advantages. Captain Hilton would not, however, abandon armour altogether; but he would use it only as an aid to fire-power, "that being the real protective agency on which the safety of ships, troops or fighting vehicles depends." He would, therefore, protect his 3-pounders with shields "proof, as regards frontal fire, against bullets, splinters, and, at anything but close range penetration by 3-pounders." This vehicle-weapon would, in relation to the tank, build up a harder striking army, for it would have a better view and possess greater hitting power and be faster, more mobile and more economical. The only serious drawback would be that of exposure to fire from flank and rear, and this would necessitate accompaniment "by 'mopping up' parties of infantry carried forward in shielded cross-country vehicles.

"These two elements would form the 'infantry' of the future, fire-power being derived from 3-pounder guns, ability to make good the ground from close-quarter parties. In defence, the 3-pounder guns would be unshipped and mounted in concealed positions; the close-quarter parties would be sited in covered positions near at hand so as to protect the 3-pounders from being run over. A proportion of this 'new model infantry' would be kept in reserve on the hulls ready to launch a counter-attack. The change



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from infantry fighting of the present day is only one of degree; movements will take place at 10 or 20 m.p.h. instead of 1 or 2 m.p.h. The fire-swept zone will be broader and will be swept by projectiles of 1½-inch calibre instead of .303 inch. Otherwise everything will be the same. Powerful artillery fire will be necessary to neutralize the defence and to allow the new infantry to go forward. Intensive air-fighting and counter-battery work will still be required to smash down the fire-power of the enemy artillery.

"The 'all-armor' idea is founded upon a natural desire to avoid heavy casualties, to win battles without bloodshed. Unfortunately this cannot be done. . . . In the warfare of the future casualties in all arms will probably be very heavy . . . the real difference from wars of the past will be that mechanization will allow all this fighting power to be intensified."

Captain Hilton's proposals have been considerably condensed in the above summary and extracts, but their main purpose has been indicated. They undoubtedly form a valuable contribution to the subject of mechanization; and, in connexion therewith, to the three problems heading this article. They are, however, open to certain objections:

(a) The forward shield affords no real protection (1) against air-attack either in the form of machine-guns or bomb-splinters, (2) against gas, (3) against shell splinters, (4) in street and hill-fighting—both very important matters in India.

If this vehicle were used for general purposes, it would probably, owing to these drawbacks, have to be withdrawn early in a campaign for the addition of more complete protection.

(b) Guns and infantry, especially the latter, would be particularly vulnerable on the march both from air and ground; and, as far more infantry would be apparently required than are needed with tanks, this is a considerable disadvantage. The artillery of heavier natures indicated as necessary would, by increasing the length of columns, add to the vulnerability of the latter from the air.

(c) It is not clear how infantry prevent guns from being run over by tanks. Surely one of the main objects of the anti-tank gun is to prevent the infantry from being run over.

(d) The counter-attack to be made by 3-pounders and infantry in vehicles merely protected by shields, against tanks, tankettes and

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armoured cars, does not offer any great prospect of success. Nor does the "new model infantry" appear at all suitable for offensive action.

(e) Once the 3-pounders have been emplaced they are fixtures. They and the infantry will have flanks and rear open to every kind of fire. The field artillery, who, in the battle of mechanized forces, may ordinarily despair of a target, will shell them with lyddite or blind them with smoke. They will be pinned to the ground while their opponents remain mobile. Any attempt to remount will be heavily punished, for the 3-pounders will be firing over open sights probably on the forward slopes and their carriages will have to be brought up over the crest in full view of the enemy.

(f) The self-propelled 3-pounder will lack the shock-action of the tank. Shock-action itself is a rarity; but potential shock-action is a powerful moral factor.

(g) Scharnhorst's generalization that "Victory lies in teaching soldiers how to die, not how to avoid dying" is sound enough; for battles are often so closely contested that only the stern fighting of courageous men decides the issue. But it is not true that "battles cannot be won without bloodshed," to which patent fact Craddock and Von Spee pay perpetual tribute. What were the German casualties in their first gas-attack? What would ours have been had we sprung our mechanical surprise with more and better tanks? In these days of racing science, the bloodshed may all be on one side. And that is why the study of war and of all the possibilities implicit in war instruments and scientific inventions must be far deeper, more constant, more thorough than ever before.

If we balance up both sides of the question we may safely say that the system proposed does not combine fire-power, protection and mobility in the correct proportion for dealing with probable issues. And it is certain that no General Staff would commit an army to a system compound of such grave drawbacks.

On the other hand it would be idle to ignore the manifest advantages of the self-propelled 3-pounder gun. There appear to be two distinct fields for its use: that of anti-tank work with the semi-mechanized army and that of supporting the reconnaissance of armoured cars.

In the former province it might furnish the proposed battalion

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anti-tank weapons and might replace the 3.7-inch howitzers. It would, however, hardly be sound to tie such a mobile weapon to battalions. If it were therefore to be the one anti-tank weapon, a reorganization would be necessary. The infantry anti-tank weapons would have to be transferred to the artillery. Two brigades would then be available—one provided by the reduction of the infantry and one from the pack artillery. The divisional commander would, in such case, have at his disposal a really valuable anti-tank force equal to protecting him on the march and equal in battle, owing to its superior mobility, to intervening between friendly infantry and enemy tanks. It would still be subject to some of the drawbacks mentioned above, but it would render possible the existence and even the action of a hybrid force in face of a mechanized force; and it appears to furnish the best solution of the very difficult antitank problem which has so perplexed the minds of men for the past decade.

In the second province—that of supporting the reconnaissance of armoured cars—we already have some experience; for motorized pack and field guns in, or towed by, lorries have been used at manœuvres for this purpose and have, in spite of their lack of cross-country mobility, proved of considerable value when used as pivots, as rallying points and for ambushes. Self-propelled 3-pounders or sections of 3-pounders in six-wheeled lorries would be much more valuable. They would give their escorting armoured cars or tankettes far greater offensive power without limiting their mobility and would enable them to fight for information, a competence otherwise beyond the power of reconnaissance vehicles. Defensively, they would greatly strengthen the protective screen to the area in which a mechanized force rests, marches and manœuvres, and they would be of considerable benefit to the force commander in that their resistance would largely increase the time available for the making of plans in the event of an enemy attack. In battle they would be invaluable for providing wide flank protection, or for furnishing a pivot either advanced, or withdrawn, or to either flank, as the situation might dictate, on which the whole plan of action might be based. They would, in fact, double the value of the high-speed groups.

Their work in this sphere is that of horse artillery, for they will

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act in the closest touch with the cavalry of the future. In the other sphere—that of anti-tank work—their rôle is not special to any branch of artillery, but the pack brigade lies there ready for conversion. *Pari passu* with the gradual mechanization of the army, the numbers required for anti-tank work will diminish, and those needed for the support of the high-speed groups will increase. The two branches—horse and pack—will thus gradually merge the one into the other; and the solution eventually reached will be that the horse artillery will swallow the pack artillery—a natural consequence on the disappearance of special duties—close-support and anti-tank—for which the latter was brought into being in the home army, and another reminder of the wisdom of the amalgamation of the various branches of the Royal Artillery.

*(To be continued)*



FEDERAL ARTILLERY OF  
FRANKLIN'S CORPS AT WHITE OAK  
BRIDGE, JUNE 30, 1862. JACKSON'S  
TROOPS IN THE DISTANCE

# SERGEANT WAITE OF THE FIELD

LIEUTENANT COLONEL G. A. TAYLOR, F.A., U.S.A.

"Service honest and faithful,  
Entitled to travel pay,"  
And here I sits a-musing  
Just in an old man's way;  
My thirty years are ended  
(Countin' my double time),  
And I thought I'd be contented,  
In some real fancy clime.

Me who was once the battery clerk,  
Keepin' the papers straight;  
No mistakes on the payrolls  
Made out by old Sergeant Waite.  
The ague shakin' my teeth out,  
Here in the park on a bench,  
Got it out by the Pasig,  
Holdin' a self-bailin' trench.

I know there's artillery in Heav'n  
For I've heard it firin' plain,  
Ridin' along of my section,  
My slicker sheddin' the rain.  
"Guide Right," sings the Cap'n,  
The bugle sounds clear as a lark,  
The guidon skins by my leaders,  
Like hell a-thrashing tanbark.

I used to be handy with shrapnel;  
Along in my fourth or fifth hitch,  
They went nicely over the pan,  
When they sent me in to pitch.  
Let me take on again proper,  
Give me a seventy-five,  
Old Waite'll take charge of a section;  
He'll show 'em he's still alive.

## BATTLING MONGOOSE

BY CAPT. E. L. NYE, V.C.

THE MONGOOSE has a large and variegated reputation as a killer of rats. He is popularly supposed to go through the most exclusive rodent colony like an angel of death, leaving a trail of ruin and desolation in his wake. One wonders if he always comes up to the advertisement, or if perhaps he has over-recommended himself.

In appearance this rodent is quite similar to the weasel and possesses the general rancidity of habits of the latter. He is, however, larger and of fast color. His coat is a dull reddish-brown and rather shaggy. In a wild state he lives in burrows in the ground, but his consuming curiosity frequently leads to complications and makes his domestication a relatively easy matter. He is very common in India and the East Indies, both in a wild and domesticated state.

The mongoose was imported into a certain territory some years ago, it being confidently expected that he would enthusiastically promote an alarming mortality among the rats, of which conservative estimators considered there were more than actually needed. He basely betrayed the confidence of those who had promoted him, made peace with the rats, and settled down to the serious business of repopulating the earth, an activity at which he is eminently successful. He shortly became a worse scourge than the rats, and much comment of an unfavorable nature relative to his antecedents and personal habits was heard. In fact, he was in bad odor, so to speak.

The writer endeavored by a couple of experiments to see what he could see. A mongoose that had apparently reached years of discretion was trapped and placed unharmed in a cage. He seemed to possess a violent disposition and would growl and spit at perfect strangers. The light of battle glowed in his eye and he thirsted for warm blood. A venerable rat, full of years and wisdom, was secured and placed in the cage with the mongoose, and an excited group gathered to witness mayhem and sudden death with the rat as exhibit "A." Nothing happened.

## BATTLING MONGOOSE

The rodents immediately became very clubby, and the most hearty good will prevailed. As a spectacle of combat it shrouded the audience in opaque gloom.

It was determined that the mongoose should fight, so a veteran tom cat, the property of one of the "Troops," was secured to double for the rat. This cat bore the marks of many years of honorable conflict. His face was scratched to resemble a waffle iron, and his ears had been chewed down until they were but vestiges of their former glory. He was the hardy hero of many a wild foray and amorous adventure, and much was expected of him. Tom took a look at the mongoose and backed off. He did not want him. Not so the mongoose! He charged the cat and snapped his murderous incisors shut on Tom's neck. There was immediately sufficient action to satisfy the most critical. In fact, so much action that the details became a nebulous streak and all was lost in a blaze of glory. After a series of universal convulsions, the mongoose was kicked loose and the cat backed off again.

These tactics were repeated for half an hour with the mongoose rushing and the cat purely on the defensive. As long as the mongoose could stand erect he would charge the cat. Tom finally won the bout, but only by defensive tactics. He never was in favor of the battle and did not enter into it with all the enthusiasm and whole-hearted attention to details that his backers expected. It was felt that Tom had not lived up to what might have been expected of a cat of his dignity and ripe experience.

This combat seems to establish the fact that the mongoose will fight, but that he entertains an abiding tenderness for rats and prefers to fight with almost anything else.

At another time the rats moved by regiments into a stable which was in the writer's charge. They became so numerous that it was felt a few of them could be sacrificed to the cause of science. Again a mongoose was secured and slipped down a large and promising rat hole which led to a sort of rat forum under the floor. It was expected that an exodus of rats, an hegira so to speak, would shortly begin. A loud rumpus quickly developed. The fight was on! It sounded as though there was a convention of rats and the chairman had temporarily lost control. Then there was a rushing noise at the rat hole and a streak of brown

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flashed across the floor. It was not the rats; it was not even a rat. It was John W. Mongoose himself, and he was going away. His movements were immediately simultaneous, and he seemed to wish to be by himself. He apparently wanted solitude, and lots of it. He felt the call of the great open spaces and responded. The rats remained. This experiment undertaken in the interest of science was a dud.

The mongoose, no doubt, has his place in the cosmic scheme, but as an exterminator of rats it is felt that he has been basking in the light of false notoriety. He is not recommended.





# FOREIGN MILITARY JOURNALS: A CURRENT RÉSUMÉ

## The Journal of the Royal Artillery, April, 1929

**Eighth of August, 1918**, is the subject of a lecture recently delivered at the Royal Artillery Institution by Lieutenant General Sir Archibald Montgomery-Massingberd, K.C.B., K.C.M.G. In this discussion of the battle of Amiens there are two items of particular interest: (1) the allied conference before the attack, and (2) the manner in which the preparation for the attack was concealed.

There has been considerable discussion as to who originated the idea of this attack, but as a matter of fact the idea came to Marshal Foch, Lord Haig, and Lord Rawlinson, commander of the Fourth Army, at about the same time. The detailed plan of attack, prepared by General Rawlinson and sent to G.H.Q., was, excepting in one important particular, the plan which was carried out. General Montgomery-Massingberd believes, with all due deference to Marshal Foch, that this plan would have been even more effective than the plan that was actually executed.

Lord Rawlinson's plan was that the attack from Amiens should take place between Moreuil and Morlaucourt, and should be entirely British; and his reasons for this are clear. Four years of experience had shown him that an attack by two allied armies was not nearly so easy to keep secret as one carried out by a single army. That was his chief reason. The second was that strategically he considered it would be much better for the French to strike from the south as soon as the British attack had shaken the German defense. Lord Rawlinson's plan would have compelled the Germans to face both ways on the 8th and would have been more effective than the purely frontal attack that actually took place.

After considerable argument at Marshal Foch's Headquarters on the 26th of July, it was decided that the Marshal's plan should be carried out, that the British and French should attack together from the same direction. Lord Rawlinson held a conference with his corps commanders on the 21st of July, but the divisional commanders were told nothing until July 30. As a result the plans

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for attack did not reach the brigades and battalions until about thirty-six hours before the attack took place. The object of this secrecy was to prevent the Germans from gaining information from any English prisoners who might be taken on the eve of the attack.

Many examples are given throughout the lecture illustrating the precautions taken to assure absolute secrecy and surprise. Every effort was made to "mystify and mislead" the Germans. Two battalions were sent to the Ypres front and prepared for an attack at Kemmel Hill. Casualty clearing stations, airdromes and wireless stations were established there. Even King Albert was so misled that he protested officially against an attack being prepared on his front without his being consulted. "This was exactly what was wanted, and the rumor immediately spread everywhere." No general registration of new batteries was allowed. However, practically every German battery had been located before the attack and with everything larger than 4.5-inch howitzers employed in counterbattery work, almost all German batteries were put out of action at zero hour.

In attempting secrecy, it was difficult to hide the horses when they were watering during the huge concentration of artillery just before the attack. "Nothing gives a concentration away more than a large number of horses going down to water."

"It is not an exaggeration to say that, at zero on the 8th of August, the battle was already won. The surprise was so complete, the confidence of the troops was so great, and the forces we had were so superior to the Germans in morale that once the attack was started the battle was never in doubt.

**L'École Supérieure de Guerre**, by "Commentdonc," is a description of the student body and the course of study at the French War College. Nations from all parts of the world send students to the École de Guerre, but the British Empire appears to be an exception. This is due to the fact that the two-year course of study is largely confined to the great continental type of war, and England, with its many colonies and consequently varied types of warfare, requires a course of study found only at its own service schools. The author remarks, however, that to keep abreast of continental thought a course spent at the École Supérieure de Guerre would be time well spent for the British officer. A description

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of the school should be interesting as well to American officers, particularly to any prospective students.

The average class consists of 80 French and 30 foreign students. French students are selected and then required to pass oral and written entrance examinations. At a recent examination there were 180 candidates for 80 vacancies. As regards the foreign students, "there is a great disparity in the representatives of the various countries. One country will select an officer or officers who have made a mark in their own army and are fluent French scholars, whilst another will send a representative who cannot read, speak, or write French, and who appears to have no particular claim to undergo this interesting course. Sometimes it is a general who is sent by his government; in another case it may be a subaltern." The order of nations is well defined. It is common knowledge that excellent students are sent by such and such a country, and poor students are to be expected from another specified country. The instructors are well selected, and a tour of five years is not exceptional. Frequently an instructor may return for a second tour.

The school year begins early in November and is divided into two periods—the indoor and the outdoor. The indoor period ends in May, and the outdoor period at the end of August. September and October are at the disposal of the students.

During the first year the student studies the tactics of a division and, in his section year, the tactics of a corps. The indoor instruction consists of: (*a*) lectures: (*b*) indoor tactical problems, lasting three to four hours and solved *viva voce* under the direction of an instructor; (*c*) rapid individual solutions of tactical problems for which about three hours is allotted; (*d*) home work, that is, the written solution of a lengthy problem in every detail (orders, work tables, traffic regulations, barrage tables, etc.) in the student's own time by a given date. During this period, several one-day tactical exercises are carried out on the ground in the vicinity of Paris. The indoor months are not limited to study of tactics. A number of lectures are given by men prominent in the literary, political, scientific and economic worlds. The classes frequently visit establishments of interest, such as government factories, experimental establishments, naval dockyards, etc. Four days are devoted to a war game and four days to an indoor combined

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military and naval operation scheme, in which the staffs and students of both colleges participate. This indoor course also includes languages, riding, fencing, and physical training.

As regards the outdoor period, all exercises are carried out by two "groups" at a time. Each class is divided into eight "groups." The first-year student does three tactical exercises—one on Cavalry tactics, one on Artillery problems, and one on Infantry tactics. The duration of each problem is about five days, carried out, mounted, in some district about 60 kilometers from Paris. In these exercises the hours from 6 a. m. to noon are spent on the ground in reconnaissance, making plans, map reading and discussions. The afternoon is devoted to orders or problems based on the morning's work. In the evening before dinner there is a conference. In addition to these three exercises the first-year French student does a three-weeks tour of the North East frontier. The outdoor period also includes a four-day military history hour of one of the early battle fields of the World War.

For the second-year student there is a ten-day staff tour by motor. An imaginary battle is fought in all its phases with detailed study of one of the Army's corps. Students of the Centre des Hautes Études act as commanders of the Army corps, the divisions and of the enemy. The students of the École de Guerre act as Staff Officers and subordinate commanders. "Every detail of war is studied, and the office work is the most trying part. It is a common occurrence for students to be working till 1 and 2 a. m. and to start next day at 7 a. m." During the whole two years notes are made by all instructors on all work done by each individual.

In conclusion the author remarks: "Except for the absence of sport, the whole course is excellent, thorough and full of interest. The staff and instructors are as charming as they are competent, and the students as good and pleasant a lot as one could wish to meet."

**Battery Tactical Training** is the continuation of a study of Artillery Training, Vol. 3 (1928) by Brevet Lieut. Colonel E. C. Anstey, D.S.O. In this number he introduces the subject of "Defense" by pointing out one extremely important change of doctrine in the new Artillery Training Regulations. The 1921 edition of Royal Artillery Training stated that Machine Guns must be coordinated with the Artillery. The 1928 volume, on the contrary,

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prescribes that the artillery fire plan must be coordinated with that of the infantry. This principle is stated in the infantry training regulations as follows: "The machine gun is the most valuable of all weapons used in the defense against infantry; so long as it is in action the area of ground swept by its fire is practically impassible by infantry. The artillery fire plans, the siting of the infantry defense works and the placing of the wire obstacles, if available, must, therefore, all be coordinated, as far as possible, to force the enemy into the arcs of fire of the machine guns." Colonel Anstey recognizes the soundness of this policy, considering "the rigidity and flatness of the machine gun trajectory compared to the flexibility of that of the howitzer and to some extent that of the 18-pounder with its reduced charge."

In formulating his plan of defense the battery commander must then remember that one of his important tasks is to "deny certain approaches to the enemy and so force them into areas which are covered by infantry and machine gun fire. Moreover, his defensive fire must be directed on the assaulting troops and the reserves."

Since infantry regulations prescribe that infantry can defend themselves with their own machine guns, it follows that the first task of artillery in the defense is to insure that the machine guns remain in being. "Thus the targets of primary importance must be the enemy's covering weapons." Counterbattery is not normally the duty of divisional artillery. But the enemy's supporting machine guns and the forward observation posts are the divisional artillery's task. Consequently our first business, in conjunction with the infantry, should be to see whether these targets can be foreseen . . . It is the infantryman who points out to us the most important artillery targets, i.e., the covering fire positions, the likely observation posts, the forming up areas, and the lines of approach . . . A considerable number of targets will thus have been selected, and it is obvious that the artillery cannot deal with them all simultaneously. Batteries must be prepared to engage targets as required by the troops they are supporting, and arrangements are to be made for concentrating fire on any given portion of the front.

"These objects can be attained and the difficulty of indicating targets in the heat of battle surmounted by giving each of the targets that has been selected a letter and a number, the list being then supplied to the infantry and the artillery commanders. If fire

is required on an area that does not correspond with a selected target, the nearest target can be used as a reference point."

**"Does Radio Telephony Offer a Possible Solution to the Main Artillery Problem of the Day?"** by Captain W. C. Holden, D.S.O., M.C., R.A., is a discussion of the possibilities and limitations of radio employment and the type of artillery sets required.

As for the limitations of radio employment, Captain Holden advocates the allotment of about five wave lengths to a brigade in mobile operations where the frontages are wide. It will then have to be settled which particular wave lengths are to be allotted to each brigade. The principle which governs this point is that sets which are likely to be near each other on the ground should be separated from each other in wave lengths as far as possible. Therefore a brigade should not be given five adjacent wave lengths, but should be given wave lengths that are separated by those allotted to another brigade.

In writing of the types of radio sets required, Captain Holden believes that for divisional artillery easily portable sets having a range of 8,000 yards would be satisfactory, for medium artillery heavier sets with a range of 14,000 yards. It has been suggested in the Royal Artillery that it might be possible to produce one universal set capable of dealing with the longest ranges. Captain Holden, however, is in favor of two types of artillery transmitters and one type of receiver which can be used with either type of transmitter or alone as a listening set.

**"Weapons"** by Captain C. T. Beckett, M.C., R.A., is a discussion of modern production of weapons and incident problems of policy, strategy, tactics, design, economy, and provision. Of the many vital points taken up in this article the following are interesting examples:

"For ease of production economy in pattern is of primary importance, and it will often be necessary to design a weapon whose means of applying fire power is adequate to cover two or even three tactical uses. For example, a light howitzer would be preferable to three different types of weapon of varying fire power for such purposes as close support of infantry, mountain warfare, and cavalry accompaniment."

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"Fire power itself shows signs of a pause in its development. Economy of supply has called a halt. Development for a while will be in the direction of improved technique of manufacture, in reduced cost and in improved mobility of the weapon. Such enhanced power as it may gather will be gained by auxiliaries such as improved communications both signal and vehicular, by more precise methods of fire control such as are afforded by sound ranging, by survey processes, and by chemical fillings."

Other articles which appear in this number are: "Current Naval Problems"; "The Transjordan Frontier Force"; "How to Write a Description of a Battle"; "The Caravan Road to Sinkiang"; and "Racing in India."

### **Revue Militaire Francaise, March, 1929**

**"A New Document on the Polish-Russian Campaign of 1920,"** by Captain Marchand, is a résumé of a book by General Sikorski of the Polish Army.

In July of 1920 the Soviet forces were greatly superior to the Poles in number and in leadership. Encouraged by his early victories, the Soviet commander wasted no time in exploiting his success. Following at first a well-prepared plan, he threw his armies into a vigorous and well-coordinated pursuit. By the first of August his troops had advanced 450 kilometers. Such easy success naturally caused the Russian command to look with contempt upon the morale, leadership, and fighting qualities of the Poles. Although two of the Polish armies made a show of resistance at the river Bug, this did not impress the Russian command, as the other armies continued a precipitous retreat.

However, at this moment certain concentrations and reactions were taking place within the Polish armies. Having fallen back to the interior of their country, the morale of the Polish soldier was revived by contact with the civilian population. It is curious to note that the Russian staff did not detect this return of fighting spirit and the resulting troop movements behind the lines. Due to the lack of aviation, the only intelligence reports received by the Soviet staff were those sent back by the infantry and cavalry in contact with the enemy.

Under these circumstances the Soviet command did not hesitate

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after crossing the Bug, when the question arose as to whether it should push on to the final objective, Warsaw, or halt to organize the territory already conquered; it chose the first course of action. At this time the Russian command was so assured of easy success that it abandoned definitely the usual formations in depth; it placed all its troops on the front line to assure the execution of the great enveloping movement around Modlin, which was to end the war.

The result of this decision was disastrous. The units which made up the right wing of the Soviet armies were so scattered that they were defeated in detail. The Russians thus lost the advantage of numerical superiority.

On the other hand, the Poles were regrouped in such a manner as to assure liberty of action and maneuver, and defeated the Russian units as they arrived successively at the river Vistula. In pushing beyond the Bug, without organizing its reserves, the Soviet command was unable to conduct even a frontal engagement. The units arrived before Warsaw in a state of disorganization; the troops were worn out after the long pursuit; they had no reserve of ammunition. On the contrary, the Poles were revived upon reaching the interior of their own country; their artillery was never before so numerous or better supplied.

The Soviet command was about to win the war in July; it lost the war in August, due to its temerity. Too deeply impressed by its initial success, it underestimated the strength of the enemy. As Clausewitz would have written, "the Russians had passed, without realizing it, the culminating point of victory."

Surgeon General Uzac, in concluding "**The Old and New Regulations of the Medical Department**," calls upon both medical and line officers to study the principles of medical organization. In the last war many medical officers, occupied with their daily routine duties of treating the sick and wounded, ceased to interest themselves in the evacuation of casualties and other important matters of administration. Only a few medical officers at the evacuation hospitals, and those at regulating stations, were familiar with such matters. These, in turn, were frequently accused of being out of touch with the fundamentals of their profession and of being no longer interested in the treatment of the wounded. Only those line officers who were on duty with G-4 were conversant



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with regulations concerning the movement of casualties.

In the future both the line and medical officers must fight against this state of mind. The line officer must have a general knowledge of the functions of the medical department as he has of any other branch of the Army. The medical officer must be familiar with all phases of work in his department. The officer concerned with administration will then base his administrative decisions on the latest medical doctrines; the officer who cares for the wounded will then be interested in the fate of his patients after they leave his care.

Captain Marchand concludes "**The Colonial Vocation of France.**" In the previous numbers he traced the rise and fall of the first French Colonial Empire. In concluding this article he appeals to the French nation to adopt the "imperial state of mind" and to avoid the mistakes which led to the loss of their colonies in the eighteenth century.

Although France has its colonies scattered throughout the world, this is not an indication of weakness, as its nearby African colonies, with eight million square kilometers of territory and 29 million inhabitants, constitute four-fifths of the territory and one-half of the colonial population. Contrary to conditions which existed in the eighteenth century, France can now, with but little delay, defend the greatest part of its colonial domain and receive colonial reinforcements. During the last war France had among its combatant troops 545,000 colonials. Of this number 86 per cent were Africans. Conditions are ideal for mutual economic and military support between France and its colonies.

In "**The General Structure of Napoleon's Campaign,**" by General Lemoine, the author states that the work of the historian is never ended; points of view change with each new generation and with each new development in the art of warfare.

Before 1914 it was thought that battle fronts would continue to expand, but it was thought that this expansion was bounded by certain limits. Today it is realized that a front may be continuous. The art of war must adapt itself to this fact. It is the purpose of this article to show that the strategy of Napoleon can be applied on a continuous front as well as on a battle front where the flanks are exposed.

The two Napoleonic principles which apply in this article are:

"(1) It is necessary to dispose of your forces so as to cover the entire theater of operations. (2) The commander must unite his forces against a single point. The breach made and the equilibrium once destroyed, everything else is useless." These seem to be contradictory statements. To cover the entire theater of operations means dispersion of forces; to make a breach means narrow concentration of forces. To reconcile these two statements, to sacrifice one of the two principles at the proper moment, has always been the important problem of warfare.

In the offensive the object is to destroy the enemy's army. To do this a narrow concentration is necessary. This involves neglecting the first principle, "Cover the entire front." This necessitates serious risks. In concentrating at the beginning of a campaign an army leaves its own frontier exposed and uncovers its lines of communications. This double danger the generals of the eighteenth century accepted without discussion. They concentrated their armies before beginning a campaign; their flanks and their rears were always vulnerable, and they were easily defeated. The generals of the Revolution adopted the opposite policy; they entered battle with their forces deployed and advanced in this formation to the attack. They operated with less risk, but in so doing, they sacrificed offensive strength.

The system of Napoleon combined these two methods. The concentration of forces was made progressively and in three stages:

1. At the beginning of a campaign he strategically deployed his forces along the frontier or at least at a great distance from the enemy.

2. As he advanced he reunited his forces on a front still many times wider than the eventual front of battle and marched quickly to meet the enemy.

3. He finally effected a narrow concentration of his forces immediately before the attack.

**"The Duties and Instruction of Interpreters"** by Colonel Paquet describes the progress made during and since the war in developing a Corps of Interpreters.

During the first part of the war, before the G-2 department was well organized, interpreters were not used to the best advantage. They were ordinarily employed as translators, clerks,

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and even at times in charge of messes. They knew little or nothing of tactics or army organization; their work was merely mechanical.

Then came the period of important battles—Artois, Verdun and Somme. It was found that an interpreter needed intelligence, a knowledge of psychology, and comprehension of methods of warfare in questioning German prisoners. By the end of the war the interpreters had become proficient in all requirements of their profession.

France is now attempting to continue the education of its wartime interpreters, now returned to civilian life. Colonel Paquet advocates that additional interpreters and replacements be recruited from men between the ages of twenty-five and thirty-five and that these men be required to report for a course of instruction at last once every three or four years. Last year the French army prescribed a course of instruction which included the following subjects:

1. Organization of the G-2 department.
2. Examination of prisoners. Psychology and technique in questioning. Preparation and execution of an examination.
3. Study of Documents (Army, Army Corps, etc.).
4. Aerial photography. Study of photographs. Conference and practical exercises.
5. French and foreign maps.

Other articles appearing in this number are: "Montdidier, the 8th of August" and "After the Conference of Robat."

### **The Italian Rivista di Artiglieria E Genio, May, 1929**

In an article, "**The New Fundamental Principle**," G. Douhet asserts that the basic principle in the organization and employment of the Italian national war resources should be: "Resistance on the surface (land and sea) in order to concentrate mass in the air."

The author states that, in his conception of future warfare, decisive combat will be in the air. With this as a premise, in conformity with the most important principle of war, mass must be concentrated on the decisive point; namely, in the air. To concentrate mass in the air, it is necessary to assemble in that element

the bulk of one's forces, which can only be accomplished by reducing to the minimum the forces in other fields, and, as a result, by renouncing the offensive in the latter. This does not, however, imply abandoning entirely to the adversary all fields other than the air.

In dividing the total available war strength of the nation between land, water and air, the distribution to be adopted against a given adversary should be such as to promise the greatest probability of victory. If 100 represents the total national war resources, and it is intended to decide upon various possible distributions of these resources among the three elements, it becomes necessary to consider in each instance the division which might be adopted by an adversary of comparable strength. The basis assumed by the author for purposes of discussion is a distribution of Italian resources into 20 for the army, 20 for the navy, and 60 for the air forces, while the adversary allots 40 to his army, 40 to his navy, and 20 to his air forces.

The defensive permits smaller forces to neutralize larger ones. This is true both on land and sea but not in the air, where, on the contrary, the defensive requires the use of larger forces to check the offensive. Therefore on land and water one should resist the enemy's forces with inferior strength, which will enable one to use the greatest strength in the air, where the enemy cannot intrench himself and neutralize. Thus the fullest advantage would be had from the various characteristics of the different fields of combat. Why should forces be hurled against the strongest resistance and dashed against a wall which is so easy to vault?

G. Stellingwerff, in an article, "**Motor Vehicles and National Defense**," notes in Italy a trend of the industry towards costly and luxurious cars, while in other countries this tendency, while manifesting itself, is linked with the trend toward vehicles of general utility and of moderate initial cost and upkeep. It is particularly strange that this condition should exist in Italy where the greatest needs of the market are for vehicles of the latter class.

High-powered, expensive, large gas-consuming passenger vehicles are not a military asset, nor is their employment advantageous.

According to the National Chamber of Commerce of New York, of the thirty million motor vehicles in operation on January

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1, 1928, the United States, with twenty-three million, holds first place by a large margin. The following is a tabulation of number of motor vehicles in the larger countries of Europe:

<i>Nation</i>	<i>Passenger Cars</i>	<i>Busses</i>	<i>Trucks</i>
France .....	660,000	10,000	290,000
Germany .....	300,000		125,000
England .....	840,000	45,000	290,000
Italy .....	120,000	3,500	35,000

Figuring that it is possible and practicable to use 10 per cent of passenger vehicles for war purposes, and taking into consideration other requirements, we can fix quite definitely the relative war strength of these countries in motor vehicles, as follows: England, 8; France, 6; Germany, 4; Italy, 1.

The average annual production of motor vehicles in these countries over the three-year period, ending in 1927, was: England, 210,000; France, 190,000; Germany, 70,000; Italy, 55,000.

These figures show clearly Italy's position with respect to motor vehicle production and indicate that in an emergency the industry will be unable to meet the military requirements.

An article, "**Questions Relating to the Employment of Artillery,**" by General Tito Montefinale, deals with artillery in the defensive, discussing in detail, in their usual order of occurrence, the various phases of the artillery action—*interdiction, counter-preparation, protection and preparation for counter attack*. General Montefinale emphasizes the fact that *counter-preparation* is the most important and most complex action of the artillery in defense. He traces the development of the conception of the counter-preparation from the early days of the World War up to the present time. In 1917, the Italian armies had not yet had occasion to study thoroughly the problem of counter-preparation, because all thought was turned towards offensive action. Counter-preparation fire was timidly conceived. Its purpose was understood at first to be, during the enemy's bombardment, to bring to bear on his assembly positions and upon probable lines of departure and approach observed fire. Detailed instructions regarding the execution of the fire were entirely lacking. Finally, the conception of the counter-preparation has developed to the point where it is now understood to be interdiction and counterbattery fire organized in advance in every detail and executed upon higher orders as soon as there is a definite indication that the enemy is about to launch his attack, in order that the attack may be crushed in its inception.

## **FIELD ARTILLERY NOTES**

### **Commendation for Field Artillery School**

The following letter of commendation to the Commandant of the Field Artillery School was written by the Chief of Staff after his recent inspection of Fort Sill:

"Before leaving Fort Sill I desire to express, through you, to the enlisted men of the Command my commendation and appreciation of the high standards of discipline and efficiency that prevail. I have been especially pleased with the military deportment and bearing of the men and with the precision in saluting. The barracks and stables which I have visited show high standards of care and attention to detail on the part of all concerned. The police and care of the grounds reflect credit upon those charged with this detail of administration. The duties performed by the enlisted men of the Command in connection with the school contribute in a determining degree to the character of the training.

"It has been my privilege to express to the officers of the Command my satisfaction with the demonstrations given by the school, and I feel that both students and officers with the school and the troops are alike conscious of the opportunities afforded for professional education and efficiency in the Field Artillery Arm.

"The consummation of the year's work is an evidence of the leadership displayed by the Commanding General and the staff, upon whom rests the responsibility for the conduct of this important command.

"C. P. Summerall, General, U. S. A., Chief of Staff."

### **Military Training Camps to Instruct 229,838 Men**

The summer military training camps of the United States this year will find 229,838 trainees under military instruction. These figures cover only the summer months. Additional numbers will be engaged during other portions of the next fiscal year.

## FIELD ARTILLERY NOTES

There will be trained 12,632 officers and warrant officers and 156,357 enlisted men of the National Guard, 15,739 officers of the Organized Reserves, 7,610 Reserve Officers' Training Corps students and 37,500 Citizens' Military Training Camp trainers.

In addition to these, 3,004 officers and 44,469 enlisted men of the regular army will be employed in the roles of instructors and in instruction units. The greatest concentration of regular troops for this purpose will be in the Eighth Corps Area, with headquarters at Fort Sam Houston, Texas. There will be 633 officers and 11,330 enlisted men in the summer camps of that Corps Area.

### **Award of Silver Star Citation for Gallantry in Action**

Announcement is made of the award of a Silver Star Citation for gallantry in action to David E. Harrower, formerly second lieutenant, 15th Field Artillery, 2nd Division.

The citation reads as follows:

"David E. Harrower, formerly second lieutenant, 15th Field Artillery, 2nd Division, American Expeditionary Forces, attached to the 54th Balloon Company, French Army. For gallantry in action during the Oise-Aisne operations, France, August 22, 1918. While attached to the 54th French Balloon Company, as observer and liaison officer, Lieutenant Harrower on August 22, 1918, was attacked by a hostile airplane and compelled to make a parachute leap. In spite of severe bruises sustained in the leap he voluntarily ascended again immediately and continued his observation until nightfall although the winch was being bombarded by enemy fire and enemy airplanes during the entire time of his ascension."

### **Field Artillery School Soldier Killed by Lightning**

The Field Artillery School detachment and a host of friends throughout Fort Sill and Lawton are grieving the death of Private Alfred E. "Red" Mennard, who was killed by lightning while at work.

Private Mennard was on duty repairing telephone lines on the range, when lightning struck the pole upon which he was

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working. Corporal Waterman, a member of this detail, is quoted as having warned the deceased to stop working just prior to the storm's approach. A few minutes more would have found the soldier safe on the ground.

The brother of the deceased, of Montpelier, Vermont, has requested that the body be shipped to that place for interment.

A fine, wholesome, clever, upright soldier, no finer in the Army. The memory of "Red" will always be that of the deepest respect by all members of his command.

### **Soldier Loved Horses—Rewarded**

Private Gasper Bronno loved horses. For the last four years he has been on duty, as a consequence, at the Ninth Corps Area stables, Presidio of San Francisco, California. Had he chosen service with the line, there is little doubt he would have attained promotion and increased pay. But he loved horses and was never so happy as when caring for his animals. Particularly did Private Bronno pour out a wealth of care and affection on the polo mounts of Major William H. Rucker, F. A. For his entire four years of service he personally tended Major Rucker's "Skyrocket," "Miss Bridges," and other prize-winning ponies of the officer's polo string. And then recently Major Rucker died. Came the reading of the deceased officer's will, and it was found that Bronno, for his application and care, had received a bequest of \$1,000.

### **Quartermaster Corps Seeks to Improve Army Clothing and Equipment**

According to Major General B. F. Cheatham, Quartermaster General, many experiments and developments are under way, with a view to improving articles of clothing and equipment furnished by the Quartermaster Corps to the Army. Among some of these are the following:

Study is being made of a method for preserving tent poles and pins.

Changes are being made in tropical raincoats to improve wearing qualities.

A study is being made to find a substitute for service hats.



## FIELD ARTILLERY NOTES

Three hundred pairs of experimental leggings now are being manufactured for test by the Infantry Board. Also, for trial by the Board a few pairs of service shoes are being equipped with leather leggings by a recently devised method.

An experiment has just been completed in connection with dyeing enlisted men's leather belts a cordovan color. It was determined that the project is not practicable, due to the fact that when dyed the belts curled at the edges.

Samples of blue dress caps have been procured, and purchase will shortly be made of 1,000 of these caps for sale to enlisted men under recent authorization of the Secretary of War. By the substitution of a rayon band for the present cloth band the cap has been given a much dressier appearance.

Since the exhaustion of the stock of war time trench coats there has arisen a demand in the Army for a coat which will serve both as a raincoat and as an overcoat. As a result there have been manufactured twenty trench coats of a design and type approved by the Quartermaster Technical Committee and conforming to suggestions made on behalf of various arms of service. These will be sent to the various boards for practical field tests.

Investigations are now under way to determine if a suitable steel chair, which will have a much longer life, can be procured at a cost which will justify the substitution of steel barrack chairs for the wooden barrack chairs which now suffer heavy annual casualties.

Experiments are being made with storm flags to determine whether the life of these flags could be lengthened by the addition of balloon cloth to the fly end. These tests will be made in the Philippine and Panama Departments.

Improvements have been worked out by the experts at the Jeffersonville Quartermaster Depot at Jeffersonville, Indiana, by which the serviceability and life of the tent will be increased, the manufacturing process simplified and the cost of manufacture considerably decreased. It is expected that models of the new type of tents will, in the near future, be sent to The Office of The Quartermaster General to be passed upon by the Quartermaster Technical Committee, which is

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composed of officers of the Quartermaster Corps and representatives of the various interested branches. Later, models of the improved type of tent will be given a thorough service test.

### **Amateur Radio Operators To Be Organized for Emergency Relief Work**

In order to provide throughout the United States additional channels of communication which in time of emergency can be used to augment or replace the land lines, both telephone and telegraph, which may be seriously damaged or destroyed by flood, fire, tornado, earthquake, or ice, the Signal Corps of the Army under the direction of Major General George S. Gibbs, Chief Signal Officer, has organized the Army Amateur Radio System, which in such emergencies will assist military commanders, the Red Cross and other relief agencies.

In organizing the amateur radio operators for this purpose, the net system has been utilized, since it has been found by experience to be the best means for organizing and training individuals for coordinated effort in time of stress. By means of the net system, every operator in the net will know what he is to do, how he is to do it, and from whom he can expect assistance.

To this end the Army Amateur nets are centered in strategical points in each geographical area of each state, in the several state capitals, in the corps area headquarters and in Washington. The Army Amateur Net Control Station is located at Fort Monmouth, New Jersey, from which Washington can be worked by radio, telephone and telegraph.

An outstanding example of the value of the amateur radio operator and his station in time of disaster is the work of two amateur operators during the Florida hurricane of 1928, when for two days and two nights the only means of communication with the outside world was through their stations.

The system inaugurated by the Signal Corps will provide an organization of amateurs for service to their communities in similar emergencies. To this end General Gibbs is desirous of enlisting the aid and cooperation of all the amateur operators of the country, in the belief that they can be of great value when other means of communication are destroyed by relaying

## FIELD ARTILLERY NOTES

information to relief agencies. Corps Area Signal officers have been made responsible for the organization of amateur operators in their Corps Areas.

### **United States Owes National Game to Army**

Baseball has been played in the Army for a long time but how long, very few people realize. That the game was originated by an Army officer is equally unknown.

The game of baseball was originated by Major General Abner Doubleday, of the United States Army, in 1839 at Cooperstown, New York, just five years after James Fennimore Cooper, of the same village came into prominence as a novelist.

In 1905, A. G. Spaulding and Henry Chadwick, known as "The Father of Baseball," started an investigation to determine definitely the origin of the game. They caused a commission to be formed for this purpose; included in this commission were: A. G. Mills of N. Y., a baseball enthusiast of the Civil War; Arthur P. Gorman, former U. S. Senator from Maryland; Morgan G. Bulkeley, U. S. Senator from Connecticut; N. E. Young, Washington, D. C., first secretary of the National Baseball League; Alfred J. Reach of Philadelphia, president of the A. A. U.; and James Sullivan, appointed secretary of the commission.

After over three years investigation they found that the game was a development of "One Old Cat" which was played extensively by the boys in Colonial times. It had no connection with the English game of "Rounders" which has been supposed by many.

Abner Doubleday, then a school boy in Cooperstown, New York, thought up the game himself. He outlined the playing field on the playground of the school with a stick. He marked off a diamond, designed bases and foul lines, and explained the rules to his playmates. He called the game "Base ball."

Doubleday later went to West Point and graduated in 1842. He became a major general in the Civil War. After that war, baseball was taken up in the Army, and in the years of peace that followed the Army played it all over the United States and the game was carried into all corners of the country by the Army.

# NATIONAL GUARD NOTES

## Hurricane Relief by the 116th Field Artillery

(THE following extracts from a report made by Sumter L. Lowry, Jr., Colonel, 116th F. A., to the Governor of Florida, give an interesting example of how a Field Artillery regiment can be used in times of peace to save lives and property.—EDITOR.)

Two predominating factors in the Okeechobee Lake situation compel the National Guard to regard it as a problem of primary importance to the Guard. These factors are:

(a) The perpetual likelihood of repeated disasters as long as the physical condition of the lake and surrounding country remain as they are.

(b) Even though operations on a comprehensive plan for control of the lake and for effecting refuge work were started immediately, a number of hurricane seasons must pass, because of the magnitude of the operation, before a state of safety from disaster could possibly be reached.

Hence, with two equinoxial seasons per annum to face, the problem of possible disaster and of following rescue, police and rehabilitation work rests squarely before us and commands our attention. Furthermore, the ever-increasing demand for the rich bottom lands of this section as farming land, and the continuous immigration into this territory, multiplies steadily the complications and the difficulties of handling the situation.

So long as the Okeechobee district remains open to settlement and lies unprotected as it now is from the "tidal wave" action of the lake, we can anticipate serious loss of life with each hurricane passing over it. Such dikes as exist, and along the northeast shore of the lake, the ridge on which Connors Highway is located, proved to be no protection from this tidal wave action. The hurricane force of the wind acting over so broad a surface and over so shallow a body has every opportunity of literally pushing the water out over its borders, creating the havoc we have witnessed at Moore Haven, at South Bay and at Taylor Creek sections. The shallowness of the water precludes the possibility, at most points along the shore, of return flow, undertow-like, of the water when it

## NATIONAL GUARD NOTES

is piled up on the broad flats, and serious flooding is almost inevitable. Once the slight elevation of the shore or protection is topped, the flatness of the country allows of practically a bodily movement of the lake out over the inhabited sections and the tilled flats.

The exceedingly flimsy construction common in the buildings of this section also adds to the hazard. It is noteworthy that practically all of the loss of life was due to drowning. Buildings in several cases, where they were of average good wood construction, well fastened together, survived the fury of the blow only to be floated off when the flood came, carrying occupants to safety on higher ground or riding out the storm, settling on some remote point with the receding waters. However, in so many cases that it is heart-sickening to remember, the homes of the lake shore dwellers in fact did tumble down, floating off piece by piece, leaving perhaps an iron range, or bed, and in at least one instance a sewing machine, to mark the spot where a dwelling had been. Light masonry construction will not stand the stress, while massive brick construction will prove only a trap in which to drown unless built well up above probable high water level.

In this connection, it is worth while to note that in the Moore Haven disaster, the water rose to 8 or 10 feet above the average ground level, while in South Bay, the recent storm caused a rise of 10 feet above lake level; and along Connors Highway in the north end of the lake, the water swept 6 to 8 feet over the highway, which itself is 5 or 6 feet above the lake level at that point. These facts are reviewed here to keep fresh in mind the gravity, yes, the terror of the situation.

Some of the most interesting and important elements worthy of consideration in any study of this problem are the evident apathy of the people concerned toward the hazard—their resignation to the fates, as it were, that imposes on them periodic floods of disastrous nature, and the striking mental inertia which apparently prevents their comprehension of the situation. After the disaster they seemed dazed, lost, aimless,—which is quite natural, following such a calamity. Notwithstanding this mental condition, many heroic acts are recounted and some striking ingenuity was displayed before

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and after the storm. One instance was the lashing of a large houseboat in the lock at South Bay where, with violent bailing and pumping, the craft was kept afloat and the hundred and fifty souls aboard rode out the storm. But the vast majority of these people need outside aid in time of emergency.

Though rich in agricultural possibilities, the lake shore section is poverty stricken. The work of beneficent organizations through the section is quite well known. Such assets as the inhabitants possessed were destroyed, other than land. Such protection against the lake as these citizens receive will have to come from outside sources; the problem is altogether beyond any possibility of their handling it themselves. The terrible loss of life experienced in these two disasters bears this out.

In view of the fact that the duty of recovering the dead, rescue of the living, the initial steps in rehabilitation, the establishment of first communications to the outside world from stricken areas, the organization of initial transportation facilities, including emergency repairs to highways and bridges, all these functions devolving immediately on the National Guard, make it a problem, to that organization, of great importance.

Two times in as many years the National Guard of this state has had to serve in the wake of disaster. Under the circumstances, I feel that some definite plan of action should be formulated, and that this plan should be immediately adopted for future use in situations as they arise.

The Okeechobee problem, for the purpose of this discussion, automatically divides itself into three parts:

I. The engineering problem of controlling the lake. Although intensely interesting, this phase must be solved by the State or Federal Government; no recommendation will be made in this report.

II. Precautions to be taken to prevent loss of life before storms occur.

(a) While plans are being accomplished for the control of the waters of Lake Okeechobee, plans that will eliminate the possibility of repeated disaster, thousands of people are residing along the lake shore and back country flats now, just as

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they did before former disasters; and so they will continue to live. The State of Florida should recognize this situation, and should take immediate steps to provide means which will prevent such terrible loss of life in any hurricane that may pass that way. While the expense of properly and safely controlling the lake will run into millions of dollars, and completion of the necessary work would consume several years, the cost of providing suitable refuges and maintaining appropriate observation and warning systems to insure that the people would be assembled in them before a disaster would be only a fraction of the former.

(b) The population of the probable flood area of the lake can only be approximated at present. A survey should be instituted to determine the numbers, names and locations of all persons in this section. However, an approximation of some value as to the cost of this work can be arrived at by estimating the housing requirements on the basis of allotting a given number of square feet of area per person in the area to be protected, and arriving by rational methods at the number of buildings necessary.

(c) Taking as a unit for study a house to accommodate one hundred persons and allowing area on the basis of six square feet per person, we arrive at a building of 20'—0"×30'—0". These could be built in standardized units, joined into groups to suit local needs or constructed separately. The buildings should be fire resistant, and of permanent type of construction. They must be designed to resist hurricane wind pressures, and withstand relatively violent water action. The type of construction most economical and best adapted to this service would be built on general specifications.

(d) Were these refuges established, the National Guard should be mobilized on definite advice that a storm is imminent over Okeechobee, moved into the area and supplement the warnings by requiring inhabitants to go into the refuges. It is understood that the use of troops on a mission of this kind would be resorted to only upon definite and authentic information from the United States Weather Bureau that the lake area would be visited by a storm of sufficient intensity to be a menace to life and property. My inquiry into the last

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disaster proved by conversation with survivors, that they would use these refuges if available. Many people left the area on receipt of warnings, but the suddenness of the disaster caught numbers on the highways, washing them to destruction. Were these buildings located at frequent intervals along the principal highways, there is little doubt but that practically all could be saved. In extreme emergency or underestimation of population, these refuges could, with some discomfort, accommodate twice as many people as estimated. The duration of the storms is short and no serious hardship would result. With these safety buildings established, the section afflicted would become more prosperous, and the terrible catastrophes of past years would not be repeated.

(e) One of the chief factors in handling a situation of this kind is to quickly determine what the actual conditions are in all towns on the lake. Accurate and authentic information is the only real basis for making correct decisions as to the handling of the problem. In this connection, a system is worked out with definite assignments to various officers of the 116th Field Artillery whereby these officers, without instructions from the Regimental Commander, will immediately go to their assigned points, thoroughly investigate the results of the storm, hurriedly ascertain the needs of the people and immediately get out of the area and make a personal report by telephone or telegraph to the Regimental Commander. The assignment is attached to this report as Appendix "A."

III. Action to be taken by the National Guard after a storm has passed through an area.

(a) This work consists of the following detailed operations:

(1) Establishing a central military headquarters from which all operations can be directed.

(2) Organization of troops into relief details and assignment to sectors.

(3) Transportation of troops into stricken areas by: (a) rail, (b) motor transport, (c) motor boat, (d) airplane.

(4) Establishing communication with outside world: (a) Repairing telephone and telegraph lines, (b) establishing radio communication, (c) courier.



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(5) Publishing from central military headquarters at noon each day an official military communique, giving the public accurate knowledge of conditions in the area as they exist.

(6) Reorganizing transportation facilities: (a) Establishing truck lines where necessary, (b) cooperation with railroads, (c) emergency repairs to roads and bridges, (d) arranging for adequate water craft for lake transportation.

(7) Police activity in cooperation with local authorities.

(8) Rescue of the living from danger and recovery of bodies.

(9) Supply of quarters and rations to refugees in emergency cases.

(10) Coordination of activities and cooperation with relief organizations.

The question of police regulations is important. Under the stunning effect of these disasters it has been found impossible for local authorities to organize survivors into relief units for the various necessary operations. Here the troops fill a very distinct breach, and it is my opinion that local authorities should in fact turn over police authority and all relief organizations to the Commanding Officers of the various relief detachments. Centralized control is of vital importance. and for the first few days after a disaster, full control by the military is the most efficient way of meeting the situation. It is not desirable that the troops be continued in control when the civil authorities and permanent relief organizations have become organized and established.

The coordination of the activities of relief and benefit organizations is of great importance. These should operate under general direction of the military, certainly during initiation of activities. The troops invariably are first on the scene. They have first authentic information of the conditions that exist, and are, therefore, best qualified to guide the initial relief work of these organizations.

Requisitions for supplies should all be checked through one headquarters in order to coordinate the supply and eliminate overlapping and waste. This should properly be the central military commander's headquarters. This is most

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important, as past experience has shown that a great amount of money and supplies are wasted for lack of proper distribution.

As conditions improve and become normal and the troops are withdrawn, direction of further relief and of rehabilitation should be turned over to the organization best qualified to properly direct it.

It is my belief that the National Guard should be ready at all times to mobilize on short notice to cope with a situation of this nature. It is my recommendation that the entire Okeechobee District be definitely assigned to the 116th Field Artillery for all relief work. The proximity of troops on the north and west, with excellent communication, the probability that troops in Miami and West Palm Beach will be busy with storm problems in their own cities, and with experience in previous disasters behind us, this unit is well situated and qualified to organize and handle this problem.

In addition to the above features in connection with this problem, suitable action should immediately be taken to make it possible for the military commander of a district to have authority to request airplane or seaplane assistance from the Pensacola Naval Station without having to go through the complicated system now in effect to secure this aid.

To sum up this report, I make the following recommendations in connection with the Okeechobee hurricane area:

(a) That this district be assigned to the 116th Field Artillery to organize and operate before and after a disaster.

(b) That refuge houses be built along the plan outlined, and based on actual survey of the true situation.

(c) That authority be given for the district National Guard Commander to call direct for Naval Air Station assistance.

(d) That appropriate observation and signal systems be established on the lake.

(e) That accurate information on storm conditions be sent by the Weather Bureau to a central point on the lake to be broadcast from refuge to refuge by signal and siren system.

NATIONAL GUARD NOTES

HEADQUARTERS 116TH FIELD ARTILLERY  
FLORIDA NATIONAL GUARD  
OFFICE OF THE REGIMENTAL COMMANDER  
APPENDIX "A" Tampa, Florida,  
December 4, 1928.

GENERAL ORDERS }  
NO. 16 }

I. *Assignment of Areas for Storm Reconnaissance.*

1. In view of the severe property damage and loss of life occasioned by hurricane winds in the region of Lake Okeechobee within the past two years, and guided by the fact that it invariably becomes the duty of the National Guard to render aid to the stricken inhabitants of this portion of the State at such a time, the following assignment of areas for the purpose of storm damage reconnaissance is made:

*Headquarters Battery 116th F. A., Fort Myers, Florida.* Fort Myers and all towns on Lake Okeechobee from Lakeport to Clewiston, both inclusive.

*Headquarters Battery 56th F. A. Brigade, Avon Park, Florida.*—Okeechobee City and all towns on the west side of Lake Okeechobee from Okeechobee City to Lakeport and all towns on the east side of Lake Okeechobee from Okeechobee City to Utopia, inclusive.

*Battery "F," 116th Field Artillery, Tampa, Florida.* Punta Gorda and all towns on south and east sides of Lake Okeechobee from Clewiston to Utopia.

*1st Battalion, 116th Field Artillery, Tampa, Florida.* All cities on Gulf Coast from Englewood to Cedar Keys, both towns inclusive.

2. As soon as definite, authentic information is received that a storm of hurricane force has struck in the area herein assigned to a unit, the Commanding Officer of that unit, accompanied by such officers of his Post as he deems necessary to accomplish his mission, will immediately go into the area and make a personal reconnaissance of his sector, he will investigate the results of the storm, ascertain the needs of the people and will then proceed as quickly as possible to the

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nearest available line of communication, telephone, telegraph, radio, etc., and notify the Regimental Commander of the results of his reconnaissance.

3. The necessity for rapid work on the part of the officer or officers making the post storm reconnaissance should be apparent to all. It is necessary that accurate information from a responsible person be quickly received by the Regimental Commander in order that effective plans for relief work may be made.

4. At least one officer will be left at home station to prepare the unit for the field. This officer should be instructed to notify all members to hold themselves in readiness for a call to active service and he will make plans for a speedy and effective mobilization of the command.

By order of Colonel LOWRY, etc.



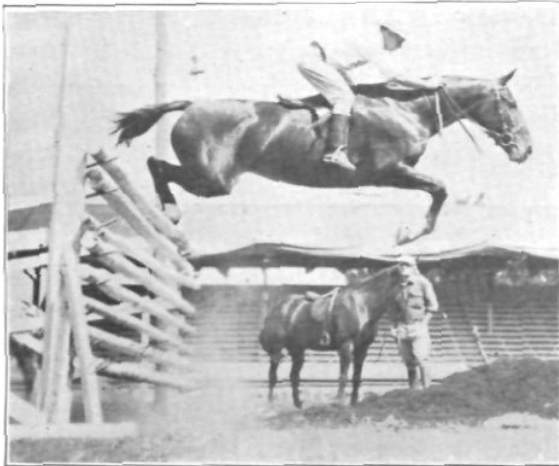
VIRGINIA INFANTRY CHARGING RANDOL'S BATTERY AT FRAYSER'S FARM, JULY 1, 1862

## SHOW HORSES OF THE 143RD F. A.

IT ISN'T what you pay for a thing in this old world, it's what you get out of it that counts.

That is an adage that can aptly be applied to the horses of the Oakland units of the 143rd Field Artillery, California National Guard, which have made high priced mounts of society stables step high, wide and handsome to retain some of their laurels.

To trace the history of the development of horses of show caliber from the mounts provided at the Leona Heights stables would make



"ROUTE ORDER," JUST A GOVERNMENT LIGHT DRAFT ARTILLERY HORSE

an interesting story in itself, but this one has to do particularly with one "Route Order," the pride of the regiment and a jumper that worries the other entries when his lithe form appears on the tanbark, with First Sgt. Albert F. Holloway of B Battery in the saddle.

The bay gelding, just horse with no particular conformation, as prize animals go, was bought for an artillery mount and he was being broken in as a light draft animal when his show and jumping qualities were discovered.

Route Order, 16 hands in height, nine years old, was purchased locally from federal funds appropriated for that purpose. Running on a Nevada range until he was seven years old, he was purchased

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by a local horse dealer, who after a short period of training sold him to the Government. Major M. G. Randol, U. S. A., being the inspecting officer. The horse is the type referred to as a combination horse, an animal particularly suited for National Guard work, having the bone and weight necessary for a light draft horse, and the action and balance so pleasing in the good saddle horse

"Light draft artillery"—that is the description of Route Order that you will find even today on his descriptive card; but he is one of those things that just naturally won't stay put according to the rules, and army regulations or no, he has forgotten his army rating and is now classed as a CHAMPION JUMPER and one of the best in the West, if not in the entire nation.

At the time he was turned over to First Sergeant Holloway he was a big handful for any man, but after six months of training he showed enough promise to be entered in the Novice Hunter and Military classes of the 1927 Stockton, Calif., show.

His schooling at the jumps was started on the longe, then continued in the chute at liberty until he was able to take care of himself over a 4-foot obstacle. First Sergeant Holloway then started riding him over low tied bars, gradually raising them so that at the time of his first class in the show ring he gave a clean performance, placing second in the Novice Hunter class.

He stands well back of his fences and continues on after passing his fence in true hunter style. Route Order makes his best performance over the big jumps but still is a consistent performer in the pig pen. He placed third in the Officers' Charger class and was a member of a hunt team that placed third in his initial appearance in the show ring.

Continuing his schooling from August until the Oakland, Calif., show in February, 1928, Route Order pranced into the Oakland municipal auditorium to give the most spectacular demonstration of jumping that has ever been seen in this section. He placed second in the Touch and Go Sweepstakes in a field of 30 entries, third in the 5-foot performance, and firsts in the Jumpers' Sweepstake. His performance in the pair and hunt teams was always dependable, enabling them to place fourth and second respectively.

His next show was at Palo Alto, Calif., in August, 1928, where



"ZERO HOUR," STATE OWNED 7-YEAR-OLD; PURCHASED IN CALIFORNIA, 1ST SGT. HOLLOWAY UP



"EL CAPITAN," ANOTHER CALIFORNIA ARTILLERY HORSE, 10 YRS. OLD, 15.2 HANDS HIGH

## THE FIELD ARTILLERY JOURNAL

he showed the advantages of his military training by placing second in the Road Hack class, before a judge who demanded a loose rein at all gaits. He performed consistently throughout the Show, winning the Sportsman's Sweepstake and placing in five of the seven classes in which he was shown.

Later at Stockton, Calif., he won the Jumpers' Sweepstake and was in the money in all classes shown. He took the blue ribbon in the enlisted class at Stockton and in both the officers and enlisted classes at Sacramento, Calif. At the Sacramento show the old boy took his first fall at a fence. This did not deter him, however, from winning in several other classes, although it did slow him up somewhat.

The horse has just been returned to his home station from the San Francisco, Calif., show, where he annexed another blue ribbon in the Touch and Go Sweepstakes over a field of 31 entries. He was also first in the Officers' Charger class, second in the Enlisted class and Road Hack, third in a field of 46 horses over a course of eight jumps, and third in the Novice Hunters.

While he has never won in a conformation class, his way of going over fences has placed him consistently in the money in heavyweight and Novice Hunter classes.

From February 18, 1928, until the present time Route Order has won a total of \$1,430. Incidentally this is nearly ten times as much as the horse originally cost the regiment.

Considering that the animal was trained without special cost to the regiment other than the regular allowance for the care of animals allotted to the National Guard, it is an achievement well worth note. His complete schooling and training have been under the supervision of First Sergeant Holloway, who has ridden him in the prize-taking events at the various horse shows and deserves no small amount of credit not only for the performance of Route Order but some of his stable mates as well.

True, Route Order has been the regiment's most spectacular horse at the shows, but there are many others who have performed well and taken many prizes for the regiment. Among the outstanding of these are Zero Hour and El Capitan.

The regiment's first entry in the show ring was the natural result of well schooled mounts and the limitless energy and enthusiasm



## SHOW HORSES OF THE 143RD F. A.

of Major Marshal G. Randol, Regular Army, attached as senior instructor, who was at that time in command of the regiment. The regiment's continued life in the show game is largely due to the following out of Major Randol's plans of work and system of training and the unselfish cooperation of officers and men.

The 143rd Field Artillery, C. N. G., Oakland units have a combined stable of 64 horses, which provides for funds to employ four men for their care. The work is arranged so that one man is free to devote his time to the training of the animals. Wisely no interference is permitted during the schooling period. The horse is not used until he is considered finished by the trainer. In this manner it has been possible to give the horses first class schooling without added expense to the regiment.

Prize money won by Route Order and some of his stable mates has provided funds to take some of the other horses to the shows and provide for their care and keep at these events.

That the horse show entries have proven a great success to aid in advertising the regiment has been ably displayed in the large amount of space that has been given the accomplishments of the horses.

## **POLO**

### **16th F. A. Team Will Represent the Army in Junior Championships**

With no international military polo matches in prospect, the Army Central Polo Committee believes that this year its efforts should be directed toward encouragement of post and regimental polo and toward developing new players able to represent the Army in future important competitions. With this end in view the Army Central Polo Committee recommended that the best and most available regimental or service school team, reenforced by the Army team mounts now at Front Royal, Virginia, be sent to represent the Army at the Junior Championship. This recommendation has been approved by the Chief of Staff and the polo team of the 1st Battalion, 16th F. A. stationed at Fort Myer, Virginia, reenforced by 1st Lieutenant Chas. N. McFarland, 6th F. A. and by the Army Polo Team horses from Front Royal, has been selected to represent the Army at the Junior Championships to be held at Rumson Polo Club, New Jersey, commencing July 20, 1929. Rumson Polo Club adjoins Fort Monmouth where the Army polo ponies will be stabled and the enlisted men will be rationed and quartered.

The Army Central Polo Committee was able thus to encourage regimental polo, particularly because this year it was not necessary to assemble a large Army Polo Team to play matches with foreign military teams. Furthermore, the selection of the strong 16th F. A. team caused a minimum of expense to the Government and absence of officers from their commands.

The 1st Battalion, 16th F. A., left Fort Myer June 17, marching to Tobyhanna, Pa., where it will be until August. The Battalion Commander, Major Cortlandt Parker, states that the players can attend sufficient practice at Rumson by means of their own automobiles to insure that the team will be in good shape and that there will be no interference with the duties of the battalion.



GENERAL SUMMERALL PRESENTING CUPS TO THE 16TH F.A. POLO TEAM JUST AFTER THEY WON THE SOUTHERN DIVISION OF THE SOUTHEASTERN CIRCUIT AT WASHINGTON, D. C., JUNE 17, 1929

LEFT TO RIGHT: 1ST LIEUT. MARK McCLURE, MAJ. CORTLAND PARKER, 1ST LIEUT. GUY C. BENSON, CAPT. R. V. MARAIST

## THE FIELD ARTILLERY JOURNAL

1st Lieutenant Guy C. Benson, 16th F. A., who has been most successful in developing a fast, smooth team and in training the 16th F. A. polo mounts, has been designated Team Captain.

The 16th F. A. has just won the southern half of the Southeastern Intra-Circuit Elimination by defeating the Baltimore Polo Club, the 3rd Cavalry and the War Department Whites, as follows:

<i>16th F. A., 15</i>		<i>Maryland Polo Club, 6</i>
McClure	1	Foster
Parker	2	Warfield
Benson	3	Meigs
Maraist	4	Riggs

Maryland given five-goal handicap. Goals: Parker 4, Benson 4, McClure 5, Maraist 2, Foster 1. Referee, General Booth. Umpire, Major Lyman.

<i>16th F. A., 11</i>		<i>3rd Cavalry, 6</i>
McClure	1	McKenney
Parker	2	Wafford
Benson	3	Divine
Maraist	4	Cunningham

3rd Cavalry given a two-goal handicap. Goals: McClure 6, Parker 3, Benson 2, McKinney 2, Wafford 1. Referee, General Booth. Umpire, Major Lyman.

<i>16th F. A., 10</i>		<i>War Department Whites, 8</i>
McClure	1	Chaffee
Parker	2	Hastey
Benson	3	Hoyle
Maraist	4	Shafer

War Department Whites given a one-goal handicap. Goals: Chaffee 4, Hoyle 3, McClure 4, Benson 3, Parker 2, Maraist 1. Referee, General Booth. Umpire, Major Lyman.



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CHANGES OF STATION (APRIL 1, 1929, TO JUNE 1, 1929)

1st Lt. N. W. Jones to O.R.C., Okmulgee, Okla.  
1st Lt. Millard Pierson to Japan (Language Student).  
Maj. J. P. Lucas to the 82nd F.A.  
Maj. Y. D. Vesely to R.O.T.C., Colorado Ag. C.  
1st Lt. T. E. Lewis to Ft. Sill (Student).  
Capt. A. F. Doran to 82nd F.A.  
1st Lt. R. T. Strode to O.R.C., Jackson, Miss.  
1st Lt. D. P. Poteet to Signal Corps Sch. (Student).  
1st Lt. E. C. Gillette, Jr., to Signal Corps Sch. (Student).  
1st Lt. H. W. Holt to U.S.M.A.  
Maj. R. C. Batson to Fort Sill (Instructor).  
Capt. R. V. K. Harris, Jr., to 4th F.A.  
Capt. C. S. Richards to R.O.T.C., Texas A. & M. C.  
1st Lt. T. O. Foreman to R.O.T.C., Iowa Ag. C.  
Capt. L. F. Crane to 2nd Div. Art., Ft. S. Houston  
Maj. J. H. Wallace to Aberdeen Proving Ground, Md.  
1st Lt. S. Edwards to 2nd Div. Art., Ft. S. Houston  
1st Lt. W. J. Klepinger to 17th F.A.  
Lt. Col. B. M. Bailey to N.G., 4th C.A.  
Lt. Col. A. F. Brewster to 76th F.A.  
Lt. Col. R. M. Danford to Hawaii  
Lt. Col. F. W. Honeycutt to G.S., Panama  
Lt. Col. L. J. McNair to Asst. Commandant, Ft. Sill  
Maj. W. R. Gruber to 7th F.A.  
Maj. R. S. Parrott to R.O.T.C., Princeton U.  
Maj. A. C. Sandeford to Hqs. 2nd C.A.  
Maj. W. S. Sturgill to R.O.T.C., Harvard U.  
Maj. M. Murray to Instr., C. and G.S.S.  
Maj. H. W. Huntley to Instr., C. and G.S.S.  
Lt. Col. W. P. Ennis to 16th F.A.  
1st Lt. R. D. Waring to 4th F.A.  
Maj. W. A. Pendleton to Fla. N.G.  
Capt. J. J. Waters to R.O.T.C., U. of Okla.  
1st Lt. B. M. Fitch to R.I. N.G.  
Capt. R. M. Bathurst, A.C., Brooks Field, Tex.  
Capt. W. H. Hitzfeldt to 82nd F.A.  
2nd Lt. R. L. Mabie to 2nd Div. Art.  
Maj. Howard Eager to Porto Rican Relief Commission, Washington, D. C.  
Maj. E. C. Hanford to O.R.C., Columbus, Ohio  
Maj. G. M. Peek to Staff of F.A.S.  
Lt. Col. J. W. Downer to 6th F.A.  
Maj. J. A. Lester to R.O.T.C., Yale U.  
1st Lt. G. S. Smith, to A.D.C., Gen. Parker, Chicago  
Maj. J. S. Wood to École de Guerre, Paris  
Capt. J. F. Roehm to Ill. N.G.  
1st Lt. R. L. Taylor to 1st F.A.  
Capt. B. A. Day to 7th F.A.  
Maj. C. K. Rhinehart to Ky. N.G.  
1st Lt. J. M. Works to Stu., U. of Pa.  
1st Lt. P. A. Reiche to Stu., U. of Pa.  
Capt. M. S. Creusere to Mo. N.G.  
Capt. D. S. Rumbough to Staff, F.A.S.  
Capt. E. H. Almquist to 82nd F.A.  
1st Lt. R. R. Raymond to U.S.M.A.  
Maj. H. Templeton to 1st F.A.  
Maj. Frank Thorp to Md. N.G.  
Capt. E. H. Brown to O.R.C.  
Maj. J. N. Hauser to 5th F.A.  
Maj. Falkner Heard to 7th F.A.  
Maj. B. Lyerly to 2nd Div. Art.  
Maj. Harleigh Parkhurst to F.A. Board  
Maj. N. N. Polk to Ohio N.G.  
Maj. F. K. Ross to 83rd F.A.  
Maj. R. C. Rutherford to Texas N.G.  
Maj. W. H. Shepherd to O.R.C., Los Angeles  
Capt. H. B. Allen to Philippines  
Maj. J. M. McDowell to O.R.C., Washington, D. C.  
2nd Lt. R. L. Easton to A.C.  
Maj. W. D. Mangan to A.C.  
Capt. F. S. Conaty to 1st F.A.  
Capt. W. Philip to 2nd Div. Art.  
1st Lt. H. L. Kersch to Ft. Slocum  
1st Lt. E. Y. Argo to Italian Cav. Sch.

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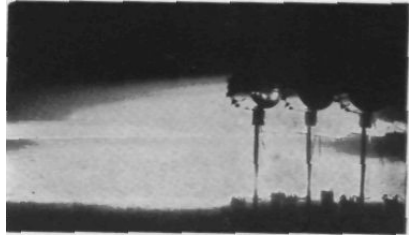
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